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ABSTRACT

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Oral communications

OC1.01

Pharmacists' current and potential role in prescribing in primary care: a multiple case study

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Background and objective: Pharmacist prescribing aims to enhance patient access to pharmacotherapy and improve outcomes, but it has not yet been implemented in the Netherlands. This study explored the current role of pharmacists in prescribing and their potential for prescribing in advanced pharmacy practice in primary care.
Method: A multiple case study was conducted in three general practices with a practice-based pharmacist and three community pharmacies with advanced collaboration with general practitioners (GPs) in the Netherlands. Participant observations of pharmacists were conducted, as were semi-structured interviews about current and potential practice. The latter was extended to other healthcare professionals and patients. Data collection took place between October–December 2022. Cross-case thematic analyses of observation notes and interview transcripts were conducted using NVivo.
Main outcome measures: The current role of general practice pharmacists and community pharmacists in prescribing, and the perspectives of healthcare professionals and patients on potential pharmacist prescribing.
Results: Eight pharmacists were observed during a total of 15 days. Ten pharmacists, eight GPs, one elderly care physician, one nurse practitioner, and fourteen patients were interviewed. In all observation cases, pharmacists wrote prescriptions that were then authorised by a GP. General practice pharmacists often made treatment changes and prescribed medication during patient consultation, without (waiting for) GP authorisation. Community pharmacists mainly influenced prescribing through (1) medication reviews where the physician often was consulted to make treatment decisions, and (2) collaborative agreements with physicians to start or substitute medications in specific situations, such as medication substitution in case of drug shortages. Most interviewees recognised the potential for pharmacist prescribing in some restricted or collaborative form. Addressing several conditions, such as defining tasks and responsibilities, providing prescribing-specific training for pharmacists, and facilitating shared patient information, would be necessary for the formal introduction of pharmacist prescribing.
Conclusion: Pharmacists in advanced pharmacy practice in Dutch primary care have multiple ways of influencing prescribing in individual patients, resembling collaborative prescribing models in other countries. However, several issues need to be addressed before introducing pharmacist prescribing.
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OC1.02

Pharmacist-led interventions in general practice on the use of oral anticoagulants

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Background and objective: Oral anticoagulation (OAC) is the mainstay of treatment for the prevention of strokes in patients with atrial fibrillation (AF). Direct oral anticoagulants (DOACs) account for an increasing proportion of OAC for patients with AF. The challenges of prescribing DOACs in established AF are widely reported, as are inappropriate dosing of DOACs and bleed risk review and management in primary care. This investigates the effectiveness of pharmacist-led interventions in general practice managing of OAC therapies in AF.
Method: A retrospective cohort study screening pharmacist-led interventions recorded in electronic health records of men and women with atrial fibrillation in central Bradford, West Yorkshire, England, between November 2018 and December 2019. A total of 616 patients

with a confirmed diagnosis of AF and on the participant practices' AF Quality and Outcomes Framework (QOF) register were included in this study. AF management and DOAC education were provided to the pharmacists. Comparisons were made to the pre-intervention and post-intervention groups to determine the effectiveness of the pharmacist-led intervention. Prior to the start of data collection, a pharmacist-led intervention was developed and implemented.
Main outcome measures: This data was analysed to identify and describe pharmacist-led interventions on: (1) those with established AF and not on OAC; (2) inappropriate prescriptions for DOACs; and (3) HAS-BLED scores.
Results: Overall, 76% of patients received OAC therapy, and 48% received DOACs. The pharmacist-led intervention increased DOAC prescribing of 6% ($p = 0.03$). Inappropriate DOAC was identified in 24% of DOACs pre-intervention, underdosed (10%) and overdosed (15%), according to DOAC dosing criteria, which reduced to 0.9% of all DOAC prescribing post-intervention, underdosed (0.9%, $p = 0.09$) and overdosed (0.6%, $p = 0.01$). Pharmacist-led interventions to address the modifiable aspects of the HAS-BLED bleed risk scores were undertaken in 12% of patients on DOACs. Mean HAS-BLED scores were calculated and compared pre-intervention to post-intervention, a reduction from 3.00 vs 2.22 ($p < 0.01$). Successful transition from VKA therapy to DOACs was achieved in 25.71% of all patients on VKA therapy (pre-intervention).
Conclusion: Overall, pharmacist-led interventions in the management of OAC therapy in general practice were found to increase OAC rates in this patient group and, significantly, effective in identifying and managing inappropriate DOAC prescribing. Pharmacists can make impactful interventions to manage the modifiable risk factors of a patient's bleeding risk and can work within general practice teams to successfully transition VKA therapy to DOAC therapy, in line with guidelines and best practice.
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OC1.03

Poland integrated medicines management (PIMM): early results of a pilot to deliver a randomized controlled trial assessing provision of complex clinical pharmacy services in the Polish healthcare system

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Background and objective: Numerous studies have shown the positive impact of clinical pharmacy services (CPS) to date. Unfortunately, CPS are still underdeveloped and underutilised in Poland. This study aims to determine if in the Polish healthcare system pharmacist's input at each stage of hospitalisation, from admission to discharge, can result in an enhanced level of patient care.
Method: Within this pilot to deliver a prospective randomized controlled trial (RCT), patients acutely admitted to vascular and general surgery departments of The Regional Specialist Hospital in Wroclaw, meeting eligibility criteria, were randomly assigned to an integrated medicines management (IMM) service group or regular hospital care group. The IMM service involved the provision of a complex clinical pharmacy service at each stage of the patient hospitalisation: medicines reconciliation and review at admission, inpatient monitoring and counselling, and medicines reconciliation with education at discharge.
Main outcome measures: The primary outcome measure was the incidence of hospital readmissions, emergency department visits and other unscheduled visits (GP and specialist care), total and drug-related, after discharge from hospital during the follow-up period. The secondary objective included length of stay (LoS) in hospital. Moreover, in the IMM group the frequency and type of interventions, their acceptance and influence on the quality of pharmacotherapy, perception of the service by patients and healthcare professionals, together with estimating the potential financial benefits of the service were evaluated.
Results: To date, 50 patients have been analyzed of which 45 completed 30-day follow-up. In both groups there were 15 males and 10 females ($p = 1$) with a mean age of 69 (SD 10.82) for the IMM group and 69.44 (SD 12.19) for control group. Additional health care system usage occurred significantly more often in the control group than in the IMM group: 11 (47.8%) vs. 3 (13.6%) [$p = 0.023$]. The median LoS was also longer in the control group, although it did not reach statistical significance: 7 (interquartile range 5–10) vs. 5 (interquartile range 4–7) days respectively. The Pharmacist performed 273 interventions in the IMM group with full acceptance by physicians. The CPS resulted in improved quality of pharmacotherapy and was well perceived by patients.
Conclusion: This pilot study showed a positive impact of the clinical pharmacy service on defined outcomes. This should be further evaluated in a multicentre RCT.
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OC1.04

Benefits of the implementation of a clinical pharmacist's-led transition of care program in a Latin American hospital

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Background and objective: Transition of Care (TOC) focused on a patient's medication is a vital healthcare service that ensures continuity of care as patients move between different treatment stages. Managing these transitions are crucial for patient safety and effective transfer of care.1,2 Pharmacists play a key role in TOC by conducting medication reconciliation and optimizing treatment alongside the healthcare team during the patient's stay in the hospital and discharge, as well as educating patients about their medication.3 This study aims to describe pharmacist interventions in medication reconciliation and hospital discharge after implementing a TOC medication program in a Costa Rican private hospital.
Method: A cross-sectional observational study took place at Hospital Clínica Bíblica in Costa Rica, involving hospitalized patients from February 2022 to May 2023. Eligibility criteria included patients who were polymedicated, on chronic therapy, or using high-risk medications. During the study period, a transitions of care protocol was implemented, focusing on two stages of patient hospitalization: medication reconciliation at admission and patient discharge. Upon admission, an interview was conducted with the patient and their support network to gather necessary information for medication reconciliation. The obtained data was documented in the patient's file for reference during their hospital stay and discharge.
Main outcome measures: Drug-related problems found in medication reconciliation and hospital discharge in hospitalized patients.
Results: During hospital admission, 403 patients were interviewed, with 266 (66.0%) meeting inclusion criteria. Among eligible patients, 139 (52.3%) lacked prior medication reconciliation by the initial

interviewing health personnel. A pharmacist conducted this reconciliation, handling 1261 medications and finding 30 discrepancies. The most common issue (73.3%) was omission of medication during the initial interview. At discharge, a total of 140 patients were reached. Clinical pharmacists performed several interventions directly to patients, with personalized education about their therapy being the most significant (45.90%). Additionally, 56 drug-related problems (DRPs) were identified, primarily concerning safety (39.29%). Following the implementation of necessary interventions, 44 (77.57%) were accepted by healthcare professionals. Among these 44 interventions, the potential impact on medical services was assessed, revealing that 50% could have led to emergency service admissions, resulting in a total cost savings of approximately $4,995. Furthermore, 31.8% could have resulted in outpatient visits to specialist physicians, representing an estimated total savings of $1,680. The remaining 18.2% could have necessitated hospital admissions, leading to approximate savings of $14,335. Thus, the total estimated amount saved from these interventions amounts to $21,010.

Conclusion: The involvement of pharmacists in the implementation of a TOC protocol offers significant benefits in optimizing patients' therapy. By focusing on medication indication and safety, pharmacists contribute to improving treatment outcomes and patient well-being. Their expertise and interventions enhance medication management, minimizing the risks associated with transitions of care.

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OC1.05

Enhancing antimicrobial use: clinical pharmacy interventions in a rural hospital

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Background and objective: Clinical pharmacy services in Austria face implementation challenges, outdated legislation, and a lack of guidelines and training, hindering their impact on patient care. To combat the global threat of antimicrobial resistance, optimizing the use of antimicrobial agents is crucial. Clinical pharmacy interventions, including targeted monitoring and recommendations, play a vital role in enhancing antimicrobial stewardship and promoting rational use. This study aims to identify necessary antimicrobial agent clinical pharmacy interventions for internal medical and orthopaedics/traumatology wards in a 360-bed rural hospital in Austria.

Method: Over 27 months, a clinical pharmacist implemented a series of clinical pharmacy interventions, with a focus on antimicrobial agent use and prescribing. These interventions underwent review, categorization, and analysis using descriptive statistics.

Main outcome measures: The main outcome measures of this study focused on the number and types of clinical pharmacy interventions related to antimicrobial agent use and the types of interventions necessary for these agents.

Results: Among 1,064 interventions analyzed, 142 targeted antimicrobial agent use. The most common intervention addressed drug-drug interactions (44/142), followed by therapeutic and laboratory monitoring (30/142)*. Dosing adjustments were necessary in 21 interventions, including 9 cases involving impaired kidney function. Antimicrobial agents were prescribed without indication in 15 interventions. Errors in documentation were addressed in 7 interventions. Deescalation based on antibiograms, application errors, and inappropriate antibiotic choice were identified as problems in 4/142 interventions each. Moreover, incorrect dosing frequency and improper choice of infusion solution were observed in 3/142 interventions each. The clinical pharmacist recommended switching from intravenous (i.v.) to oral administration in 2 cases, addressed side effects in 2 cases, provided support or advice to patients in 2 cases, and added an agent when there was an indication but no prescription in 1 case.

Conclusion: This study emphasizes the crucial role of clinical pharmacy interventions in enhancing antimicrobial stewardship in a rural hospital. Despite challenges, clinical pharmacists can significantly optimize antimicrobial use, improving patient outcomes and mitigating resistance development. Integrating and expanding clinical pharmacy services are vital for enhancing antimicrobial stewardship in healthcare settings.

OC1.06

Off-label reduced doses of direct oral anticoagulants and risk of ischemic stroke or gastrointestinal bleeding in patients with atrial fibrillation—a case–control study

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Background and objective: Due to fear of bleeding, some clinicians prescribe direct oral anticoagulants (DOACs) at an off-label reduced dose. However, data on the risks and benefits of this practice are scarce and conflicting. Here, we explored the effect of an off-label reduced DOAC dose on the risk of ischemic stroke (IS) or gastrointestinal bleeding (GIB) in patients with non-valvular atrial fibrillation (NVAF).

Method: Two 1:1 matched case–control analyses, including patients aged $\geq$ 18 years with NVAF under ongoing treatment with a DOAC, admitted to a large teaching hospital in north-western Switzerland between 1 January 2012 and 31 December 2021. Cases were patients admitted due to an IS or a GIB, controls patients admitted due to any other reason and free of a history of IS or GIB. Matching criteria included age, sex, year of hospitalisation and type of DOAC.

Main outcome measures: Relative risk estimates, expressed as odds ratios (ORs) with 95% confidence intervals (CIs) of suffering an IS or a GIB in relation to previous treatment with an off-label reduced DOAC dose, adjusted for several potential confounders, using conditional logistic regression.
Results: We identified 203 patients with an IS, 166 with a GIB and the same corresponding number of matched comparison subjects. Among patients with an IS and those with a GIB, rivaroxaban was the most commonly prescribed DOAC (62% and 60%, respectively). Compared to patients with an on-label DOAC dose, patients with an off-label reduced DOAC dose had more than twofold higher risk of suffering an IS (adjusted OR 2.35, 95% CI 1.09–5.08). The risk of suffering a GIB, however, was not altered in patients with an off-label reduced DOAC dose compared to patients with an on-label DOAC dose (adjusted OR 1.01, 95% CI 0.51–2.38).
Conclusion: In this case–control study, off-label reduced DOAC dosing in patients with NVAF seemed to increase the risk for IS, while not providing any benefit in reducing bleeding risk.
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OC1.07

Med rec or Med wreck: hospital-wide analysis and medication reconciliation at the emergency department

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Background and objective: Currently, there is no standardized way of obtaining medication histories in the General Hospital Sint-Jan Brugge-Oostende AV in Bruges. Therefore, this study examined the current medication reconciliation process and how it could be optimized. The implementation of medication reconciliations by pharmacy technicians and medication reviews by a pharmacist at the emergency department were reviewed to determine the added value of pharmacy employees at the emergency department.
Design: The current medication reconciliation process was analysed using the tracer methodology at 10 departments, followed by a Healthcare Failure Mode and Effects Analysis (HFMEA). Medication reconciliation at the emergency department was implemented in stages, with a pharmacist conducting medication reconciliations first (group 1) followed by training of pharmacy technicians who then conducted medication reconciliations (group 2). The number and type of discrepancies between the pharmacist and physician (group 1), pharmacy technician and physician (group 2) and pharmacist and pharmacy technician (group 3) were recorded. The clinical relevance of a selection of discrepancies (which were obtained from 50 patients in each group) was evaluated by 3 physicians and 2 pharmacists. Lastly, a pharmacist performed medication reviews using an implicit (Adapted Medication Appropriateness Index) and explicit tool (Ghent Older People's Prescriptions community Pharmacy Screening).
Results: The HFMEA identified 29 out of 38 possible failure modes requiring action. Multiple actions were listed and categorized by degree of effect. In addition, 459 (group 1, n = 119), 830 (group 2, n = 169) and 39 (group 3, n = 102) discrepancies were recorded. These differences were statistically significant for all 3 groups. Out of a selection of 440 discrepancies, 38.9% were deemed clinically relevant, with a moderate to good level of agreement (0.756; CI 0.718–0.790) between raters. The medication reviews revealed 771 possible drug-related problems. Of the 185 recommendations given, 77% were accepted by the treating physician and 37% were implemented.
Conclusion: The HFMEA helped to define actions in order to improve the quality of the medication reconciliation process. Both pharmacists and pharmacy technicians can conduct medication reconciliations more thoroughly than physicians and medication reviews performed by a pharmacist could have added value for improvement of appropriateness of therapy.

OC1.08

The effect of an multidisciplinary team group consultation on Type 2 diabetes management within the primary care sector

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Background and objective: Cases of newly diagnosed diabetes within the UK are rising exponentially each year. This is a result of sedentary lifestyle, longer life expectancy, ethnic diversity and social inequality. As a result, a holistic approach should be incorporated to manage type 2 diabetes. At a time of Covid restrictions and extra pressure on the NHS, we should adapt our consultations to reduce the burden on the primary care sector when it comes to dealing with managing chronic conditions. Therefore, a multi-disciplinary team virtual group consultation was devised to tackle this issue. The effect of this novel approach will be analysed and compared to more conventional methods that have been part of the current healthcare system.
Method: A pilot virtual group consultation scheme was introduced in North West London to target diabetic patients and support them through a structured educational course. This consisted of three sessions carried out over three months whereby lifestyle advice and referrals to suitable healthcare professionals were made to allow individuals to meet their own targets set at the initial stages of group consultation. An eligibility criteria was created and strictly adhered to during the patient invitation phase. This included type 2 diabetic patients who have been diagnosed within the past 10 years on oral therapy only. Those who gave consent were enrolled onto the three VGC sessions and had initial blood tests followed by another one 3 months after completing the last session. Those who didn't enrol or finish the three sessions were coded as "did not attend" and treated as our control group.
Main outcome measures: The primary outcome of this research was changes in HbA1c over the period of time that patients were enroled onto the VGCs. This parameter is a good indicator of diabetes control and served as the main outcome measure. Due to reglar variations in random blood glucose testing, it was not considered an appropriate tool to compare data. The number of patients who had a decline, increase or no change in HbA1c from their initial and last blood tests were counted for both cohort groups.
Results: During the course of this research, a total of 38 patients had enrolled onto the VGC sessions. Approximately, more than half of these successfully finished the VGC sessions but up to now 16 of them had the blood test within the accepted window. This also corresponds to the number of individuals in the control group who didn't attend the sessions fully. In comparison, it can be noted that the VGC cohort were twice as likely to decrease their HbA1c and maintain these levels for 6 months post initiation phase. This is evident since a total of 13 patients from the VGC session had observed a reduced HbA1c reading as opposed to only 6 within the control group. Conversely, an increase in the readings were observed greatly with the control group whereby 7 patients had lost control of their diabetes as opposed to only 3 within the VGC cohort.

Conclusion: Overall it can be concluded that the VGC cohort were guaranteed a change in HbA1c results as they felt more self-motivated by taking part in the sessions. This was the consensus amongst most individuals according to feedback received after each VGC session. They felt that the MDT approach helped to triage each patient to the correct healthcare professional such that they can work on their own targets, leading to enhanced person centred care.

OC2.01

Sustainability of medicine changes one year post isimpathy medication review by a pharmacist independent prescriber

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Background and objective: iSIMPATHY (implementing Stimulating Innovation in the Management of Polypharmacy and Adherence Through the Years) is an EU-funded partnership between Scotland, Ireland and Northern Ireland. The iSIMPATHY team conducts patient-centred medication reviews using a 7-step medication review tool focusing on 'what matters to you'[1]. Shared decision making aims to reduce inappropriate polypharmacy, to promote adherence and health literacy and to provide patient education. In Northern Ireland the project pharmacists are independent prescribers actioning changes with the patient. One driver for change is the WHO 3rd Global Patient Safety Challenge, Medication Without Harm which aims to reduce severe avoidable medication-related harm by 50% globally in the next 5 years, one of the three key action areas is polypharmacy[2].
Method: Structured, patient centred medication reviews were conducted with patients in acute medical wards in a secondary care setting in Northern Ireland. Priority was given to those on 10 or more medicines, over 50 and resident in a care home, on a high risk medicine or approaching end of life. Data was collected for a cohort of 76 patients who consented to an iSIMPATHY review and who had a change to their medicines by the independent prescriber. Patient records were reviewed to consider the sustainability of the intervention one year post medication review.
Main outcome measures: The main outcome measure was sustainability of medicine changes one year following iSIMPATHY medication review.
Results: The study cohort had an average age of 70 (range 23–97) with 6 long-term conditions and the average number of Eadon interventions per patient was 11. Ninety-five percent of initiated medicines (n = 39) and 100% of dose increases (n = 5) were continued after one year. When short courses of medicine were prescribed (n = 31) e.g. folic acid replacement, 94% were stopped appropriately following the course completion. Of medicines stopped at the medication review (n = 49), 92% remained stopped at one year with only one identified case when an alternative medicine was started in primary care (NSAID). Medicine dose reductions (n = 33) actioned during the review were sustained (n = 20) or the medicines subsequently stopped (n = 10) at one year in 91% patients.
Conclusion: This study showed that the medicine changes made by a pharmacist independent prescriber were sustainable one year after the iSIMPATHY medication review. Indeed dose reductions initiated in secondary care led to further cessation of medicines post review. Shared decision making and communication with the patient has led to sustained changes with no evidence of alternative medicines prescribed. A reduction in inappropriate polypharmacy will lead to improved patient care.

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OC2.02

Exploring the barriers and enablers of remote polypharmacy reviews by pharmacists

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Background and objective: Polypharmacy is when a person is prescribed multiple medications. Polypharmacy reviews aim to consider 'what matters' to patients and optimise clinical outcomes through holistic medication review. Throughout the COVID-19 pandemic, general practice-based pharmacists in Scotland were required to undertake polypharmacy reviews using telephone and/or video consultations. This study aimed to explore and evaluate the barriers and enablers' general practice-based pharmacists experienced when undertaking remote polypharmacy reviews.
Method: All general practice-based pharmacists working within NHS Greater Glasgow and Clyde, Scotland's largest health authority serving a population of 1.2 million residents, were invited to particiipate. One-to-one semi-structured interviews were utilised. Interviews were video-recorded and transcribed verbatim. Qualitative transcripts/data were analysed using an inductive framework analysis.
Main outcome measures: Qualitative themes and sub-themes.
Results: Of 15 participants (10 female), 14 were actively undertaking remote polypharmacy reviews, with 12 utilising telephone only. Six themes were identified; Physical Environment (sub themes Home Working, and GP Practice Working), Logistical (sub-themes Remote Connections, Affiliation/Non-verbal Information, Timeliness, Workforce Issues, and Linking Tasks), Multidisciplinary Team Working, Patient Factors, Professional Factors (sub-themes Experience, Continued Professional Development, and Inefficiency), and Psychological Factors (sub-themes Confidence, Motivation/Personality, and External Pressures).
Conclusion: It is evident general practice-based pharmacists can undertake polypharmacy reviews via telephone or video consulting however, multiple factors regulate the success of these. Physical environment was perceived as an influencing factor and working at home created many barriers throughout the covid19 pandemic. Professional and psychological factors also had an impact on the delivery of remote consultations suggesting a change in workforce culture is required. Further research into the future application of these methods will be required.
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OC2.03

Detecting and reversing prescribing cascades in older adults admitted to an emergency department

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Background and objective: A prescribing cascade is the treatment of an adverse drug reaction (ADR) with another drug. There would be "intentional" and "unintentional" prescribing cascades, "appropriate" or "problematic" ones when the risks of the prescribing cascade exceed benefits. The aim of this study was to detect and correct prescribing cascades in older adults admitted to the emergency department (ED) of a 400-bed public hospital in France.
Design: We conducted a prospective monocentric non-interventional study from September to November 2022. Patients over 65yo admitted to the ED were included. Medication reconciliation and prospective data collection on an observational basis were performed. We identified the prescribing cascades, the drugs involved, if they were appropriate or not, and for clinically problematic prescribing cascades, if they were corrected during hospitalization.
Results: 83 patients were included (mean age 81 ± 9 years, sex ratio 1.0, average length of stay 4.0 days). In medication history, we found 9 medications per patient. 55% of the patients included had at least one prescribing cascade. The average number of cascades was 2 per patient and 79% of the prescribing cascades identified were considered "problematic". 40% were corrected by the medical team during hospitalization. The drugs-ADRs involved in prescribing cascades were: NSAIDS-PPIs (22%), Anticholinergics/Opioids-induced constipation-Laxatives (17%), Antidepressants-anxiety disorder-Benzodiazepines (8%), Calcium channel blockers-edema-Diuretics (7%), Antidepressants-insomnia-Hypnotics (6%), Antiepileptics/anxiety disorder-Benzodiazepines (5%), Antidepressants-agitation-Antipsychotics (3%), Metformin-vitamin B(9) deficiency/Supplementation (2%), PPIs-vitamin B(12) deficiency/Supplementation (2%), Diuretics-hypokalemia-Supplementation (2%).
Conclusion: This study demonstrates the need to raise awareness among healthcare professionals about prescribing cascades. The « problematic» cascades may be reversed by deprescribing. However, sometimes it is complicated to find the chronology of medication history, and a comprehensive interdisciplinary management of patients remains fundamental.
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OC2.04

Why are non-formulary drugs prescribed? A qualitative exploration of the perspectives of patients

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Background and objective: Well-designed and well-maintained drug formularies serve as a reliable resource to guide prescribing decisions, impacting medication safety, efficiency and expenditure. There is, however, an accumulation of evidence of widespread non-formulary prescribing across many institutions. Previous research in Qatar focused on the perspectives of physicians on non-formulary prescribing [1]. This study aimed to explore the perspectives of patients prescribed non-formulary drugs.
Design: A qualitative study comprising semi-structured interviews conducted within Hamad Medical Corporation (HMC), the main provider of secondary and tertiary care in Qatar. The interview schedule items were derived from the Theoretical Domains Framework (TDF), an integrative framework of theories of behaviour change [2]. Patients recently prescribed non-formulary drugs were identified and sampled purposively based on clinical condition. The interviews were audio-recorded, transcribed, and independently analysed by two researchers, using TDF as a coding framework. Ethical approval was obtained from HMC and Qatar University.
Main outcome measure: Qualitative themes on non-formulary prescribing relating to the perspectives of patients.
Results: Data saturation was achieved after interviewing 13 patients. The study findings identified three key themes: non-formulary drug was considered the best option given past response, likely effectiveness and adherence; patients requesting non-formulary drug due to social influences and treatment abroad; and concerns over treatment delays due to formulary processes. The influence of the patient in decision-making and joint patient-physician decision making were apparent throughout.
Conclusion: The findings of this study are original and can be used as targets to facilitate intervention development. TDF domains of social influences, beliefs of consequences, and environmental context and resources appear to be particularly relevant. Mapping these to relevant behaviour change techniques may lead to an intervention which is more likely to be effective compared to pragmatic intervention development.

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OC2.05

Community pharmacist-led falls risk evaluation

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Background and objective: Older people are at higher risk of suffering fall-related injuries due to multiple medications. Community pharmacists may screen older people to identify drugs that increase the risk of falls and contribute to preventing potential harm through collaborative practice. The study aimed to determine community pharmacist interventions to identify older persons at increased risk of falls due to medication use within a collaborative approach.
Method: A literature review of community pharmacy-based medication-related fall risk assessment studies was conducted. The characteristics of each tool used were compared, and a consensus on a final tool for application in community practice was determined through a focus group. The identified tool was applied to screen the medication list of 200 anonymised older persons in a community pharmacy practice. Data analysis determined the prevalence of fall risk-increasing drug (FRID) use in older adults and the feasibility of tool application. After disseminating the results to the focus group, a community pharmacist-led falls risk evaluation framework was developed.
Main outcome measures: Prevalence of fall risk-increasing drug use in a community pharmacy setting, Framework for service implementation.
Results: The literature search generated 26 articles on the topic. Further screening resulted in ten studies utilising three fall risk assessment tools. The consensus from the focus group was to use the Medication Fall Risk Score tool[1]. The mean age of the patients in the

study was 75 years (SD = 7). Almost all patients (94%, n = 188) were prescribed one or more FRIDs. According to the tool criteria, 36% (n = 72) of patients were at high risk of falls, requiring review by a healthcare professional. Of the 128 prescribed medications, 43% (n = 55) are considered FRIDs. Most FRIDs belonged to the medium-risk group (55%, n = 30). Antihypertensives (n = 260) and diuretics (n = 96) were the most frequently prescribed FRIDs in the population. The inclusion criteria for framework implementation were identified as (1) older persons aged 65 and over, (2) with one or more antihypertensive medications, and (3) with one or more high fall-risk drugs.

Conclusion: FRID use among older people was frequent in the sample population. The study provides a framework that could be implemented within a community pharmacy practice to identify older persons at high risk of medication-induced falls through a medication review within a collaborative approach between community pharmacists and physicians.

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OC2.06

Financial impact of a pharmacist-led in-hospital adverse drug events prevention program

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Background and objective: Adverse drug events (ADEs) contribute to rising healthcare costs in Europe (1,2). Clinical pharmacists (ClinPhar) reduce risks of ADEs by preventing medication errors (MEs) through drug therapy optimization. We aimed to build an economic model to reveal whether costs of clinical pharmacists' medication review (MR) activities were compensated by a reduction in healthcare costs associated with the prevention of potential ADEs.
Method: ClinPhar performed MR by identifying and solving drug-related problems (DRPs) to prevent ADEs during ward rounds in an internal medicine unit of a Swiss University Hospital. First, avoided costs were estimated by monetizing five categories of DRPs (*improper drug selection, drug interactions*, *untreated indications*, *inadequate dosages*, and *drug use without an indication*). An expert panel assessed potential ADEs and their probabilities of occurrence for 20 randomly selected DRPs in each category. The costs of ADEs were extracted from internal hospital financial data (analytical accountability). Then, a partial economic study was realized in a hospital perspective, considering all DRPs solved in 1 year by a 0.9 full-time equivalent (FTE) ClinPhar. It estimated the annual costs avoided through ADE prevention and the return on investment (ROI) of MR. Sensitivity analyses were conducted.
Main outcome measures: Median avoided costs by DRP category, annual cost avoided of the potential ADEs, and the ROI of MR.
Results: Median avoided costs by DRP category were EUR 897 for *improper drug selection*, EUR 725 for *drug interactions*, EUR 714 for *untreated indications*, EUR 100 for *inadequate dosages*, and EUR 0 for drug use without an indication. The estimated annual cost avoided of the potential ADEs resulting from 676 DRPs detected was EUR 304,170. The cost of a 0.9 FTE ClinPhar was EUR 112,408. Extrapolated to 1 FTE, the net saving per annum was EUR 213,069, or an ROI of 1 to 1.71. Sensitivity analyses showed the robustness of the economic model.
Conclusion: An innovative calculation model was created using real hospital costs. This study showed the cost-effectiveness of a MR intervention performed by a ClinPhar. It should encourage the future deployment of a pharmacist-led ADE-prevention program.

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OC2.07

Linezolid: the impact of therapeutic drug monitoring in clinical practice

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Background and objective: Linezolid is an antibiotic usually used in drug-resistant gram-positive infections. Although linezolid is typically given at 600 mg/2id, the exposure can differ significantly between patients and can result in treatment failure or toxicity, such as thrombocytopenia[1]. Our aim was the characterization of the hospitalized population under linezolid therapy according to the protocol of the Advanced Pharmacokinetics and Personalized Therapeutics Unit (UFAP) of the Pharmacy Department of our hospital, regarding their demographic characteristics, pharmacotherapeutics and serum levels observed. This study also intends to evaluate the correlation between the trough values obtained and the clinical parameters.
Method: Retrospective and observational study, between August 2022 and March 2023. Data were collected from the patient's clinical files and from the UFAP clinical pharmacokinetic monitoring platform. The protocol considers that the sample collections are carried out in a steady state, with a trough being collected immediately before the administration. The adjustment was based on a mono-compartmental model and linear kinetics. Data were organized according to gender, age, number of measurements per patient, dosages, haematological and biochemical parameters and also the linezolid trough value. In order to understand the impact of dosage adjustments during treatment, the serum concentration values between the first and the last measurement were compared. Statistical analysis was performed using Microsoft Excel®.
Main outcome measures: Comparing the therapeutic regimens between the first and the last dosing, according to the therapeutic range (2–8 mg/L) for the linezolid minimum concentrations.

Results: In this study, 152 patients (96 men and 56 women) with a mean age of 69 ± 15 years were included, corresponding to 295 linezolid measurements (an average of 2 sampling times). All patients started therapy with the standard dose of 600 mg/2 id, translating into a total daily dose (TDD) of 1200 mg. Considering the patients who underwent more than one measurement (n = 77), in the first trough dosing, about 45.5% of the patients were underdosed (< 2 mg/L), 31.2% were within the therapeutic range (2–8 mg/L) and 23.4% were supratherapeutic (> 8 mg/mL). It was verified that in 50% of the patients, there was a change in the TDD instituted according to the proposal of the clinical pharmacist. This intervention made it possible to reduce infratherapeutic dosages to 32.5% and increased dosages within the therapeutic range to 36.4%. However, there was an increase in toxic ones to 31.2%. In the last treatment measurement, 11 patients had a TDD less than 900 mg/day, 30 patients with 1200 mg/day, 22 patients with a TDD greater than 1800 mg/day and 14 patients had their treatment discontinued. Statistically significant correlations were identified between linezolid trough concentrations and platelets count ($r = -0.2$), glomerular filtration rate (GFR) ($r = -0.3$) and aspartate aminotransferase ($r = -0.3$). According to the stratification of patients by their GFR, lower mean values of platelets count were identified (≥ 90 mL/min; 105.1 ± 10.6 × 109/L); (60–90 mL/min 77.8 ± 8.8 × 109/L); (30–59 mL/min; 46.1 ± 9.3 × 109/L); (≤ 30 mL/min; 19.3 ± 6.9 × 109/L).
Conclusion: In this study, therapeutic drug monitoring of linezolid was a useful tool to optimize antimicrobial therapy, reducing underexposure to linezolid. Patients with lower GFR are at greater risk of thrombocytopenia, underlining the importance of linezolid dosage individualization.

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OC2.08

Assessing the reporting of tapering methods in antidepressant discontinuation trials using the TiDier checklist

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Background and objective: Tapering is the recommended approach for discontinuing antidepressant medication. This involves gradually reducing the dose over time to minimise the potential for withdrawal symptoms. However, no previous studies have examined the reporting of antidepressant tapering methods in published studies. The aim of this study was to assess the completeness of reporting of antidepressant tapering methods in a published systematic review using the Template for Intervention Description and Replication (TIDieR) checklist.
Design: A secondary analysis was conducted of studies included in a Cochrane systematic review that examined the effectiveness of approaches for discontinuing long-term antidepressant use. Full-text articles of all studies included in the systematic review were obtained and independently reviewed by two researchers to identify studies that implemented a tapering regimen as part of the discontinuation intervention. This was supplemented by a search for publications of studies that were classified as 'ongoing' in the original review and had since been completed. The completeness of reporting of antidepressant tapering methods in included studies was independently assessed by two researchers using the 12 items from the TIDieR checklist. Each TIDieR checklist item was independently rated by the researchers as either 'reported, 'not reported', or 'unclear'. Any disagreements between the researchers throughout the data extraction/assessment process were resolved through discussion and, consultation with a third researcher.
Results: Twenty-two studies were included in the analysis. Study sample size ranged from 18 to 478 patients. Fourteen studies focused on a single antidepressant or class of antidepressants. Sixteen studies involved the use of placebo substitution. Most studies (19 studies) reported taper durations ranging from 1 to 8 weeks. The most commonly reported taper duration was four weeks (10 studies). Eight studies provided details on tapering rates with reductions typically ranging from 25 to 50% at weekly or monthly intervals. None of the study reports described all TIDieR checklists items. No study clearly reported what materials had been provided (item 3) or whether tailoring had occurred (item 9). With the exception of providing a name for the intervention or study procedures (item 1), only a minority of studies clearly reported on any of the remaining checklist items.
Conclusion: The findings highlight a lack of detailed reporting of antidepressant tapering methods in published trials to date. This needs to be addressed as poor reporting could ultimately contribute to research waste and delay advancements in this area as poorly reported interventions hinder replication and the potential for successful translation of effective tapering interventions into clinical practice. Future antidepressant discontinuation trials could benefit from the use of reporting tools to ensure that details of tapering interventions are adequately reported.
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OC3.01

Impact of a clinical decision support system on clinical pharmacy interventions

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Background and objective: Through aggregation of healthcare digital data, clinical decision support system (CDSS) is a promising approach to prioritize patients according to their potential drug related problem and to benefit from interventions by clinical pharmacist (CP). The aim of this study is to identify the impact of CDSS on CP interventions.
Method: In December 2021, a University Hospital of 985 bed acute care in France, implemented a knowledge-based single system CDSS (PharmaClass. KeenTurtle). Sociodemographics, biological and prescription data were integrated by the CDSS with 73 decision support rules proposed by a multi-disciplinary expert panel. CP screened relevant alerts and proposed pharmaceutical intervention (PI) for physicians corresponding to any proposed therapeutic change about medication.
Main outcome measures: Number of alerts triggered and their criticality analyzed by pharmacists, PI made, medical acceptation rate, error prevention rate.
Results: PharmaClass® detected 1989 iatrogenic situations (5 264 alerts) during the one-month study inclusion period. A total of 681 alerts were analyzed: 190 (27.9%) were considered as technically invalid—mainly due to the characteristics of the interface: 178 (36%)

were pharmaceutically relevant and let to a PI whose 112 (63%) were accepted by physicians. For 88 PI (49%), first drug nurse administration was prevented. The average criticality of the alerts was 5.8/10. Only 12.7% of the alerts during the collection period were analyzed due to a too large number of alerts and duplicates alerts generated (23.4%).
Conclusion: Use of a CDSS seems to be benefit to improve pharmaceutical practice but needs to optimize decision support rules.
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OC3.02

SIMON-PRO: software for clinical follow-up and investigation of people living with HIV

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Background and objective: Clinical follow-up and clinical investigation of people living with HIV (PLWH) must incorporate innovative solutions that allow optimizing the data from the electronic medical record (EMR) and to acquire data from patient reported outcomes (PROs), since traditional manual methods are insecure and inefficient. Our objective is to describe a software (SiMON-PRO: Intelligent Monitoring System; acronym in Spanish) based on EMR data digitization and PROs telepharmacy data record and to describe the data collection procedure.
Design: A multidisciplinary group of clinicians (pharmacists and infectologists) transferred the following software requirements to the hospital's informatic engineers: automatic incorporation PLWH data from EMR (basal, epidemiological, biochemical, microbiological, HIV resistances…); events generations related to clinical events and efficacy and safety antiretroviral treatment (ART) alerts; ART adherence calculation; pharmacist consultations documentation; data analytics by business intelligence for investigational purposes. Regarding the data capture procedure, in each visit to the outpatient consultation of the hospital's pharmacy department, a record is made that incorporates the latest EMR digitized data and the PROs data completed by the PLHIV on a mobile device and transferred to the software through a cyber secure Wi-Fi connection.
Results: A software solution, SiMON-PRO, structured in 5 sections, subdivided into subsections for each PLWH: 1. Basal Record (general, demographic, epidemiological); 2. Follow-up Record (general, epidemiological, analytics, ARTs, PROs); 3. Events; 4. Notes; 5. Tables; 6. Graphics. Each section presents a number of tabs with those coded data needed for clinical follow-up. The software automatically generates alerts for assisted prescription validation. It includes a versatile Indicator Control Panel, where temporary monitoring standards and alerts can be set. It also generates reports for exporting to EMR. It also allows data to be exported to the usual operating systems, through Big Data and Business Intelligence. To date, a total of 1716 patients have been registered in this system, although PROs date has been incorporated very recently.
Conclusion: SiMON-PRO is an innovative solution for clinical monitoring and investigation of PLWH, increasing the quality, efficiency and safety of healthcare. It also makes it possible to have a large amount of digitized data for health research.
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OC3.03

Effect of interdisciplinary pharmaceutical care on the identification of medication errors through telepharmacy

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Background and objective: Early recognition of medication errors (ME) to avoid drug-related problems (DRP) will be possible with the application of Pharmaceutical Care (PC). In remote locations, support with telepharmacy and interdisciplinary management will facilitate the development of the community pharmacist's competencies in this activity. The aim of this study was to determine the ME detected in interdisciplinary PC through telepharmacy.
Design: Pharmacotherapeutic records from a pilot PC via telepharmacy were used, in which 8 pharmacists from 8 community pharmacies from 3 regions of Peru participated. Likewise, 3 clinical pharmacists were assigned as monitors for every 2 to 3 community pharmacists, who identified DRPs, including ME, by performing pharmaceutical interventions. The ME were communicated to patients, physicians and the National Medicines Authority.
Results: Twenty-one patients, 10 women (48%) and 11 men (52%), received PC through telepharmacy, aged 28 to 83 years, with an average of 3 diagnoses per patient. Eighty and nine ME were identified: 45 related to product use, 26 to administration, 13 to prescription, 4 to monitoring and 1 associated with accidental exposure, according to the MedDra 25.0 classification. In addition, according to the NCC MERP classification, 52 ME (58.43%) were category C (an error reached the patient but did not cause harm), 34 ME (38.20%) were category D (an error required monitoring and/or intervention), and 3 ME (3.37%) were category E (an error caused temporary harm to the patient and required intervention). The most frequent ME were: wrong technique in product usage process, inappropriate schedule of product administration and product prescription error.
Conclusion: Interdisciplinary management between clinical and community pharmacists has enabled the identification and communication of ME to patients, physicians, and the National Medicines Authority.
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OC3.04

Pharmacy student attitudes to mental health care: a longitudinal survey

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Background and objective: Attitudes to mental illness are an important factor in the willingness of professionals to engage in mental health care. [1] An understanding of beliefs and attitudes can lead to effective targeted local interventions to improve attitudes.[2] We sought to understand the attitudes of undergraduate pharmacy

students in Ireland to severe mental illness and the provision of medicines optimisation services. Further, we aimed to understand if these attitudes changed through the course of the students' undergraduate training.
Method: A survey instrument was compiled using existing published research. The survey was distributed to all pharmacy students in their first, third and MPharm years annually between 2014 and 2019. The study was designed to elicit attitudes longitudinally as students progressed through undergraduate training. However, following the matching process there were a limited number of students who completed more than one survey and therefore data were treated as independent variables.
Main outcome measures: Pharmacy students' attitudes to psychiatry as a component of the undergraduate curriculum, attitudes to mental illness, the provision of medicines optimisation services and preparedness to practice.
Results: The overall response rate to the survey was 25%. Respondents were mostly female (77.5%) and knew someone experiencing mental illness (83.2%). Notwithstanding generally positive attitudes, a sizeable proportion of students felt people with severe depression and schizophrenia were hard to talk to (29.2% vs 25.3%). Less than half of MPharm students expressed confidence and competence in caring for people with more severe mental illnesses such as bipolar disorder and schizophrenia and 29% of students would feel awkward asking someone about their antipsychotic medication. Almost two thirds (63.8%) expressed an interest in a career in mental health.
Conclusion: Irish pharmacy students have generally positive attitudes towards people with severe mental illness and provision of medicines optimisation services. Self-reported competence and confidence to provide services differ according to the type of mental illness with schizophrenia among the lowest rated. Practical difficulties in conducting longitudinal research are challenging to overcome with low response rates to surveys limiting the generalisability of results. It is nonetheless encouraging that a significant proportion of our future pharmacists consider mental health care to be a potentially rewarding career option.

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OC3.05

Skills and attributes of research supervisors: student and supervisor priorities

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Background and objective: Research in clinical practice has become an integral component of healthcare professional education and is often scaffolded throughout undergraduate (UG), professional registration (PRP) and post-graduate (PG) learning. The alignment of expectations between student and supervisor is key to research success, yet it is still unclear what specific skills and attributes are required in this role. The objectives of this study were to identify the skills and attributes required for effective pharmacy research supervision from both supervisor and student perspectives and describe areas for supervisor support and development.
Design: Pharmacy UG, PRP and PG students undertaking research through Monash University (and their supervisors) were invited to participate in an anonymous electronic survey. Questions captured data on demographics, supervisory skills and attributes identified from existing literature and research experience. Participants were required to list all important skills and attributes, then select from a pre-formatted list, before ranking their top five of each. Supervisors were asked to self-identify supervisory development needs.
Results: In total, 27 students (UG:19, PRP:4, PG:4) and 20 supervisors completed the survey. Four of the five most important skills ranked by students and supervisors were identical: 'prior research experience', 'knowledge in the topic of research', 'prior experience as a supervisor' and 'expertise in methodology'. Students selected 'clear communication' and supervisors chose 'problem solving' in addition to those above. Both groups were similar in their choice of attributes, yet differed in ranking. 'Being supportive' was the top attribute chosen by students which was considerably preferenced compared to the remaining top four attributes of 'being interested in the project', 'provides clear direction', 'provides constructive feedback' and 'being approachable'. Supervisors did not choose 'being approachable' but 'has realistic expectations of the student' and 'interested in the development of the student' instead. Results did not differ significantly when stratified by student group. Supervisor development questions were answered by 18/20 supervisors with the most frequently identified area for development being research methods and analysis.
Conclusion: Pharmacy students and supervisors prioritise similar skills and attributes required for effective research supervision. Outcomes from this survey will inform resource development for supervisors.
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OC3.06

Content analysis of the language used when documenting in the medical records of people with mental illness

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Background and objective: Inappropriate terminology when referring to people with mental health conditions can adversely impact quality of care and aggravate stigma surrounding mental health practice. Identifying biased language is necessary to appropriately address it when training healthcare providers. This project aims to identify, describe, and compare patterns of language used by different mental healthcare providers when documenting care on their patients' medical records.
Method: This is a retrospective review of notes written by 8 healthcare professions. Includes notes of patients who received mental health services from Qatar's sole governmental provider from October to December 2021 through admission, outpatient clinics, and home visits. Language was classified as "Inappropriate (negative) or potentially stigmatizing" and "Appropriate (positive) or conducive of recovery". The content analysis framework was based on the College of Psychiatric and Neurologic Pharmacists (CPNP) Communication Style Guide. Notes were analyzed and classified by two investigators independently, and peer reviewed by a third. Discrepancies were resolved through consensus. Data was entered into Microsoft Excel and characterized by patient demographics, healthcare professional

information and encounter type. Ratios of notes with stigmatizing language were analysed for differences according to healthcare provider and patient diagnosis using Kruskal–Wallis (post-hoc Dunn's; Bonferroni correction).
Main outcome measures: Percentages of "Inappropriate/negative/potentially stigmatizing" and "Appropriate/positive/recovery" language used. Ratios of notes with stigmatizing language by profession and diagnosis.
Results: A total of 300 notes were analyzed. Most notes included potentially stigmatizing language (62.7%). Under this category, disability-first and inappropriate treatment-related language prevailed (33.22% and 31.31%, respectively). A similar proportion of notes (66.7%) also displayed the use of positive/recovery language. Under this category, using personalized descriptors was the most frequently identified (44%). Notes on patients with depression or bipolar had a non-significantly higher ratio of stigmatizing language (0.7 and 0.69, respectively). Profession-wise, notes with stigmatizing language were higher in documentations by dietitians (0.9), Nurses (0.78), and physicians (0.68). Clinical pharmacists had the lowest ratio (0.5) of stigmatizing language used.
Conclusion: Content analysis of mental-health notes revealed similar frequency of positive and negative language patterns. Still, presence of potentially stigmatizing language in the majority of notes indicates a pressing need to raise awareness and training on the use of appropriate documentation terminology by mental health care providers.

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OC3.07

A theory-based evaluation of a simulation based education course for general practice clinical pharmacists: effects on knowledge, confidence and experience

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Background and objective: Increasing numbers of qualified General Practice Clinical Pharmacists (GPCPs) are working in patient facing roles as Independent Prescribers (IPs) with the requirement for managing clinical risk and skilful decision making.[1] Simulation based education (SBE) replicates real-life clinical situations.[2] This research is part of a theory-based comprehensive evaluative programme with the objective to determine the effect of a GPCP SBE course on knowledge, confidence and experience.
Method: This study was carried out with 31 GPCPs from across Scotland. A SBE course was designed for IP-GPCPs containing four advanced practice scenarios. Kirkpatrick Model[3] was used to determine the impact of the course on 'learning'. A tool with 33 items was developed to determine impact on clinical practice in relation to the constructs of knowledge (8 items), confidence (18 items) and experience (7 items) pre and post the delivery of the course. Item responses were on a 5-point Likert Scale (Strongly Agree to Strongly Disagree). Pre/post construct scale scores were transformed to a 0–100 scale using new score = 25(old score −1). Differences were analysed using the Wilcoxon Signed Ranks Test. Cronbach's alpha tested scale item reliability. Ethics approval was granted by RGU PALS Ethics Review panel.
Main outcome measures: Construct scale scores before and after GPCP SBE course were used to test the hypothesis that the course increased participant scores on the constructs of knowledge, confidence, and experience.
Results: Complete data for 20 participants showed; all were active prescribers, only 3 had Advanced Clinical Examination Skills qualifications, and 12 had < 3 years' experience working in general practice. Median (Interquartile Range) construct scores were pre/post: knowledge 70.3 (63.3–77.3)/79.7(72.6–86.7), confidence 60.4 (54.5–71.9)/69.4 (60.8–82.6) and experience 64.2 (50.9–75)/78.6 (75–91.1). Cronbach's alpha for each construct was 0.7 or greater. There was a statistically significant difference between pre and post values for each construct; knowledge $z = -3.564$, $p < 0.001$, confidence, $z = -3.730$, $p < 0.001$, experience, $z = -3.335$, $p < 0.001$.
Conclusion: This work indicates that the GPCP SBE course effectively contributes to the advancement of knowledge, confidence and experience for GPCP clinical practice. Limitations include: a small cohort and use of a non-validated tool but still highlights the importance of this area and need for further work including consideration of changes to clinical practice and impacts on patients.

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Poster Discussion

PDF1.01

Implementation of pharmaceutical care in daily practice in South-Eastern Europe Health Network (SEEHN) member states

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Background and objective: The South-eastern Europe Health Network (SEEHN), a regional intergovernmental organisation, and the European Directorate for the Quality of Medicines & HealthCare (EDQM), a Directorate of the Council of Europe (CoE), are both committed to contributing to improve the health of their member states' (MSs) populations. With a view to promoting Council of Europe Resolution CM/Res(2020)3 on the implementation of pharmaceutical care for the benefit of patients and health services, a joint EDQM-SEEHN survey was conducted to map the implementation of

pharmaceutical care (PC) and related services in daily practice in SEEHN MSs that are also CoE members (i.e. Albania, Bosnia and Herzegovina, Bulgaria, Moldova, Montenegro, North Macedonia, Romania, Serbia).
Design: The survey was distributed using a web-based application to SEEHN National Focal Points, i.e. officials nominated by SEEHN National Health Co-ordinators with knowledge of the latest policy developments in the PC domain. Questions covered the concept of PC, its implementation in daily practice, PC services available in community and hospital pharmacies, and barriers to the implementation of PC. Quantitative data were analysed in percentages and thematic analysis was used for qualitative data (free-text questions).
Results: Seven of eight countries completed the survey (response rate: 87.5%) and eight answers were included in the analysis, as two answers were received from the two entities in Bosnia and Herzegovina. Here are the major findings: 50% of respondents are familiar with the Resolution; the high-level concept of PC is known to 62.5% of respondents and is mostly included in guidance documentations developed by healthcare professionals' associations (50%); electronic health information exchange between healthcare professionals is much more often in place in hospital pharmacy settings than in community pharmacy settings (75% versus 25%); the PC process as described in the Resolution is not fully implemented in any of the SEEHN MSs; PC services (e.g. medication reconciliation and medication review) are mostly available in community pharmacies and reimbursement is lacking in all the countries; the three most frequently mentioned barriers to the implementation of PC were: the absence of regulations or healthcare policies, the lack of data on the proven benefit of PC, and the lack of computerised systems and/or IT tools.
Conclusion: Implementation of the PC process is still limited and PC services are not widely available or reimbursed in SEEHN MSs; therefore, a wider dissemination of the Resolution and promotion of PC are still needed. A first step could be to disseminate these results among relevant stakeholders and policy makers, and to develop a roadmap with all parties to help remove some of the barriers identified.
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PDF1.02

Exploring the implementation of pharmacist independent prescribing into community pharmacy practice using Normalization Process Theory

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Background and objective: Different models of pharmacist prescribing have been implemented around the world [1], with a paucity of evidence for pharmacist independent prescribing (PIP) in community pharmacy (CP). In 2020, the National Health Service (NHS) Scotland launched the Pharmacy First Plus (PFP) service enabling PIPs in CP settings to manage common clinical conditions. The objective was to explore, using Normalization Process Theory (NPT), the implementation of PIP into CP within the context of PFP.
Method: Four semi-structured interviews and three focus groups were undertaken with 11 PIPs online via Microsoft Teams. All currently offered PFP and participated in a previous online survey [2]. The interview schedule and topic guide were based on survey findings and NPT [3]. Use of NVivo v20 supported a framework approach to thematic analysis. Data collection and analysis continued until data saturation. A university ethics review panel approved the study; NHS approvals were not required.
Main outcome measures: Themes related to key stakeholders' views and perceptions of the implementation of PIP into CP within the context of PFP.
Results: Generally, participants were positive about PFP, articulating a willingness to continue to offer it. Seven themes emerged that linked to NPT constructs. In COHERENCE participants shared; their understanding and confidence of new practices and barriers/facilitators to sustaining PFP, views on perceived impacts (Theme: Differentiating new ways of working for PFP), views on benefits of PFP for patients and enhancing professional roles (Theme: Benefits of PFP). In COLLECTIVE ACTION participants highlighted; variations in and complexity of CP workflows (Theme: Pharmacy team roles and dynamics), shared reflections on pharmacists' current skillset and need for new skills and training (Theme: Pharmacy team skillset), shared concerns of additional work including challenges communicating with GP practices (Theme: Workflow changes and challenges). They also shared views on policies and resources supporting PFP (Theme: Resource availability). In REFLEXIVE MONITORING participants highlighted variations between pharmacies, and limited awareness of and engagement with monitoring of PFP prescribing (Theme: Focus on future development and monitoring of PFP).
Conclusion: The predominance of themes linked to coherence and collective action reflects the lack of PFP service maturity. Policy makers and operational leaders should consider how to develop standardised approaches to workflows and consider workforce capacity and skillset along with the need for further support and feedback for participating pharmacists.

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PDF1.03

Does the introduction of pharmacists to the inflammatory bowel disease multidisciplinary team across 3 district general hospitals improve on time post-induction review of biologic therapy?

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Background and objective: The use of biologic therapies is well established in the treatment of IBD. Despite their efficacy, up to 40% of patients fail to respond to treatment [(1)]. Patients established on biologics should therefore be reviewed by the inflammatory bowel disease (IBD) multidisciplinary team (MDT) at key time points to

assess clinical response. The UK IBD registry has developed key performance indicators (KPI's) which recommend a post-induction review at 8–16 weeks and 12 months to assess efficacy [(2)]. IBD MDTs across the UK should include pharmacists to ensure good medicines governance around the use of biologics [(3)]. The NHS Lanarkshire IBD Pharmacy Team, including pharmacist independent prescribers, was established in 2021 across 3 district general hospitals. The team now leads the prescribing of biologics and supports the delivery of post-induction reviews as part of the IBD MDT. The objective was to assess the impact of the introduction of the IBD pharmacy team on the achievement of the IBD registry biologic post-induction review KPIs at 8–16 weeks and 12 months.

Method: A retrospective sample of 2 cohorts of patients initiated on biologics was collected from two time periods; pre-introduction of the IBD pharmacy team (August 2018–October 2020) (n = 31) and post-introduction of the IBD pharmacy team (January 2021–January 2022) (n = 31). All patient's clinical records were analysed to determine when the post-induction reviews took place, as well as which member of the MDT conducted the review and who prescribed the biologic.

Main outcome measures: 1. The percentage of post-induction reviews conducted at 8–16 weeks and 12 months pre and post introduction of the IBD pharmacy team. 2. Where on time reviews were completed at 8–16 weeks and 12 months pre and post introduction of the IBD pharmacy team, which member of the MDT completed the review. 3. Which member of the MDT prescribed the biologic pre and post introduction of the IBD pharmacy team.

Results: Outcome measure 1: Prior to the introduction of the IBD Pharmacy Team, 42% and 61% of post-induction reviews at 8–16 weeks and 12 months respectively were completed on time. After the introduction of the IBD Pharmacy Team, this increased to 88% and 91% at 8–16 weeks and 12 months. **Outcome measure 2:** Prior to the introduction of the IBD pharmacy team, 62% and 53% of the on time reviews were completed by IBD nurses at 8–16 weeks and 12 months respectively, with the remainder being completed by consultant gastroenterologists. After the introduction of the IBD pharmacy team, pharmacists completed 22% and 34% of the on time post-induction reviews at 8–16 weeks and 12 months respectively. IBD nurses completed 46% and 38% at 8–16 weeks and 12 months, with consultant gastroenterologists completing 32% and 28%. **Outcome measure 3:** Prior to the introduction of the IBD pharmacy team, 100% of all biologic prescribing was completed by consultant gastroenterologists. After the introduction of the IBD pharmacy team, 88% of all biologic prescribing was completed by pharmacist independent prescribers.

Conclusion: Introduction of Pharmacists into the IBD MDT improves the timely review of biologic therapies at 8–16 weeks and 12-months. Pharmacists are leading prescribing activities, as well as contributing to post-induction reviews, resulting in increased capacity for the IBD MDT.

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PDF1.04

A cross-sectional study to explore the prescribing of drugs with potential drug gene interactions in Irish primary care

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Background and objective: Pharmacogenetics (PGx) is being increasingly recognised as a strategy for medicines optimisation and prevention of adverse drug reactions. According to guidelines produced by the Clinical Pharmacogenetics Implementation Consortium (CPIC)[1] and the Dutch Pharmacogenetic Working Group (DPWG),[2] most drugs with drug-gene interactions (DGIs), are prescribed in primary care. The aim of this study was to estimate the prevalence of potential and actionable DGIs involving drugs prescribed in primary care in Ireland.

Method: A large primary care database (the Health Service Executive Primary Care Reimbursement Service (HSE-PCRS), which details all prescribing to patients who have a means tested General Medical Services (GMS) card), was analysed to estimate the national prevalence of total prescribing and incidence of first time prescribing of 42 drugs with potential DGIs according to the CPIC and/or DPWG guidelines, for the year 2021 (01/01/21–31/12/21). Phenotype frequency data from the UK Biobank[3] and the CPIC were used to estimate the incidence of actionable DGIs.

Main outcome measures: The main outcome measures were (1) the overall prevalence of prescribing of medicines with potential DGIs, and (2) the prevalence of actionable DGIs.

Results: A potential DGI was present in 17.3% (n = 10,830,871) of 62,754,498 medicines prescribed to GMS patients in 2021, 15.7% (n = 1,700,187) of which were prescribed to patients for the first time. Upon application of phenotype frequencies, 21.4% (n = 2,313,080) and 21.5% (n = 366,103) of total prescribing and instances of first-time prescribing with potential DGIs were actionable. Compulsory changes in prescribing (dose adjustment or drug alternative) were recommended for 41.4% (n = 957,342) and 37.5% (n = 137,341) of total and first-time prescribings with an actionable DGI. The remainder of recommendations entailed increased monitoring, guarding against maximum doses, or an optional drug/dose change. Actionable DGIs were most commonly identified for antidepressants, weak opioids, and statins.

Conclusion: There is a high prevalence of potentially actionable DGIs in primary care. This study identifies areas of primary care prescribing that have the greatest opportunity for medicines optimisation to support the implementation of pharmacogenetic screening programme. The role of targeted PGx testing needs to be further explored and future research should follow patient-reported and clinical outcomes upon implementation of such a programme to evaluate its clinical utility and impact on patient care.

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PDF1.05

Pharmacist's impact on biosimilars' adoption in rheumatology: a prospective study in a Swiss hospital

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Background and objective: Biosimilars represent an opportunity to reduce drug costs for health systems. In our hospital, biosimilar infliximab (b-IFX) was introduced in 2017 and the switch rate has stayed around 60% since 2020. This study aimed to assess pharmacist's impact on b-IFX's switch rate and acceptance by both physicians and outpatients in rheumatology.
Method: In 2020, pharmacists started educating rheumatologists, nurses and outpatients through medical meetings, a self-administered online survey and a patient information-booklet. From 1st October 2021, a prospective cohort study was performed by a senior pharmacist interviewing patients treated by originator infliximab (OI) during the infusion in day hospital, after obtaining both physician and patient consents. A structured questionnaire was used to assess biosimilar patients' beliefs, knowledge, confidence and experiments. All patients received oral information and biosimilar's brochure during interviews and pharmacist's recommendations for physicians were transmitted in electronic medical records. Patients were respectively classified in group A ($\geq$ 1 infusion of b-IFX administered but restarted OI), group B (switch refused by the patient) and group C (switch not suggested or not realized) and a pharmacist follow-up was maintained one year after interviews with regular reminders to rheumatologists.
Results: From 1st October 2021 to 31st January 2022, 16 of 18 patients treated by OI accepted the interview and 3, 6 and 7 patients were respectively in group A, B and C. 44% of patients did not know what a "biosimilar" is. Overall, 9 patients agreed to switch for b-IFX during the interviews and were respectively from group A (n = 1), B (n = 2) and C (n = 6), allowing to reach a switch rate of 82% and an additional annual cost-savings of 94 000 euros. 7 patients refused to switch because they were stable or have discontinued b-IFX before interviews due to patient-reported lack of efficacy. The one-year post-interview assessment reported 3 patients switched (for an annual cost-savings of 30 000 euros), 4 patients with a switch still in progress mostly linked to healthcare professionals' lack of coordination and 2 switches cancelled due to health events. No OI initiations occurred during the study and no rheumatologists refused substitution.
Conclusion: Communication with healthcare professionals and patient information are key for biosimilar use and the adoption rate can be improved by the pharmacist's intervention. A long-term follow-up by the pharmacist is also crucial to support the switch to biosimilars for patients with chronic diseases.
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PDF1.06

A comparison of clinical and patient reported treatment outcomes in chronic hepatitis C patients using direct acting antivirals with and without cirrhosis: a prospective cohort study

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Background and objective: Chronic hepatitis C (CHC) patients with advanced liver diseases such as hepatic cirrhosis are challenging population in clinical management and patient care that require appropriate, safe and effective treatment. **Objective**: To compare clinical and patient reported treatment outcomes of routinely used direct acting antivirals (DAA) in Chronic Hepatitis C patients (with and without cirrhosis).
Method: A prospective cohort study was undertaken recruiting outpatients from a large referral tertiary care hospital. Patients who were diagnosed of having Hepatitis C Virus (HCV) infection and presented with or without cirrhosis were included. A standard twelve weeks treatment comprising of Sofosbuvir (SOF) 400 mg O.D/Daclatasvir (DCV) 60 mg O.D with and without Ribavirin (RBV) 400 mg B.D or T.I.D was used.
Main outcome measures: The primary outcome measure was cure rate. The cure rate was measured in terms of non-detectable viral load level at the end of 12 weeks treatment whereas, the secondary outcome measure was patient reported outcomes (PROs) that were calculated in terms of health related quality of life using Euroqol questionaire; EQ-5D-3L and work productivity loss were determined administering Work productivity and activity impairment questionnaire (WAPAI) through a researcher's administered survey.
Results: The treatment regimen (Sofosbuvir/Daclatasvir/Ribavirin) showed high cure rate (92.6%) in non-cirrhotic patients compared to cirrhotic patients (53%) with a p-value < 0.05. Similarly, in assessing secondary outcome measures, the cirrhotic patients showed significantly lower scores (p-value; < 0.05) of PROs compared to non-cirrhotic patients when measured before and after 12 weeks of treatment.
Conclusion: The Direct Acting Antiviral regimen comprising Sofosbuvir/Daclatasvir/Ribavirin showed higher effectiveness in clinical practice and patient reported outcome measures for chronic hepatitis C patients (without cirrhosis) compared to those with cirrhosis. Therefore, it is imperative to develop and optimize more effective treatment regimens for target population of cirrhotic CHC.
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PDF1.07

An evaluation of the general practice pharmacist role in Northern Ireland

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Background and objective: In order to alleviate healthcare pressures in primary care, the Department of Health in Northern Ireland (NI) announced a 5-year funding initiative in 2015 to fully incorporate General Practice Pharmacists (GPPs) into general practices [1], with similar schemes launched throughout the UK. A previous study by Savickas et al., evaluating the role of the GPP in 2018–19, lacked data from NI [2]. This study aimed to address this gap by exploring the views of GPPs in NI on their role.
Method: Following ethical approval, an electronic questionnaire was distributed by email on two occasions during April and May 2022 to all GPPs in NI (n = 326) who are employees of GP Federations. The

questionnaire was based on that developed by Savickas et al., with permission from the authors [2]. It comprised 31 questions, focusing on services provided, benefits of the role, barriers to role development, and training requirements. Descriptive analyses were conducted using SPSS v27 and free-text responses analysed thematically.
Main outcome measures: N/A.
Results: Eighty-seven responses were received (response rate 27%), the majority of respondents being female (75.9%; n = 66). Respondents provided a range of services, the most common being: undertaking medication reviews (100%; n = 87), medicines reconciliation and resolving transfer-of-care issues (98.9%; n = 86), managing drug safety alerts (95.4%; n = 83), undertaking audits (95.4%; n = 83), and managing repeat prescription requests (95.4%; n = 83). Over half of GPPs described their area of clinical expertise as "generalist" (55.2%; n = 48). The most common perceived benefits of the GPP role was improved patient safety (97.7%; n = 85), a reduction in prescribing errors (96.6%; n = 84), improved cost-effectiveness of medicines (97.7%; n = 85,) and GPPs ' development of new knowledge and skills (94.3%; n = 82). Barriers to developing new roles included lack of time (94.3%; n = 82) and workload (93.1%; n = 81). GPP team meeting workshops was the most useful training activity with 80.2% of respondents (n = 81) rating them very or extremely useful.
Conclusion: GPPs in NI have positive views of their role and identified several perceived benefits of their services to key stakeholders. Some barriers to role development are also highlighted, which should be addressed.

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PDF1.08

Impact of pharmaceutical care service on medication administration hassles of family caregivers at community pharmacy

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Background and objective: The aim of this study was to evaluate the impact of pharmaceutical care service on the medication administration hassles of family caregivers at community pharmacy.
Method: This prospective, quasi-experimental study has been conducted in one community pharmacy located in Istanbul, Türkiye between May, and December 2022. Clinical pharmacist-led pharmaceutical care service (including education and counseling by using teach-back technique and personalized pill card including pictograms) has been provided to the family caregivers (≥ 18 years) in person and follow-up by phone.
Main outcome measures: Changes in score of Turkish version of the Family Caregiver Medication Administration Hassles Scale (FCMAHS-TR) (1).
Results: Among 100 family caregivers (response rate: 86.9%), the mean age [standard deviation] of them was 48.1 [13.38] and 76.0% of them were female. The median [IQR] age of the patients was 74.0 [63.0–83.0]. There was a statistically significant decrease in the median [IQR] of the total FCMAHS-TR score after providing this pharmaceutical care service (baseline assessment: 23.0 [17.0–27.0] vs. final assessment: 17.0 [10.3–20.0]; $p < 0.001$). There were statistically significant decreases in the medians [IQRs] of five subscales of FCMAHS-TR: medication information seeking (baseline assessment: 6.0 [4.0–8.0] vs. final assessment: 4.0 [2.0–6.0]; $p < 0.001$), medication schedule (baseline assessment: 4.0 [3.0–5.0] vs. final assessment: 3.0 [3.0–5.0]; $p < 0.001$), prescription filling (baseline assessment: 2.0 [2.0–4.0] vs. final assessment: 2.0 [1.0–2.8]; $p < 0.001$), medication management (baseline assessment: 4.0 [3.0–6.0] vs. final assessment: 3.0 [3.0–4.0]; $p < 0.001$), and medication knowledge (baseline assessment: 5.0 [4.0–6.0] vs. final assessment: 4.0 [2.0–4.0]; $p < 0.001$).
Conclusion: Clinical pharmacist-led pharmaceutical care service has significantly improved medication administration of family caregivers.

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PDF1.10

The impact of integrated medication reconciliation model led by the hospital clinical pharmacist on hospital readmissions

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Background and objective: Patient safety is a priority of health care. Transfer of care is a critical point for the occurrence of medication errors which can jeopardize pharmacotherapy outcomes. Medication errors related to pharmacotherapy can result in rehospitalization. No optimal and unique model has been standardised in the care transfer between hospital and outpatient settings. The objective was to determine the impact of an integrated medication reconciliation model led by a hospital clinical pharmacist on the incidence of hospital readmissions.
Method: A randomized controlled study of patients 65 years or older was conducted at the University Hospital Dubrava, Zagreb, Croatia. Intervention group of patients received an integrated medication reconciliation model led by the hospital clinical pharmacist (medication reconciliation at admission, review and optimization of pharmacotherapy during the patient's stay in the hospital, patient education and counselling, medication reconciliation at discharge, medication reconciliation in primary health care in collaboration with the primary care physician and the community pharmacist). The outcome measure was number of rehospitalizations and emergency

admissions. All statistical analysis were performed using the statistical program e R 4.0.3 (R Core Team, 2020). Data were analysed based on intention-to-treat analysis. Categorical data were presented as a share or percentage and were analysed with the chi-square test. The fundamental analysis is the goodness-of-fit test.
Main outcome measures: The incidence of hospital readmissions.
Results: A total of 353 patients were analysed (182 in the intervention and 171 in the control group). The two groups, control and intervention, did not differ significantly with regard to the participants' characteristics. The median age of patients in the intervention group was 75.5 (IQR 71–80) while in the control group was 75 (IQR 70–80.5) ($p = 0.470$). The total number of rehospitalizations and emergency admissions, within one year of hospital discharge, was lower in the intervention group than in the control group (41.7% *vs.* 58.3%, $p = 0.005$; 40.8% *vs.* 59.2%, $p = 0.008$).
Conclusion: Transfer of care requires optimized models that would ensure continuity of correct and complete pharmacotherapy. The integrated medication reconciliation model led by the hospital clinical pharmacist in collaboration with all health professionals involved in pharmacotherapy and patient reduced hospital readmissions. The hospital clinical pharmacists should coordinate the transfer of care between the hospital and the primary care in order to increase patient safety.

PDF1.12

The incorporation of pharmacy technicians into the medication administration process as independent checkers: an implementation study

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Background and objective: Extending the role of pharmacy technicians to include supporting nurses in the administration of intravenous (IV) medication has the potential to alleviate current nursing workforce pressures, and is supported by international precedence. (1) This study sought to evaluate the implementation of the introduction of two ward-based pharmacy technicians to conduct this service using mixed methods to determine the service viability and implementation lessons.
Method: A confirmatory mixed methods study design of six months activity data, qualitative interviews (n = 10), and a nurse survey (n = 22) was conducted at the haematology-oncology ward at Children's Health Ireland, the largest paediatric hospital in the Republic of Ireland. The Consolidated Framework for Implementation Research (CFIF) was used to determine implementation lessons.
Main outcome measures: Descriptive activity data was captured including number and type of medications checked, error-reporting trends, and direct nursing time saved. Implementation lessons were thematically analysed.
Results: Pharmacy technicians assisted in the administration of 20% of all IVs during the study period (920/1447), saving one hour per day of direct nursing time. An increase in reporting of near misses and safety issues was observed while actual errors reaching patients remained rare. Twenty-one of twenty-two (95%) nurses regarded the new service as an improvement on the previous model. Implementation lessons centered on the need for adaptability of the intervention for the local context, the prolonged training period due to lack of technician regulation in Ireland, improvements in work culture and medication safety practices, and the appetite for future service expansion.
Conclusion: The incorporation of pharmacy technicians into the medication administration process can provide a safe, effective, and acceptable service and be part of the solution to nursing workforce shortages. This service introduction has provided preliminary data and implementation lessons for other clinical areas and hospitals.

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PDF2.01

The use of behavioral theories in health professional's continuing professional development: scoping review

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Background and objective: Behavioural theories have been used widely in the health field to investigate the ability of interventions to predict and understand behaviours; furthermore, there is conclusive evidence that interventions are more likely to be effective if they are supported by behavioural theory. This scoping review aimed to collate, summarize, and categorize the literature relating to the use of behavioural theories in studies of health professionals' continuing professional development.
Method: This review was was conducted in accordance with the Joanna Briggs Institute (JBI) methodology for scoping reviews (1) and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist (2). The articles were imported into Rayyan web application. Two independent reviewers screened the articles against the inclusion criteria, and completed the data extraction. Data was summarized quantitatively and a descriptive content analysis was adopted of qualitative data.
Main outcome measures: The use of behavioural theories in studies of health professionals' continuing professional development.
Results: Ten articles were included. Studies were published between 2007 and 2022; the majority were conducted in Netherlands and US. A range of behavioural theories were reported; Theory of Planned Behaviour was used most frequently; Self-Determination Theory; Theoretical Domains Framework; Diffusion of Innovation; and the Capability, Opportunity, Motivation and Behaviour model were also reported. In the majority of studies, theory was used to inform the development of data collection tool, either survey questionnaires or interview questions, most frequently to assess the impact of CPD on participants' behaviours. Other studies used theory to evaluate motivation to undertake CPD, assess attitudes towards CPD, or explore the barriers and facilitators to implement CPD. Two studies used theory to underpin the design of the CPD activity. Details for the rationale for the selection of the specific theory were lacking in most studies.
Conclusion: This review provides a descriptive synthesis of the application of behavioural theories presented in ten studies that focus on continuing professional development, which future researchers and program developers might draw to inform their research designs. This review emphasises indicated that underpinning CPD studies with behavioural theory can provide deeper insights into health professionals attitudes and intentions which can be targeted in the design of interventions.

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PDF2.02

Exploring organisational change for the implementation of polypharmacy management using the Consolidated Framework for Implementation Research

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Background and objective: Polypharmacy is a global healthcare challenge. Research has often focused on the use of polypharmacy at the patient level with a paucity at the organisational level. A systematic review showed the need for better use of organisational change management theory [1]; and a recent scoping review identified the need for consideration of implementation frameworks for organisational change [2]. This study aimed to explore the views and perceptions of key stakeholders regarding the development of a framework for implementation of polypharmacy management (PM) in Oman.
Method: Between March 2022-March 2023, semi-structured interviews were conducted in Oman with Ministry of Health medical, pharmacy and nursing leaders, academics, and policy and patient safety leaders. The schedule was developed from a scoping review [2] and Consolidated Framework for Implementation Research (CFIR) [3]. Interviews were digitally recorded, transcribed, deductively coded using the CFIR and analysed thematically.
Main outcome measures: Themes related to key stakeholders' views and perceptions of the development of a framework for implementation of PM.
Results: Thirteen interviews were conducted with; directors of medical (n = 3), pharmacy (n = 3) and nursing practice (n = 1), academic leaders (n = 3), a healthcare policy developer (n = 1) and patient safety leaders (n = 2). Themes were linked to all five CFIR domains. INNOVATION CHARACTERISTICS themes were related to; current evidence for the challenges of polypharmacy in Oman and advantages of PM implementation. OUTER SETTING themes were related to; how PM is a priority in the region aligning with external organisations. INNER SETTING themes focussed on; national leadership support and good organisational awareness of the need for PM, features of available electronic health system supporting or hindering PM, and culture change challenges in Oman healthcare. CHARACTERISTICS OF INDIVIDUALS themes were around stakeholders' familiarity with the concept of PM and their beliefs about capabilities to execute actions related to it. PROCESS themes were related to; the need for a context-specific plan for achieving successful implementation and better outcomes, and engaging all healthcare professionals in implementation of PM.
Conclusion: This study highlights key challenges regarding PM implementation in Oman and the need for support regarding the development of an implementation framework.

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PDF2.03

All aboard—delivering pharmacy support for Ukrainian refugees: a retrospective analysis

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Background and objective: The Russia-Ukraine war displaced 8 million Ukrainians across Europe, with over 20,000 coming to Scotland.[1,2] The Scottish Government chartered a cruise ship Motor Vessel Ambition (MVA) to provide temporary accommodation for 1,100 refugees with a range of healthcare needs.[3] Barriers to refugees accessing pharmaceutical care include: language, health literacy, unfamiliarity with health systems; cultural norms.[4,5] Facilitators include; communication strategies, education, relationship building and medication review.[4,5] NHS Greater Glasgow and Clyde (NHSGGC) placed a bilingual Ukrainian-English speaking general practice clinical pharmacist (GPCP), aboard MVA, embedded in multidisciplinary Asylum Health Bridging Team (AHBT) providing medicines translation and provision. This study describes this initiative.
Method: Retrospective analysis of GPCP IP-led clinics for refugees, Sep2022-Mar2023. The GPCP's role included medicines translation; advice/prescribing UK equivalent medicines; signposting to other services; producing educational material explaining: the prescription ordering process, options for obtaining prescription medication if ran out, listing common Ukrainian medication with no alternatives in the UK. The characteristics of patients were summarised and anecdotal comments from staff and patients were recorded, and summarised.
Main outcome measures: The descriptive account of characteristics of Ukrainian Refugees on board a ship. A description of the intervention characteristics of a bilingual pharmacist prescriber.
Results: 9%(102/1100) patients accessed the GPCP service. Median age 43(range 2–73) years, majority female (71%), resulting in 261 consultations; median 2(range 1–10) per patient lasting approximately 30 min. Effective pathways for medicines reconciliation were established including cardiovascular, respiratory, endocrine diseases and other conditions, with the GPCP issuing 236 (53% of all prescriptions (practices provided 47%)). Many additional patients required

signposting to community pharmacy and other services. Youtube video was produced to address some educational needs. Patient testimonies included: *'This [the video] is really useful… I didn't realise I can approach community pharmacy for supply of medicines, when I can't get to a GP '*. Staff valued the service *'…made a massive difference to patients and has supported the delivery…'* [GP],*'…it made it a lot easier having you on board and able to deal with most of the patient queries before they came to us'* [Practice Manager].

Conclusion: This novel, bilingual GPCP service, integrated within the AHBT, overcame barriers to pharmaceutical care facilitating access to medicines for a vulnerable cohort of Ukrainian refugees. The service smoothed patient's healthcare journeys, and helped minimise the impact on local general practice workloads.

PDF2.04

Anticholinergic drug burden in community-residing older adults in Europe and its association with negative health outcomes

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Background and objective: Anticholinergic medications (ACH meds) and medications with partial anticholinergic activity (AA) are prescribed in older patients particularly for the treatment of psychiatric, gastrointestinal, and genitourinary disorders, but also for other disease conditions. AA of combined drug regimens should be reduced as much as possible in seniors to avoid negative health outcomes. The aim of our study was to describe the prevalence of use of ACH drug regimens in the sample of community-residing seniors (CRS) participating in the EuroAgeism H2020 project and to document associations between AA of drug regimens and health problems in geriatric patients.

Method: Data of 2,865 CRS 65 + assessed in 7 European countries in the EuroAgeism H2020 project (2017–2022) were analyzed (the Czech Republic (N = 450), Serbia (N = 460), Estonia (N = 311), Bulgaria (N = 543), Croatia (N = 391), Turkey (N = 450), and Spain (N = 260)). Seniors were prospectively assessed (Feb 2019-Mar 2020) using the Comprehensive Geriatric Assessment protocol. Descriptive statistics was used to describe the prevalence of use of ACH meds and ACH drug regimens. Logistic regression (adjusted for country, gender, age, number of drugs and diseases) was applied to explore the associations between cumulative ACH burden calculated as a sum of ACH activities of individual medications (on average) obtained from all until now published ACH drug scales. Associations between ACH drug regimen burden and the occurrence of at least 1 expected health problem (e.g., vertigo; chronic constipation; falls in the last month; tachycardia; cognitive impairment etc.) was tested.

Main outcome measures: To determine the prevalence of use of ACH drug regimens in community-dwelling older patients and document the potentially significant associations between ACH drug burden and health problems.

Results: In the European sample, there were 61.2% women, and the mean age of participants was 73.2 ± 6.8 *SD* years. Total prevalence of use of at least one meds with AA was documented as 52.4% (ranging from 37.6% in Bulgaria to 67.2% in Serbia). Combination of 2 and 3 + ACH medications were prescribed in 12.6% and 7.0% of older adults (with the highest prevalence in Spain (12.6%) and Croatia (15.1%), respectively). The most commonly prescribed medications with various AA were: metformin and furosemide (16.6%, 6.0% in the total sample, both with weak AA-1), paroxetine and solifenacin (0.9%, 0.7%, moderate AA-2), and hydroxyzine and amitriptyline (0.7%, 0.5%, strong AA-3). The adjusted odds of experiencing at least one health problem that may directly or indirectly be associated with AA of drug regimen was 3.47 times higher (95% CI 2.12–5.66, $p < 0.001$) in seniors using drug regimen with AA 3 + compared to nonusers of ACH meds, and it linearly increased with the cumulative ACH burden of drug regimen (for one unit increase OR = 1.25, 95% CI 1.14–1.38, $p < 0.001$).

Conclusion: Medications having AA are widely prescribed in CRS in various drug combinations. Significant association between cumulative ACH burden and health problems/symptoms was also confirmed in such population. ACH drug burden should be regularly checked and reduced as much as possible in order to improve individual health outcomes and health prognosis in older adults. Collaborating researchers were supported by grants: I-CARE4OLD H2020 No 965341, EuroAgeism H2020 MSCF-ITN-764632, Cooperatio research program KSKF-I- Faculty of Pharmacy, Charles University (Research Unit chaired by Assoc. Prof. Fialová) and SVV260 655.

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PDF2.05

Management of heart failure in Africa: drugs strategies and 6-year trends (the February study 2016–2021)

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Background and objective: Heart Failure (HF) is an important cause of morbidity and mortality in Sub-Saharan Africa (SSA). The hospital prevalence studies estimate that in SSA, HF is responsible for 9.4% to 42.5% of all medical admission. Our study aims to describe in hospital drugs strategies and 6-year trends in Africa.

Method: We conducted a transversal and longitudinal study in cardiology departments of 36 hospital (public and private) in 16 SSA countries. The February study is an ongoing observatory included all inpatients in February from each year since 2016.

Main outcome measures: Collected data included socio-demographic and clinical characteristics, causes of admission, clinical, biological, complementary examinations, medicines, length of stay were collected by the investigating physicians. HF severity was defined according to proportion of Left Ventricular Ejection Fraction

(LVEF): reduced (LVEF $\leq$ 40%), mildly reduced (LVEF $\geq$ 41–49%) or preserved (LVEF $\geq$ 50%). All analyses were performed with random effect on countries through scripts developed in the R software (4.0.3(2020-10-10)).
Results: HF is the major cause (47.9%) of hospitalization with 2084 patients (57 $\pm$ 17.4 years; 53.8% men) among 4350 included in the February study (2016–2021 (N = 2084/4350). Proportions of patients admitted for HF varied across countries from 28% in Democratic Republic of the Congo to 75% in Guinea. At admission, 55.2% of patients had reduced LVEF, 12.5% had mildly reduced and 32.3% had preserved LVEF. Proportions of drug classes varied significantly according to LVEF: diuretics were significantly more prescribed in patients with mildly reduced (77.8%) or reduced (73.4%) LVEF compared to patients with preserved LVEF (64.3%) ($p > 0.01$). The same result was observed for betablockers (BB) (44% and 43.7% VS 38.6%) and angiotensin-converting enzyme inhibitors (ACEI) (78.3% and 70% vs 50.4%) ($p < 0.01$). Mineralocorticoid receptor antagonists were significantly more prescribed in patients with preserved LVEF ($p < 0.01$). The proportion of BB prescribed increased significantly over the years ($p < 0.05$) from 17% in 2016 to 53% in 2021. Proportions of drugs strategies differed significantly across countries: Two-drug strategies varied from 27% in Benin to 53% in Chad. Drugs strategies differed significantly according to LVEF ($p < 0.01$). The more reduced the LVEF, the more the drug strategy was increased. In patients with preserved LVEF, the proportion of monotherapy was 19%; this decreased to 9% in patients with reduced LVEF. Combinations of three drugs increased from 35% in patients with preserved LVEF to 45% in patients with reduced LVEF. Overall, drug strategies differed across years ($p < 0.05$): three-drug strategies increased from 35% in 2016 to 49% in 2021 and two-drug strategies decreased from 38% in 2016 to 23% in 2021.
Conclusion: Up-titrated strategies were prescribed according to severity of HF and access to BB increased across years. However, according to international guidelines, novel drugs classes remain unavailable in SSA.

PDF2.06

Development of a treatment pathway for nausea and vomiting in palliative care

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Background and objective: Nausea and vomiting (N/V) are of high prevalence in palliative care (PC) and very burdensome. Challenges include the heterogeneous patient population with different potential causes for N/V and the thin evidence-base for available treatments. The German Palliative Care Guideline aims at tumour patients only and remains unspecific in its recommendations (e.g. identifying underlying cause, recommendations for ineffective first-line-therapy). Objective is the development and implementation of an evidence-based treatment pathway (TP) for N/V in PC.
Design: A Before-After-Study consisting of
1. a retrospective study, evaluating the Status Quo of N/V-therapy (15 months),
2. the development of the treatment pathway for N/V in PC and
3. a retrospective study to evaluate the effect of the TP in clinical practice (12 months, expected number of patients: 150).

Primary endpoint (1°): symptom burden of nausea, using IPOS-scale (Integrated Palliative Care Outcome Scale, patient-reported).
Secondary endpoints (2°): A) Effectiveness of therapy (Quality Indicator, QI_N and QI_V respectively) = proportion of patients with IPOS-reduction for nausea or vomiting after 2 days of treatment); B) Drug-related Problems (DRPs) with therapy.
Results: Phase 1: 170 patients with nausea and/or vomiting (60% female, 19–95 years; 25% non-cancer diagnosis; median $IPOS_{N,day0} = 2$); 1°: reduction of nausea on IPOS-$scale_{ØN,day2} = 0.9$ points; 2°: $QI_N = 58\%$, $QI_V = 34\%$; frequent DRPs regarding dose, drug-choice and lack of effectiveness.
Phase 2: TP was developed; consisting of a 4-step-pathway for treatment of N/V; focus on finding underlying cause and indicated pharmacotherapy (including 7 primary scenarios and 10 antiemetics); additional information on drugs to avoid DRPs (e.g. dosing in organ failure, contraindications, drug combinations).
Phase 3: currently taking place since 03/2023, about 25 patients included so far.
Conclusion: Phase 1 confirmed presumption that the management of nausea and vomiting remains unsatisfying for both patients and doctors with need for a treatment pathway to address these challenging symptoms in pallitive care. The implementation process has only just begun and does not yet allow any conclusions to be drawn; preliminary feedback from clinicians shows a simplification of the clinical decision-making. This study helps to facilitate treatment of N/V in PC for clinicians and to improve symptom burden and drug safety for patients, ensuring that therapy meets the current evidence.
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PDF2.07

Usefulness of therapeutic monitoring of isavuconazole in patients with invasive fungal infection

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Background and objective: Triazole antifungals have become first-line drugs for treating invasive fungal infections (IFI). Unlike other triazoles, the need for therapeutic drug monitoring (TDM) to personalize dosing was not initially considered with isavuconazole. However, recent studies in real-life situations have shown greater variability in concentrations than that observed in clinical trials, a fact that would advise TDM to ensure the efficacy and safety of treatments. The aim of this study was to evaluate the usefulness of isavuconazole TDM when used as treatment for IFI.
Method: Prospective observational study (June 2020–February 2023) performed in patients receiving isavuconazole followed up by a TDM program at a university hospital. Demographic information and biochemical parameters were obtained. Isavuconazole was administered in accordance with the drug's SmPC, and plasma concentrations were measured by UPLC using a Luna Omega C18 column (1.6 µm; 2.1 mm × 50 mm, Phenomenex Company). Steady-state trough serum isavuconazole concentrations (Cmin) were determined. A target Cmin therapeutic range of 1–4.6 µg/mL was considered.
Main outcome measures: Thirty-seven patients were included (20 males), of whom 30 belonged to the hematology service and 7 to the intensive care unit. The median (range) age was 59 (26–89) years and the body mass index was 24.7 (17.5–46.3) Kg/m^2. Median (range) of biochemical parameters were: total bilirubin 0.69 (0.21–4.76) mg/dL, AST 29 (8–228) IU/L, ALT 28 (5–220) IU/L, alkaline phosphatase 93 (32–811) IU/L, GGT 77 (8–565) IU/L.

Results: A total of 73 determinations were performed, with a median (range) of monitoring per patient of 2 (1–10) and Cmin of 2.7 (0.17–9.35) μg/mL. After the first monitoring and with isavuconazole standard dosing according to the SmPC, 12 patients (32%) achieved isavuconazole Cmin outside the established range: 7 patients < 1 μg/ml and 5 patients > 4.6 μg/ml. A 71.4% of the intensive care patients presented Cmin outside the established therapeutic range after the first monitoring.
Conclusion: The interindividual variability observed in isavuconazole concentrations with standard dosing, mainly in critical care patients, highlights the utility of TDM as a useful clinical tool to individualize the dose, in order to improve efficacy and safety in IFI treatment.

PDF2.08

Impact of hospitalization on the anticholinergic burden in elderly patients

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Background and objective: Anticholinergic medication usage has been linked to detrimental clinical outcomes, such as delirium and cognitive decline. In elderly patients specifically, the use of anticholinergic drugs has been associated with impaired physical and cognitive functioning, increased fall risk, and higher morbidity and mortality rates. Therefore, the aim of this study was to evaluate the impact of hospitalization on the anticholinergic burden in elderly patients.
Method: We conducted a retrospective analysis of patients discharged from the Internal Medicine Unit between August 2022 and January 2023. Inclusion criteria consisted of patients aged 65 or older who were hospitalized in the Internal Medicine Unit and were prescribed at least one anticholinergic drug at the time of discharge. Patients below 65 years of age or without prescribed anticholinergic drugs at discharge were excluded. We assessed the patients' home treatment upon admission and compared it to their treatment at discharge, calculating the anticholinergic burden at both baseline and discharge.
Main outcome measures: The Anticholinergic Cognitive Burden (ACB) and Drug Burden Index (DBI) scales were used to measure the anticholinergic burden. Statistical analysis was performed using the R program (v 3.6.2).
Results: A total of 101 patients (54 women and 37 men) with a mean age of 83 ± 7.7 years were included in the study. Hospitalization in the Internal Medicine Unit resulted in a significant increase in the ACB score (1.70 ± 1.41 vs 1.93 ± 1.36; $p = 0.02$). Additionally, there was an observed increase in the average score of the DBI scale (0.892 vs. 0.927). After discharge, the ACB scale rating increased in 11 patients (10.8%) and decreased in 1 patient (1%), while the rest remained the same. Regarding the DBI scale, the score increased in 5 patients (5%) and decreased in 1 patient (1%). The risk classification of patients differed between the two scales. At discharge, 28 patients (27.8%) were classified as high risk, 26 (25.7%) as medium risk, 37 (36.6%) as low risk, and 10 (9.9%) as no risk according to the ACB scale. On the DBI scale, 48 (47.5%) patients were classified as high risk, 42 (41.6%) as medium risk, and 11 (10.9%) as no risk.
Conclusion: The findings of this study confirm that hospitalization increases the anticholinergic load in elderly patients. Therefore, it is crucial for pharmacists to review the treatment at discharge to minimize the prescription of drugs that contribute to the anticholinergic burden and enhance the safety of elderly patients.

PDF2.09

Analysis of the effectiveness and safety of tralokinumab in moderate-severe atopic dermatitis

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Background and objective: Atopic dermatitis (AD) is a chronic inflammatory skin disease characterized by the presence of intense itching, eczema and xerosis. The goals of treatment are to reduce symptomatology and prevent exacerbations. Within the systemic treatment of moderate-severe AD, a recently authorized option is tralokinumab, a human monoclonal antibody specifically targeted and with high affinity to IL-13, thus inhibiting binding to its receptor and decreasing levels of mediators of type 2 inflammation. The aim of the study is to evaluate the efficacy and safety of tralokinumab with moderate-severe AD in three tertiary level hospitals.
Method: Observational, retrospective, multicenter study of patients treated with tralokinumab from April 2022 to April 2023. Variables collected: age, sex, previous treatments, concomitant treatments, initiation and duration of treatment, adverse effects (AE) and the severity of AD was analyzed using the scales: Eczema Area and Severity Index (EASI), Investigator Global Assessment (IGA) y Body Surface Area (BSA).
Main outcome measures: Effectiveness was evaluated by the evolution of EASI, IGA, and BSA, assessing the number of patients with a reduction of at least 50% or 75% in EASI values (EASI50 and EASI75, respectively), number of patients to achieve IGA values of 0 or 1 and number of patients to reduce BSA, All this in week 16 approximately. Sources of information: application of electronic prescription Prisma® and computerized medical record Diraya®.
Results: We included 27 patients, of whom 20 (14 women, 6 men) had reached week 16 of treatment or higher, with a mean age of 36.2 years (range 16–53 years) and a median follow-up of 28 weeks. All had received previous treatments with topical corticosteroids (CST) and cyclosporine, where 8 of them had received treatment with dupilumab and 4 with JAK inhibitors. The dosage used was as indicated in the summary of product characteristics. 8 patients were treated concomitantly with CST, 3 with cyclosporine and 2 with methotrexate. The baseline mean of EASI was 28.7 and after the assessment carried out around week 16, 40% (8/20) achieved EASI50 and 25% (5/14) EASI75. With a median dermatologist assessment of 27.5 weeks, the number of patients that continued in EASI50 were 8, and in EASI75 5. As for IGA, starting from 14 patients with values greater than 0 or 1, 43% of them managed to reach these values. The median baseline of BSA was 24, where 2 (10%) patients suffered an increase and 12 (60%) reduced it, reaching 2 of them to values of 0.9 patients discontinued treatment, all of them due to decreased efficacy. In relation to AEs, 2 cases were reported: one patient suffered syncope after the 3rd dose and another patient reported headache, both AEs being limited in time.
Conclusion: Tralokinumab is a novel alternative in patients with moderate-severe AD refractory to other therapies. However, due to the recent indication of this drug, more data on long-term efficacy and safety are needed.
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PDF2.10

Exploring the perspectives of significant others on patients' experiences of cancer services

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Background and objective: Globally, there has been a growing concern that patients are not receiving appropriate cancer care based on their needs. Whilst efforts were made towards better quality of care to meet patients' expectations, healthcare systems are required to operate with decreasing resources given the overall economic context. This study aimed to explore the perspectives of significant others regarding cancer care experiences of patients receiving antineoplastic medicines for colorectal cancer.
Method: A longitudinal design was adopted over a six-month period. Individuals initiating treatment for colorectal cancer with either FOLFOX for 12 cycles or XELOX for 8 cycles at the national oncology centre in Malta were asked to nominate at least one significant other; that is a person who in their opinion was highly involved in their care. Two in-depth interviews with significant others were conducted at patient's initiation and completion of treatment (24 weeks interval), transcribed verbatim and thematically analysed.
Main outcome measures: Themes illustrating perspectives of significant others regarding patients' experiences.
Results: A total of 16 participants, were interviewed [females (n = 12) and spouses (n = 6)]. Three themes were identified: (1) patients' experiences of cancer services (2) healthcare professionals' communication with patients and others (3) recommendations for services. Whilst significant others noted that patients were overall satisfied with cancer services throughout the treatment journey, negative experiences were mainly related to misdiagnosis. The issue of being truthful about cancer diagnosis raised different opinions, with some considering that complete disclosure was insensitive. Some argued that healthcare professionals were directly answering patients' questions without further expansion. This was irrespective of the patients' lack of knowledge and ability to ask further questions. At initiation of treatment, significant others recommended the need for improved awareness of available support services such as psychological services and more regular contact time with healthcare professionals. At completion of treatment, recommendations shifted to availability of cancer care services in the community setting including provision of ambulatory care.
Conclusion: This study showed that timeliness of diagnosis and accessibility to healthcare services were crucial in cancer care. Introduction of interventions along the treatment journey to address the patients' current needs were recommended and "one size fits all" approach is not suitable.

PDF2.11

Entrustable professional activities—assessing medication reconciliation performance of German foundation pharmacists

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Background and objective: Entrustable professional activities (EPAs) are observable process descriptions of clinical work units consisting of knowledge, skills and attitudes[1]. EPAs support assessment of learners within healthcare settings. We developed the EPA "medication reconciliation (MedRec)" at the LMU University Hospital in Munich. This is the first EPA for use in Germany in a clinical pharmacy setting to our knowledge. The objective was to assess and evaluate the foundation pharmacists at the pharmacy department of the LMU University Hospital in MedRec using this EPA.
Method: We tested the EPA "MedRec" in a pre-post-setting. Foundation pharmacists were evaluated twice, once after an introduction into the local MedRec process, then after 4–5 weeks working in that area. The observing pharmacist used an assessment checklist to observe the students with two patients each and to assess the categories "patient conversation", "preparation of medication plan", and "attitudes". The Levels of supervision (LoS) Scale[1] was used to denote the abilities of the participants, with "1" being "only observer" and "5" "can supervise other learners".
Main outcome measures: Performance of medication reconciliation by foundation pharmacists as measured by LoS. Paired t-test was performed with $p < 0.05$ set as significant.
Results: We observed 21 foundation pharmacists in 2022. Participants showed a statistically significant improvement across all categories. The biggest improvement (mean ± SD) was observed in the category "attitudes" (3.99 ± 0.51 vs 4.42 ± 0.45). Students already scored high in the pre-test for "attitudes" as well as "patient conversation" with significant improvements in the post-test. In the category "preparation of medication plans" foundation pharmacists moved from observer status (LoS1) to supervised performance (LoS2).
Conclusion: We could successfully evaluate our foundation pharmacists using the EPA "MedRec" in combination with an assessment checklist. Foundation pharmacists can also use the EPA description and checklist for individual assessment of their learning needs and progress. Further clinical EPAs relevant to pharmacy practice are currently under development.

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PDF3.01

Digital literacy in undergraduate pharmacy education: a scoping review

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Background and objective: Pharmacists play a vital role in harnessing digital tools to optimise patient care. However, a gap exists in pharmacy education regarding digital literacy and effective training. This scoping review aims to identify the approaches for integrating digital literacy into undergraduate pharmacy programmes across different countries, specifically focussing on methods for education, training, and assessment.

Design: Following the Jonna Briggs Institute methodology, a comprehensive search was conducted across electronic databases (CINAHL, MEDLINE, PubMed, and EMBASE) from 1995 onwards, limited to English language publications. Keywords related to digital literacy concepts, education, training, assessment, and undergraduate pharmacy students were employed. Three independent reviewers screened titles, abstracts, and full-text articles, with arbitration by a fourth reviewer. Data were extracted onto a customised data extraction sheet, and a narrative synthesis of findings were conducted.
Results: Fifty-seven articles were included in this scoping review. The findings revealed that effective approaches for digital literacy education focused on a variety of areas, including knowledge of health informatics concepts, exposure to specific technologies, advanced skills for clinical tasks, and interprofessional collaboration skills. Blended pedagogical strategies were commonly employed. A range of assessment approaches were utilised to evaluate students' digital literacy e.g., patient plan development utilizing digital information retrieval, critical appraisal of digital tools, live evaluations of telehealth skills and, quizzes and exams on health informatic concepts. Lastly, external engagement with system developers and suppliers or other institutes supported successful digital literacy education in undergraduate pharmacy programmes.
Conclusion: This scoping review identifies various learning objectives, teaching methods and assessment strategies to incorporate digital literacy in undergraduate pharmacy curricula. Recommendations include acknowledging the evolving digital health landscape, using standardised guidelines for reporting educational interventions e.g., template for intervention description and replication (TIDieR) and the guideline for reporting evidence-based practice educational interventions and teaching (GREET), ensuring constructive alignment between learning objectives, teaching approach and assessments, and collaborating with stakeholders to facilitate the development of digital literacy courses. Despite some limitations, this study provides practical suggestions for enhancing digital literacy education in undergraduate pharmacy programmes.
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PDF3.02

An innovative workshop for undergraduate pharmacy students on inflammatory bowel disease

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Background and objective: Crohn's and ulcerative colitis are the two main forms of inflammatory bowel disease (IBD) which affects about 300,000 people in the UK[1]. Both conditions can have a huge impact on the patient's life and there is no cure. Students at Queen's University of Belfast (QUB) had a 2 h lecture in their third year and may have had the opportunity to meet IBD patients on their hospital or community placement. In addition to this lecture a pilot workshop was developed in conjunction with Crohn's and Colitis UK (CCUK) and the Northern Trust involving a Clinical Education Pharmacist and IBD specialist nurse and volunteers from CCUK; a retired gastroenterologist and patients. The aim of this project was to increase knowledge and understanding of the patient experience, incorporating pre-prescribing skills.
Method: A pilot workshop was co-produced, developed and organised. The workshop was built around clinical activities and scripted scenarios involving primary and secondary care, ulcerative colitis and Crohn's and interdiscplinary working. Students had the opportunity to take blood pressue, pulse and temperature measurements and practise using dummy injectors. Shared decision making and communication skills were demonstrated. Twenty-eight third year MPharm students attended the workshop in November 2019 and completed a pre- and post-workshop questionnaire. Ethics approval was granted by QUB.
Main outcome measures: The main outcome measures were student reported knowledge and confidence.
Results: There was a significant increase in knowledge gained during the workshop; 32% of students 'didn't know that much' about the patient experience before the workshop and after 100% felt knowledgeable, 50% didn't know the side-effects of medicines used before with 100% feeling knowledgeable after. Students listed three things they learned: communication and counselling skills (13 responses), choice of medicines (13), shared decision making (12), pre-prescribing skills (11), diagnosis (10), side-effects of medicines (9), patient experience (9), monitoring (6) and the multi-disciplinary team (2). All agreed that they feel more confident to help patients with IBD and hope to help IBD patients on placements, that the presenters engaged the group and that it was useful to include some pre-prescribing skills in the workshop.
Conclusion: This workshop allowed students to develop their knowledge about IBD while increasing patient understanding and skills development in communication, shared decision-making, multidisciplinary team working, clinical and pre-prescribing skills. All students agreed that the workshop was of benefit. The delivery of the workshop by hospital multi-disciplinary staff and an IBD charity is a novel technique.

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PDF3.03

Deprescribing in frail older people using a multidose drug dispensing system: experiences on shared decision making and information needs

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Background and objective: *Background:* In recent years, increased attention towards deprescribing resulted in a growing body of research and development of guidelines in this area. However, limited knowledge exists regarding individuals' experiences with deprescribing, shared decision-making, and their specific information needs in this context.
Objective: To explore older patient's perspectives on shared decision-making and their information needs regarding deprescribing, as well as their experiences on medication discontinuation and dosage reduction.
Method: Semi-structured interviews were conducted with older patients (≥ 75 years) (n = 20) with hyperpolypharmacy (≥ 10 drugs) using a multidose dispensing (MDD) -system, who received a clinical medication review focused on deprescribing. A topic list was developed and themes covered included *patient's role in the deprescribing process*, *shared decision-making, information needs* and *deprescribing experiences*. Telephone interviews were audio recorded, transcribed verbatim, inductively coded and thematic content analysis was performed.
Main outcome measures: Content analysis of the ad verbatim transcript of the semi-structured interviews will reveal data on patient

satisfaction with the deprescribing process and with the provided information, as well as their experiences on shared-decision making.
Results: In terms of patient's *role in the deprescribing process,* patients primarily expressed their opinions on specific medications they considered unnecessary and highlighted current health issues that should be taken into account. Furthermore, patients indicated whether to resume or increase the dose of the reduced medication, particularly when they experienced less favourable outcomes as a result of deprescribing. The patient's experience with *shared decision-making* regarding proposals to deprescribe medication revealed that they were given the opportunity to express their implementation preference after the consultation and agreement between the pharmacist and the general practitioner. *Information* regarding the advantages and disadvantages of deprescribing from patient's perspective was not consistently provided by the pharmacist although this was not always deemed essential by patients, indicating variable needs for such information. Overall, deprescribing interventions were positively evaluated. They were satisfied to use less medication. However, disappointment was expressed when current health issues did not improve or when originals symptoms resurfaced after deprescribing. Furthermore, the implementation of modifications and tapering schedules through the MDD-system was found to be highly helpful.
Conclusion: Older patients actively participate in the deprescribing process by expressing their thoughts on unnecessary medication, relevant health issues and they indicated preferences to resume or increase reduced medication when outcomes were unfavourable. Patients generally reported information on deprescribing benefits and risks was inconsistent but not always considered crucial. Overall, deprescribing interventions were positively evaluated, with satisfaction from reduced medication use and helpfulness of MDD-system implementation.

PDF3.04

Verification of pharmacy electronic triaging tools for surgical inpatients

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Background and objective: With increasing quantity and morbidity of surgical patients, there is greater demand on clinical pharmacy services to deliver care to patients with complex pharmaceutical care needs. To improve efficiency of clinical pharmacy teams and in line with national priorities, digital solutions should be utilised to electronically identify patients where a clinical pharmacy service would be of greatest benefit. The electronic triaging tools available for use within the health board include; the Pharmacy Early Warning (PhEW) tool, which uses prescribed medicines and a verified scoring tool to prioritise patients as high, medium or low priority for pharmaceutical care. Hospital Electronic Prescribing and Medicines Administration (HEPMA) reports list patients and any high-risk medicines per ward. The objective of this project was to verify these tools prior to implementation to ensure the safe and accurate identification and prioritisation of patients who will obtain greatest benefit from clinical pharmacy review.
Method: Clinical pharmacists at the Queen Elizabeth University Hospital in Glasgow reviewed inpatients in twelve surgical wards over four weeks, applying their clinical judgement to assess and record patients as high, medium or low priority for a clinical pharmacy review that day. This initial priority assessment (IPA) was made as part the pharmacists daily workload, prior to their clinical review of patients and based on the patient's medicines, clinical presentation, blood results and medical notes. The IPA's were then independently compared to the review priority assigned by the PhEW tool for that day. In addition to their IPA, the pharmacists assessed if patients were high priority for clinical pharmacy review based solely on the HEPMA report, which was also compared the pharmacists IPA.
Main outcome measures: To compare clinical pharmacists' assessent of priority for clinical pharmacy review for surgical inpatients, to that assigned by the PhEW tool and HEPMA reports.
Results: There were 201 IPA's carried out by ten pharmacists ranging from a trainee pharmacist to specialist surgical team lead pharmacists. Of the 201 IPA's made by clinical pharmacists, 125 (62.5%) agreed with the priority assigned by the PhEW tool. There were 76 assessments that did not agree, and 54 of them (71.1%) disagreed due to the PhEW tool assigning a higher priority than a pharmacist's IPA. Of the 201 IPA's, 146 (72.6%) agreed with the pharmacists' assessment of priority assigned by the published HEPMA reports.
Conclusion: A pharmacist's IPA of clinical priority was taken as the most accurate and reliable method of assessment in this project and was therefore what both electronic triaging tools were compared to. The PhEW tool agreed with the pharmacist's IPA in 62.5% of cases. Although this is the majority, nearly one third of clinical priorities assigned by the PhEW tool did not agree with a pharmacists IPA. This lack of agreement presents a patient safety issue for the 28.9% of assessments where the PhEW tool underestimated the priority assigned by the pharmacist's IPA, and a workload concern for the 71.1% of assessments that were overestimated by the PhEW tool. There was greater correlation between the priority assigned from review of the HEPMA reports and pharmacist's IPA. Given these results, additional systems are required to work synergistically with electronic triaging tools to ensure the safe and accurate prioritisation of surgical inpatients for pharmacy review.
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PDF3.05

Creation of an educational video to improve the management and administration of ophthalmic treatments at home: hospital retrocession has its role to play!

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Background and objective: Our hospital receives patients with ophthalmic treatments (OT): eye drops and ophthalmic ointments to treat infectious and inflammatory diseases. These OT are at risk of administration errors and storage at home, which may impact their efficacy and/or lead to adverse effects. We evaluated the knowledge and practices of ambulatory patients to whom we dispense OT at the hospital pharmacy (retrocession) and created educational tools to enhance our dispensing advices.
Design: A questionnaire which characterizes patients' knowledge and difficulties about OT has been created and approved by our institution's ethics committee. We also developed with an ophthalmologist and an educational engineer an animated video for adult patients and advice sheets for each OT dispensed. To obtain feedback on those tools we created an anonymous questionnaire.
Results: Of 34 patient responses, 26.7% have administration difficulties, 43.3% have already forgotten their treatment and 23.5% use the same single-dose eye drop several times. Nearly one-third are unaware that an eye inner angle light pressure promotes the drop action and reduces side effects. Patients are interested in getting advice or educational tools. The 5-min video in French: "How to

administer your OT" (+ 2000 views on YouTube) describes practical aspects (status, availability, hygiene rules, administration methods, side effect management) and administration steps (compliance with prescription, administration order, time between each OT, good practice gestures). We developed 7 good use recommendation sheets accessible on the hospital website. A QR-code referring to those tools is integrated into all ophthalmology prescriptions. We obtained 50 feedback responses: 17 patients and 33 city and hospital health professionals. All patients found the video understandable and it made them feel more confident in managing their OT. All professionals deemed the video relevant, appropriate and would recommend it. The advice sheets were considered useful. The overall approach to improve dispensing advice was evaluated as satisfactory (17.6%) or very satisfactory (82.4%).
Conclusion: OT's retrocession must be accompanied by advices. The tools created enable patients and professionals to reinforce their knowledge and improve their good use. We would like to create a similar video for pediatrics and expand to other high-risk treatments to promote good use and compliance at home.
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PDF3.06

A scoping review of the social media-related views and experiences of health professionals in the Middle East and North Africa

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Background and objective: Health professionals are increasingly using social media to provide services to patients, share and disseminate medical information, and develop their professional skills. The World Health Organization (WHO) has articulated that the use of social media has potential to impact healthcare management and health outcomes [1]. Evidence syntheses of largely western literature reports appropriateness of health professionals' use of social media, suggesting the need for greater policy and practice direction. Given cultural and healthcare structure differences compared to other global regions, this review aimed to scope the literature on the social media-related views and experiences of health professionals in the Middle East and North Africa region.
Method: The scoping review was conducted in accordance with the guidelines of Arksey and O'Malley [2]. In November 2022, American Psychological Association Database, Cumulative Index to Nursing and Allied Health Literature, Embase, International Pharmaceutical Abstracts and Pubmed were systematically searched. Title, abstract and full-text screening, and data extraction were independently undertaken by two reviewers.
Main outcome measures: Synthesised findings of views and experiences.
Results: Thirty-four studies, mainly from Saudi Arabia (n = 20) met the inclusion criteria. Fifteen studies reported data from physicians, 7 studies were of dentists, 3 of nurses and 2 of pharmacists. Seven studies reported data from mixed health professional groupings. Study designs were mainly cross-sectional surveys (n = 29), 3 were mixed methods and 2 were qualitative. Only 3 studies included theory in development of data collection tools and/or analysis. The main findings were that social media was perceived to enhance skills and open new communication channels with other professionals and/or patients. Challenges indicated the cultural makeup of the region in terms of confidentiality, sensitivities, and potential ethical and legal consequences. There was an acknowledged need for policy and professional guidance.
Conclusion: While there is an abundance of literature, most originated in one country and is cross-sectional in design. There is a lack of in-depth qualitative research and a notable lack of pharmacist focused research. The pooled data from this scoping review highlight that future theory-based studies are required around policy review, development, implementation and evaluation.

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PDF3.07

Medication at risk of inducing delirium: development of a comprehensive pocket guide for clinical practice

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Background and objective: Delirium is one of the most common causes of acute end-organ dysfunctions across all hospital settings. Patients who develop delirium are more likely to experience increased short- and long-term mortality, decreases in long-term cognitive function, longer hospital stay and increased complications of hospital care. Based on an existing list of medications at risk of inducing delirium developed by clinical experts at the University Hospital Innsbruck this study aimed to comprehensively review all available literature to date to develop the most comprehensive pocket guide detailing medication, mechanism of action and therapeutic alternatives for use in clinical practice.
Design: A total of 17 scientific databases and 96 websites of professional medical organisations worldwide were searched to identify all original, peer-reviewed studies, literature reviews, grey literature and published guidelines. In addition, the Pharmacovigilance databases EUDRAVIGILANCE and FAERS were hand searched for any reported incidents and product characteristics using the EMA website and Medicines Complete. Both narrative and Systematic Review (SR) methodology were followed across three separate projects (PROSPERO: CRC42022366025 & CRD42022366020). The SRs were conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and reported in line with the Equator Network guidelines for systematic reviews. All titles, abstracts and full texts were considered against the inclusion and exclusion criteria by two researchers independently (RM/GBP), with discrepancies resolved by discussion or consideration by a third researcher (AEW). Quality assessment of all included studies was carried out using evaluated tools.
Results: A total of 3600 records were identified across 17 scientific databases as well as 143 guidelines, frameworks or pocket guides. In addition, 26.955 cases associated with delirium were identified in

FEARS and 14.228 in EUDRAVIGILANZ. The product characteristics of 201 drugs across 29 drug classes were included in the study. Antipsychotics, opioids and benzodiazepines carry the highest risk of inducing delirium; however, this study identified many more drugs, drug classes and drug combinations that put patients at risk.
Conclusion: This research has allowed the development of the most comprehensive pocket guide on medication at risk of causing delirium available to practice to date, with further studies focusing on the systematic review of all literature relating to the risk in the perioperative setting.
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PDF3.08

Lived experiences of pharmacy students with atopic dermatitis and their views about dermatology education in pharmacy degree

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Background and objective: Atopic Dermatitis (AD), also called eczema, is a long-term recurrent condition, affecting 10% of the population during their lifetime. It generally develops in children under five. It can also present in adulthood affecting just over 7% of adults[1]. Although there are some available treatments, such as emollients, topical corticosteroids, immunomodulators, and light therapy[2], there is no definite cure so having a good management routine is crucial. This is the point, where pharmacies have the opportunity to improve patient outcomes since patients with AD often come into pharmacies for over the counter solutions and support from pharmacists[3]. Therefore, it is important to make future pharmacists well-equipped to counsel patients properly. One potential area for improving AD care is harnessing the lived experiences of pharmacy students with AD. This study aimed to identify how these experiences influence the way they treat patients with AD and the impact of dermatology education in pharmacy degree.
Method: Qualitative data was collected from interviews with pharmacy students in the United Kingdom. Semi-structured interviews were conducted with students ranging from Stage 1 to 4. Inclusion criteria was diagnosis of AD and having been prescribed any medicine used for AD. The interviews took place in person or online. Each interview was recorded and transcribed verbatim. Thematic analysis method was followed.
Main outcome measures: Pharmacy students' views about the impact of lived experience on the way they treat patients with AD and their views about dermatology education in pharmacy.
Results: Thirteen pharmacy students were interviewed. 12 of them were female and one was male. Most of them were diagnosed in childhood. After thematic analysis, two main themes were identified: i) the added value of lived experience, ii) more visibility in the curriculum. Participants thought eczema impacts people both mentally and physically, and consulting a healthcare provider who has understanding of the reality of the condition helps patients feel that their experiences are understood. Participants felt that lived experience gives them as a pharmacist the ability to show empathy which would help patients. One way of showing this was through sharing their experiences and even giving useful tips about eczema management. However, participants stated the need for more support with the mental health impact of eczema and felt that the impact of their condition was underestimated by society. One way the mental health impact manifested itself for them was needing support with the ongoing management. Participants believed that psychological effects need to be recognised in the management and suggested embedding mental health support into the pharmacy curriculum since they thought pharmacists should have been better trained about how to best support patients with mental health impact of living with chronic condition.
Conclusion: The results highlight that pharmacy students with eczema believe they will be better enabled to help patients through their experiences and show empathy. There is a lack of support for patients with the mental burden of eczema in pharmacy curriculum. Future pharmacists need to be better educated to give mental health support. A limitation of the study is a few participants were Stage 1 students and had not covered all parts of skin conditions so their reflections on the curriculum were hypothetical.

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PDF3.09

Knowledge is power, but ignorance is bliss. Developing a communications strategy for sharing information on medicine shortages with patients

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Background and objective: Recent world events have brought the impact of medicine shortages on patient health outcomes to the fore. Although efforts have been made to provide information to health professionals (HPs) on a national basis, there is no consistent strategy in the UK's medicines policy to communicate information about medicine shortages to patients who receive this information from their interactions with HPs only. There is limited research exploring what information patients prefer to be communicated on medicine shortages. This qualitative study explores patient communication preferences on medicine shortages from the perspective of both patients/representatives and HPs. It also explores current barriers and facilitators to developing an effective strategy to deliver this information to patients.
Method: A descriptive exploratory approach using semi-structured interviews with patients/representatives (n = 10) and HPs (n = 10) was adopted. Participants were recruited via opportunistic and snowball sampling techniques, using the researchers' networks of patient groups, the national Medicine Shortages Response Group (MSRG) and HPs. Interviews were conducted between August and November 2021 via online MS Teams platform, transcribed verbatim and analysed via general inductive thematic analysis with the support of NVivo 12.
Main outcome measures: barriers, facilitators, and patient preferences to inform an effective communication strategy to deliver information on medicine shortages.
Results: Patients prefer a communication strategy on medicines shortages that is personalised, timely, empathetic and originate from a

trustworthy source. The communicated information should ideally be delivered digitally, clearly defining the risks and actions needed to be taken by patients and empowering them to actively participate in their health journey; all aspects which mirror the sentiment and therefore could be facilitated by current UK health policy strategies. Patients felt that difficulty in accessing the desired information and the risk of information overload were the main barriers to achieving their preferred communication. Whilst HPs supported the described strategy and reported digital technology and system opportunities such as workforce developments, sharing of best practise and intermediaries (e.g., patient groups) as facilitators to achieving these, they often felt unsupported and overburdened by this critical task. They identified inadequate access to patient-focused information and lack of resources required to facilitate the strategy objectives as the principal barriers to an effective communication strategy.

Conclusion: Patients' expectations of medicine shortages communication were clear, well-characterised and supported by HPs. These expectations along with the identified facilitators and barriers to effective communication are key to inform design and optimise any communication strategy relating to medicine shortages. Policymakers should seek to use these findings to design, pilot and implement a suitable medicines shortage communication strategy for patients.

PDF3.10

Cost avoidance of pharmacist-led deprescribing using stoppfrail for frail older adults in residential care

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Background and objective: Frail older adults with limited life expectancy in residential care are often prescribed potentially inappropriate medications (PIMs) that increase the risk of adverse drug events (ADEs) and hospitalisations. Whilst the STOPPFrail criteria can aid deprescribing in this cohort, there is insufficient research on the cost savings associated with its application. The aim of this study was to determine the cost avoidance associated with pharmacist-led application of the STOPPFrail criteria to this cohort in residential care facilities in Ireland.

Method: Frail older adults aged $\geq$ 65 years with a poor one-year survival prognosis in six residential care facilities in Ireland had their medications reviewed between August 2021 and April 2023 by a pharmacist using the STOPPFrail criteria, who then recommended to the residents' general practitioners (GPs) to stop/dose reduce PIMs. An independent panel of 4 raters (two GPs and two pharmacists) were asked to rate the probability of an ADE (pADE) occurring if a recommendation was not accepted, using methodology outlined by Nesbit et al. For pADE consensus to be achieved, 75% of raters had to choose the same probability.

The cost of an ADE (cADE) was calculated by multiplying the consensus pADE occurring by the estimated cADE occurring in an older adult from an ambulatory setting ($1,983—converted to euros and adjusted for inflation and purchasing power parity). Direct cost savings (DCS) associated with deprescribing medications were added to the cADE; these were calculated based on publicly available drug reimbursement prices and pharmacy dispensing fees of €5.48 per medication (as of May 2023) in accordance with published guidance for inclusion of drug costs in pharmacoeconomic evaluations (8). The cost of providing the service (cPS) was based on the cost of employing a pharmacist and GP; public salary scales in the Republic of Ireland and Northern Ireland were used to estimate these salaries. The total cost avoidance was calculated based on the cADE multiplied by the pADE in addition to the DCS (drug reimbursement price + pharmacy dispensing fees) less the cPS (time spent by GP and pharmacist on the review x pay per hour). Each factor in the overall cost avoidance estimate included a lower and upper range estimate to produce minimum and maximum estimates.

Main outcome measures: Cost avoidance i.e. expenditure in euro saved that otherwise may have been incurred in the absence of the intervention.

Results: Consensus pADE was achieved thus far for 69 GP-accepted recommendations across 44 residents, with 3 rated as zero pADE (4.3%), 42 as very low pADE (60.9%), 12 as low pADE (17.4%), and 12 as medium pADE (17.4%). The estimated mean cost avoidance based on avoided ADEs alone (cADE x pADE) was calculated as €14,573 (minimum €1,419; maximum €27,741). DCS associated with deprescribed medications was €6,314. The mean cPS was estimated at €1,079 (minimum €384; maximum €2,392). The mean total cost avoidance of the intervention was therefore €19,809 (minimum €7,349, maximum €31,663).

Conclusion: Pharmacist-led deprescribing reviews based on STOPPFrail reduce the number of PIMs and the risk of ADEs for frail older adults with limited life expectancy in residential care, which have the potential for substantial cost savings, and should be considered for implementation on a wider scale in similar settings in future.

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PDF3.12

The effect of clinical pharmacist-led pharmaceutical care services on medication adherence and clinical outcomes in patients with stroke

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Background and objective: The aim of the study is to examine the effects of patient education and follow-up services provided within the scope of the 1-year pharmaceutical care program offered by the clinical pharmacist to the patients admitted to the neurology service with the diagnosis of stroke, on the medication adherence, quality of life and clinical outcomes of the patients.

Method: The study was conducted as a parallel controlled prospective study in the Neurology Service and Stroke Outpatient Clinic of a University Hospital in Turkey. Patients followed up for stroke in the Neurology Clinic were randomly assigned to the Intervention group to receive pharmaceutical care provided by the clinical pharmacist in addition to their routine discharge services, and to the Control group to receive only usual care.

Main outcome measures: Medication adherence (Morisky Green Levine Scale), quality of life (Stroke-Specific Quality of Life Scale, SSQOL) and the NIHSS (National Institutes of Health Stroke Scale) values.

Results: 193 patients (mean age: 61 years, 67.4% male) were included in the study, and the data of 89 intervention and 104 control patients who completed the 12th month control were included in the analysis. 92.2% of the patients were hospitalized with a diagnosis of ischemic stroke. Percentage of patients with medication adherence (86.5% vs 47.1% $p < 0.001$) and the the Stroke-Specific Quality of Life total score ($p < 0.001$) were higher and the patients mean NIHSS score ($p < 0.001$), mean blood pressure and mean LDL cholesterol level were lower in the intervention group when compared to the

control group at 12 months ($p < 0.001$). The percentage of patients with HbA1c target increased more in the intervention group (19.1% vs. 4.8%). The stroke recurrence rate for 12 months was less in the intervention group (2.2% vs 10.6%, $p = 0.044$).
Conclusion: According to the findings of the pharmaceutical care services provided by the clinical pharmacist, it is seen that stroke patients have a positive contribution to medication adherence and clinical outcomes. Therefore, it is an important need to include clinical pharmacists in multi-disciplinary health- care teams.

Posters

PP001

Liquid medication dosing errors in paediatric along parents satisfaction and healthcare providers role perception: Istanbul, Turkey

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Background and objective: The accurate dosing and administration of liquid medications in pediatric patients is crucial by the parents for ensuring effective treatment outcomes and minimizing potential risks to their health and well-being. Predominantly, pediatric medications come in liquid form, requiring parents to select a suitable dosing tool (e.g., milliliter, teaspoon, and tablespoon, etc.). This study aims to address these gaps and shows the most precise and reliable measurement method for liquid medication administration.
Design: This research employed a cross-sectional study design, utilizing a questionnaire and measurement of liquid medication in both community pharmacies and hospitals. The participants included parents of children aged 0–8 years old. The questionnaire was adapted and customized for the specific study setting, and face validation was conducted through forward and backward translation into Turkish language. Prior to data collection, written consent was obtained, and the study design received ethical approval from the relevant committee. The statistical analysis was performed using SPSS version 25.
Results: Totally 400 patient families responded. Overall 49% were woman and 93% were of these women were the child's mother. More than 90% of respondents reported to be knowledgeable of indications, dosing techniques, and duration of medications for their children. Parents report both pharmacists and physicians (31%) to educate them regarding their disease or medicine. 46% reported that they use spoons or dosing cups during administration of liquid medications. Following evaluation of parents dose measuring of 2.5 ml, 5 ml, 7.5 ml the following readings (mean *(range, SD) were attained respectively: 3.64 (2–7; 1.067); 5.57 (3–12;1.24); 8.49 (4–17; 1.846).
Conclusion: Inaccurate devices use and dosing errors are common among parents in Turkey, posing a risk of treatment failure in pediatric patients. Healthcare professionals should employ advanced counseling strategies and provide demonstrative dosing instruments to educate against liquid medication dosing errors, ensuring better treatment outcomes for pediatric patients.

PP002

Drug prescription patterns and cost analysis in diabetes patients: a cross-sectional study in northern Iraq

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Background and objective: Diabetes poses a significant disease burden in Northern Iraq, leading to a high number of prescriptions in both private and public healthcare facilities. Medication regulations in North Iraq are inferior compared to advanced countries however many generic medications in the Iraqi market may offer substantial potential savings to health systems compared to their branded counterparts cost.
The aim of this study is to describe medication utilization patterns in diabetic patients along with the outcomes of therapy and prescription costs in North Iraq.
Design: A cross-sectional study is carried out among patients with type 2 diabetes in three cities. Inclusion criteria included T2DM patients for the last 6 months, Patients taking at least one anti-diabetic medication chronically for 6 months or more, and Patients who had consented to participate in the study. A translated and validated version of the Diabetes Quality of Life (DQoL) instrument and the 5 items Medication Adherence Report Scale were used to interview patients. The patient hospital records were also used to attain clinical outcomes.
Results: Out of 119 sampled patients so far, 79% were women and half of the sampled patients were university graduates. Only 59% were identified as adherent to medication therapy while the majority (79%) were identified as uncontrolled in terms of HbA1c levels. We found no association between the cost of medication therapy and HbA1c status or adherence level.
Conclusion: No significant differences were found in terms of adherence or achieving glycemic targets between patients using generic or costly branded antidiabetic agents. However, the study did identify other socioeconomic factors that were associated with glycemic control. These findings highlight the importance of considering socioeconomic factors beyond medication cost when addressing treatment outcomes in diabetes management.

PP004

Understanding the influence of ethnicity on adherence to antidiabetic medication: meta-ethnography and systematic review

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Background and objective: A high prevalence of diabetes and diabetes-related complications in people from minority ethnic communities is of significant concern. (1,2) Several studies have indicated low adherence rates to antidiabetic medication in ethnic minority groups. (3,4) Poor adherence to antidiabetic medication leads to a higher risk of complications and potential mortality. (5) This review aims to qualitatively explore the barriers to and facilitators of adherence to antidiabetic medication among ethnic minority groups in high-income countries.
Method: A comprehensive search of MEDLINE, Embase, CINAHL, and PsycINFO databases for qualitative studies exploring the barriers to or facilitators of adherence to antidiabetic medication in minority ethnic groups was conducted from database inception to March 2023 (PROSPERO CRD42022320681). A quality assessment of the included studies was conducted using the Critical Appraisal Skills

Programme (CASP) tool. Key concepts and themes from relevant studies were synthesised using a meta-ethnographic approach.
Main outcome measures: Factors identified among ethnic minorities that perceived as barriers or facilitators of adherence to antidiabetic medication.
Results: A total of 20 studies were included in the review and three overarching themes were developed: (1) cultural underpinnings, (2) communication and building relationships, and (3) management of diabetes at home and away.
Conclusion: Multiple barriers and facilitators of adherence to antidiabetic medication among people from minority ethnic communities in high-income countries have been identified. A medication adherence intervention focusing on identified barriers to adherence to antidiabetic medication in these communities may help in improving diabetes outcomes in these groups.

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PP005

Partner pilot study: interprofessional clinical pathway to patient-oriented deprescribing of psychotropic and anticholinergic medications in elderly patients with polypharmacy

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Background and objective: Several psychotropic and anticholinergic drugs are known as potentially inappropriate medications and can increase the risk of adverse drug reactions, especially in older patients with polypharmacy. However, their deprescribing (discontinuation or dose reduction) is often complex and time-consuming. Pharmacists can support general practitioners (GPs) in this regard, provided that both professions adopt a coordinated approach and work together. The aim of the PARTNER pilot study was to test the feasibility, acceptability, potential benefits and barriers to implementing the PARTNER intervention and key processes of a planned cluster-randomized trial.
Method: The study design was a single-arm prospective intervention study. Intervention components included (1) educational material for GPs and pharmacists on target medications, (2) a moderated interprofessional case conference, (3) a patient-pharmacist consultation using medication-specific empowerment brochures, medication analysis, and (4) a patient-GP consultation. Data were collected by the study team and health care providers at defined intervention steps and through semi-structured interviews. Quantitative and qualitative data were integrated as part of a mixed-methods approach.
Main outcome measures: We will report the proportions of patients with a decision to deprescribe target medication, pharmacists' and GPs' perspectives on intervention components as well as implementation barriers for the intervention.
Results: Four clusters, each consisting of a GP practice and at least one collaborating community pharmacy, were subjected to the intervention. Among eligible patients ($\geq$ 65 years with polypharmacy, use of $\geq$ 1 psychotropic/anticholinergic drug and not meeting exclusion criteria), a total of 30 patients were randomly selected and recruited by participating GPs. Half of the patients had more than one target medication and received more than one empowerment brochure. After patient-GP consultation, deprescribing (discontinuation or dose reduction) of one or more target medication was agreed in 18 (60%) patients. The results of the qualitative data analysis will be presented at the symposium.
Conclusion: The findings of the pilot study confirm the feasibility of implementing the PARTNER intervention in German primary care as well as the potential of the PARTNER intervention to stimulate deprescribing of psychotropic/anticholinergic medication. A multicentre confirmatory cluster-randomized trial with process evaluation is currently evaluating its effectiveness in reducing the use of target medication in German primary care.
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PP006

Patient evaluation of a community pharmacy travel health service

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Background and objective: The NHS Grampian Travel Health Service is available to all travellers (including children) who require advice and/or vaccinations for travelling to a destination considered at risk of tropical disease. Four NHS funded vaccinations included within the service are provided free of charge with additional vaccinations and anti-malarial products available for a fee.
An 18 month pilot of this service has recently concluded and an evaluation has been undertaken to capture patient satisfaction and feedback about this new service model via community pharmacy.
Design: A patient feedback questionnaire was adapted from a previous audit of COVID vaccination provision from community pharmacy.
Five-point Likert scale questions assessing statement agreement along with free text comments box were used to capture user views of service provision.

Paper versions of the questionnaire, provided by participating pharmacies, supplemented by NHS Grampian social media messaging with a QR code linked to an electronic questionnaire, were used to capture feedback. The data collection period was 10th January 2023 to 20th February 2023.
Results: 45 service users responded during the data collection period (10% of those who used the service). A summary of the quantitative responses is detailed below:

- 100% were very satisfied with the overall service provision (top score)
- 100% were very likely to recommend to friends and family (top score)
- 100% were very likely to return to pharmacy for future vaccinations (top score)

- 69% said they would have tried to be vaccinated elsewhere **if** the pharmacy service wasn't available
- 13% said they would not have been vaccinated elsewhere
- 18% said they were unsure if they would have been vaccinated elsewhere

31 patients also provided comment in the free text final question.

- 100% positively reinforced patient experience of the service

The most frequently used words in the free text section were "excellent", "professional", "efficient", "easy", "appointment" as well as expression of "thanks" for providing this "accessible" service.

Conclusion: Patient feedback about the NHS Grampian travel health service, delivered by community pharmacies, is overwhelmingly positive, captured via the patient questionnaire, with particular emphasis on the 31% of patients who either wouldn't or were unsure if they would have obtained vaccines if this service model wasn't available.

PP007

Pharmacist intervention when responding to symptoms

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Background and objective: Community pharmacy provides an accessible healthcare service for patients with requests to treat minor illness. Pharmacists are able to facilitate patient self-medication in a safe and appropriate manner. The objective of this study was to characterise presentation of symptoms and requests by patients for self-care in community pharmacy practice and to evaluate pharmacist's intervention in self-care pharmacotherapy.

Method: In the first phase of the study, two pharmacies from each of the five Maltese districts (N = 10) were randomly selected using stratified sampling. Two sessions of three-hour duration of non-participant observational studies were carried out. A data collection form was compiled to list down patient category, pharmacist intervention and organ system for which the request is made. For the second phase of the study, a focus group discussion with community pharmacists, healthcare professionals and laypeople was held online to explore pharmacist intervention during self-care pharmacotherapy. A thematic analysis was carried out to discuss and interpret emergent themes.

Main outcome measures: Determination of the most popular requests for self-care and characterisation of pharmacist intervention.

Results: In total, 154 requests for self-care were observed. The adult population is the most common patient group which frequented the pharmacy (49%). Symptoms or requests for skin conditions (25%) are the most frequent, followed by respiratory (19%), digestive (16%) and musculoskeletal (12%) systems. Out of 107 instances where pharmacists provided advice, pharmacological advice (68%) was the most frequently provided. From 117 instances where pharmacists asked questions, the most frequently asked question related to elaboration of symptoms (64%). Thematic analysis of the focus group discussion identified four main themes; pharmacist's role in self-care, information-gathering performed by the pharmacist, type of advice given by the pharmacist during self-care requests and the quality of pharmacist-patient interaction.

Conclusion: This study highlights the adult population as the most frequent population requesting self-care pharmacotherapy. Pharmacist intervention is widely observed during self-care requests while four main organ systems characterise symptom-based requests.

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PP008

Mental health evaluation in Portuguese community pharmacies

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Background and objective: Anxiety and depression's prevalence in Portugal, which was already high, has risen with the Covid-19 Pandemic. Community pharmacists are well-positioned to identify and monitor the treatment of these mental illnesses. The aims of the study were to screen undiagnosed people for anxiety and depression symptoms, and to assess the control of these conditions in diagnosed patients. Additionally, we aimed to assess the frequency of symptoms based on sociodemographic characteristics, isolation, and the perceived impact of the COVID-19 pandemic.

Method: Observational, descriptive, and cross-sectional study of a sample of community pharmacy users, selected by a non-probabilistic method by the pharmacy team. Inclusion criteria were being 18 years or older and having the ability to complete a self-administered questionnaire, providing informed consent. The questionnaire included sociodemographic information, diagnosed diseases, anxiety assessment scale (Generalized Anxiety Disorder-7, GAD-7), depression assessment scale (Patient Health Questionnaire-9, PHQ-9), and questions related to isolation and the impact of the COVID-19 pandemic. Statistical analysis was conducted using SPSS (IBM SPSS V. 28).

Main outcome measures: Anxiety and depression scales scores.

Results: Between September 2020 and July 2021, a total of 592 participants were included, of which 442 (74.7%) were females. The mean age was 50.2 ± 0.7 years and the majority had secondary (32.6%) or higher (32.8%) education. Out of the total, 82 (13.9%) participants reported living alone. The most frequently reported diseases were hypertension (26.2%), hypercholesterolemia (18.6%) and anxiety (17.2%). Among the 477 undiagnosed participants who completed GAD-7, 87 (18.2%) exhibited moderate or severe symptoms of anxiety. For those 485 who completed the PHQ-9, 59 (12.1%) displayed moderate or severe symptoms of depression. Related to the 94 patients diagnosed with anxiety, 37 (39.4%) reported moderate to severe symptoms. Similarly, among the 97 patients with depression, almost half of them (49.5%) reported moderate to severe symptoms. Moderate or severe symptoms of anxiety and depression were more prevalent in females ($p < 0.001$), participants with secondary educational level or lower ($p < 0.05$) and those taking medication for insomnia ($p < 0.001$), pain ($p < 0.05$), anxiety ($p < 0.001$), and depression ($p < 0.001$). Regarding the impact of the COVID-19 pandemic, the domains of professional life (229; 38.7%) and family life (218; 36.8%) were reported as being the most negatively affected. Additionally, on a scale from 0 (no impact) to 10 (serious harm), 50.2% of the respondents rated the impact of COVID-19 pandemic on their lives with 5 or lower. Living alone was statistically associated with a lower impact on participants' lives ($p < 0.05$).

Conclusion: Consistent with the pilot study conducted, the data presented in this study underscore the potential role of pharmacists in identifying individuals at risk for anxiety and depression. Furthermore, in the case of previously diagnosed patients, it is evident that clinical pharmacists can play a significant role in managing these conditions.

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PP010

Cardiovascular risk evaluation using the risk predictors score and score2 in a community pharmacy

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Background and objective: Cardiovascular disease (CVD) is a major public health problem worldwide. As health professionals, pharmacists can identify early individuals at risk of CVD, by implementing screening programs, based on risk prediction algorithms. In 2021, a new cardiovascular risk assessment algorithm the SCORE2 (Systematic COronary Risk Evaluation 2) was published, which assesses the 10-year risk of fatal and non-fatal cardiovascular events. The previous SCORE assesses the 10-year risk of fatal cardiovascular events. We aimed to compare risk prediction using the SCORE and SCORE2 in individuals who were not on cardiovascular therapy in a community pharmacy.

Method: A cross-sectional observational study was conducted. All individuals who entered the pharmacy during the recruitment week were registered, and were subsequently contacted to participate in the study. The exclusion criteria were customers below the age of 18, pregnant customers, and customers who were already on cardiovascular therapy. During the interview, the pharmacist recorded sociodemographic data, assessed physiological and biochemical parameters, and determined the cardiovascular risk by applying the SCORE and SCORE2.

Main outcome measures: Evaluation of the prevalence of cardiovascular risk factors in participants who were not on cardiovascular therapy, the SCORE and SCORE2 risk, and the participation rate.

Results: Of the contacted individuals, 53.4% (n = 588) returned to the pharmacy for their cardiovascular risk assessment. Of the 588 participants, 43.4% (n = 255) were not on cardiovascular therapy, and of these 94.9% (n = 242) had at least one modifiable cardiovascular risk factor: 18.4% (n = 47) smoking, 60.4% (n = 154) dyslipidemia, 53.7% (n = 137) overweight, 41.6% (n = 106) hypertension, 21.6% (n = 55) impaired fasting glucose, and 57.7% (n = 147) sedentary lifestyle. The SCORE and SCORE2 algorithms were applied to the 150 eligible participants. With the SCORE scale, 96.0% had low to moderate cardiovascular risk, 2.7% had high cardiovascular risk, and 1.3% had very high cardiovascular risk. With the SCORE2 scale, 64.7% had low to moderate cardiovascular risk, 32.0% had high cardiovascular risk, and 3.3% had very high cardiovascular risk.

Conclusion: We demonstrated the feasibility of CVD risk screening in community pharmacies, both by the high attendance rate and the high prevalence of screened patients at risk of CVD. The SCORE2 shows greater discrimination in risk classification in the younger age groups, an important factor in CVD screening.

PP012

Development of quality indicators to measure quality of medication handling in municipalities

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Background and objective: Studies have shown that community pharmacies can contribute to strengthening medication handling in municipalities by providing relevant teaching and pharmacy services to staff at nursing homes, home care and residential facilities about how to work safely with medication. A Danish study is being conducted to strengthen the implementation of this teaching and pharmacy services. One objective in the study is to develop and test a set of quality indicators to measure the quality of medication handling in municipalities to be used by pharmacies and municipalities to support preparation and practice-orientation of teaching and pharmacy services for municipal staff.

Design: The indicators were developed in four steps: (1) Collecting literature on already developed indicators, issues and legislation related to medication handling; (2) Having a dialogue with a nurse responsible for medication at a nursing home to get an insight into the medication workflow; (3) Testing and adjusting the indicators at the same nursing home; (4) Testing and adjusting the indicators by a community pharmacy at a residential facility. Testing of the indicators at a larger scale is being carried out in 20 municipalities by 20 community pharmacies from November 2022 to April 2023, with a before and after teaching measurement to access sensitivity of the indicators for changes in the quality of medication handling. The measurements are registered electronically in Microsoft Forms. The data will be analysed quantitatively. After the testing the pharmacies will answer a survey on the use of the indicators and data will be analysed qualitatively.

Results: Of the six indicators developed, two relate to municipal institutions' procedures (structure indicators), one is a process indicator for the medication list, one is a process indicator for dispensing medication and two are process indicators for medication administration. The measurement will be conducted by pharmacy staff at a visit to at least one institution in the municipality. The results from the testing will be presented at the symposium.

Conclusion: A set of six quality indicators, both structure and process indicators, to measure the quality of medication handling in municipalities was developed to be used by pharmacies and municipalities to support preparation and practice-orientation of teaching and pharmacy services.

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PP013

A multi-site repeated prevalence study of medication shortages in community pharmacies

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Background and objective: Medication shortages are now recognised as a global problem, with notable examples featuring in recent media coverage. (1,2) They are expensive for health systems to manage, causing additional costs for the replacement of medicines and absorbing significant staff time, and presenting a risk of errors from medication substitutions. Most academic research to date has focused on the hospital setting, and on staff views. To contextualise the research to date, this study sought to provide a contemporary estimate of the prevalence of medication shortages in community pharmacies.

Method: Four community pharmacies (two urban, two rural) in the Republic of Ireland recorded details of prescription request shortages per items dispensed. Data were gathered one study day per month

over from February to April 2023. The 'shortage' definition was adopted from national regulatory guidance, which, of note, does not consider shortage of a specific brand of a mediation as a shortage when other brands are available.
Main outcome measures: Mean prevalence of medication shortages per one hundred requested prescription items.
Results: Pooled analysis of the four community sites indicated 82 of the 3102 requested prescription items were classified as medication shortages. Shortage prevalence was estimated at 2.5% (95% CI 2–3%). Urban pharmacies had a higher shortage rate than rural pharmacies (2.8% vs 1.6%, $p < 0.05$). There was a non-statistically significant increase in prevalence from February to April.
Conclusion: Community pharmacists encounter and manage medication shortages on a daily basis with a contemporary estimate of prevalence now estimated. Delays in treatment and increased costs to the health system were also reported. Changes in supply arrangements also lead to staff time taken from direct patient care. Further longitudinal studies could better capture seasonal trends in shortages. Increased pharmacist autonomy to manage shortages, along with regulatory initiatives are required.

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PP014

A qualitative study of the psychological wellbeing of pharmacists during the COVID response

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Background and objective: Research has begun to draw attention to the challenge to community pharmacists in delivering services during the COVID-19 response, and the associated adaptions in the sector. (1,2) However, few qualitative studies have examined the impact of these experiences on their wellbeing, This study aimed to examine community pharmacists' work-related experiences and psychosocial needs arising from the COVID-19 response.
Method: Twelve community pharmacists in the Republic of Ireland participated in semi-structured interviews that were thematically analysed.
Main outcome measures: Themes relating to psychological stressors and perspectives on the needs of the profession to foster wellbeing were elicited.
Results: Participants experienced increased workload-related stressors that arose from the multiple roles that pharmacists adopted resulting from being one of few services in the community that remained open during the pandemic. Stressors included the challenges of meeting the needs of patients who could not access other primary services. Pharmacies also acted as a site for social connectedness for the public creating new relationships with patients. Despite this, participants felt that contributions during the COVID-19 pandemic had largely gone unrecognised by the wider healthcare structure. This added to a sense of disenchantment that had already taken root within the profession prior to the emergence of the pandemic due to long-standing under-resourcing, lack of clinical autonomy, and their role being stripped of meaning by high administrative burden.
Conclusion: The post-pandemic environment is an opportune time for policymakers to reconsider the role of pharmacists. Greater clinical autonomy in medicines supply and service provision would enhance pharmacists' sense of purpose and meaning as healthcare professionals. Such actions would help support the longer-term of viability of community pharmacy in Ireland and help to ameliorate the sense of disenchantment currently meant by many within the profession, but also assist in the retention of pharmacists within community pharmacy.

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PP015

Citizens' perspective on the role of pharmacists in prescribing in primary care: results of a citizen platform

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Background and objective: The provision of high quality pharmaceutical care is facing challenges in an aging society. To address this issue, task shifting is widely considered. In this context, increasing the role of community pharmacists in the medication prescribing process is an option to optimally use their expertise. However, pharmacist prescribing has not yet been implemented in the Netherlands. The aim of this study was to investigate the perspective of citizens on the role of pharmacists in medication prescribing in primary care, taking into account needs, barriers and preconditions.
Method: A citizen platform was organised, consisting of a one-day programme where citizens were engaged in interactive assignments and received expert presentations to foster the development of informed opinions. In the final assignment, groups of citizens were moderated to design their ideal future scenario for medication prescribing in primary care, considering the role of the pharmacist. All assignments were recorded and notes were taken. Results from the groups were combined and thematically analysed.
Main outcome measures: The characteristics and preconditions of the citizens' ideal medication prescribing process.
Results: Ten participants (from different age, region and background) described a future scenario involving a primary health centre where general practitioners, pharmacists and other healthcare professionals collaborate as a multidisciplinary team, using a shared patient record. In this scenario, pharmacists may have a prescribing role for certain chronic conditions and initiate treatment independently for minor ailments. Pharmacists may also provide support for patients with polypharmacy and complex care needs. Participants mentioned the

need for additional training for pharmacists to enable them to prescribe. They also emphasized the importance of clear agreements between healthcare professionals about tasks and responsibilities, with general practitioners retaining the overall patient overview. The four-eyes principle to review prescriptions before dispensing was considered an important precondition as well.
Conclusion: The findings suggest that if preconditions related to collaboration, patients records and training are met, informed citizens are open to an expanded role of pharmacists in medication prescribing in primary care.
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PP016

Identification, classification, and documentation of drug related problems in community pharmacy practice: a scoping review

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Background and objective: Drug related problems (DRPs) can have negative impacts on patient´s health, increase hospital admissions and healthcare costs. The identification, classification, and documentation of DRPs can improve patient care and facilitate inter-professional communication. Community pharmacists are well placed to identify DRPs. Although there are validated methods to document and classify DRPs such as the Pharmaceutical Care Network Europe (PCNE) Classification system or the Westerlund system, there is no uniformly accepted classification system agreed upon to document and classify DRPs in community pharmacies across Europe. This scoping review aimed to characterise the approaches to the identification, classification, and documentation of DRPs in community pharmacies.
Design: The scoping review was conducted in accordance with the Joanna Briggs Institute methodology for scoping reviews and the PRISMA ScR reporting guidelines. Eleven scientific databases and grey literature sites were searched to identify publications on the identification, classification, and documentation of DRPs in community pharmacies across Europe since inception. All titles, abstracts and full texts were considered against the inclusion and exclusion criteria by two researchers independently (DH/AEW/LSN/DS), with discrepancies resolved by discussion. The reference lists of included full text and other key studies were hand-searched for further eligible studies for inclusion and citation searching was carried out using the included full texts to identify further relevant publications.
Results: A total of 67 publications were identified. The publications originated in 15 different European countries with publication dates between 1997 and 2022. The objectives of the publications varied from the detection, nature, and frequency of DRPs in prescription/over-the-counter medications to the development of new classification or documentation systems. The review identified 12 different approaches to the identification of DRPs, 12 approaches to their classification and many different approaches to their documentation.
Conclusion: Approaches to DRPs are heterogeneous and there is still no standardized method for identifying, classifying, or documenting DRPs in community pharmacy, despite 25 years of research in this field of practice. This scoping review highlights the need for the development and implementation of a standardized system for community pharmacy service provision and patient safety.
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PP017

Extended competences of the community pharmacist in the field of prevention—measuring the level of vitamin D in the pharmacy

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Background and objective: Vitamin D insufficiency is a problem that affects more than a billion children and adults worldwide. Vitamin D deficiency is associated with many acute and chronic diseases, including autoimmune disorders, infectious diseases, cardiovascular disease, cancer, type-2 diabetes, and neurological disorders. Pharmacists as healthcare professionals have many competencies that can also be used in the prevention of vitamin D deficiency. The community pharmacy is an unique environment for point-of-care testing (POCT) the level of vitamin D. It provides an excellent opportunity for community pharmacies to enhance pharmaceutical care competences, revenue by expanding patient care services while improving health at the patient and population levels. The aim of the project "Measuring the level of vitamin D in the pharmacy" was 1. to raise awareness of the importance of a sufficient level of vitamin D in the blood; 2. to inform about the broad competencies of pharmacists and appeal to the prevention options of vitamin D deficiency in the community pharmacy.
Method: Measuring of vitamin D levels was realized as community one-time pharmacy-based POCT screening in patients and short questionnaire survey on using of vitamin D. The vitamin D was determined with fluorescence immunoassays-based in vitro test used HURRICANE HP-083/4-II. It is designed for the quantitative determination of total 25-hydroxy Vitamin D in human finger-prick blood.
Main outcome measures: Vitamin D levels in patients who underwent the POCT screening in community pharmacy and the questionnaire survey results on using the vitamin D in its deficiency prevention.
Results: We´ve screened 48 patients during two days in community pharmacy. Only 15 (31.3%) of patients had a value within the norm, i.e. above 30 ng/ml. Twenty-four patients (50%) knew the optimal daily dose of vitamin D; 47.9% of patients use vitamin D only in winter and only 18.8% year-round. and 10.4% only were recommended to have their vitamin D levels determined by their general practitioner; 88.9% of patients correctly stated in the questionnaire that vitamin D is taken after a meal. The patients also correctly stated that it can be dripped into cold or lukewarm food (40.7%) and that vitamin D capsules and tablets should not be chewed or crushed (66.7%). Patients were ever before educated by pharmacists about the vitamin D to support immunity (n = 96.4%). Patients also showed knowledge about using of the vitamin D in the therapy of serious diseases; and 42.9% only knew about the vitamin D effects and role in cell division and proper functioning of muscles. All tested patients confirmed sense in pharmacy measurements and would undergo it regularly. All of them were also educated about the importance of using of vitamin D and were recommended the re-examination of vitamin D level measurement.
Conclusion: Our results show that vitamin D deficiency is wide. Vitamin D community pharmacy-based screening could help to improve the prevention of vitamin D deficiency and to strength the role of the community pharmacists and pharmaceutical care providing.

PP018

Development of a tool to prevent and reduce inappropriate use of opioids in patients with non-cancer pain in primary care

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Background and objective: Opioid prescriptions have been rising in Netherlands. The primary care guideline on pain was recently updated to tackle inappropriate opioid use. Qualitative research has demonstrated that health care providers are in need of tools to implement these guidelines. This study, therefore, aims to determine practical components for a tool that can be used to assist Dutch primary care prescribers and implements the recently updated guideline to reduce opioid prescriptions and high-risk use.
Method: A pragmatic Delphi approach was used. A concept of an intervention tool was constructed based on literature. In a three-round consensus process, a multidisciplinary expert panel of 21 experts assessed the content, usability and feasibility of the tool components. The concept tool consisted of two parts: part A to reduce opioid initiation and to stimulate short-term use, and part B to taper opioid use among chronic opioid users. In three rounds, components and subcomponents were added, deleted and adapted until consensus was reached.
Main outcome measures: Consensus on intervention components suitable to reduce inappropriate opioid prescriptions in primary care.
Results: The resulting Part A of the tool consisted of six components: education, opioid decision tree, risk assessment, agreements on dosage and duration of use, guidance and follow-up, and interdisciplinary collaboration. The resulting Part B consisted of five components: education, patient identification, risk assessment, motivation and tapering.
Conclusion: This Delphi study included focus group discussions with panel members to create in-depth knowledge on topics discussed and identify shared views. The tool has to be tested in a feasibility and implementation study.
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PP019

An evaluation of the clinical effectiveness of a pharmacy-led clinic on the management of patients with Type 2 diabetes mellitus

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Background and objective: Prevalence of Type 2 diabetes mellitus has increased worldwide. Compounding this public health concern is a workforce shortage in general practice in Scotland. Consequently, there has been a drive to integrate pharmacist independent prescribers into general practice who would be ideally placed to provide quality care to patients with diabetes.
This study aims to evaluate the clinical effectiveness of a clinic led by a Pharmacist Independent Prescriber on the management of patients with type-2 diabetes in primary care.
Method: The clinic was established in General Practice in NHS Lothian using a Teach and Treat model (1), based on an initial pilot study (2).
Patients with type 2 diabetes and BP $>$ 130/80 and/or HbA1c $>$ 53 mmol/mol were invited to attend. Patients with severe CKD (GFR $<$ 20 mmol/L), newly diagnosed or under the care of secondary-care diabetic clinics were excluded.

Blood pressure, HbA1c and lipid epidemiology of all patients attending the clinic were analysed and reviewed by the pharmacist. A management plan was developed which included dose adjustments, initiation, or discontinuation of therapies. All medication changes were made by the pharmacist in a stepwise approach following local formulary guidelines. Patients also received healthy lifestyle advice regarding smoking cessation, alcohol consumption, diet and exercise. Patients attended the clinic approximately every 4–6 weeks until treatment was optimised.
Main outcome measures: Baseline measurements were taken pre-intervention and compared with results taken post-intervention. The clinical characteristics of the intervention group (51 patients) were then compared with the control group (47 patients who did not attend the pharmacist-led clinic). Baseline and post-intervention measurements for the control group were assessed retrospectively.
Results: Clinically and statistically significant improvements in blood pressure (systolic BP 145 ± 18.79 before vs 129 ± 10.11 after; diastolic BP 83 ± 9.22 before vs 77 ± 7.74 after), HbA1c (70 ± 14.93 before vs 59 ± 11.46 after) and total cholesterol (4.5 ± 1.27 before vs 3.9 ± 0.94 after) were observed in patients attending the pharmacist-led clinic, but not in the control group.
HbA1c and systolic blood pressure were significantly higher in the intervention group than the control group at baseline but not on final assessment. Diastolic blood pressure and total cholesterol were not statistically different at baseline but were significantly lower in the intervention group compared with control group at the end of the study.
Conclusion: This study provides evidence to support the upskilling and effective utilisation of pharmacists in primary care settings to improve patient outcomes and proposes pharmacist-led clinics as a solution for the workforce shortage in the NHS.

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PP020

The combiconsultation by the pharmacist: let's talk about goals

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Background and objective: The CombiConsultation is a consultation with the community pharmacist (CP) for patients with diabetes, COPD and/or CVRM, before the annual- or quarterly consultation with the practice nurse or general practitioner. This CombiConsultation is a new concept with focus on potential health-related complaints related to the patient's chronic condition. The aim of this study is to investigate how pharmacists apply the instructed Calgary-Cambridge based conversation model in the CombiConsultation and to identify the content of these consultations between the CP and the patient.
Method: Structure and content of the consultations were examined using recorded videos. An observation guide, based on the Calgary-

Cambridge guide, was used to analyse how CPs applied the taught structure on a 4-point scale and the MEDICODE classification system was used to investigate the content of the consultations by scoring all topics.
Main outcome measures: Scores (4-point scale) of the consultations on the items of the Calgary Cambridge guide and number and percentage of MEDICODE items of all consultations.
Results: A total of 24 consultations were included in the analysis. The majority of the consultations scored sufficiently on almost all items of the Calgary-Cambridge guide. The CPs identified the patient's problems or the issues that the patient wishes to address with appropriate opening questions and encouraged patient to tell the story of the problem(s). They had more difficulty prioritizing problems and setting treatment goals. All four areas of MEDICODE (General information, Knowledge of the drug, Discussion of the prescribed medication and Effects of the drug) were addressed during the CombiConsultations. The most common topic was 'general information', followed by 'discussion of the prescribed medication'. During the consultation, most time was spent on respectively 'medication-usage issues' and 'control of problem'.
Conclusion: This study showed that CPs are generally able to adhere to the structure of a taught consultation model, although they experienced difficulties in goal setting. Regarding the content, CPs often reverted to their familiar task of providing information about the medication in use. Training in following a consultation model with a focus on the patient's perspective is necessary.
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PP021

Consensus on mechanisms of change to support implementation of medication reviews

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Background and objective: Since 2022 patients with five or more medicines can receive a medication review (MR) in a community pharmacy remunerated by the German health system. Implementation is slow and few pharmacies are currently providing MRs. To inform implementation strategies, this study aimed at reaching consensus among key community pharmacy stakeholders on which type of support is needed and which incentives would trigger owners to implement MRs in their pharmacies.
Method: Setting: Community pharmacies in Germany. Method: An online Nominal Group Technique (NGT) was used. Participants were either community pharmacy owners or employees of regulatory chambers across Germany. These participated in separate NGT-sessions. Participants generated 'mechanisms of change' in terms of "external support" and "incentives" in relation to the implementation of MRs in community pharmacies. They then voted for the mechanisms they perceived to be the most effective Mechanisms were ranked according to sum and frequency of votes.
Main outcome measures: Quantitative: Relative importance (rI) [1]. Qualitative: Themes of recommended mechanisms of change.
Results: Four online sessions were held: two with owners (ow; n = 4&5) and two with chamber employees (ch; n = 4&4). Overall, the participants identified 69 potential mechanisms for "external support" and 41 for "incentives". Highest ranked mechanisms for "external support" in relation to MR implementation were: an expert support line (ow&ch; rI = 52.7&25.0), integration of MR-software within the existing pharmacy software (ow; rI = 39.4), administration support for all steps of MRs from recruitment to billing (ow; rI = 31.6), network support (ch; rI = 28.4) and training for the entire team (ch; rI = 25.1). In relation to effective "incentives" higher remuneration in the initial phase (ow; rI = 25.0), an MR-starter kit with advertising materials and detailed team-instructions (ow; rI = 17.3), and reduction of bureaucracy (ow; rI = 16.0) were named. Chamber employees thought that making role models visible (rI = 21.7) and highlighting the benefit of MRs for pharmacists (rI = 16.7) would incentivise owners to implement MRs in their pharmacies.
Conclusion: While owners suggested practical mechanisms for external support which would also incentivise them to get started, chamber employees had a more theoretical perspective with view to long term goals. Both viewpoints appear important to move the implementation of MRs forward.

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PP022

Safer prescribing and monitoring of direct oral anticoagulants for atrial fibrillation in a primary care network through the implementation of a tailored template embedded in the general practice IT system

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Background and objective: In Leeds, DOACs are classified as amber drugs; suitable for GP prescribing with specific monitoring requirements. Amber guidance recommends before initiating DOACs in AF, patients must have baseline bloods, weight and alcohol intake recorded, a review 3–6 weeks after initiation, and again at 3 months. Creatinine Clearance (CrCl) is calculated using baseline bloods and weight to guide dose prescribed and appropriate monitoring frequency needed (annual if CrCl > 60 ml/min, 6 months if CrCl 30–59 ml/min or 3 months if CrCl < 15–30 ml/min). In Otley Primary Care Network (PCN), an audit reviewing data across the 3 PCN practices between June 2019 to June 2020, highlighted there was inadequate adherence to amber guidance when initiating DOACs in AF. Results showed incorrect DOAC doses were sometimes prescribed and/or poor adherence due to patients experiencing side effects or having difficulty taking a DOAC, went unidentified. These factors can increase the risk of stroke (if DOAC dose is too low or there is non-adherence) or increase bleeding risk (if dose is too high, patient incorrectly taking DOAC, or concomitantly taking medication that increases bleeding risk e.g. NSAIDs). In this audit, we found that any interventions made were usually opportunistic during Pharmacist medication reviews. Information from the primary audit provided a basis for the project aim; to increase adherence to local amber drug guidance when prescribing DOACs in AF, which in turn ensures correct DOAC dose prescribed on initiation and appropriate follow up thereafter. This would lead to early identification of any adherence or medication issues, and overall, decrease the potential risk of bleeding or stroke.
Design: Clinicians were provided education on local amber guidance for initiation and monitoring of DOACs in AF via in-house clinical meetings and reminders in the PCN prescribing bulletin, which is circulated monthly. A template was designed, tailored to PCN requirements and embedded in the GP IT system, SystmOne. This tool was used during consultations when initiating a DOAC,

prompting the clinician to collect appropriate data and arrange follow-up. A protocol was created to support this and distributed to clinicians. Changes were implemented for 15 months, then a retrospective review of patient records was completed reviewing patients newly started on a DOAC for the indication of AF, between July 2020 to October 2021 (116 patients).
Results: After introducing the template, there was a 50% increase in CrCl documented on initiation, 27% increase in monitoring frequency established at initiation, 50% increase in reviews at 3–6 weeks and 36% increase at 3 months. The DOAC template was utilised in 45% (52 patients) of those initiated on a DOAC for AF over the period reviewed.
Conclusion: Use of the template was directly related to amber guidance adherence, correct DOAC dose being prescribed, and identification of problems earlier. For the 52 patients where the template was used, 16 interventions were made leading to safer prescribing; appropriate monitoring interval, correct dose prescribed, and addressing side effects experienced to improve adherence. There were 12 errors identified including DOAC dose too low/high, inappropriate choice of DOAC, taking medication incorrectly, and non-adherence to DOAC. All these errors occurred in patients where the template had not been used, therefore we conclude increasing use of the template amongst clinicians will lead to safer prescribing of DOACs.

PP024

Pharmacists' knowledge regarding hypertension screening in the community

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Background and objective: High blood pressure (BP) is one of the leading cardiovascular disease (CVD) risk factors. (1) Community pharmacists (CPs) have a strategic position in primary care, to early screen and manage hypertension in adults. Interestingly, Greece has the highest number of pharmacies (84.06 pharmacies per 100,000 citizens) among the European countries. (2) More specifically, CPs can offer disease state education, patient counseling, BP measurement, and monitoring as well as adherence monitoring. (1) CPs should have adequate knowledge to help increase hypertension detection rates and management. The study aimed to examine the knowledge of CPs regarding detecting hypertension in the general public.
Method: This quantitative study used a survey-based questionnaire, which was designed after an extensive literature search of the published data. It consisted of 39 questions (multiple choice and Likert scale 1–5) and demographic questions regarding BP measurement, BP categorisation, etc. The sampling method of the study falls under random sampling. A pilot study was conducted for the validity and reliability of the questions with no further changes. It took place in the cooperative pharmacies under the second largest pharmaceutical cooperative in Greece (PEIFASYN) in the region of Attica (Peiraeus), Peloponnese (Argos, Korinthos), and Islands (Samos). Pharmacists were approached via email by the PEIFASYN. Pharmacists were approached initially via email by the PEIFASYN. The questionnaires were distributed electronically via the university's platform (Moodle).
Main outcome measures: Participation was anonymous and voluntary. Before data collection, all the relevant documentation was ethically approved by the Federation of the Cooperative Pharmacies of Greece (OSFE). Data were collected between December 2022 and April 2023. The data were analysed descriptively and inductively by using the SPSS v22. The sample of the present study consisted of 92 pharmacists (men n = 45, 48.9%, women n = 47, 51.1%). Participating CPs have good levels of knowledge regarding BP measurements in the pharmacy (71.74% ± 16.08%) and good levels of knowledge regarding the categorisation of hypertension (76.9% ± 8.48%). Among pharmacists of different ages, statistically significant differences were observed in the levels of knowledge about how a person's lifestyle affects blood pressure (p-value = 0.013 < 0.05), as well as in the total knowledge score (p-value = 0.012 < 0.05).
Results: Interestingly, there were no statistically significant differences between CPs who had received training about hypertension guidelines after their degree and CPs who had not in terms of their total knowledge score, as well as in terms of their levels of knowledge regarding the interpretation of the blood pressure readings and hypertension categorisation (p-value > 0.05). However, participating CPs who hold an MSc showed significantly higher knowledge on how to measure BP, but also significantly higher overall knowledge of hypertension. (p-value < 0.05) To our knowledge, this is the first study exploring pharmacists' knowledge about their role in BP screening and management. The study's limitations included the small sample size which may not lead to generalisation of the results and the short data collection period.
Conclusion: CPs in Greece should show their strong role and strength in BP screening and management. It is important to initiate collaborative practice agreements and to re-examine the public health policy to achieve these goals.

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PP026

A mixed-methods study on the patients' and pharmacists' perceptions of the benefits of the interprofessional medication management programme ARMIN

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Background and objective: The retrospective evaluation of the physician-pharmacist medication management (MM) programme ARMIN for patients with polymedication (n = 5.033) showed a 16% relative risk reduction of mortality compared to persons of a control group (n = 10.039) (p = 0.001). Little is known, however, if patients perceive any benefit from the intervention. We, therefore, aimed to evaluate the benefits of this MM from the patients' compared to the pharmacists' perspective.
Method: Inclusion criteria were participation in the ARMIN MM for at least six months and at least five long-term medications. The patients' perspective was assessed in (qualitative) semi-structured interviews addressing 14 topics. The community pharmacies' (CP)

perspective on the patients' benefits and perception was assessed with a cross-sectional (quantitative) paper-based questionnaire. Data were analysed separately and compared. From the interviews, a coding framework was developed inductively by two independent researchers using content analysis according to Kuckartz. Deviations were discussed until consensus was reached.
Main outcome measures: Perceived benefits of the ARMIN MM reported by patients and CPs collected through interviews and a questionnaire.
Results: Overall, 57 patients (54% male; 84% older than 60 years) with a mean time in ARMIN of 25.3 months (range 6–50 months) and a mean of 13.5 (range 5–30) medications, and 10 caring CPs participated. For the interviews, the coding framework included 31 main categories; 8 of these categories had a benefit aspect. To answer the initial question, 34 patients spontaneously reported a benefit, but in the course of the interviews, all patients named at least one benefit. The most frequent benefits mentioned were: "increased knowledge regarding drug therapy" (n = 45), "high quality of CP care" (n = 43), "high quality of general practitioners' (GP) care" (n = 29), "improved communication between CP and GP" (n = 29), and "increased safety feeling" (n = 29).
In the pharmacists' questionnaire, different aspects of patient benefit were reported: Regarding knowledge, 32 patients improved, 29 patients improved in therapy implementation, and 18 patients became more adherent. Finally, pharmacists were asked to rate the overall benefit for patients; according to pharmacists, all patients benefited. The most frequent overall benefit aspects named were: "checking drug therapy safety" (n = 15), "increase in knowledge" (n = 12), "better medication overview" (n = 11), "optimisation of drug therapy" (n = 9), and "safer handling of the medication" (n = 8).
Conclusion: Except for the increase in knowledge, the perception of patients and pharmacists of the benefits of the MM differed: While patients mainly reported humanistic outcomes, such as intensified care processes and an increased safety feeling, pharmacists often outlined aspects on drug therapy as major benefit, e.g. optimization and better implementation of drug therapy as well as an improved adherence. Patients either did not consider these aspects relevant or hardly perceived the CPs interventions. CPs should give more attention communicating these potential benefits to patients. Furthermore, CPs should be aware that patients highly value the intensified interprofessional care.

PP027

Evolution of pharmaceutical care within general practice in England—a review

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Background and objective: Medicines optimisation and pharmaceutical care are used across the UK to address the problems associated with sub-optimal use of medicines and adopt a patient-centred approach to improved outcomes. The changing medical model of prescribing in the UK and the increasing utilisation of clinical pharmacists in general practice in England, coupled with national policy change, has brought a renewed focus on medicines optimisation in pharmacist-led care in general practice. Reviewing and understanding the topic of medicines optimisation in the context of changing national policy can help advance primary care pharmacy practice.
Design: We conducted a thorough search across multiple databases including PubMed/MEDLINE, Scopus, Embase, and Google Scholar within the timeframe of date of inception to 10/2022 using key words *medicines optimisation, medicines management, medication review, pharmaceutical care, structured medication review, primary care, United Kingdom, England.*
Results: This review highlighted the classification and definition of medication review in the process of medicines optimisation and how national policy has evolved to focus on achieving its objectives and provided awareness on how medicines optimisation can be effectively implemented in general practice.
Conclusion: The principles of medicine optimisation remain broad and multifaceted, and there is a lack of evidence to evaluate the impact of critical medicine optimisation principles in a general practice setting. Medication review remains an essential part of the medicines optimisation process, with a greater emphasis on adopting a patient-centred approach aligned with shared-decision making principles, evolving from a medicines management approach focusing on systems and processes only. Defining medication review represents a challenge as there is overlap in the literature and different countries, and territories use variations of the term to describe similar services, with the definition of medication review adopted in England evolving over time. A targeted approach for medication review has been advocated in the most recent national policy, however, there appears to be variation in how and when medication reviews are carried out, regardless of which healthcare professional is undertaking the activity. Utilising a structured approach to medication review using support tools may help standardise this process and ensure equity of care for patients.
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PP030

Community pharmacist-led clinical review of diabetic patients

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Background and objective: Community pharmacists are in a strategic position to conduct pharmaceutical care interventions and contribute to patient management in diabetic patients. The aims were to: (1) develop and implement a diabetic patient clinical review toolkit and (2) evaluate pharmacist interventions in community pharmacy.
Method: A toolkit was developed and validated by an expert panel. Patients (N = 60) registered with a private community pharmacy, taking at least one antidiabetic medication were invited to the study. At baseline (t0), medications were compiled through the electronic patient profile prior to the first session (t1) with the patient, and any pharmaceutical care issues identified were documented. At t1, the pharmacist reviewed medications and assessed patient diabetic knowledge, medication adherence, diabetic complications, lifestyle, laboratory investigations and monitoring using the devised toolkit. An individualised pharmaceutical care plan was developed for each patient to address issues, and interventions were proposed. Follow-up after one month (t2) was conducted to assess actioning of the care plan.
Main outcome measures: Pharmacist intervention in diabetic patient review.
Results: Fifty-five patients completed the study; male (n = 29), female (n = 26) mean age 61 (range 24–92) years, diabetes type 2 (n = 41), diabetes type 1 (n = 14), mean number of medications per patient 5 (range 1–11), mean number of antidiabetic medications 2 (range 1–4). Metformin was the most common antidiabetic medication (n = 34), followed by insulin glargine (n = 17), gliclazide (n = 15), insulin aspart (n = 10) and empagliflozin (n = 6). Mean

duration of the patient review was 15 min (range 10–25) for t1 and 3 min (range 2–7) for t2. A total of 160 pharmaceutical care issues were identified in 50 of the patients; patient education-related (n = 127) or drug-related (n = 33) Patients required education regarding medication usage, adherence and storage (n = 28), lifestyle modifications (n = 26), and self-monitoring (n = 23). Drug-related issues were inappropriateness of drug selection (n = 18), dose selection (n = 9), or use by patient (n = 6). General practitioner/specialist referral was needed for 9 patients. At t2, 104 interventions were addressed. Implementation rate of interventions was highest for dose selection (89%), followed by patient medication handling (83%), medication use (68%), lifestyle (67%), self-monitoring (60%) and drug selection (55%).
Conclusion: The devised toolkit is practical, strengthens pharmacist-patient relationship and supports patient empowerment. Interventions improved patient awareness and led to behavioural changes. A limitation of the study is patient self-reporting.
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PP031

A study exploring public opinion of and attitudes towards being vaccinated in a community pharmacy

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Background and objective: There is growing evidence that vaccination campaigns in community pharmacies lead to greater awareness of the importance of vaccination and increased vaccination rates [1]. Italian community pharmacists have been administering vaccines since the COVID-19 pandemic [2]. This study explored the public's opinion of attitudes towards being vaccinated in a community pharmacy and aimed to determine whether there is a role for the community pharmacist as a vaccination health educator.
Method: The study was conducted at a pharmacy in Pozzonovo (Padova, Veneto Region, $\sim$ 3500 inhabitants), All the patients who have been vaccinated at this pharmacy and could be contacted via email or WhatsApp, were invited to participate. If consenting, they received a short questionnaire which had been piloted for face and content validity with other Italian community pharmacists. Staff members and their relatives vaccinated here were excluded.
Main outcome measures: Participant responses.
Results: 84 questionnaires (53 females) were returned out of 171 sent (49% response rate). Participants were mainly 50 to 59 years old (29.8%). "Ease of access" was chosen by 47 participants (56%) as their principal motivation for vaccination in a community pharmacy. Other reasons included easy and straightforward system (48.8%), short waiting times (44%) and familiarity with pharmacy staff (42.9%). All participants showed high degrees of satisfaction towards the pharmacy staff and the community pharmacy as a vaccination hub. All participants would choose a community pharmacy again for future vaccination. 28 participants (34.6%) stated their awareness of the importance of being vaccinated increased following vaccination in the community pharmacy; 16 (57%) of these said they were uncertain about the importance of vaccination on first attending the pharmacy.
Conclusion: This study is limited by the fact that it is conducted only in one pharmacy but gives important pilot data in a rapidly developing area of pharmacy practice. In conclusion, the community pharmacy is accepted by the patients as a potential vaccination hub. Increased participant awareness of the importance of vaccination may have been due to factors such as opportunities to discuss vaccination with the pharmacy staff, indicating a role for the community pharmacist as a vaccination health educator.

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PP032

An assessment of COPD and asthmatic patients' knowledge regarding the proper use of inhalation devices: pharmacy students as evaluators in community pharmacies

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Background and objective: Person-centered treatment, especially for progressive chronic conditions like chronic obstructive airway disease COPD and asthma, requires an understanding of the patient's pharmaceutical care needs. Our research examines COPD and asthmatic patients' requirements utilizing pharmacy students' point-of-care. The primary aim of these assessments was to evaluate the patients' proficiency in using their inhaler devices.
Method: Following approval from the ethical committee of Altınbaş University, the pharmacy students conducted interviews and distributed surveys to all patients diagnosed with COPD and asthma who visited the community pharmacies in Istanbul/Türkiye between February and April 2023. The survey were translated from English to Turkish and pilot tested for validation. SPSS 26 was used for all statistics. The 95% confidence interval with $p < 0.05$ and percentage values were utilized to evaluate findings. Categorized data was evaluated using chi square.
Main outcome measures: A survey requests information regarding sociodemographic characteristics, symptoms, diagnosis, device type, and steps of inhaler device use. The evaluation of the appropriate utilization of inhaler devices was conducted by determining the proportion of accurate steps reported in the patient survey.
Results: 100 Patients used one of three different types of inhalers: salbutamol 49%, fluticasone furoate/vilanterol 29%, or salmeterol/fluticasone 22%. 66% were female. Even though 60 individuals were educated by a pulmonologist, only 28 of those patients' doctors assessed their inhaler usage.
The surveys show that only 73.5%, 24.1% and 9.1% of the patients shake the inhaler before each use, 44.9%, 48.3% and 36.4% of patients exhale away before inhaling, 36.7%, 34.5% and 40.9% of patients breathe appropriately during inhalation and 48.9%, 38.1% and 27.2% hold their breath long enough after inhalation while using salbutamol Metered dose inhaler, fluticasone furoate/vilanterol Dry powder inhaler DPI and salmeterol/fluticasone DPI, respectively. Females were more likely than males to use all inhaler kinds appropriately, $p < 0.05$.
Conclusion: The provision of feedback can offer a comprehensive assessment of the effectiveness of patient education, highlighting areas of success and areas that require improvement. Despite the fact that the majority of patients possessed a certain level of education, a small subset of individuals sought feedback from their physicians, which had a significant impact on their proper utilization of inhaler devices. Given the substantial proportion of pharmacy students engaging in apprenticeships within community pharmacies, they possess the potential to serve as exceptional human resources subsequent to receiving adequate training and education.

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PP033

Community pharmacy survey assessing collagen customers' profiles and attitudes

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Background and objective: The utilization of Collagen has gone through a significant surge in recent years, with its applications ranging from skincare to joint health. This study aimed to understand the profile of collagen supplement users, assess their knowledge on nutritional supplements, adherence to use and purchase behavior and satisfaction.
Method: The study was conducted in various community pharmacies located all across Istanbul, Turkey, during the period of February to April 2023. Participants filled out a pre-designed questionnaire to provide demographic information. A questionnaire assessed their knowledge and opinion of collagen use. Altınbaş University's ethics committee approved the study. All statistics utilized Statistical Package for the Social Sciences SPSS 26. The 95% confidence interval with $p < 0.05$ and percentage values, Chi square and Pearson correlation were utilized.
Main outcome measures: Assess the nutritional supplement/collagen usage pattern, knowledge levels, expectations, and experience of the patients regarding collagen use by evaluating the clients responses.
Results: A total of 125 participants with an average age of 43.66 ± 12.9 years, consisting of 20.8% males and 79.2% females, were included in the study. Most participants 64% were university graduates. The presence of at least one chronic disease was reported by 32% patients. 61.6% participants reported currently using a variety of supplements, including collagen, and 10.4% of them had a history of supplement use. The main purpose of supplement use was reported to be for health improvement and insufficient dietary intake. Pharmacies were the preferred place of purchase for most participants 79.2%, and pharmacists 29.6% and social media outlets 28.8% and doctors 25.6% were the main sources of information. The majority of participants reported using collagen on a daily basis, but for irregular periods of time. But most participants had no idea of the required duration of use. Type 1, 2, and 3 colleges were most preferred. 66.4% patients believed collagen was effective for the purpose they were using it for and urge to continue use. They reported positive improvements in skin, body and joint pain with only 6.4% patients stating mild side effects. Mild positive correlation between age and duration of collagen use were noticed, $r = 0.281$ and $p < 0.05$. No differences between male and female in their responses $p > 0.05$.
Conclusion: Although Consumers' propensity to buy collagen products is significantly correlated with their positive attitudes and subjective norms, there are still gaps in the general public's understanding of collagen and its evidence-based use, which the pharmacist must fill in order to provide the best possible guidance and make sure it is used properly.
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PP034

Determining the types of information pharmacists include in comprehensive medication management review reports: a qualitative content analysis

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Background and objective: Background: Comprehensive medication management reviews are an established intervention to identify medication-related problems, such as the prescribing of potentially inappropriate medications, and under- and over-prescribing. Consultant pharmacists provide these medication management reviews to people living in the community after referral from a medical practitioner. However, the types of information included in these reports, beyond types of medication-related problems, are unknown. **Objective:** This study aimed to explore the types of information Australian pharmacists include in their written reports following comprehensive medication management reviews.
Method: Australian consultant pharmacists from multiple Australian States and Territories who are accredited with performing medication management reviews were invited to upload their 10 most recent written reports of their domiciliary-based comprehensive medication management reviews. A random selection of the reports, stratified by each pharmacist, were included for qualitative content analysis.
Main outcome measures: The study sought to analyse retrospectively written comprehensive medication management review reports by consultant pharmacists for patients living in the community. A content analysis approach allowed for the appropriate coding of information in the comprehensive medication management review reports and then subsequent quantification of the identified codes.
Results: Seventy-two de-identified reports from eight consultant pharmacists were included for analysis. From the evaluated reports, four major categories of information were identified: (1) patient details such as date of interview (n = 72, 100%) and medicine history (n = 70, 97%); (2) pharmacist assessment including assessment of the patient (n = 70, 97%), medicines management (n = 68, 94%) and medicine-related issues (n = 60, 83%); (3) pharmacist recommendations, specifically pharmacological recommendations (n = 67, 93%); and (4) patient-centred experiences such as perspectives on medicines (n = 56, 78%). Reporting of patient-centred experiences appeared most variably in the included reports, including patient concerns (n = 38, 53%), willingness for change (n = 27, 38%), patient preferences (n = 13, 18%), and patient goals (n = 7, 10%).
Conclusion: The holistic nature of the medication management reports suggests a broader role for pharmacists beyond medication-related tasks and could encompass championing the patient perspective. However, variability across reports has the potential to impact consistent service delivery.
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PP035

Do students' self-reflections of performance align with their graded performance in objective structured clinical exams?

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Background and objective: The metacognitive skill of self-reflection is important in health professions education students, with self-awareness of strengths and weaknesses being important for lifelong learning and development. The aim of this study was to assess the alignment in third-year undergraduate pharmacy students' self-reflections of their objective structured clinical exam (OSCE) performance to their actual OSCE scores, and explore the most common aspects students reflected on as markers of perceived performance.
Method: Students completed a three-station OSCE and a written self-reflection about their performance. These reflections were coded using a latent pattern content analysis, with categories defined as "doing well ($\geq$ 50% on exam)" and "not doing well ($<$ 50% on exam)." Using these categories, students' self-perceived OSCE performance were compared to their actual OSCE exam scores, to determine the degree of alignment. A subsequent summative content analysis explored the most common aspects students reflected on as indicators of their perceived performance.
Main outcome measures: To compare OSCE grades to OSCE reflections, a latent pattern content analysis was used to convert qualitative data from the OSCE reflections to quantitative data, as the meaning of the text needed to be interpreted to a category of doing well or not doing well. Qualitative data were coded and reviewed to a subset of the data to identify and label different codes that fell into the categories in the context of reporting student performance as "did well" or "did not do well".
Results: 269 students completed the OSCE and reflection. Students had a low degree of alignment between their self-reflections and actual OSCE performance with only 14% (n = 22) having alignment between their self-reflections and OSCE scores on all three stations. Low alignment was overwhelmingly prevalent and significant in high-achieving students with OSCE scores of $\geq$ 90%. Most common aspects students reflected on as indicators of performance were finishing on time and communicating effectively. High-achieving students reflected on aspects such as empathy, systematic questioning, and patient teach-back as aspects of their performance.
Conclusion: High-achieving students are self-critical of their performance and have higher cognitive level self-reflections compared to average achieving students who have more surface-level self-reflections. Health professions educators should provide feedback mechanisms to high-performing students to help them better recognize their strengths, which can empower them to be more self-confident in future clinical decision-making to ensure optimal patient outcomes.

PP037

Implementation of objective structured clinical examination in a Master's program in pharmacy: evaluation by students and by community pharmacists

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Background and objective: In recent years, pharmacy students' education has undergone significant changes, with a greater emphasis on learning clinical skills, inherent to the pharmacist profession and acquired through teaching activities like role play and during their internship. To improve the evaluation of those skills, we developed a new evaluation system that uses Objective Structured Clinical Examination (OSCE), considered as a good method for assessing clinical competencies. This assessment method was evaluated by students and community pharmacists in 2021 and 2022.
Design: The OSCE consisted of a series of five stations in which students demonstrated clinical skills to solve short clinical situations with a patient, simulated by a pharmacist. After 7 min, an examiner completed a standardized scoring system. The evaluation criteria included the students' scientific approach, but also their listening and communication skills, respect for the patient, sense of responsibility, and the quality of decision-making. The OSCE was evaluated by the students and community pharmacists, who participated in the 2021 and 2022 OSCE, using an anonymous questionnaire. Data were analysed with descriptive statistics using Excel® version 16.66.1.
Results: In 2021 and 2022, respectively, 45 and 84 students, and 18 and 21 pharmacists answered the evaluation questionnaire. In both years, most students felt that the OSCE assessment method was fair and objective, while their perception of its effectiveness improved significantly in 2022 compared to 2021. The community pharmacists also agreed on the overall positive metric qualities of the OSCE. Students found simulated patients moderately credible and clinical situations moderately realistic. According to feedback from both students and pharmacist, the "triage" stations were considered as moderately challenging, while the "validation" and "monitoring" stations were deemed more difficult to solve. In 2021, student satisfaction levels ranged from dissatisfied to good. In 2022, satisfaction levels improved significantly, ranging from satisfactory to excellent. However, regardless of the year, half of the students did not feel adequately prepared for the OSCE.
Conclusion: Most students and pharmacists found the OSCE to be a fair, objective, and effective assessment method. However, improvements are needed to improve the stations' credibility and feasibility. Additionally, students may benefit from better preparation for OSCE throughout their internship.
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PP038

Implementing learning into practice from continuous professional development activities: a scoping review of health professionals' views and experiences

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Background and objective: Continuing Professional Development (CPD) is widely acknowledged as an approach for health professionals to maintain knowledge and competence in their scope of practice, and as a way that can contribute to improving delivery of care and patient outcomes (1). Evidence indicating that simply providing knowledge to health professionals does not lead to a change in practice (2). The aim of this scoping review was to collate, summarize, and categorize the literature that reports on the views and experiences of health professionals' on implementing into practice their learning from CPD activities.
Method: This review was guided by the Joanna Briggs Institute Reviewers' Manual methodology for scoping reviewsand was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews checklist. Three electronic databases were systematically searched for published studies answering the following research question (based on the *Population/Concept/Context*): What does the literature report regarding health professionals' views and experiences on implementing into practice their learning from CPD activities?
The sources were imported into Rayyan web application. Two independent reviewers screened the titles and abstracts, and then the full-

text against the inclusion criteria. Two reviewers independently completed the data extraction. Any disagreements were discussed and if necessary resolved through consultation with a third reviewer. Data was summarized quantitatively and a descriptive content analysis was adopted of qualitative data; themes were generated to synthesize the findings related to views and experiences.
Main outcome measures: Views and experiences of health professionals' on implementing into practice their learning from CPD activities.
Results: Thirteen articles were included in which implementation of learning was not the primary focus; rather it was an aspect of wider investigations. Studies were published between 2008 and 2022. The majority of the studies were conducted in North America. Two themes relating to the views and experiences of health professionals' regarding implementation of learning into practice were generated: *Challenges of implementing learning from CPD activities into practice*; *Facilitators of implementing learning from CPD activities into practice*.
Conclusion: This review highlights gap in the literature. Further studies, underpinned with implementation theory, are required to comprehensively investigate the implementation of learning from CPD into practice.

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PP039

Self-care and minor ailments education in primary schools: is there a role for pharmacists?

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Background and objective: Children from Primary school age begin to have an increase in self-awareness and start to become independent in caring for themselves and ensuring that health standards are maintained.
Knowledge and awareness regarding responsible self-care can improve people's ability to look after their wellbeing and to know where and when to seek advice and professional support. Self-care and self-management of minor ailments can endow confidence in children to be more health conscious and manage their minor and self-limiting conditions as they are growing up and as the future of the society. This study will explore the current curriculum around self-care and self-management of minor ailments in primary schools.
Design: A non-participant ethnographic observation technique using qualitative study design was adopted. Eleven in-class observational studies were undertaken in a sample of West Midlands primary self-care classes.
Results: Self-care topics are discussed in science, PE and PSHE lessons. Schools focused on healthy eating and physical activity within lessons as well as at lunch and break times. Since the coronavirus pandemic specific lessons and techniques were introduced to classroom teaching to support students' mental health. The Islamic Supplementary School (Madrasah) setting demonstrated a foundation of hygiene rituals taught to all children with each step of cleanliness described. Teaching around self-management of minor ailments was not observed.
Conclusion: It is apparent that there is no one-size-fits-all type of education and there is no national scheme to ensure that every child within the primary school age will receive the same teachings. A blanket curriculum to cover all aspects of self-care and minor ailment education is needed to ensure equal opportunity for all children in the UK irrespective of location or background. This is a gap that can be filled by utilising the pharmacy workforce.
Pharmacists are well versed in self-care and minor ailments, providing this advice to patients on a daily basis. The role of the pharmacist can be evolved to work with schools and education providers to provide valuable self-care and minor ailment educations within schools.
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PP040

Clients seek magnesium supplementation, but what about their knowledge and attitude? A sample from the community pharmacy

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Background and objective: It is worth noting that the benefits of magnesium extend beyond its use as a dietary supplement. Magnesium has been shown to play a crucial role in many bodily functions, including muscle and nerve function, blood pressure regulation, and protein synthesis. The objective of this study is to assess the level of knowledge and attitude among clients who utilize Magnesium supplementation.
Method: Pharmacy student in Istanbul/Türkiye interviewed and surveyed all the clients who visited the community pharmacies seeking for magnesium products from February to April 2023 after maintaining Altinbas University ethics committee permission. All statistics utilized Statistical Package for the Social Sciences SPSS 26. The 95% confidence interval with $p < 0.05$ and percentage values were utilized to evaluate findings. Categorized data was evaluated using chi square.
Main outcome measures: A 19-question survey on socio-demographic variables, magnesium knowledge and advantages, and public expectations for supplement use was given to clients to answer in five minutes. The study relied on survey responses.
Results: 129 clients, comprising 65% males and 35% females, accepted to participate. 49.5% were using magnesium to relieve muscle pain. 84.4% of patients received magnesium supplementation based on recommendations from health care professionals. 35.9% and 31.1% of the participants reported using magnesium for a duration of less than one month and five months, respectively. Females reported using magnesium for a longer duration than males, $p < 0.05$.
30.1% of the respondents reported their knowledge of 1–3 forms, while 34% of them indicated familiarity with 3–4 forms of magnesium, and 35.9% of all participants utilized the magnesium oxide form. 44.7% consumed magnesium in the morning after food and 88% experienced no adverse effects while using magnesium. Specifically, 81.6% expressed their intention to refill magnesium products. There are no significant differences between males and females regarding attitudes and knowledge of magnesium products ($p > 0.05$).

Conclusion: The present study's results suggest that magnesium utilization is prevalent among the Turkish population. The majority of magnesium clients exhibited a moderate level of knowledge, yet displayed a positive attitude and high level of trust towards healthcare providers' recommendations. As a result, pharmacists are presented with a significant opportunity to augment their knowledge and cultivate their attitudes. The results of the study highlight the necessity of implementing educational initiatives aimed at clients in order to address the current deficit in knowledge and enhance the judicious utilization of magnesium products.

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PP041

Pharmacy clinical decision-making

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Background and objective: As pharmacists take on advanced clinical roles, there is a greater need for effective autonomous decision-making. Feedback from prescribers has revealed that two barriers to implementing prescribing into practice are lack of confidence and lack of opportunity to prescribe regularly.

This proof of concept study investigated the use of a 'choose your own adventure' style e-learning resource to allow pharmacists to practise decision-making skills in a risk-free environment.

The aims were to:

1. determine the effect of the resource on learners' self-reported competence and confidence in pharmaceutical clinical decision making (for patients post myocardial-infarction).
2. determine learners' perceptions of the module for future resource development.

Design: We developed a bespoke branching scenario-based e-learning module: 'Pharmacy clinical decision-making: Myocardial infarction (MI)' which enabled learners to make and see the outcome of their prescribing decisions. Learners' perceptions of their confidence and competence in clinical decision-making was investigated using a pre- and post-evaluation survey (utilising 5 scale Likert-type questions) developed using Microsoft Forms. Additional questions were asked in the pre-evaluation module to assess motivation to choose the module and in the post-evaluation survey to seek the learner's opinion on whether their current practice had been challenged or confirmed, whether the scenarios were of an appropriate complexity and where improvements could be made to this or future modules.

Results: Responses to pre- and post-module evaluation surveys (n = 34) were compared and revealed a statistically significant (Wilcoxon, $p < 0.001$) increase in the self-perceived confidence and competence in relation to all survey components. Thematic analysis revealed a desire for more content and increasing complexity in the 'choose your own adventure' format.

Conclusion: This study determined that self-reported confidence and competence in clinical decision-making related to the optimisation of pharmaceutical care for patients post-myocardial infarction can be improved through the use of online scenario-based e-learning. Participants have indicated acceptance of this method of learning; thus proving the concept. This method should be developed further, covering more conditions, with increasing complexity. Future evaluation should determine if self-reported confidence and competence leads to change in prescribing practice, and which prescribers benefit most from this method.

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PP042

What is the role of patient mentors in health professions education?

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Background and objective: To explore the involvement of patients as mentors in healthcare professions education.

Method: Scoping review inspired by patient and public involvement using the Arskey and O'Malley Framework. Search conducted using a simple high sensitivity search followed by forward and backward citation analysis.

Main outcome measures: How patients are involved as mentors, enablers and challenges to involving patients as mentors, impact of patients as mentors on students and patient mentors.

Results: Thirty-six papers (8 seed references and 28 direct citations) were reviewed. Patients were involved through longitudinal contact between a patient mentor and a single student, or small groups of students, in some cases interprofessional. The majority of the mentorship programmes were implemented over one academic year or more. Patients were recruited in various ways. Enablers included relationship building, assessing suitability, orientation, supporting patients and recognition of mentorship. Challenges included reliance on volunteering, apprehension, lack of shared values, logistical challenges and illness. The impact for students was enhanced appreciation of patient-centred care, increased empathy, increased understanding of interprofessional care and the healthcare system, development of knowledge, skills and professional behaviours. Benefits to patients included developing connections, personal satisfaction, empowerment and improved health and well-being. Other insights included recognition of the importance of longitudinal contact in a non-clinical setting, recommendations for the composition of student-patient mentor groups and suggestions for facilitative faculty involvement.

Conclusion: Patient mentorship has the potential to have a powerful impact on the student professional journey. There are some challenges, which can be minimised through careful planning and investment in building relationships.

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PP043

Knowledge, awareness, and attitudes of pharmacists about dermocosmetic products—a descriptive study

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Background and objective: Pharmacists, who have duties in the research, design, development, production, presentation, and consultancy of rational use of dermocosmetics. In our study, it was aimed to evaluate the knowledge, awareness, and attitudes of community pharmacists about dermocosmetics.

Design: This descriptive study was conducted on community pharmacies in Istanbul (Turkey). A self-structure questionnaire was applied to community pharmacists online and face-to-face. The questionnaire contains 18 items including social demographic characteristics and knowledge, awareness, and attitudes about dermocosmetics.
Results: A total of 55 pharmacists participated in the study and the response rate was approximately 1%. Of the 55 pharmacists, 85.5% were female and the median age was found as 36 years. Seventy-six percent of the participants had education about dermocosmetics after graduation and 86% have been sold dermocosmetics. About 22% of the participants stated that they were working with a dermocosmetic specialist. Most of the pharmacists (86%) stated that they were aware of the difference between dermocosmetics and cosmetics. They defined dermocosmetic as follows: used for the treatment of dermatologic diseases (67.3%), a medical device (49%), a semi-drug (27.3%), and a medicine (5.5%).
Conclusion: According to the results of the study, community pharmacists sell dermocosmetic products at a high rate and the rate of pharmacists working with a dermocosmetic specialist is very low. In addition, community pharmacists have a high level of knowledge and awareness about dermocosmetics. Additionally, they are interested in training in dermocosmetics after graduation. For this reason, pharmacists are a competent professional group in informing and selling dermocosmetics, and providing pharmacists with information and training about dermocosmetics will contribute to increasing knowledge and awareness.
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PP044

Pharmaceutical care delivery by clinical pharmacists and its impact on patients in territory hospitals in Oman

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Background and objective: Oman's healthcare system has developed progressively, with the Ministry of Health prioritizing services and extending the health Vision to 2050. Investments establish health centers and specialty hospitals, managed by regional directorates overseeing public and private facilities. Despite spending less than 6.1% of GDP (1816.88 million USD) on healthcare, Oman's system is recognized by the World Health Organization as one of the best. The Ministry emphasizes evaluation and improvement through feedback and a patient satisfaction hotline, ensuring quality services for the public. This study evaluates the impact of clinical pharmacists' services in Oman on patient outcomes. It assesses how the expertise of clinical pharmacists improves health results and enhances patient satisfaction. The findings provide valuable insights into the effectiveness of clinical pharmacists in Oman's healthcare system.
Design: A cross-sectional survey study was conducted with the use of two questionnaires. The first questionnaire captures provider characteristics and their utilization of the integrated clinical pharmacist. The second questionnaire assesses patient perceptions in a clinical pharmacist-managed primary care clinic, focusing on education and satisfaction. Both questionnaires were translated and validated using a forward–backward translation method and an expert panel.
Results: 120 patients and 95 physicians responded so far in this study. Around 52% of responding physicians were Females mostly aged 35–44 years (52%). 59% of responding patients were males 53% of them aged older than 45 and as well being university graduates. More than half of Physicians reported that clinical pharmacists contribute to decreasing their workload and time spent on patient education. The majority of Physicians agree that Clinical pharmacy services have improved overall medication use in their setting while around 70% of patients overall positively rate their clinical pharmacy services and visits.
Conclusion: Clinical Pharmacy services in Oman are associated with both positive physician and patient experiences along with improved patient care in tertiary hospitals.

PP045

Establishment of a clinical pharmacy unit in a university hospital

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Background and objective: In Turkey there is a lack of 'Clinical Pharmacy Unit's in private hospitals established to provide structured pharmaceutical care to patients. Our aim is to provide and evaluate the outcomes of certain clinical pharmacy services at inpatient clinics of Infectious Diseases, Internal Diseases and Chest Diseases Departments of a private university hospital through the establishment of a Clinical Pharmacy Unit.
Method: Randomized controlled prospective study in a 216-bed university hospital; once hospitalized intervention group received: identification of and intervention to drug-related problems, education on discharge medications and new medicine service; control group received: usual care. As follow-up all patients would receive three bi-monthly clinical tele-pharmacy services including monitorization of relevant parameters such as number of hospitalizations, outpatient and emergency department admissions, drug therapy changes, medication adherence, drug knowledge.
Main outcome measures: Comparison of monitoring parameters between the intervention and control groups and descriptive analysis of drug-related problems.
Results: Patients enrolled in the study were randomized to control (n = 44, 6 were lost to follow-up) or intervention group (n = 50). This preliminary report describes the outcomes of the first bi-monthly follow-up of 94 patients [female: 60.2%; mean (SD) age: 70.96 (14.5)]. Baseline characteristics such as mean (SD) number of chronic diseases [3.3 (1.5)] and medications [6.8 (3.6)] were similar for both groups. On follow-up intervention group had higher medication adherence and drug knowledge scores than the control group [median (IQR): 0 (1) vs. 2 (2); $p < 0.05$; 6 (2) vs 4 (1); $p < 0.05$, respectively]. Number of outpatient clinic admissions was higher in the control group compared to the intervention group [1 (2) vs 0 (1); $p < 0.05$]. Number of hospitalizations, emergency department admissions and parameters related with drug therapy changes were similar for both groups. A total of 101 drug-related problems were identified in 36 patients in the intervention group; 81.2% of these problems were intervened and 84.1% of the interventions were accepted by the physicians or patients.
Conclusion: These results demonstrate that establishment of a 'Clinical Pharmacy Unit' and provision of structured pharmaceutical

care services improved medication knowledge and adherence of patients besides contribution to safe and effective drug therapy through drug-related problem identification and resolution.

PP046

Intervention for a correct medication list and medication use in older adults—a feasibility study among inpatients and residents

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Background and objective: Background—Medication discrepancies in care transitions and medication non-adherence are problematic. Few interventions consider the entire process, from the hospital to the patient's medication use at home. Interventions that focus on the whole process are needed. Aim—This study aimed to examine the feasibility of an intervention to reduce medication discrepancies in discharge summaries and the potential effectiveness of a person-centred adherence intervention.
Method: This intervention study was performed in Southern Sweden and involved persons prescribed five continuous medications, who handled their medications themselves. Hospital patients participated in a pharmacist-led intervention to establish a correct medication list upon discharge and a follow-up interview two weeks post-discharge. Hospital patients (n = 7) and persons from a residential area (n = 6) received a person-centred adherence intervention for three to six months. Discrepancies in the medication lists, Beliefs about the medicines questionnaire (BMQ-S), the Medication Adherence Report Scale (MARS-5), and health literacy (HL) were assessed.

- **Main outcome measures:** Feasibility of correct medication list intervention and adherence intervention.
- Medication discrepancies
- BMQ-S improvements
- MARS-5 improvements

Results: A total of 24 discrepancies in the medication lists were found among hospital patients, and six out of seven had at least one discrepancy. The discharging physician agreed that all discrepancies were errors, but only ten were corrected in the discharge summary. Ten out of 12 participants decreased their total BMQ-S concern scores ($p < 0.005$), i.e. they reported fewer concerns with their prescribed medications; seven increased their full MARS-5 scores, i.e. reported higher adherence ($p = 0.025$), and nine had insufficient HL.
Conclusion: The results show that a pharmacist-led intervention on medication discrepancies and adherence is feasible. Experiences from this study are essential for the planning of a full-size RCT.
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PP047

Factors contributing to medication non-adherence in chronic patients within Oman healthcare

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Background and objective: Chronic disease patients have higher non-adherence rates than acute illness patients [1], likely due to medication complexity, prolonged periods of therapy, and the need for close monitoring by a family member or healthcare provider to manage the treatment of multiple comorbid conditions [2]. Medication nonadherence continues to be a substantial hurdle in the management of chronic diseases. The objectives of this study are to evaluate medication non-adherence, its underlying causes, and the potential for pharmacist-led interventions.
Method: A questionnaire was created as a self-reporting tool to cover several aspects of medication non-adherence, including healthcare system-related (7 questions), patient-related (8 questions), and medication-related (6 questions). Its design provides relevance to a wide spectrum of chronic diseases and patient demographics. Prior to starting the questionnaire, the patient's agreement to participate and demographic information were acquired.
Main outcome measures: Factors related to chronic patients' non-adherence to their prescribed therapy.
Results: Cardiac disease (41%), diabetes, and thyroid-gland disorders dominated among the 206 chronic disease patients. 30% of patients had polypharmacy, and 60% needed more than three doctor visits per year. 31% stopped taking their prescription if they felt better within a few days, while 40% stopped due to inadequate instructions from healthcare providers. 55% forgot to take their medications, and 23% need supervision during administration. 29% will discontinue taking medication if it interferes with daily life, and 20% prefer folk treatment. 24% may have trouble affording medicine. 44% of patients stopped their prescriptions owing to side effects, whereas only 7% reported ADRs. 23% ceased their medications due to polypharmacy, and 28% due to medication shortages. Elderly and low-literate patients were more likely to not adhere.
Conclusion: The research revealed that contributing factors can be categorised into three groups: healthcare, patients, and medication-related. Additional research was required to design individualised interventions to address emergent issues.

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PP049

Roles and interventions of clinical pharmacist in coronary care unit and intermediate care ward at the national heart centre

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Background and objective: Clinical pharmacist interventions defines as the actions to know and prevent drug-related problems, and optimise patient medication therapy from the time patients are admitted, and until they are discharged. This study aims to show the importance of presence of an electronic form in *AlSifa* System to facilitate clinical pharmacy service implementation in different wards. Objectives were to determine the roles of clinical pharmacist in Coronary Care Unit (CCU) and Intermediate Care Ward (ICW), and to document all clinical interventions types in the CCU and ICW,

including medication errors related to injectable antibiotics, using Excel sheet forms prepared by the current clinical pharmacist.
Design: Retrospective observational study that was carried out from January 2022 to March 2023 in a 8-bed CCU and 24-bed ICW in the National Heart Centre/the Royal hospital.
Results: A total of 9 different roles of the clinical pharmacists were identified in CCU and ICW. Roles of the clinical pharmacist in CCU and ICW were classified into inpatient prescriptions reviewing, clinical rounds attending, response to doctor's referral, documentation of errors related to inj. antibiotics, response to nurses' queries, discharge patients' prescriptions reviewing, counselling to non-compliance patients, and protocols/guidance formulation or reviewing. A total of 1460 inpatients prescriptions reviewed by the clinical pharmacist during the period of the study. Ninety rounds were attended by the clinical pharmacist with CCU team. However, medication reconciliation service was implemented in only 30 patients. Around 69 verbal/written doctor referrals were responded. A total of 90 errors (related to injectable antibiotics) were reported. Regarding discharge patients, approxiemetly 365 discharge prescriptions were reviewed by the clinical pharmacist and 41 patients were counselled by the clinical pharmacist. In addition, 6 protocols/guidance were formulated in cooperation with doctors.
A total of 848 interventions were reported. Approximately 30% of interventions were addition of medication, followed by dose adjustment (21%), monitoring laboratory order (11%), discontinuation of medication (9%), and drug information interventions (8%) respectively. Hold medication interventions were around 5%, while frequency of other interventions was less than 5%.

A total of 211 errors (related to injectable antibiotics) were reported. Errors were classified into 3 categories, prescribing, administration and monitoring errors, and sub-categorised. The highest percentage of errors were prescribing (64%), followed by monitoring errors (30%) and administration errors (4%) respectively. Incorrect doses were the most common type of prescribing errors (45%), while the most common type of monitoring error was drug level is not monitored (14%).
Conclusion: The present data showed that implementation of clinical pharmacy services in CCU and ICW resulted in high number of clinical interventions that improve the patient's safety. Results confirms the importance to provide an electronic clinical pharmacy interventions form in AlShifa system to facilitate documentation of these interventions and improve performance of the clinical pharmacists in the Ministry of Health. As a result, indicating the value of the clinical pharmacist roles in the multidisciplinary team.
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PP050

Importance of clinical pharmacist interventions in methotrexate administration

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Background and objective: Severe or fatal adverse reactions have been reported with methotrexate, a folic acid antagonist that is commonly used as an immunosuppressant and anti-inflammatory drug in the treatment of rheumatoid arthritis or psoriasis. Whether it is administered orally or by injection, compliance with the correct dosing regimen, routine monitoring and co-prescription of folic acid are highly recommended to minimise the risk of serious toxic side-effects.[1] As clinical pharmacists have comprehensive knowledge in the rational and safe use of medicines, they have the capability to promote appropriate administration of methotrexate. The aim of this study was to evaluate the relevance of clinical pharmacists in the detection, solution and prevention of drug-related problems (DRPs) in patients with methotrexate therapy presented to hospital.
Method: Electronic requests for methotrexate—which are checked by clinical pharmacists by default—from January 2018 to May 2023 were screened for pharmaceutical interventions based on possible DRPs. Furthermore, medical records within that period were searched for pharmaceutical recommendations, which documented any issues with methotrexate, even if no requests for the drug were made.
Main outcome measures: All detected DRPs were classified using the PCNE Classification for Drug-Related Problems V9.1.[2].
Results: Overall, 128 requests for methotrexate were analysed. More than half of them (57%) were actively cancelled, exchanged or dose-adjusted by the pharmacists and 67 (64%) pharmaceutical recommendations were written. In sum, 105 patients taking methotrexate with a total of 128 possible DRPs were identified. PCNE classification showed that most problems (50%) affected treatment safety, leading to (potential) adverse events. The causes were mainly inappropriate drug selection (45%) and wrong dosing (40%) due to medical conditions or lack of information. Most recommendations (88%) comprised discontinuation of therapy, changes in the dosing regimen and instructions for use. The level of acceptance was fairly high with 79% and the majority of problems could totally or partially be solved (63%), whereby in most other cases acceptance and outcome remained unknown (20% and 36%, respectively).
Conclusion: Patients admitted to hospital often present with clinical conditions that require dose adjustments or cessation of methotrexate. By checking every methotrexate request for its appropriateness based on a patient's individual state of health, clinical pharmacists are able to detect medication errors, avoid possible harm and contribute to overall patient safety.

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PP051

Updates in the managment of anaemia in patients on haemodialysis

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Background and objective: CKD affects 9.8% of the general population worldwide. In 2018, prevalence of end stage renal disease (on dialysis) in Oman was 0.115%. Anaemia is a common complication in Chronic Kidney Disease (CKD), which can adversely affect their quality of life and increase morbidity and mortality. The optimal management of anaemia in these patients remains controversial, and clinical pharmacists play an important role in ensuring safe and effective use of medications. This study aimed to evaluate the management of anaemia in patients on haemodialysis at a Royal hospital, focusing on the role of clinical pharmacists in optimizing medication therapy.

Method: A retrospective chart review of haemodialysis patients at the Royal hospital was conducted for a six-month period. Data was collected on patient demographics, laboratory values (haemoglobin (Hgb), iron, ferritin, transferrin saturation (TSAT)), erythropoietin-stimulating agent (ESA) use, iron supplementation, transfusion rates, and outcomes. The involvement of clinical pharmacists in medication management was also be documented.
Main outcome measures: The main outcome measure of this study was to evaluate the management of anaemia in patients on haemodialysis, with a focus on the role of clinical pharmacists in optimizing medication therapy. The specific measures included hemoglobin levels, erythropoietin-stimulating agent (ESA) use, iron supplementation, transfusion rates, serum ferritin concentrations, transferrin saturation values, and the involvement of clinical pharmacists in medication management.
Results: The study included 36 patients with a mean age of 54.6 ± 15.8 years. The average haemoglobin (Hgb) level in July was 8.7 ± 1.46 g/dL, which increased to 9.80 ± 2.10 g/dL after three months, indicating a mean increase of 1.1 g/dL within three months. The majority of patients (64%, n = 23) received darbepoetin 40 ug, followed by 31% (n = 11) on darbepoetin 80 ug, and 5% (n = 2) received erythropoietin. IV iron replacement therapy was administered to 22 patients (61.1%), with a mean serum ferritin concentration of 726 ug/L ± 544 ug/L and an average transferrin saturation (TSAT) value of 23.0 ± 12.5. Clinical pharmacists played a significant role in optimizing medication therapy, including ESA recommendations and dose modifications for all patients. They were also involved in monitoring all lab parameters.
Conclusion: Clinical pharmacists play a crucial role in the management of anaemia in haemodialysis patients. This study provided valuable insights into the current practices of clinical pharmacists in haemodialysis patients at a Royal hospital. The findings can inform clinical practice and contribute to the development of evidence-based guidelines for the role of clinical pharmacists in the management of anaemia in this population.

PP054

Assessment of adherence to carbamazepine using direct and indirect methods, a study from Jordan

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Background and objective: Measuring of carbamazepine level in the biological sample is a requirement to guide dosing, decrease toxicity and is useful to assess adherence to medication. The primary aim of the present study was to analyze carbamazepine levels in saliva and plasma samples of patients and to assess of the adherence to carbamazepine using direct and indirect methods.
Method: Adults who were using carbamazepine for at least one month were recruited from outpatient clinics department in Princess Basma Hospital, a public hospital in Irbid. Saliva samples and blood samples (1 ml) were collected simultaneously from subjects and a microanalytical method using high-performance liquid chromatography with an ultraviolet detector and the level of carbamazepine (in microgram per milliliter) was ascertained. Analysis of adherence to carbamazepine was carried out using plasma and saliva level and adherence scale.
Main outcome measures: Prevalence of and factors influencing non-adhernce to carbamazepine, triangilated via plasma and saliva levels and adherence scale.
Results: A total of 69 consecutive patients attending the neurology clinic were recruited. Overall, about two-third (63.8%) of the study sample were non-adherent in any of the adherence assessment methods. By referring to the plasma sample carbamazepine concentration, 75.4% of the respondents were adherent, 15.9% had under-adherence and 8.7% had over adherence. A sum of 85.9% of the responders were adherent using the carbamazepine level in saliva samples. Plasma and saliva carbamazepine levels were linearly correlation. The predictor associated with higher plasma and saliva carbamazepine level using linear regression analysis was seizures frequency that occurs less than monthly as compared with seizure free.
Conclusion: Saliva carbamazepine level showed the potential to be used as alternative matrix to assess medication adherence with considerable correlation with the plasma carbamazepine level. Adherence to carbamazepine assessment was triangulated using direct and indirect measures, that have the utility to identify and address the issue of non-adherence in its different dimensions in routine care.

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PP056

Impact of clinical pharmacist interventions in intensive care unit

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Background and objective: Intensive care unit (ICU) patients suffer from drug-related problems (DRPs) that cause treatment ineffectiveness and adverse effects due to organ dysfunction and pharmacokinetic alterations. In Turkey, clinical pharmacy services were limited in the private hospitals. This study aims to determine the prevalence of DRPs and to evaluate the impact of clinical pharmacist (CP) interventions in the ICU.
Method: This study was conducted in two steps: retrospectively (control group) between January 2022–April 2022 and prospectively (intervention group) between May 2022–October 2022. Clinical pharmacy services were not established in a private hospital in the control group. The DRPs were identified and intervened in the intervention group by a CP during daily rounds with anesthesiologist. Presence of DRPs in treatment protocol was evaluated according to the Classification Scheme of the Pharmaceutical Care Network Europe (PCNE) v.9.1. Data was analyzed by SPSS Statistics 23.
Main outcome measures: To compare the clinical significance of the CP interventions in the intervention and control groups and to identify the prevalence of DRPs in ICU.
Results: Total of 220 patients (100 in the control and 120 in the intervention group) were included in the study. In the intervention group, 226 treatment protocols were examined. One hundred and eighty-six DRPs were detected in 68 critically ill patients and 86.0% of CP interventions were accepted and fully implemented by the physicians. The prevalence of DRPs detected in critically ill patients treated in the ICU was 56.7%. An increased number of medications were associated with more DRPs (43.3% vs 56.7%, $p = 0.016$). The median (IQR) number of DRPs detected per patient was 1(2), of

which 54.3% related to treatment safety and 44.6% were related to effectiveness. The most frequent cause of DRPs were high-dose drug administration (23.7%). Although the length of stay was longer in the intervention group ($p = 0.003$), the 30-day mortality was similar in the control and intervention groups (36.4% and 43.3%, respectively, $p = 0.295$).
Conclusion: As a member of the multidisciplinary team in ICU, CPs will contribute to the prevention of drug-related adverse effects and improving economic outcomes by reducing unnecessary medication use.

PP057

Patients' understanding of the pharmaceutical interview support sheets for appropriate antibiotic use

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Background and objective: Compliance to antibiotic treatment is essential to ensure cure of infections. Therapeutic patient education (TPE) involves the patient in their care and improves compliance. In accordance with the recommendations of the French National Authority for Health, the main objective of the study is to assess the patients' understanding of the information sheets on antibiotic treatment.
Design: A monocentric prospective observational study was conducted in our hospital from May 1, 2022 to January 31, 2023. Information sheets for patients on the most frequently prescribed antibiotics were written jointly by the pharmacy and the Antimicrobial Management Team (AMT). The readability of each antibiotic sheet was evaluated by the Flesch Reading Ease, ranging from 0 (very difficult) to 100 (very easy). The sheets were given to the patient by a pharmacist before their discharge during a TPE interview. Patients' understanding of the sheet was assessed by a seven-question questionnaire at the end of the interview.
Results: Forty-two TPEs were conducted, of which 9 (21%) patients were excluded due to cognitive disorders, illiteracy or language barrier. Thirty-three (79%) patients were included. The median age was 65 years [IQR 54–73]. Among them, 12 (36%) were non-native french speakers, 12 (36%) of low level of education and 9 (25%) in professional activity. The main inpatient services were orthopedics (14), vascular surgery (6) and diabetology (6). Patients had 3 [IQR 0–4] comorbidities and 6.1 [IQR 0–4] co-medications. Each patient received between 1 and 3 antibiotics for an intented treatment duration of 6 [IQR 3–10] weeks. Each interview lasted approximately 15 [IQR 10–20] minutes. The Flesch score of the antibiotic sheets was 27.1 [IQR 27.1–36.2], i.e. very difficult to read. The comprehension score was $>$ 5/7 for 26 (79%) patients, 4 and 5/7 for 4 (12%) patients and $<$ 4/7 for 2 patients (6%).
Conclusion: The antibiotic sheet could be proposed and seemed well understood by the majority of patients despite a "very difficult" Flesch score and a high proportion of elderly, non-french citizens or with a low level of education. The presence of a pharmacist in the AMT makes it possible to carry out these TPE interviews, which require significant time and human investment. It would be interesting to conduct additional interviews to reassess the understanding of the antibiotic sheets subsequently to the initial TPE and therapeutic compliance.
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PP058

Antimicrobial use in palliative care service: a prevalence study

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Background and objective: Palliative care patients are commonly affected by infections. However, good practice guidelines for antimicrobial use in palliative care patients have not been established.
Method: We conducted a prevalence study of antibiotic prescriptions in palliative care services between December 1 and 31, 2022. All hospitalized patients receiving a systemic antibiotic were included.
Main outcome measures: The primary outcome of this study is the percentage of patients using antimicrobials within one month in the palliative care service.
Results: This study covered 36 patients hospitalized in palliative care services. Among 36 patients hospitalized in the ward during the study period, 28 (77.8%) who used antimicrobials were eligible for the study. The mean age was 73.5 $\pm$ 15.7 years (range 29–98), and 50% were female. The most common reason (42.9%) for antimicrobial use was "skin and soft tissue infections." Twenty-three (82.1%) had a positive bacterial culture, 2 (7.1%) had a negative culture, and 3 (10.7%) had no culture at all. The number of patients who started monotherapy on the first day of antimicrobial therapy was 19 (67.9%), and the number of patients who began combination therapy was 9 (32.1%). The most used antimicrobials on the first day of treatment were carbapenems (35.1%) and anti-pseudomonal penicillins (18.9%). In total, the most frequently used antimicrobial drugs in one month, tigecycline, meropenem, and piperacillin-tazobactam, were 103/453 (22.7%), 96/453 (21.2%), and 56/453 (12.4%), respectively.
Conclusion: In this study, used antimicrobials were highly prevalent among palliative care patients. In addition, it has been determined that broad-spectrum antimicrobial use is relatively high. Therefore, we advocate for a careful and comprehensive assessment of antimicrobial therapy's potential benefits and treatment burdens, especially when palliation is the goal.
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PP059

Clinical pharmacy practices in palliative care service: a scoping review

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Background and objective: The pharmacist is part of the multidisciplinary team in palliative care at different levels of health care. However, the importance of the clinical pharmacist and the clinical pharmacist's role within the multidisciplinary team in palliative care is poorly studied. Therefore, this scoping review aimed to map and summarize scientific evidence on the part of clinical pharmacists in palliative care. Aim of this study is to provide an overview of the impact of clinical pharmacy practices in palliative care service.
Design: Scoping review of the literature was performed. Then review was conducted following the recommendations of the Preferred

Reporting Items for Systematic reviews and Meta-Analyses statements for Scoping Reviews (PRISMA-ScR). This study is a descriptive study. The search included the following keywords: "Palliative Care Pharmacist," "Clinical Pharmacy Services in Palliative Care," and "Palliative Care Clinical Pharmacist" in Pub-Med and Web of Sciences databases to determine the clinical pharmacy services applied in the palliative care service and their effects. The study was conducted between January 2018 and January 2023 to cover retrospective five-year studies. Articles published only in the English language were included. Two independent authors conducted the study selection and data review. In case of any inconsistency, the third and fourth authors were consulted. Pharmacist interventions in studies were classified using DEPICT (Descriptive Elements of Pharmacist Intervention Characterization Tool) v2.

Results: Of the 656 articles found, 11 publications were evaluated within the scope of the study in accordance with the inclusion criteria. Literature was collected from various countries, mainly from the USA; additionally, from the UK, the Netherlands, Brazil, and Jordan with single-centered studies. Studies have generally shown that pharmacists within the multidisciplinary palliative care team make significant contributions. The most common interventions made by the pharmacist were the recommendation/discontinuation of medication, followed by medication reconciliation and healthcare professional/patient counselling. The clinical team highly accepted interventions (80–90%).

Conclusion: Including the clinical pharmacist in the palliative care team has been shown to improve therapeutic endpoints and significantly reduce health expenditures.

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PP060

Toxicity and effectiveness of durvalumab

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Background and objective: Durvalumab is a monoclonal antibody that selectively blocks the interaction of PD-L1 with PD-1 and CD80. Indicated and funded for the treatment of unresectable non-small cell lung cancer stage III. The funding criteria are at least two cycles of platinum-based chemotherapy, not progressed following chemoradiation therapy, performance status (PS 0–1), tumours express PD-L1 on $\geq$ 1% of tumour cells, no contraindications for immunotherapy and no prior treatment with anti-PD-1 or anti-PD-L1 antibody. To evaluate toxicity and effectiveness of durvalumab in routine clinical practice.ral.

Design: Observational retrospective study that included all the patients thoat had started treatment in our hospital with durvalumab (between January 2020-March 2023). Variables analysed were demographics and clinical (age, sex, PS), treatment (chemotherapy protocol, number of cycles received, percentage of PD-L1 expression, TAC result before starting durvalumab). CTCAE (Common Terminology Criteria for Adverse Events) v5 of National Cancer Institute was used to establish toxicity. Response and survival rate were used to analyse durvalumab effectiveness from the start treatment. Data were obtained from clinical medical record and chemotherapy management software.

Results: Twelve patients were included, median age 66 years (55–72), six women. Stages: four patients III-B, five patients III-A, two patients III-C, one patient II-B. The funding criteria were respected but one not (patient II-B). Toxicity: cough five patients (one G1, four G2) and pruritus two patients (one with neurotoxicity G1, one G2). Three patients discontinued treatment due to pneumonitis. Response rate was partial response (9), stable disease (2) and complete response (1). When the study concluded (16/05/2023) 3 patients finished treatment due to toxicity, 3 had disease progression (2 during durvalumab treatment and 1 after) and 6 not disease progression (3 finished treatment and 3 continued in active treatment). Progression free survival (PFS) was 28.72 months (IC 95%, 16.27–41.17 months).

Conclusion: In our study, effectiveness and toxicity data are similar to clinical trial. However, the incidence of pneumonitis as a reason to discontinued treatment is remarkable. Due to the small size of our sample, larger studies are needed to confirm pneumonitis' incidence.

PP061

Application of root-cause analysis to the return of drugs from a nursing home

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Background and objective: The hospital's pharmacy service (HPS) dispenses treatments to residents in nursing homes (NH). Some medicines are returned on a weekly basis. It is important to analyse the reasons and implement improvement measures to improve patient safety and the quality of the service.

To apply root-cause analysis (RCA) to identify the root causes for returned drugs from a NH to HPS and propose improvement actions to reduce this incidence.

Design: Descriptive and retrospective study conducted between november 2021-september 2022 in a HPS.

Variables: age, sex, number of prescribed and returned drugs and reasons to return.

Data were collected from clinical medical record (CMR), electronic prescription, management software.

Pharmacy technician filled a return form and the pharmacist analysed it. Detected incidents were discussed with NH staff.

A multidisciplinary team carried out an RCA to identify the causes of the returns.

Results: Forty-eight (58.5%) patients returned drugs. Median age was 74 years, 66.6% male. Mean number of prescribed drugs per resident was 7.6(1–19). Returned drugs were 260, corresponding to 62 ATC pharmacotherapeutic groups.

Reasons were: unknown (42.4%), collected at pharmacy (18.6%), no adherence (7.3%), treatment modification by physician (6.7%), hospital admission of the resident (6%), pro re nata (PRN) drugs (5.3%), stock in NH (4.6%), inadequate medication reconciliation (3.3%), NH discharge of resident (2.6%), administration error (1.3%), exitus (0.6%), resident was on holiday (0.6%), HPS error dispensation (0.6%).

Causes identified by RCA:

1. Organisation: NH geriatrician (NHG) cannot access to residents' CMR. Lack of established safety culture.
2. Task: Duplicity of prescription: no communication between primary/specialised care and NH. No protocol about NH dispensation.
3. Equipment and resources: Insufficient NH staff and knowledge weakened by staff turnover.

4. Communication: Not all information is recorded in the electronic prescription or CMR. No fluid communication between HPS and NH. Patients didn't communicate drugs change to NHG.
5. Training and knowledge: No training programme about drugs.
6. Patient: Insufficient adherence and knowledge of their treatments.

Improvement actions:

To design a dispensation/prescription protocol and training program for NH and HPS staff to reinforce protocols. Medication reconciliation protocol after healthcare transitions.

Not send PRN drugs or collected at pharmacy. Training programme for residents to reinforce the need to communicate any drugs change to NH staff.

Conclusion: RCA is a key tool to identify root causes.

In our case, lack of protocols and communication between NH staff, pharmacy and residents stand out as the root causes of medication returns.

PP062

Effectiveness and safety of systemic bevacizumab for the treatment of refractory hereditary hemorrhagic telangiectasia: a case report

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Background and objective: Hereditary hemorrhagic telangiectasia (HHT) is an autosomal dominant vascular disorder characterized by severe anemia and bleeding due to arteriovenous malformations and telangiectasias. Treatment options for this disorder primarily focus on limiting the bleeding and correcting the anemia with blood transfusions and iron supplementation. Bevacizumab is an anti-VEGF antibody which was approved for the treatment of many cancer types and has been used as an off-label drug to treat severe HHT forms. The aim of this case report is to illustrate the effectiveness and safety of systemic bevacizumab in a patient with refractory HHT.

Design: Prospective study of fifteen-month follow-up of a 81-year-old man diagnosed with HHT, that showed secondary anemia to multiple intestinal angiodysplasias in which endoscopic treatment was not applicable. Until 2012, anemia was controlled with tranexamic acid and oral/intravenous iron. Since 2013, the patient has had a frequent need for transfusions (4 units of packed red blood cells every week plus iron supplementation). Treatment with subcutaneous octreotide and thalidomide was attempted, which were ineffective. In these circumstances, treatment with bevacizumab (5 mg/kg iv every 2 weeks) was requested which began in March 2021. Effectiveness of bevacizumab was measured by the number of units of packed red blood cells (PRBC) transfused and values of hemoglobin. Safety was assessed through blood pressure monitoring and adverse drug reactions reported by the patient.

Results: The patient received 20 doses of intravenous bevacizumab in the course of 15 months. During this period, the number of units of PRCB transfused decreased by 43.9% and the mean level of hemoglobin increased by 27.6%. However, due to the diagnosis of bladder cancer and the consequential radical cystectomy, bevacizumab was discontinued for 5 months, after which treatment was restarted. The patient developed worsening of his baseline hypertension, requiring an increased dose of antihypertensive therapy and presented nausea and vomiting episodes that subsided with antiemetic. Finally, the patient died after perforation due to unresectable neo-rectosigma.

Conclusion: Therapy with bevacizumab for the treatment of HHT has shown to be effective and safe in this patient, but more studies with a larger number of patients would be needed in order to obtain robust data.

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PP063

Exploring communication challenges during hospital discharge of older patients: insights from healthcare professionals' perspectives

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Background and objective: Hospital discharge of older patients is a critical and intricate process that poses substantial challenges for patient safety. Effective communication among stakeholders during this process is therefore essential to ensure desirable patient outcomes. This study aimed to explore the communication process and medication information transfer during hospital discharge of older patients, from the perspective of healthcare professionals (HCPs) across different healthcare organisations.

Method: A qualitative study using focus groups and semi-structured interviews was conducted with physicians, nurses, and pharmacists, from hospitals, primary healthcare centres, nursing homes, and home healthcare in Sweden. Data collection occurred between September and October 2021. A semi-structured interview guide was used to explore current medication communication practices, potential improvements, and feedback on suggestions for alternative processes. The data were thematically analysed using the systematic text condensation method.

Main outcome measures: N/A.

Results: Four focus group discussions and three semi-structured interviews were conducted with 23 HCPs. Three themes emerged: (1) *Support systems that help and hinder*; identifies the use of laws and regulations, nursing homes, and informal caregivers in the discharge process to compensate for the fragmented healthcare organisations and the impact of these structures on HCPs' communication practices; 2) *Communication between two separate worlds*; describes the challenges in communication experienced by HCPs working in different healthcare organisations and how they manage them; and 3) *The large number of medically complex patients*; depicts the impact of the highly pressurised healthcare system on HCPs' communication practices during hospital discharge.

Conclusion: This study highlights the complex nature of hospital discharge of older patients. Communication at hospital discharge is hindered by the fragmented, highly pressurised healthcare system, posing a risk to patient safety. HCPs face challenges in managing the communication difficulties and, as a consequence, are at risk of moral distress. Therefore, developing and implementing improved communication practices during hospital discharge is crucial for the benefit of both patients and HCPs.

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PP064

Conciliation and deprescribing medication for elderly patients in a traumatology unit

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Background and objective: There is an attendant increment in chronic illnesses and polypharmacy in elderly patients. For this reason, there is a requirement to ensure patient safety through deprescription methods. The objective is to conciliate medication on admission by an orthopaedic and traumatology unit (OAT) and to detect the domiciliary drugs which could potentially be deprescribed.
Method: Twelve month long prospective study that included all polymedicated elderly patients (aged 65 years or greater) admitted in the OAT. We reconcile the perioperative (PO) treatment. Data collect were age, gender, chronic and pluripathological condition, either urgent or scheduled surgery, reason for admission, anticoagulation and/or thrombolytic therapy, number of domiciliary drugs, justified and non-justified discrepancies. We also detect domiciliary drugs which could potentially be deprescribed using as reference the medication review protocol for polypharmacy patients produced by andalusian health service. Data collect were: number of patients with potentially inappropriate medication (PIM), therapeutic group involved, cause of potentially deprescription (security, low therapeutic value or higher anticolinergic burden (AB)), Barthel index, pluripathological condition, Profund index (PI) and mortality risk. Anticholinergic drug burden (ADB) was measured with anticholinergic drug scale (ADS).
Main outcome measures: Most frequent discrepancy was omission of medicament. The most frequent therapeutic group potentially inappropriate was anxiolytic/hypnosedative and security was the major cause of potentially deprescription. ADB was high in a sizable percentage of patients.
Results: 87 patients with average age of 74 ± 9.5 years and range (66–95) were included.100% had some type of chronic disease with average of 11 ± 3 domiciliary medicaments. Main cause of admission was hip fracture (62.8%) 0.263 discrepancies were detected:152 were justified and 111 non-justified. Most frequent in last ones were:omission of medicament (53.1%), different dosage/route of administration/frequency (30.6%) and medical interactions (11.7%). Less frequent: duplicity (2.7%) and wrong medication (1.9%) 0.77% of patients had at least one PIM with an average of 2.4 drugs per patient. The most frequent therapeutic group potentially inappropriate was anxiolytic/hypnosedative (22.9%) followed by proton pump inhibitors (PPI) (19.2%). Security was the major cause of potentially deprescription (69.7%) followed by AB (26.5%). Low therapeutic value was the minor cause (3.7%). Median Barthel index was 51.1 ± 28.7. Only 16% (14 patients) were pluripathological patients with a 9.6 ± 3.6 median PI (intermediate-high risk group) and a mortality twelve months between 46.2 and 52.1% 0.38% of patients had any ADB (median 1.1 ± 0.7). 44.4% patients had high risk ADB.
Conclusion: Conciliation medication is particularly needed in elderly and polimedicated patients during healthcare transitions to avoid medication errors. Anxiolityc, hipnosedative medication and PPI were the most frequents therapeutics groups potentially inappropriate, consequently rational deprescribing of them in elderly patients may be a good star to reducing risk of adverse drug reactions. An important number of elderly patients had high risk of ADB, consequently we advocate for standardization of anticholinergic risk assessment.
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PP065

Development of guidelines for direct oral anticoagulant management in hospitalised patients: a modified Delphi study

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Background and objective: The management of patients treated with direct oral anticoagulants (DOACs) upon hospital admission is a common challenge in clinical practice. Determining when to discontinue DOACs, to switch to low molecular weight heparins (LMWHs), or to restart DOAC therapy can be complex. Our objectives were to investigate DOAC prescription behaviour, to update the local guideline for perioperative management, and to develop a practice-oriented guideline for anticoagulation management in non-surgical patients regarding temporary DOAC discontinuation.
Method: We conducted a modified Delphi study in Ghent University Hospital (Belgium), a 1000-bed teaching hospital. Initially, a telephone physician survey was conducted using an open-ended questionnaire to gather insights into motivations for (prolonged) DOAC interruption and/or switching to LMWHs. International guidelines were also analysed, and with the survey results, statements for the Delphi questionnaires were developed. Two different multidisciplinary expert panels were formed to reach consensus about valid reasons for DOAC interruption and corresponding anticoagulation management for surgical and non-surgical patients, respectively.
Main outcome measures: Each statement was rated by experts on a five-point Likert scale to determine agreement and relevance. Statements with a rating of 80% or higher on either end of the scale were classified as consensus.
Results: The telephone survey revealed two common misconceptions: a preference for LMWHs over DOACs based on the belief that LMWHs have a significantly shorter half-life and the perception that therapeutic LMWH is safer than a DOAC. The Delphi study led to one major adjustment in the preoperative guideline (an additional category "minor bleeding risk" to categorise procedures according to their bleeding risk) and two major adjustments in the postoperative guideline (management in case of insufficient haemostasis or chance of re-intervention within 3 days). We developed a guideline for non-surgical, hospitalised patients that includes reasons to interrupt DOAC therapy and corresponding anticoagulation management strategies.
Conclusion: We have updated/developed guidelines for DOAC management in surgical/non-surgical patients in a hospital setting. Our guidelines include specific and straightforward anticoagulation management strategies, which aim to support prescribers and enhance targeted validation by hospital pharmacists. Educating physicians and implementing interventions to improve guideline adherence will be crucial in the near future.
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PP066

Drug reconciliation in orthopaedic major surgery on admission

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Background and objective: Drug reconciliation (DR) process identifies and resolves discrepancies in patient's medication regimen. DR-related medication errors happen in about 60–70% of admissions and represent 45% of all errors. In our hospital we identified orthopaedic major surgery patients (total knee and hip arthroplasty) as priority ones to perform DR actively by pharmacists. Our aims were to quantify and qualify the discrepancies observed between home therapy and drugs prescribed on admission, analyzing the acceptance rate of pharmaceutical interventions (PI) in this population.
Method: Prospective, interventional study, conducted in two periods: February and November 2022. Inclusion criteria were adults undergoing major orthopaedic surgery, with minimum stay of 3 days and at least 1 home drug. Information sources were electronic medical records, patient interview and physical drug confirmation.
Main outcome measures: Main outcome measures were rate of DR, number and type of discrepancies, age, gender, number of home drugs and type of surgery. All data were collected and analysed using Microsoft Excel®.
Results: In the first period (n = 20), 14 (70%) were female, average age was 72.2 years and 60% had $\geq$ 5 home drugs. 18 (90%) had elective surgery, 10 (50%) underwent total hip arthroplasty,. From a total of 106 drugs, 43 (40%) were reconciled. 63 discrepancies were identified, 18 unjustified (11 by omission and 7 additions). 10 DR PI were made, with an acceptance rate of 80%. In the second period (n = 46), 31 (67.4%) were female, average age was 71 years and 81% had $\geq$ 5 home drugs. 41 (89.1%) had elective surgery, 27 (58.7%) underwent total hip arthoplasty. From a total of 285 drugs, 132 (46%) were reconciled. 183 discrepancies were identified, 69 unjustified (54 by omission, 4 by addition, 8 by dose modification/replacement, 2 by change of frequency of administration). 34 DR PI were made with an acceptance rate of 61.76%.
Conclusion: There is quality of evidence in the DR process in our hospital. However, due to the low acceptance rate, it is important to focus and pryorize pharmacist interventions on patients with high risk of medication errors, detected during DR process, and get involved with a multidisciplinary team to optimize patient care and safety.

PP067

Enhanced recovery program after orthopedic surgery: the pharmacist added-value

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Background and objective: Enhanced Recovery After Surgery (ERAS) is a comprehensive, multidisciplinary approach to patient care (before, during, and after surgery) that promotes early recovery of the patient's abilities and a quick hospital discharge. In our center, a new ERAS program was implemented in March 2023 for orthopedic surgery of the hip and knee.
The objective was to integrate the participation of a clinical pharmacist into this new multidisciplinary activity.
Design: In our 380-bed hospital, the clinical pharmacist has been involved from the conception of the orthopedic ERAS program to contribute their expertise to the multidisciplinary team and patients. An interview guide was developed following the recommendations of the French Society of Clinical Pharmacy and validated in collaboration with the multidisciplinary team.
Results: The clinical pharmacist is involved prior to surgery during the day-care hospitalization, which takes place one month before the procedure. During this hospitalization, the patient has individual interviews with the anesthesiologist, pharmacist, and surgical nurse, as well as a group session with the physiotherapist. If the patient is over 75 years old, they also meet with the advanced practice nurse in geriatrics.
During the pharmaceutical interview, a medication assessment is conducted in collaboration with the patient and their community pharmacy, using a comprehensive list of prescribed medications and the ones actually taken by the patient. This assessment aims to facilitate prescribing during the surgical hospitalization.

Subsequently, during the pharmaceutical interview, the pharmacist discusses various aspects of the patient's medication management at home: lifestyle (who prepares the medications? How?), the patient's use of the medications (administration difficulties, crushed tablets, side effects, …), as well as adherence using the GIRERD score.

Based on the interview and the information gathered, the pharmacist suggests treatment modifications to the anesthesiologist if necessary (medications not recommended for elderly patients, uncontrolled pain, medications not available at the hospital, …).
Conclusion: The skills of a pharmacist in an ERAS program now appear to be essential for the surgical team, allowing for optimal management of the patient's medication.
We aim to expand the pharmaceutical interview activity in bariatric surgery and heart failure. An evaluation of the pharmacist's impact will also be conducted.
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PP068

A patient partnership approach to identify priority pharmaceutical care needs of patients receiving oral experimental products

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Background and objective: The pharmacy Department manages around 600 studies opened for inclusions corresponding to 3600 new patients on 2022. This represented a total of 24.9% of our patients receiving experimental product (EP).
The oral EP are dispensed to the outpatient Pharmacy. However, due to the current organization and time allocated, the pharmaceutical supportive care to patient is quite erratic although some patients require more attention.
Objective: Identify pharmaceutical care needs for patients 'being dispensed an oral EP based on the patient partnership approach.
Method: We carried out a prospective study from august 2022 to May 2023 to collect the needs by conducting semi-directed interviews until saturation phase for gathering was reached.
Two pharmacists and five patients/caregivers contributed to this project. All of them were members of the patient and caregiver

committee. For each interview, there was one pharmacist and one patient or caregiver. After literature analysis and a brain storming with the patient/caregiver, we developed a semi-structured-interview guide with open questions within a predetermined thematic framework.

Prior to the semi-directed interviews, the patients were tought about clinical trials basic knowledges and all the related pharmaceutical processes. Some communication workshops were proposed about good practices to communicate/interact with other patients. The patient interviews were recorded and transcripted prior to reviewing and analyzing. We used the thematic analysis, an iterative process as to how to go from messy data to a map of the most important themes in the data. This involves "coding" words, patterns, or recurring responses, separating them into labels or categories.

Main outcome measures: Free list of priority needs of patients included in a clinical trial.

Results: We reached gathering's saturation phase after 13 semi-structured interviews (13 patients, age 35–71 years) over 1 month. The average length of an interview was 50 min.

This qualitative analysis revealed clear themes relating to patient perceptions of drugs and pharmacists, patients knowledge and skills relating to clinical trial drugs, clinical trial stakeholders and the patients' journey. Comments on positive aspects of the pharmacy experience were related to the feeling of being well informed and consulted about their care. Comments on the worst aspects of care were related to waiting time without explanation (sensation of being transparent to the healthcare staff caring for them) and pharmacy access.

Conclusion: This qualitative analysis based on the patient experience provides us a framework to better design pharmacist roles and pharmacy environment in clinical trial patient's care.

The next stage will be the development of an ad hoc questionnaire, based on relevant results from the interviews and address it to a larger panel of patients included in clinical trials to get quantitative notions about their needs.

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PP070

Managing drug shortages to prevent medication errors in hospitals

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Background and objective: Shortages are a very common problem nowadays. To manage drug supply problems and avoid medication errors, it is recommended that healthcare professionals analyze the available alternatives and establish appropriate prevention safety measures. The objective of our study was to evaluate the impact of drug shortages and explain the error prevention measures carried out in our hospital.

Design: Observational and descriptive study of the drug shortages that affected our hospital from March, 2022 to March,2023. The number of medications involved was quantified and alternatives were evaluated using a standardized form containing several items related to selection, storage preparation, dispensing and administration of the available alternative drugs, with the aim of identifying potential risks and establishing measures to avoid medication errors.

Results: During the study period, 293 drugs experienced shortage problems, but it was only necessary to find an alternative for 103 of them since sufficient stock was available for the rest.

In 19 drugs (18%), the available alternative was imported as a foreign drug and in 84 (82%) it was purchased from another national supplier.

Additionally, the following measures were carried out: in 33 (32%) cases, an informative note about the new presentation, possible changes in the composition or any other information that facilitated safer use was distributed to all healthcare professionals. In 15 (15%) cases, warnings were included in the electronic prescription system to inform prescribers about shortages and possible therapeutic alternatives. Also, to avoid confusion in the pharmacy program due to the coexistence of different equivalent presentations, in 35 (34%) cases the drug description in the management program was modified by adding a double name. Finally, in 13 cases it was necessary to remove the previous presentations from the automated dispensing cabinets of the units to avoid errors derived from the coexistence of both, and in 5 it was necessary to relabel or recondition the newly acquired presentation.

Conclusion: Medication shortages have increased in recent years, making it necessary to have in place a standardized procedure for identifying the risks associated with alternatives and to proactively establish measures to prevent medication errors.

PP072

Improvement of outpatient care at the counter of the hospital pharmacy

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Background and objective: Quality of care has become a key element in healthcare. It can be defined as a safe, equal, patient centered, efficient and effective way of caregiving. As the outpatient care of patients at the counter of the hospital pharmacy is rising, feedback about our service to these patients is important. The purpose of this investigation is to improve the outpatient care at the counter of our hospital pharmacy.

Design: In this study, the principle of PDCA or 'plan-do-check act-concept' was used as a basis to develop the method. First, the quality of caregiving was measured through **patient experience**. Semi-structured interviews and questionnaires were used to measure the patient experience of outpatients at the counter of the hospital pharmacy in the Jessa vzw Hospital. Based on the outcome of these results, measures of improvement emerged and were implemented by the hospital pharmacists. After implementation, patient experience was measured again using the same questionnaires to identify differences before and after implementation.

Results: From 01-03-2021 till 01-06-2021, 74 patients completed the questionnaire and 10 patients were interviewed. Attitude, professionalism, hygiene and waiting time received a high satisfaction score. **Information, privacy and localization** of the hospital pharmacy counter in the hospital received the **lowest scores**. Starting from the results of these surveys, a set of measures for improvement were defined. The most important measure was the **introduction of outpatient pharmaceutical counseling at the counter of the hospital pharmacy** when a patient starts on new medication (EUB). This was carried out with the aid of standardized information sheets and documented in the electronic patient record. Pharmaceutical counseling was done in a separate consultation room to improve the privacy. After 6 months, patient experience was measured again (N = 38). Patient satisfaction scores showed a major improvement in the level

of pharmaceutical information given to patients. Also privacy and localization of the hospital pharmacy received a higher score.
Conclusion: Introduction of outpatient pharmaceutical counseling at the counter of the hospital pharmacy significantly improved patient experience, predominantly determined by satisfaction scores on information.

PP073

Pharmacotherapy problems at hospital admission and discharge in the older patients with impaired renal function

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Background and objective: Hospital admission and discharge are critical points for the occurrence of unwanted adverse drug events, especially in elderly people with impaired renal function. Polypharmacy, drug-drug interactions (DDIs), potentially inappropriate medications (PIMs) and renal risk drugs (RRDs) are important pharmacotherapy problems in the elderly. The aim of this study was to determine the type and frequency of polypharmacy, potential clinically significant DDIs, PIMs using the EU(7)-PIM list, RRDs in elderly patients with impaired renal function at hospital admission and discharge.
Method: An observational prospective study was conducted at the Department of Internal Medicine at the National Memorial Hospital "Dr. Juraj Njavro", Vukovar, Croatia. This study included patients 65 years or older whose estimated GFR at hospital admission was less than 60 ml/min/1.73 m^2, i.e. belonging to categories G3a, G3b, G4 and G5. Pharmacotherapy analysis was performed in BPMH, the first prescribed therapy after admission to the hospital, and upon discharge.
Main outcome measures: Prevalence of polypharmacy and excessive polypharmacy at admission and discharge, prevalence of PIMs at admission and discharge, prevalence of DDIs at admission and discharge, prevalence of RRDs at admission and discharge.
Results: A total of 67 subjects with a median age of 76 (72–85) years were included in the study. Of the 64 subjects included in the study, 43 (64%) were women. Polypharmacy (5–9 medications) was detected in 32.8% and 25.4% patients, excessive polypharmacy ($\geq$ 10 medications) in 65.7% and 64.2% patients, DDIs in 97% and 96.8% patients, PIMs in 15.5% and 22.9%, RRDs in 53.7% and 49.2% patients at hospital admission and upon discharge. The positive correlation between all pharmacotherapy problems were determined by calculating the Pearson correlation coefficient.
Conclusion: This is the study conducted in hospitalized elderly patients with impaired renal function, which analyzed pharmacotherapy problems in two points transfer of care, i.e. at admission and discharge from the hospital. The clinical pharmacist detected a very high prevalence of polypharmacy, PNLs, renal risk drugs and potential clinically significant DDIs in the group of elderly patients with renal impairment in pharmacotherapy at hospital admission and upon discharge. The positive correlations between pharmacotherapy problems indicates that their co-occurrence is frequent. Future research should focus on developing guidelines in detecting pharmacotherapy problems in elderly patients with impaired renal function. The clinical pharmacist should have a key role in the evaluation and supervision of pharmacotherapy during the transfer of care.
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PP074

Medication incident reporting: a pilot study to assess if a simple intervention tool can increase nursing engagement with reporting and capture system failures

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Background and objective: Over half of all medication errors are preventable[1]. Recognition of systemic flaws is essential for effective error management. The incident reporting system is a universally implemented method to manage risk in healthcare. However, underreporting and organisational barriers limit the usefulness of reporting systems. The aim was to establish engagement with reporting using a co-designed intervention tool and to improve medication safety by the identification of system failures.
Method: This was a process improvement pilot interventional study conducted in a 20-bed unit with 16 full-time nurses. Co-design methodology was used to inspire collective creation of the intervention. A comprehensive literature search was undertaken. A pre-intervention survey determined nurses' perception of safety culture. The intervention was designed, informed by the literature and the participating nurses. The intervention a pocket-sized flash card system was created to be simple, accessible and quick to use. The flash cards were used to report 'System Failures' over an eight-week pilot period.
Main outcome measures: The number and nature of reports during the pilot were analysed. Data from the submitted flash cards were categorised according to the 'Institute of Safe Medication Practices' system factors framework[2]. A post-intervention survey assessed the views of nurses on the intervention.
Results: *Pre-intervention survey*: There was an overall positive safety culture reported by nurses. However 33% of nurses had never submitted an incident report and only 13% knew how to correctly use the system. The main barrier identified was the time consuming nature of the system (87%). *Intervention data:* There was a clear increase in engagement with reporting. 51 reports were received over the eight-week period. The tool successfully captured system failures. Nurses reported 'Staff competency and education' as the largest contributory system factor (41%) while the researcher identified 'Communication' as the largest factor (55%). *Post-intervention survey*: There was a positive change in nurses' perception of safety culture and all nurses agreed that the intervention should continue.
Conclusion: This study highlights that by identifying and targeting local barriers to reporting, a simple unit-based intervention can be used as a momentum for culture change, increasing engagement with medication reporting, capturing system failures and ultimately improving patient safety. The novel study design facilitated engagement and inspired communication. The multitude of issues identified, illustrate the positive impact that nurses can have in identifying areas for system improvement, allowing for proactive and effective risk management. This study design could be used as a template to guide other hospitals establishing a reporting culture. Future research is needed to validate this intervention as an effective quality improvement tool.

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PP075

Tumor-agnostic drugs: safety of pembrolizumab and entrectinib

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Background and objective: Tumor-agnostic treatment is a type of targeted therapy based on the cancer's genetic and molecular features without regard to the cancer type. Microsatellite instability-high (MSI-H), or mismatch repair-deficient (dMMR), and NTRK gene fusions, are two biomarkers that are targeted by tumor-agnostic treatments approved by the FDA/EMA: pembrolizumab (MSI-H/dMMR) and larotrectinib and entrectinib (NTRK gene fusions). This new paradigm has revolutionised precision oncology. The aim of this study is to describe and analyse tumor-agnostic drugs safety in real world conditions at a tertiary hospital.
Method: Observational retrospective study of 100% patients with MSI-H/dMMR or NTRK gene fusion solid tumors treated with tumor-agnostic drugs between December 2018 and September 2022. Data source: electronic medical records. Variables analysed: demographics, drug administered, type of tumor, type and grade of adverse events (AEs-CTCAE 5.0), cause of treatment interruption and affected genes.
Main outcome measures: Safety was adressed through adverse drug reactions reported by the patients.
Results: 27 patients, 51.9% women, mean age 68 (range 35–87) years old. Treatment, type of tumor and AEs were as follow: Pembrolizumab (N = 24): 15-colon, 4-gastric, 3-small bowel and 2-biliar. Abdominal pain G1 (N = 1) and G2 (N = 1); anemia G1 (N = 3); arthralgia G1 (N = 5); asthenia G1 (N = 6), G2 (N = 2) and G3 (N = 2); diarrhea G1 (N = 7) and G2 (N = 1); dry skin G1 (N = 2); edema G1 (N = 2); kidney toxicity G1 (N = 1); liver profile alterations G1 (N = 2) and G2 (N = 2); lung toxicity G3 (N = 1); mouth ulcers G1 (N = 1); nausea G1 (N = 1) and neutropenia G1 (N = 1). Entrectinib (N = 3): 1-colon, 1-lung and 1-sarcoma. Anemia G1 (N = 1); asthenia G1 (N = 1); arthralgia G3 (N = 1); constipation G1 (N = 1); diarrhea G1 (N = 1); dysgeusia G1 (N = 1); kidney toxicity G1 (N = 1); leg weakness G2 (N = 2); myalgias G3 (N = 1) and neutropenia G1 (N = 1). 15/27 patients continue with active treatment. Interruption causes: progression (N = 7; 25.9%), exitus (N = 3; 11.1%) and AEs (N = 2; 7.4%). 2/24 patients with pembrolizumab discontinuated due to lung toxicity G3 and diarrhea G2, respectively.

In 68% patients both PMS2 and MLH1 were the MMR affected genes.
Conclusion: Tumor-agnostic treatments, pembrolizumab and entrectinib, were well tolerated in this study. Most AEs reported were G1 and only a small percentage discontinued for this reason. However, our results may be interpreted with caution due to the small sample size (rare tumor types).

PP076

Implementation and optimization of a somatic cell therapy medicinal product circuit by clinical pharmacists

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Background and objective: Somatic Cell Therapy Medicinal Product (sCTMP) is classed as Advanced Therapy Medicinal Products (ATMPs). Darvadstrocel consists of expanded human allogeneic mesenchymal adult stem cells and is indicated for the treatment of complex perianal fistulas in adult patients with luminal Crohn's disease when fistulas have shown an inadequate response to at least one conventional or biologic therapy. The objective was the implementation and optimization of the sCTMP circuit by the pharmacists, in the hospital setting, as pharmacist oversight and handling are required in order to assure the quality, efficacy, and safety for the intended use.
Design: The pharmacists undertook specific training for sCTMP handling. Thus, in addition to ensuring the correct order, receipt, and storage, the pharmacists optimize the circuit by delivering and handling darvadstrocel in the operating room, next to the surgeon. Subsequently, in the laboratory, the pharmacists evaluated the cell concentration and viability with the trypan blue exclusion test and verified the compliance with the certificate of conformity. The effectiveness of darvadstrocel was evaluated with the outcome of the proportion of patients who remain in clinical remission, with fistulous tract closure, objectified by imaging evaluation, and the absence of pain. A prospective observational study was conducted on eleven patients, who were treated with darvadstrocel, six patients prior and five subsequent to the pharmacists' intervention in the optimization of the circuit.
Results: The analyzed cell concentration and viability were in conformity with the certificate specification. Of the patients with the pharmacists' intervention (five patients), 60% (n = 3) presented complex perianal fistula before the surgery for the administration of darvadstrocel and 6 months after the surgery, 60% (n = 3) were in remission, and 40% (n = 2) showed no perianal pain. Of the patients prior to pharmacist intervention (six patients), 33% (n = 2) presented complex perianal fistula before the surgery for the administration of darvadstrocel; 12 months after the surgery, 33% (n = 2) were in remission, and 50% (n = 3) showed no perianal pain.
Conclusion: The implementation of the sCTMP circuit was successful and accepted by the multidisciplinary team. The optimization of the circuit of darvadstrocel by the pharmacists assured quality, efficacy and safety of the sCTMP use.

PP077

Prescription of opioids for cancer pain: retrospective study

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Background and objective: Pain is one of the main symptoms in oncohematological patients. Physicians use World Health Organization (WHO) analgesic ladder to treat acute cancer pain being morphine the opioid of choice. The objective was to analyze the evolution of the prescription of opioids for cancer pain in oncohematological patients in the last 10 years.
Design: A descriptive and retrospective study was performed in oncohematological patients treated with opioids in a second-level hospital. The study period was January 2012 to March 2023. The data were obtained from the Microstrategy® database. In order to facilitate analysis, the study was divided into two periods: 2012–2016 (P1) and 2017–2023 (P2). The medical services included were Hematology (HM), Medical Oncology (MO) and Radiotherapy Oncology (RO).
Results: During the study period, 116807 Defined Daily Dose (DDD) of opioids were prescribed: 61787 (52.9%) MO, 28724 (24.6%) RO and 26296 (22.5%) HM. P2 increased 68.6% DDD compared to P1: all services improved their prescriptions (77.5% MO, 75.6% RO and

43.3% HM). The maximum and minimum value was reached in 2017 (16265 DDD) and 2013 (7238 DDD). The most indicated drug was fentanyl (70367 DDD: 60.2%), followed by morphine (25915 DDD: 22.2%), tapentadol (8763 DDD: 7.5%), hydromorphone (5476 DDD: 4.7%), buprenorphine (2923 DDD: 2.5%), oxycodone/naloxone (2776 DDD: 2.4%) and oxycodone (588 DDD: 0.5%). The prescription of tapentadol, morphine and fentanyl increased by 359.9%, 87.3% and 78.9% respectively, while the rest of drugs dropped. In fact, hydromorphone and oxycodone were not prescribed in the last two years. Fentanyl was the most indicated drug by medical services studied, followed by morphine in MO and tapentadol in RO and HM.
Conclusion: The prescription of opioids for cancer pain has increased in recent years, mainly in the MO service. Fentanyl has been the most prescribed opioid despite WHO analgesic ladder recommendations.
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PP078

Luspatercept experience in transfusion-dependent anaemia due to myelodysplastic syndrome: a case report

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Background and objective: Luspatercept is an orphan drug indicated for the treatment of adult patients with transfusion-dependent anaemia (TDA) due to very low, low and intermediate-risk myelodysplastic syndromes (MDS) with ring sideroblasts, who had an unsatisfactory response to or are ineligible for erythropoietin-based therapy. The recommended starting dose is 1.0 mg/kg administered once every 3 week subcutaneously. In patients who are not red blood cells (RBC) transfusion-free, the dose should be increased to a maximum of 1.75 mg/kg. The objective was to describe the use of luspatercept in a patient with TDA caused by MDS as well as the safety of this treatment.
Design: We ran a descriptive study of a 64-year-old man diagnosed with low-risk MDS. Due to disease, the patient developed anaemia that was treated unsuccessfully with maximum weekly dose of erythropoiesis-stimulating agents. In November 2021, he started requiring RBC transfusions (Haemoglobin (Hb) = 7.6 g/dL) to achieve Hb baseline value. Blood transfusion is an useful procedure in anaemia management, although it has important adverse effects. Therefore, physicians decided to start treatment with luspatercept.
Results: The patient received ten doses of luspatercept from July 2022 to February 2023. The first three doses were administered according to the approved protocol (1.0 mg/kg). He was not RBC transfusion-free after starting doses so the dose was increased to 1.33 mg/kg (fourth dose) and subsequently to 1.75 mg/kg (sixth dose). After the dose increase, the man presented a good clinical evolution. Hb levels returned to baseline value (Hb = 9.5–10.8 g/dL) and no further blood transfusions and erythropoiesis-stimulating agents were required. However, despite receiving the maximum dose of luspatercept, the patient presented neutrophilic leukocytosis and Hb = 7.0 g/dL after the tenth dose, so the doctor decided to suspend the treatment. Luspatercept was well tolerated with few reported adverse side effects: back pain after first injection and asthenia and nausea after six dose. Back pain was successfully treated with analgesics and the patient was able to continue the treatment.
Conclusion: Our experience shows that luspatercept does not seem to be an effective treatment of TDA due to MDS. Although more and longer treatment periods are needed, it could be a well-tolerated treatment option.
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PP079

Effectiveness and safety of bitherapy with dolutegravir and rilpivirine in the treatment of HIV in clinical practice

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Background and objective: The combination of dolutegravir (DTG)-rilpivirine (RPV) is indicated for the treatment of Human Immunodeficiency Virus type 1 (HIV-1) infection in adult patients who are virologically suppressed. Dual therapy has a serie of advantages over conventional triple therapy: the number of tablets is reduced, favoring adherence, long-term adverse effects of triple therapy are avoided, and interactions with other concomitant medications are minimized. The objective of this study is to evaluate the effectiveness and safety of combination therapy with DTG and RPV in the treatment of HIV.
Design: Retrospective descriptive study, in a university hospital, which included all HIV patients treated with DTG and RPV, administered as a single tablet, from September 2019 to April 2022. Data were obtained from the digital medical record (Diraya ®) and the outpatient dispensing program (PRISMA-APD®). The variables collected were: sex, age, reasons for switching from triple to dual therapy, duration of treatment until the end of the study, most recent viral load (VL) (copies/ml), most recent CD4 T-lymphocyte count (cells/ml), interactions with home treatment adverse effects (AE) and adherence to treatment. To evaluate the effectiveness, the VL (virological response < 50 copies/ml) and the CD4 T lymphocyte count (540–1660 cells/microl) were determined. To assess safety, AEs and interactions were recorded.
Results: Twenty-eight patients were included, 12 women and 16 men, with a median age of 55 years (21–90). The reasons for change were treatment simplification in 21 patients, AE in 3, and of unknown origin in 4. The median duration of treatment was 27.5 months (6–31). All patients had undetectable VL or less than 50 copies/mL at the time of the study. The median CD4 levels were 847 cells/microL (517–1906), although 2 patients had CD4 levels below the range. Regarding safety, an increase in cholesterol levels was observed in 7 patients, of which 4 required the prescription or increased dose of statins. 1 patient experienced hearing loss and headache. Interactions associated with the use of proton pump inhibitors were detected in 2 patients, without affecting the effectiveness of the treatment. None discontinued treatment due to AEs. 100% of the patients were adherent to the treatment.
Conclusion: Treatment with RPV and DTG has shown adequate effectiveness, without increasing the risk of virological failure, since it maintains undetectable VL and adequate levels of CD4 lymphocytes. In addition, it has a favorable safety profile in our study, although some patients show alterations in the lipid profile, requiring the administration of statins.

PP080

Pharmacist interventions for chronic non-cancer pain: preliminary results of a scoping review

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Background and objective: Chronic non-cancer pain affects many patients (approximately 19%).[1] Its management remains challenging

and requires a multi-modal treatment approach. Drugs used may compromise medication safety. Studies report that pharmacist interventions increase safety and patient reported outcomes.[2] Currently, we lack information on the scope and structure of these interventions. We aimed to describe and compare pharmacist interventions for chronic non-cancer pain.

Method: We performed a systematic literature search in Medline, Embase, PsycInfo via Ovid and CINAHL via EBSCO databases, as well as the Cochrane Library. Two independent reviewers executed both title-abstract and full-text screening. One reviewer completed, and a second verified data extraction. We used PRISMA-Scr guidelines for reporting.

Main outcome measures: Types and characteristics of pharmacist interventions.

Results: As the reviewing process is ongoing, we report preliminary findings: We screened 3011 studies of which we included 96 for full-text screening. Forty-two studies met our inclusion criteria. Studies originated from North America (66%), Europe (30%), Asia (5%) and Australia (2%). Services were located in outpatient clinics (82%), hospitals (12%) or community pharmacies (6%). Interventions intended to improve patient reported outcomes (i.e. pain, quality of life) and quality of therapy (i.e. management of adverse events, improvement of adjuvant medication) in 68% and 61% respectively. Others targeted opioid stewardship (39%), medication safety (32%) or economic aspects (10%). Pharmacists engaged in face-to-face medication reviews (68%), patient education (49%), medication management (26%) and remote medication reviews (20%). Physicians (88%), nurses (15%) and physiotherapists (10%) collaborated with pharmacists. In most interventions, pharmacists counselled patients (85%) and made recommendations to physicians (58%). 39% of pharmacists possessed prescribing rights and managed patients independently.

Conclusion: Pharmacists approached the management of patients with chronic non-cancer pain in various ways. Typically, pharmacists performed face-to-face medication reviews, educated patients and proposed therapy optimisations to physicians. These services addressed patient reported outcomes (i.e. pain or quality of life) and quality of therapy.

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PP081

Cannabidiol-drug interaction in cancer patients: a retrospective study in a real-life setting

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Background and objective: There is an increase in use of Cannabidiol (CBD) in cancer patients to prevent and manage cancer-related symptoms and anticancer-treatment related adverse effects. Because cannabidiol-drug interaction (CDI) are poorly studied, this requires greater vigilance for CDI in real life. In this study, we sought to explore the prevalence and relevance of CDI risk between CBD, anticancer treatment, and other conventional drugs for patients consuming CBD.

Design: The study was conducted in an oncology day-hospital in a tertiary center. A preliminary study of 363 cancer patients receiving anticancer treatment revealed that 20 patients (5.5%) used CBD. Among these 20 patients, detection of CDI and the clinically relevance were performed using the U.S. Food and Drug Administration (FDA) Drugs.com database. Clinical relevance was assessed accordingly by 2 independent clinical pharmacists and discussed with an oncologist and a third clinical pharmacist.

Results: Ninety CDI related to 34 different conventional drugs were detected, with an average of 4.6 CDI per patient. The three most incriminated drugs were acetaminophen (n = 14), metoclopramide (n = 14) and aprepitant (n = 8). The main CDI were considered moderate (n = 76) and 4 major CDI were reported for 3 drugs (buprenorphine, morphine and rivaroxaban). The most frequent clinical consequences were the risk of central nervous system depression (n = 39) and increased hepatotoxicity (n = 37). Six anticancer were identified as being at risk of CDI (oxaliplatin, bortezomib, lenalidomide, dacarbazine, vincristine and methotrexate), with a risk of increased hepatotoxicity. More than half of the CDI (n = 48) involved 8 supportive care drugs (2 antiemetics, 5 analgesics and 1 anti-infective agent). CDI management was based on monitoring (clinical follow-up of the risk of CNS depression and follow-up of liver function).

Conclusion: This study showed that anticancer treatments do not seem to increase the risk of CDI especially in comparison to supportive care. Because CDI could have a major clinical risk, it is recommended that cancer patients starting cancer treatment be routinely screened for CBD use.

PP084

Influence of the presence of the clinical pharmacist on its clinical impact in the pediatric intensive care unit

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Background and objective: Studies have shown that medication errors are common in intensive care units. The management of medications in pediatric and neonatal populations is particularly at risk of iatrogenic errors due to the pathophysiological characteristics of these populations and the absence of adapted pharmaceutical forms based on weak evidence. The safety of drug prescriptions is critical in these situations and is managed by pharmacists. The objective of this study was to measure the influence of the presence of the clinical pharmacist in the clinical service its clinical impact.

Method: We conducted an observational, before/after pharmacist involvement study in a 30-bed critical care unit. Daily pharmaceutical analysis and validation of prescriptions was performed from the pharmacy from June 2018 to June 2019 (before). Issuance of pharmaceutical interventions (PIs) was performed by telephone and traced to the printed order. Between June 2019 and December 2021 (after), pharmaceutical validation of prescriptions was performed in the department and PIs were transmitted orally to prescribers in the face-to-face setting and traced in the same manner.

Main outcome measures: The primary endpoint of the pharmacist's impact was measured using the Hatoum and CLEO(r) scale for clinical impacts.
Results: We observed 485 PIs over a 162 day period, mainly concerning overdoses (41%), inappropriate route and/or administration (18%) and non-compliance with guidelines (12%). 208 children were affected by these PIs.
We identified 1275 PIs over 321 days, mainly concerning monitoring to be followed (29%), overdosing (26%) and underdosing (10.1%). 332 children were affected by these PIs.

According to the CLEO® scale, we observed a reduction in clinical impacts: harmful (13 vs 10; $p = 0.002$), nil (106 vs 80; $p = < 0.001$) and minor (173 vs 317; $p < 0.001$). And an increase in clinical impact: moderate (121 vs 448; $p = 0.002$), major (51 vs 334; $p < 0.001$) and vital (20 vs 87; $p = 0.04$).

These results were also observed with the Hatoum scale, with a reduction in clinical impacts: nil (130 vs 99; $p < 0.001$), the same proportion of significant impacts (266 vs 666; $p = 0.5$). And an increase in clinical impacts: very significant (69 vs 428; $p < 0.001$) and vital (19 vs 83; $p = 0.04$).
Conclusion: The pharmacist's presence in the clinical department has increased the number and relevance of PIs performed. The nature of PIs has evolved, with a more patient-centred orientation. These PIs have had very significant, major and vital clinical repercussions. Risk reduction and impact are enhanced by the presence of a clinical pharmacist on the ward.
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PP085

A framework for assigning in-use shelf life for aseptically manipulated small molecule preparations in unlicensed hospital compounding units—a Delphi study

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Background and objective: Increased demand for chemotherapy due to increased patient numbers and centralised services means Aseptic Compounding Units (ACUs) are facing capacity problems. (1) Products are typically licensed for immediate use; however, if chemotherapy is prepared in advance, it can positively impact all stakeholders. Allocating shelf lives beyond that recommended in product licenses is routinely conducted although variation in the quality of stability data, and lack of standardized approaches to data scrutiny are risks to patient safety. This study was carried out to achieve formal consensus on statements to use as criteria when determining the assignment of extended in-use shelf life for aseptically manipulated small molecule preparations in unlicensed hospital compounding units**.**
Method: A two-step Delphi consensus study took place between September 2022 and January 2023 in collaboration with Children's Health Ireland. The Delphi panel comprised pharmacists with direct aseptic experience, clinical pharmacists with previous aseptic experience, and industry experts on stability. Stability statements were extracted from a literature review, and refined or rejected if not accepted during the Delphi process. Accepted statements were later incorporated into a tool for use by ACU pharmacists to standardise their approach to assigning extended shelf lives.
Main outcome measures: Statements relating to the interpretation and conduct of chemotherapy stability studies were accepted if they met an a priori defined threshold.
Results: Consensus was achieved after two rounds of Delphi for 36 stability statements. Consensus was not reached for ten statements mostly relating to acceptance criteria and extrapolation of data. The tool developed to assist ACU pharmacists when assessing extended in-use shelf life for products is now used in practice, and has led to the alteration of previously defined shelf-lives at Children's Health Ireland.
Conclusion: Allocation of shelf-lives for chemotherapy beyond the product license is undesirable, but necessary to meet the needs of cancer care. A bespoke quality assurance system would be welcome to provide supporting data on stability, however, in the absence of this service, a standardised approach supported by this study can reduce risks to patients.

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PP087

Implementation of best practices for delivery of paediatric infusions in the Irish healthcare setting

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Background and objective: Standard concentration infusions (SCIs) and 'smart-pumps' are recognised as best practice in paediatric patients. Implementation rates in European hospitals remain low.[1] Children's Health Ireland (CHI), a tertiary paediatric hospital group, developed a 'smart-pump' drug library of SCIs; most other Irish hospitals continue to use traditional pumps and weight-based infusions for their paediatric patients. A project was undertaken to extend the use of the CHI drug library to maternity and general acute hospitals across the Irish paediatric network and thereby standardise practice at a national level.
Design: The CHI drug library, originally developed for paediatric intensive care, was further developed for use in emergency departments, general paediatric wards, neonatal units, adult intensive care and transport services. The original library (42 drug lines, 1 'care-unit') was substantially expanded (216 drug lines, 7 'care-units') and a neonatal sub-library was created to support broader implementation, including into maternity hospitals. National and local executive support, dedicated resources and governance structures were secured. An implementation plan and training package were developed.
Results: Implementation has occurred in all areas of CHI, paediatric and neonatal transport services, 52% (n = 11) of neonatal units, and 22% (n = 6) of paediatric network sites. Research in the originator site has demonstrated significant reductions in infusion prescribing errors (29.0% to 8.4%, $p < 0.001$), high compliance rates (98.9%) and low programming errors (1.6%).[2,3] 100% of nurses surveyed 9 months after expansion to general wards considered the drug library enhances patient safety.
Conclusion: Strategic planning and collaboration can standardise infusion practices. The CHI drug library was approved as a national standard of care in 2019. Phased national implementation is continuing.

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PP088

Preparation for the digital transformation of medication management in Ireland's new national children's hospital

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Background and objective: Ireland's new national children's hospital, opening in 2025, will merge three existing children's hospitals and be the first publically-funded Irish hospital to be 'born digital'. Implementation of closed loop medication management, utilising an electronic health record (EHR), automated dispensing cabinets (ADCs), dispensary robot and smart-infusion pumps is core to its vision of achieving HIMSS Stage 6. Currently utilising primarily paper-based and manual processes, the pharmacy departments in Children's Health Ireland (CHI) are leading on the digital transformation of pharmacy services and medication management. To support the hospitals' merging and optimise medication-related benefits, the CHI pharmacy departments set out to support procurement processes, identify opportunities for standardisation and early implementation, and devise suitable studies to support ongoing evaluation.
Design: Early engagement was undertaken to ensure appropriate pharmacy input was provided during all stages of EHR and all other medication-related procurements. To front-load the planned changes: business cases were developed to support early adoption of ADCs; early participation in the roll-out of Ireland's new national hospital medication management system (HMMS) was sought; standardisation of prescribing and administration guidelines, smart-pump drug libraries and medication inventories were prioritised; opportunities to learn from more digitally mature paediatric hospitals were investigated; suitable baseline metrics were identified.
Results: Two pharmacists—Head of Pharmacy and Chief Pharmacy Information Officer (CPIO)—were members of the CHI EHR procurement evaluation group. ADC implementation into the Emergency/Urgent Care Departments (n = 4) of existing hospitals is complete. HMMS implementation is scheduled for Q2 2024. Expansion of a single-site paediatric formulary and the CHI smart-pump drug library to all four sites was undertaken between 2019 and 2021; development of a single medication inventory will be complete in June 2023. On-site learning in St. Jude's Children's Research Hospital, a leading US paediatric institution was facilitated by a Fulbright Tech-Impact scholarship awarded to CHI's CPIO. A study post-implementation of ADCs in ED identified a 20% reduction numbers of items dispensed and overall medication costs, and 47% reduction in ED pharmacy technician time. Further baseline metrics and research resources have been identified.
Conclusion: Pharmacy departments can prepare for a'big-bang' medication management transformation through careful planning, collaboration and innovation.

PP092

Potentially inadequate medications in geriatric patients: an exploratory trial to evaluate the impact of recommendations by a ward pharmacist at clinic Favoriten, Vienna

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Background and objective: Potentially inappropriate medications (PIMs) lead to an increased incidence of adverse drug events, drug-related problems, inpatient stays and other negative outcomes in geriatric patients. By using validated screening tools, such as the Priscus list, the Beers list or the START/STOPP criteria, PIMs can be identified and switched to evidence-based alternatives if possible. Clinical pharmacists can contribute to drug therapy safety by sensitizing the treating physicians and nursing staff to the issue and offering sensible solutions. Although the issue already has been known, there is still a need to raise awareness in clinical practice and a potential for optimizing the prescribing behaviour to avoid PIMs. In Austria, therapeutic decisions are the sole responsibility of physicians due to their sovereignty to prescribe.
Method: This study was conducted at the geriatric ward at Clinic Favoriten, Vienna among elderly patients (> 65 years). A retrospective control group receiving standard care was compared to a prospective intervention group. The intervention consisted of a clinical pharmacist providing medication reviews to detect PIM use. Groups were matched for age, gender and comorbidities and evaluated in a descriptive analysis. The trial was approved by the ethics committee of the city of Vienna.
Main outcome measures: Prevalence of PIMs in discharge notes in two comparison groups without (group A, retrospective) and with (group B, prospective) pharmaceutical care.
Results: Forty patients (77.5% female) per group were evaluated, with a mean age of 80 years, an average of 11 comorbidities in both groups and 11 (group B) and 12 (group A) prescribed drugs, respectively. The most common drug-related problem in both groups was "drug without (replicable) indication". Thus, the most frequent pharmaceutical recommendation was discontinuation of the drug in question. The drugs pantoprazole, atorvastatin, and bisoprolol were most frequently discussed. PIM prevalence was reduced from 22.4 to 16.8% and the average number of drug-related problems per patient was reduced from 2.7 to 1.9.
Conclusion: Both PIM prevalence and the average number of drug-related problems per patient were reduced by pharmaceutical recommendations by a ward pharmacist. The common goal of optimizing medications for better patient care was successfully implemented. Further studies with a larger sample are needed to evaluate statistical significance.

PP093

Dalbavancin as consolidation therapy in patients with infective endocarditis produced by gram-positive bacteria. A real word experience

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Background and objective: Dalbavancin is a novel lipoglycopeptide which has a long elimination half-life against gram-positive cocci (GPC), including methicillin-resistant *Staphylococci aureus* (MRSA).

However, few clinical data are available on its effectiveness against GPC infective endocarditis (IE).
The main objective is to evaluate the effectiveness of dalbavancin as consolidation therapy in patients with GPC IE and the dalbavancin-related adverse drug reactions (ADRs).
Method: Single-center, observational, retrospective study was conducted of hospitalised patients with GPC IE who received at least one dose of dalbavancin.
Main outcome measures: Clinical response and mortality were assessed at the end of treatment (EOT) and relapse and mortality at 180 days after finishing treatment.
Results: Twenty-eight patients were included, mean age 75.75 ± 11.68 years (range 52–94), 57.14% male. CCI mean value was 6.36 ± 2.71.
Definite IE was present in 67.86% of patients. The type of IE was 35.71% native valve, 42.86% prosthetic and 28.57% associated with an intracardiac device. Regarding the valve affected: 57.1% aortic, 14.29% mitral and 7.14% tricuspid.

Causative microorganisms: *S. aureus* (57.15%), MRSA (17.86%), coagulase-negative Staphylococci (17.86), *Streptococcus spp.* (14.29%), *E. faecalis* (7.14%) and negative culture (3.57%). Septic complications occurred in 57.14% of patients, 37.71% septic embolism, 37.71% septic metastasis and 14.26% both.

All the patients received prior antibiotics (mean: 5.21 ± 2.15 weeks). Surgical treatment was performed in 46.43% of the patients. Switching to dalbavancin was motivated by continuing the anti-infective treatment through outpatient care in 82.14% of the patients, due to toxicity to previous antibiotics in 10.71% and in 7.14% due to difficult venous access. Mean dalbavancin covered weeks were 4.96 ± 10.63.

Clinical cure was obtained in 96.43% of the patients. None relapses were detected during the follow-up. Mortality rates were 7.14% (n = 2) at EOT and 17.86% (n = 5) at 180 days.

Three patients experienced dalvabancin-related ADRs. One patient had mild ADRs with asthenia and gastrointestinal disorders and two with severe ADRs requiring discontinuation of dalbavancin and additional treatment: one with infusion reaction and another with thrombocytopenia.
Conclusion: Dalbavancin has been shown to be effective with a good safety profile as a consolidation treatment for GPC IE in our cohort of patients.
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PP094

Safety and effectiveness of givosiran in acute intermittent porphyria: a case report of a young patient

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Background and objective: Acute intermittent porphyria (AIP) is a dominant disorder characterized by life-threatening acute attacks related to the accumulation of the heme derivatives delta-aminolevulinic acid (ALA) and porphobilinogen (PBG). Treatment options for porphyria crises are limited, being hemin the only approved therapy. In 2020, givosiran was approved by the centralized procedure of the European Medicines Agency for the treatment of AIP. Givosiran is a small interfering RNA (siRNA) directed towards delta-aminolevulinate synthase 1 (ALAS1), which causes a decrease in ALA and PBG levels. With this case report we aim to illustrate the safety and effectiveness of givosiran in a young patient with AIP.
Design: Prospective study of two-year follow-up of a 24-year-old woman diagnosed with AIP in 2015 who had several hospital admissions in recent years due to porphyria crisis. Given the recurrence of acute flare-ups and the greater severity, treatment with givosiran was proposed (2.5 mg/kg subcutaneously once a month). Effectiveness of givosiran treatment was measured by ALA and PBG levels. Safety and tolerability were monitored through transaminases and creatinine levels and adverse drug reactions (ADR) reported by the patient.
Results: The patient has received 25 doses at approximately 4–6 week intervals. During this period, the patient presented a clear clinical improvement without new episodes of porphyria or hospital admissions, showing a 100% reduction in the annualized seizure rate. ALA and PBG mean blood values were 30.8 mg/g creatinine and 81.4 mg/g creatinine, respectively, the previous year. At 8 weeks from the start of givosiran, a reduction of 81.5% for ALA and 91.2% for PBG was observed. Subsequently, ALA levels decreased more and maintained steady, whereas PBG levels suffered a slight increased, although considerably lower than previous levels to the start of givosiran. The patient has not reported any type of ADR. In addition, liver and kidney function were maintained since ALT, AST and creatinine levels remained within normal limits.
Conclusion: Therapy with givosiran has been shown to be safe and effective in this patient, but given that it is a single case, more studies with a larger number of patients would be needed in order to obtain robust data.
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PP096

Wild-type individuals for the DPYD gene: is it necessary to update the recommendations?

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Background and objective: Fluoropyrimidines are antimetabolites used to treat different types of malignancies. Serious adverse drug reactions that reduce the safety of treatment remain a relevant concern. Hand-foot syndrome (HFS) is the most frequently reported dose-limiting side effect of capecitabine. Genotyping of 4 DPYD gene variants is currently standard practice for the prediction of fluoropyrimidine-related toxicity (rs3918290, rs55886062, rs67376798, rs75017182). However, there is no complete correlation between the presence of these variants and the occurrence of toxicity in patients, so although this may be related to other factors such as age, comorbidities or general condition, it may also be influenced by the presence of other polymorphisms in the DPYD gene. The aim of this study is to evaluate the occurrence of severe toxicity (grade ≥ 3) in DPYD wild-type patients treated with fluoropyrimidine-based therapies.
Method: A retrospective observational analysis was performed including 150 wild-type patients for the DPYD gene treated with fluoropyrimidine-based chemotherapy. All of them were genotyped for the 4 variants described with evidence 1A and with therapeutic recommendation in clinical practice guidelines (Dutch Pharmacogenetics Working Group (DPWG), Sociedad Española de Oncología Médica (SEOM) and Clinical Pharmacogenetics Implementation Consortium (CPIC). Genotyping of samples was obtained by real-time polymerase chain reaction or qPCR using TaqMan probes. Toxicity was assessed according to the Common Terminology

Criteria for Adverse Events in terms of severe general toxicity (grade $\geq$ 3). Adverse reactions described were obtained from medical records.
Results: The mean age was 61.5 $\pm$ 11.08 years (54.8% were male). 71.3% of patients had advanced neoplastic disease (EIII-EIV). The chemotherapy regimens administered to the patients were: capecitabine monotherapy 43.3%, FOLFOX 26%, XELOX 23.3%, FOLFIRI 4.6%, FLOT 2.6%. 26.5% of patients had some kind of severe reaction despite individualised dosing by DPYD genotyping. **Conclusion:** Despite genotype-guided treatment of fluoropyrimidines according to the recommendations of the clinical practice guidelines, some patients still experience severe adverse reactions. This suggests that due to the genetic variability of the DPYD gene, we need to focus research on the search for new polymorphisms of the DPYD gene relevant to the toxicity of this treatment.
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PP097

Implementing pharmacogenomics in a stroke service

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Background and objective: 'Pharmacogenomics' describes how a patient's genetic make-up affects their response to drug therapy. Clopidogrel is an antiplatelet widely prescribed in stroke prevention. It is a prodrug requiring hepatic metabolization, mainly by the CYP2C19 enzyme in order to become effective. Studies have identified genetic variants resulting in loss of function (LOS) CYP2C19. Consequently, patients treated with clopidogrel who carry these genetic variants are at an increased risk of recurrent strokes compared to noncarriers. 25–30% of European population will carry at least one CYP2C19 LOF variant. A simple genetic test can identify these individuals and help prescribers tailor antiplatelet prescribing and improve effectiveness. In NHS Tayside, the P4Me-Clopidogrel initiative in stroke aims to: 1. Implement and make the use of pharmacogenomic testing routine practice to inform antiplatelet prescribing. 2. Improve patients' outcomes: reduce re-occurrence of stroke.
Design: The CPIC (Clinical Pharmacogenetics Implementation Consortium) publishes guidelines to aid clinicians interpret pharmacogenetic tests and support decision making. Following CYP2C19 genotyping, patients who are identified as poor or intermediate metabolisers have a recommendation to be prescribed an alternative antiplatelet to clopidogrel. CYP2C19 laboratory genotyping processes were developed and validated in line with NHS Laboratory standards to identify the most common variant alleles (*2, *3 and *17). New clinical pathways were designed and shared with the teams in formal and informal educational sessions. Implementation was led by the stroke clinical pharmacist working in close collaboration with the medical team. The pharmacist also acted as a pharmacogenomic champion with a daily presence on the ward, promoting and supporting the implementation of the initiative. Target patients were those presenting with an acute non-cardioembolic ischaemic stroke or TIA with an indication for clopidogrel. For these patients a blood sample (standard EDTA tube) was taken and sent to the NHS Genotyping laboratory. Collaboratively, medical and pharmacy teams, reviewed genotyping results: patients identified with a LOF variant had their antiplatelet medication optimised.
Results: The initiative commenced in April 2022 and is now embedded into routine practice. By March 2023, 723 genetic tests had been completed. Preliminary audit metrics confirm the expected prevalence of 25–30% LOF CYP2C19 (28.2%) and also show that 168 (23.2%) patients identified as impaired metabolisers were prescribed an alternative to clopidogrel, with expect improved outcomes in line with published studies. Future statistical analysis will aim at comparing event rates for this initiative.
Conclusion: Integrating pharmacogenomics into antiplatelet decision making in stroke has the potential to significantly improve stroke outcomes in approximately 1 in 4 patients who require clopidogrel. This initiative is regarded as a first step to broader implementation of pharmacogenomics in the NHS—making medicines safer and more effective.
Pharmacists, with their unique scientific background and clinical role, are ideally placed to: raise awareness and advocate for the rational use of precision medicine and pharmacogenomics in healthcare systems; promote genomic education, disseminate new scientific advances and support integration into practice; discussing genetic test results with both healthcare professional and patients to support person centred care.

PP098

Appropriateness of pharmacotherapy and drug interactions with urate-lowering pharmacotherapy in hospitalized patients

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Background and objective: Hyperuricemia is elevated serum uric acid (urate) level, above the reference values of 360 umol/L (6.1 mg/dL) for women and 428 umol/L (7.2 mg/dL) for men. Asymptomatic hyperuricemia is the beginning stage in the development of gout; in this stage, the patient shows no symptoms or signs of this medical condition. A smaller number of these patients will develop uric arthritis in the future, so the guidelines of the American College of Rheumatology and the European League Against Rheumatism (EULAR) do not recommend the introduction of urate-lowering pharmacotherapy because the risks of long-term treatment of asymptomatic hyperuricemia outweigh the benefits. Asymptomatic hyperuricemia progresses with the first flare of acute uric arthritis or the development of urate nephrolithiasis/nephropathy. These medical conditions generally require the introduction of urate-lowering agents into pharmacotherapy.
Method: A prospective study was conducted at the Department for Rehabilitation of Orthopaedic Trauma Patients of the Special Hospital for Medical Rehabilitation in Varaždinske Toplice from 1 May 2022 until 31 December 2022 in which all patients treated with urate-lowering agents were observed. After the signed informed consent, a clinical pharmacist took the Best possible medication history by interviewing the involved patients. In agreement with the doctors, the patients' serum urate levels were measured. Drug interactions in patients with prescribed urate-lowering pharmacotherapy were analysed using the Lexicomp database. Only clinically significant interactions (grades C, D and X) were analysed.
Main outcome measures: Prevalence of patients with asymptomatic hyperuricemia who were prescribed urate-lowering pharmacotherapy. Proportion of patients receiving urate-lowering pharmacotherapy and who had target serum urate values. Prevalence and significance of potentially clinically significant interactions of urate-lowering pharmacotherapy with other prescribed pharmacotherapy.
Results: 58 patients with a median age of 75 years were included in the research. Female patients were more represented in the observed

group (53.4%). A total of 623 prescribed drugs were determined. Patients had an average of 10.7 prescribed medications. In 41.4% of patients, asymptomatic hyperuricemia was treated with allopurinol. 93.1% of patients received allopurinol pharmacotherapy, with 79.6% of them taking 100 mg a day, and the rest 200 mg a day; the rest of the patients were taking febuxostat. Less than half of the patients (48.3%) had serum urate values within the reference values. A total of 95 potentially clinically significant allopurinol interactions of grade C and D with other prescribed pharmacotherapy were observed, which means 1.8 potentially clinically significant interactions per patient. In patients who were prescribed febuxostat in pharmacotherapy, no potential clinically significant drug interactions were identified.
Conclusion: This study demonstrated that a great proportion of patients treated with urate-lowering pharmacotherapy had it prescribed for asymptomatic hyperuricemia. In more than a half of patients who received urate-lowering pharmacotherapy, target serum urate concentrations were not achived. The introduction of urate-lowering pharmacotherapy in patients with asymptomatic hyperuricemia increases the risk of clinically significant drug interactions. These results indicate the importance of optimizing pharmacotherapy in patients with hyperuricemia.

PP099

The behavioral influencers of patient adverse drug reaction reporting: a qualitative synthesis using the theoretical domains framework

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Background and objective: Background: Patient reporting of adverse drug reactions (ADRs) offers numerous advantages to health care systems, namely promotion of patient rights, earlier detection of important ADRs, and benefits to healthcare organizations from patient involvement (1). The World Health Organization advocates for the establishment of mechanisms to allow for patients and the public to report their ADRs directly through accessible reporting systems (2). In Qatar, despite advancements in pharmacovigilance and medication safety, a direct patient/public reporting systems is yet to be developed.
Objective: Synthesizing the Theoretical Domains Framework to identify the behavioural influencers of local patient towards direct reporting of ADRs.
Method: A purposeful sampling technique was adopted to recruit in-patients receiving care at Hamad Medical Corporation Heart hospital in November 2021. Semi-structured interviews were conducted using an interview guide developed using the Theoretical Domains Framework (TDF). Interviews conducted in either Arabic or English, lasting 15–30 min were audio-recorded and transcribed verbatim. Data were analyzed using thematic analysis and behavioural influencers were mapped to the TDF.
Main outcome measures: Behavioural influencers of reporting Adverse Drug Reactions.
Results: 16 patient interviews were conducted. The prominent TDF behavioral domains that influence direct reporting of ADRs were *knowledge; beliefs about capabilities* and s*ocial/professional role and Identity.* Although patients expressed an interest to use an ADR reporting system and a sense of responsibility to contribute to medication safety, they lacked understanding of what compromises an ADR and had doubts in their ability to accurately report their ADR.
Conclusion: The key behavioural determinants identified in this study which influence patient ADR reporting can be mapped to evidence-based behavioural change strategies to facilitate intervention development and optimization to enhance rates of ADR reporting. Aligning strategies should focus on patient and public awareness, education, and training regarding ADRs and ADR reporting.

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PP100

Interferon alpha-2b eyedrops in the treatment of corneal-conjunctival intraepithelial neoplasia

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Background and objective: Corneal-conjunctival intraepithelial neoplasia (CIN) is the most frequent tumour on the ocular surface, representing 33.4% of acquired epithelial lesions and a third of those which underwent surgery. They are eye injuries confined to the epithelium, with a slow growth pattern, but precursors of invasive squamous cell carcinoma. Recently, studies have been carried out to demonstrate the efficacy of topical interferon alfa-2b (IFN alpha-2b). The aim of this study was to describe the use of topical ophthalmic IFN alpha-2b eyedrops in patients diagnosed with CIN, as well as the characteristics of these patients and treatment. The secondary objective is to evaluate the considerable increase in the number of patients with this treatment in recent years.
Design: We conducted a retrospective observational study of patients who started treatment with IFN alpha-2b eyedrops for CIN during 2022. Data were obtained from the digitalized medical record (Diraya) and the electronic prescription program (Athos Prisma).
The variables analysed were treatment indication, dosage, age, sex, duration and reason for discontinuing treatment, mean time to CIN resolution and frequency of ophthalmology check-ups.

Moreover, a quantitative comparative review was made of the number of patients with this treatmentin 2021 and 2022.
Results: In 2021, a total of 4 patients started treatment with IFN alpha-2b eyedrops, whereas in 2022 this number increased more than 4 times, up to 17 patients. In the period analyzed (2022), 15 of 17 patients (88%) received IFN alpha-2b eye drops for a diagnosis of CIN, 1 patient (6%) for conjunctival melanosis, and 1 patient (6%) for actinic keratosis. The dosage in treatment with IFN alpha-2b was 1 administration every 6 h in the affected eye(s). A total of 15 patients, 10 (67%) men and 5 (33%) women with a mean age of 55 years [6–84] were treated with those eyedrops. The mean duration of treatment with IFN alpha-2b eye drops was 4.7 months. In the period of time studied, 60% (9/15) of the patients achieved improvement/cure of CIN and discontinued treatment for this reason. Whereas, 4 patients (27%) still continue with the treatment and 2 patients (13%) discontinued it on account of ineffectiveness. Except for 1 patient, the remaining 93% had between 2 and 4 ophthalmology check-ups in the 5 months following the start of treatment.
Conclusion: The use of IFN alpha-2b eye drops for the treatment of CIN has increased exponentially in recent years. This increase appears to be due to the greater efficacy of IFN alpha-2b compared to classical alternatives. The patients with this treatment are mostly men, around 55 years of age, with an estimated duration of treatment

of 4.7 months. In 60% of cases the neoplasia manages to improve in this time and the eyedrops are suspended. Additionally, the Ophthalmology Unit closely monitors these patients, especially at the start of therapy.

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PP101

The peri-operative management of diabetes

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Background and Objective:
It is estimated that peri-operative mortality is ~ 50% higher in diabetic patients than non-diabetics and around one third if diabetic inpatients experience a medication error during their stay. This audit focusses on diabetic patients managed with medications attending for elective surgery enrolled in the Enhanced Recovery After Surgery (ERAS) pathways. The objective was to identify how the management of their diabetic medication during the peri-operative period compared the current criteria outlined in the Joint British Diabetes Society guidance.

Method: To determine if diabetic patient's prescribed anti-diabetic medication were managed in accordance to the guidelines patients were identified retrospectively and the inpatient notes/documentation were used to adherence. SCI- diabetes was used to retrospectively identify if patients had an individualised management plans for the peri-operative period created at the pre-op clinic. Data was collected from June 2019-January 2020 and included all patients prescribed medications for diabetes undergoing elective major surgery.

Main outcome measures: Criteria and Standards included 95% of peri-operative medicines management of diabetic medication (insulins and non-insulins) should be in accordance with the Joint Diabetic Society guidelines for patients undergoing elective surgery in GRI on: **a.** Day -1, **b.** Day 0 (before noon) and **c**. Day 0 (afternoon). An additional criterion was set stating 95% of patients with diabetes undergoing elective surgery should have an individualised diabetes management plan.

Results: There were 68% of patients that had an individualised SCI-diabetes report which did not meet the standard of 95% set. Only 29% and 14% of insulin patients met the criteria set for Day 0 (before noon) and Day 0 (afternoon) retrospectively.

Conclusion: None of the criteria and standards set in this audit were achieved showing a need for further intervention. Studies have shown active pharmacist involvement in the peri-operative period starting from pre-operative to discharge has shown a significant reduction in the length of stay and the number of complications for surgical patients. By implementing peri-operative pharmacist involvement targeted at high risk diabetic patients we could hope to achieve an increased adherence to guidance.

PP102

The association between depressive symptoms and adherence to oral anticancer therapy in woman with advanced breast cancer

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Background and objective: Non-adherence due to depression can have negative treatment outcomes, including increased risk of recurrence and mortality in breast cancer patients (Thakur et al., 2021).

We aimed to identify the presence of depressive symptoms and to explore its association with the adherence to oral anticancer treatment (OAT) in a sample of woman with advanced breast cancer.

Method: A cross-sectional study was conducted at the Department of Oncology and Radiotherapy, University Hospital Centre Zagreb, Croatia, involving women (18 + years) with stage IV advanced breast cancer receiving OAT. Data collection included a questionnaire assessing socio-demographic and clinical information, as well as the BDI-II (21 items, four-point scale, total score range 0–63) and MARS-5 (5 items, five-point scale, total score range 5–25) scales; higher scores indicating more severe depressive symptoms, and better adherence, respectively. Statistical analyses were performed using IBM SPSS (version 22.0, Armonk, NY, 2013), with significance set at $p < 0.05$.

Main outcome measures: Depressive symptoms measured by Beck Depression Inventory II (BDI-II) and adherence to OAT, measured by Medication Adherence Report Scale (MARS-5).

Results: A total of 89 participants (median age: 60 years, IQR: 47–70) took part in the study, with a median duration since diagnosis of 6 years (IQR: 2.63–11.38). The most frequently prescribed OAT included anti-estrogen therapy (71.3%) and CDK 4/6 inhibitors (60.9%). The average MARS-5 score was 24.1 (SD: 1.6), while 67.4% scored the maximum of 25 points, indicating high adherence. The incidence of depressive symptoms was high, with 41.57% scoring 12 or more. Patients without depressive symptomatology were more often in the high-adherence group (44.94% high adherent vs. 13.48% lower adherence) ($p = 0.043$).

Conclusion: The study demonstrated that adherence rates were remarkably high in woman with advanced breast cancer. As lower adherence was associated with depressive symptoms, recognizing and addressing depressive symptoms in breast cancer patients can have multiple benefits for patients on OAT.

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PP103

Impact of a clinical decision support system on clinical pharmacy interventions

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Background and objective: Through aggregation of healthcare digital data, clinical decision support system (CDSS) is a promising approach to prioritize patients according to their potential drug related problem and to benefit from interventions by clinical pharmacist (CP). The aim of this study is to identify the impact of CDSS on CP interventions.

Method: In December 2021, a University Hospital of 985 bed acute care in France, implemented a knowledge-based single system CDSS (PharmaClass. KeenTurtle). Sociodemographics, biological and

prescription data were integrated by the CDSS with 73 decision support rules proposed by a multi-disciplinary expert panel. CP screened relevant alerts and proposed pharmaceutical intervention (PI) for physicians corresponding to any proposed therapeutic change about medication.
Main outcome measures: Number of alerts triggered and their criticality analyzed by pharmacists, PI made, medical acceptation rate, error prevention rate.
Results: PharmaClass® detected 1989 iatrogenic situations (5 264 alerts) during the one-month study inclusion period. A total of 681 alerts were analyzed: 190 (27.9%) were considered as technically invalid—mainly due to the characteristics of the interface: 178 (36%) were pharmaceutically relevant and let to a PI whose 112 (63%) were accepted by physicians. For 88 PI (49%), first drug nurse administration was prevented. The average criticality of the alerts was 5.8/10. Only 12.7% of the alerts during the collection period were analyzed due to a too large number of alerts and duplicates alerts generated (23.4%).
Conclusion: Use of a CDSS seems to be benefit to improve pharmaceutical practice but needs to optimize decision support rules.
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PP104

Effectiveness of alirocumab and evolocumab in the treatment of hypercholesterolemia in real clinical practice

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Background and objective: At present, we do not have comparability studies between alirocumab and evolocumab, hypolipemiants anti-proprotein convertase subtilisin-kexin type 9(PCSK9-inhibitors). To analyze the effectiveness of PCSK9-inhibitors on low-density lipoprotein cholesterol (LDL-C) levels in a sample of patients with hypercholesterolemia, and to analyze the comparative effectiveness between the group of patients who received alirocumab and evolocumab.
Design: Retrospective descriptive study between January 2018 and September 2021. The effectiveness variables were reduction (mean ± SD) of LDL-C and proportion of patients who reached LDL-C less than 100 mg/dl and 55 mg/dl, after 24 and 48 weeks. Comparisons between groups for qualitative and quantitative variables were Mann–Whitney U test and Chi-Square test, respectively. Student's t-test was used for comparisons of means.
Results: 48 patients were included (64.6% women). 62% had heterozygous familial hypercholesterolemia (HFHe), 19% HFHe and Atherosclerotic cardiovascular disease (ASCVD), and 19% only ASCVD. 77% started treatment with Alirocumab and 23% evolocumab. 81% of the patients were being treated with other lipid-lowering drugs. In the general population, the mean in LDL-C at 24 and 48 weeks decreased significantly (165 ± 59.51 mg/dl to 66 ± 38.92 mg/dl 163 ± 59.61 to 73 ± 60.40 mg/dl, respectively; $p < 0.001$). After 24 weeks, 72.9% of patients achieved LDL-C < 100 mg/dl and 50% LDL-C < 55 mg/dl. The effectiveness was maintained in the long term (48 weeks). The comparative effectiveness results of alirocumab and evolocumab in the qualitative variables (percentage of patients with LDL-C less than 100 mg/dl and 55 mg/dl at 24 and 48 weeks) were not statistically significant ($p < 0.05$). No statistically significant differences were observed in the mean LDL-C reduction at 24 weeks ($p = 0.089$) and 48 weeks ($p = 0.868$), despite the fact that the evolocumab patients had a higher baseline LDL-C level than the alirocumab group ($p = 0.041$).
Conclusion: We can affirm that iPCSK9 drugs have been shown to be effective in the short and long term according to real clinical practice results. No differences in effectiveness were observed between alirocumab and evolocumab at 24 and 48 weeks, despite the fact that the mean baseline LDL-C was lower in the alirocumab group and most of them received concomitant treatment with statins and/or ezetimibe.

PP105

Adequacy of the prescription of the gucagon-like peptide 1 receptor agonists

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Background and objective: The glucagon-like peptide 1 (GLP-1) receptor agonists have been authorized by the Spanish Agency for Medicines and Health Products (AEMPS) for use in the treatment of adults with type 2 diabetes mellitus (DM2), who do not have been adequately controlled, as a complement to diet and exercise. The use of these medicines for other purposes, such as the treatment of obesity, has led to their shortages, with the consequent damage that they have entailed for some patients. The AEMPS issued a series of recommendations to prescribers to alleviate these supply problems, among which is the prioritization of its use for the authorized indication. In Spain, the financing of these medicines is subject to approval by the corresponding Pharmacy Services. The aim of this study is to assess the adequacy of GLP-1 receptor agonists prescriptions.
Design: Retrospective observational study in which the prescriptions of GLP-1 receptor agonists made from January to October 2022 by medical specialists from a regional hospital were analyzed. The data was obtained from the electronic prescription program ($RXXI^{O}$), the restricted funding drug authorization program, and the digital history of the patients.
Results: A total of 103 semaglutide prescriptions were analysed. 40.8% of the prescriptions had been made to women. Ninety prescriptions were for maintenance treatment and 13 for initiation. 21 (20.4%) prescriptions did not fit the indication authorized by the AEMPS, since they had been made to patients without DM2. In these patients, the review of the clinical history led to the refusal of the visa by the pharmacy.
Conclusion: The degree of adequacy of GLP-1 receptor agonists prescriptions in our hospital has been low. The assistance work of pharmacists is a fundamental support to ensure the rational use of medicines, minimizing the consequences derived from their misuse.

PP106

Interaction table of oral factor xa inhibitors with oral anti-cancer drugs

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Background and objective: Patients with active cancer are generally considered at increased risk for thrombosis. For secondary prevention

of thromboembolism or in the presence of other co-morbidities, the anticoagulation in these patients is warranted. On the other hand, due to the cancer type, chemo- or radiotherapy and concomitant anticoagulation, the bleeding risk increases. Prescribing direct oral anticoagulants in patients concomitantly treated with oral anti-cancer drugs represents a challenge for clinicians as the metabolic pathways often interfere, which can lead to clinically relevant drug-drug interactions (DDI). Scientific evidence for the clinical management of these DDI is emerging, but the robust data is still lacking.
Design: We screened the main metabolic pathways of 67 oral anti-cancer drugs, focusing primarily on CYP3A4, P-gp and BCRP as they are often involved in metabolism of the oral factor Xa inhibitors. For every drug, the product information was consulted. In case of lacking data on metabolism, we searched in other sources (e.g. UpToDate, DrugBank). Furthermore, a PubMed search concentrating on the management of the potential DDI was performed.
Results: Our clinical pharmacy team together with the in-house haemato-oncologists developed an interaction table of the oral factor Xa inhibitors (apixaban, edoxaban, rivaroxaban) with the commonly prescribed anti-cancer drugs to help to identify and manage DDI. Based on these data we propose the management of the possible DDI by considering dose reduction, switching to other drug within the therapeutic class or avoiding the combination. If applicable, increased bleeding risk caused by the drug itself is mentioned as well.
Conclusion: The interaction table in an easy-to-use format (traffic light system) is already publicly available on our website and provides clinicians with unique recommendations which are not listed in the interaction software and thus contributes to the medication safety. Along with the regular updates, the next step could be an implementation into the clinic information system or creating a web-based tool.
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PP107

Optimization of the administration of intravenous medication by reduction of the residual volume taking user-friendliness, cost efficiency and safety into account

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Background and objective: It has been known for many years that with the administration of intravenous medication a rather significant part of the planned to be administered infusion solution, the residual volume (the volume that remains in the IV line and or infusion bag), does not reach the patient and is wasted. This could possibly result in underdosage and diminished therapeutic effect. Despite the important impact on the patient, the reduction of residual volume lacks attention. An optimized and cleary stated protocol concerning the reduction of residual volume in a IV line is necessary for each hospital. As described in my master thesis, acquiring the degree Master in Hospital Pharmacy, administration of intravenous medication can be optimized by reduction of the residual volume. Herewith effectiveness, user- friendliness, cost efficiency and safety were taken into account.
Method:: By usage of a literature study and an online questionnaire, sent out to all Flemish hospitals and hospitals in the Netherlands (province Limburg), current flushmethods could be mapped out. In laboratory research possible flushmethods aiming to reduce the residual volume were measured. Furthermore a self developed experimental method to reduce the residual volume was added to the study. The current flushmethods and the self developed experimental method were compared to eachother based on cost efficiency, user-friendliness and safety.
Main outcome measures: There is a major difference between the Flemish and the hospitals in the Netherlands (Province Limburg) concerning the approach and method of flushing of IV lines after administration of an intravenous medication. According to the laboratory research, the self developed experimental method is feasible and has the advantage that the remaining fraction of the medication can be administrated to the patient in unchanged concentration without dilution. Furthermore this technique can be applied regardless the level of the residual volume.
Results: The residual volumes were measured and laboratory research showed that if flushing was done with minimally 1 time equivalent the residual volume, 95 percent of glucose would be flushed through. Based on comparison it became clear that flushing by use of a pre-filled syringe would be the most cost efficient, user-friendly and safest method.
Conclusion: It is recommendable to revise the current infusion systems andflushing methods in most hospitals. Aside from education of the hospital staff and alignment on a uniform substantiated protocol, an optimized and clear policy on the reduction of residual volume is necessary in each hospital. It is recommended to flush all IV lines with rinsing fluid with at least the equivalent volume of the residual volume. Further laboratory and clinical research for the self developed experimental method is needed before this method can be implemented clinically in a broader setting.
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PP109

Innovating the role of the hospital antimicrobial pharmacy technician using technology and quality improvement

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Background and objective: Antimicrobial pharmacy technician (AMPT) roles are evolving and offer an excellent opportunity to support improvement in antimicrobial stewardship (AS) and patient care and safety in the acute setting. Keeping patients informed and involved in their antimicrobial treatment and documenting oral antibiotic stop dates (OASD) on the electronic prescribing system (HEPMA) can improve AS by ensuring patients receive the correct antibiotic for the appropriate duration. In addition, management of common antimicrobial drug interactions is important in improving patient safety and preventing treatment failure and antimicrobial resistance (AMR). This study set out to develop a patient-centred AMPT service promoting improvement in AS and patient care and safety using technology and embedded quality improvement (QI) methodology.
Method: An AMPT ward service was developed over 6 months at the Royal Alexandra Hospital (RAH) using daily HEPMA antimicrobial reports to identify patients for targeted AMPT review including: oral antibiotics without a stop date and patients initiated on oral clarithromycin, levofloxacin, ciprofloxacin, fluconazole or IV gentamicin. Electronic data collection/decision support tools were used to support AMPT patient review, counselling and data collection. Omissions in OASD and antibiotic interactions were highlighted to the ward team and standard interaction management advice provided with antimicrobial pharmacist referral if required. Eligible patients received standardised counselling and patient information.
Main outcome measures: Run charts were used to measure improvement in the proportion of wards achieving 75% documentation of OASD on HEPMA. AMPT interventions including the number

of antibiotic interactions highlighted and patients identified and counselled were collated as additional indicator measures of AMPT promotion of AS and patient-centred care.
Results: Following AMPT service introduction OASD documentation on HEPMA improved from baseline in 88% (14/16) of wards with the 75% target achieved in 38% of wards. AMPT review (n = 345) identified 34% of patients prescribed tetracycline or fluoroquinolone antibiotics were prescribed interacting multivalent cation products. Only 17% of these interactions were appropriately managed prior to AMPT intervention. Ciprofloxacin, clarithromycin, levofloxacin and fluconazole review identified potential clinically relevant interactions in 63% of patients with a high proportion (49%) related to QTc prolongation risk. In patients prescribed oral antibiotics eligible for counselling (n = 97), prior to AMPT intervention only 27% knew the antibiotic prescribed, 64% the indication and 4% the planned antibiotic duration. Review of patients prescribed IV gentamicin (n = 127) identified 52% were suitable for counselling of which prior to AMPT intervention 24% were unsure of gentamicin indication and 86% were unaware of potential gentamicin adverse effects including ototoxicity.
Conclusion: Introduction of a targeted AMPT ward service using technology and QI, resulted in improved AS and patient care and safety in terms of improved documentation of OASD, identification and management of common antibiotic interactions and promotion of patient-centred care.
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PP110

Evaluation of a preoperative medication reconciliation program in patients scheduled for urological surgery

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Background and objective: The aim of this study is determining the incidence of potential reconciliation errors (RE) detected and avoided in polymedicated patients who are going to be admitted to hospital for scheduled urological surgery. It has been also analyzed the types of RE and pharmacological group involved.
Design: Prospective observational study carried out during 2022, in which all patients treated with at least 5 drugs or one of those considered high risk according to the REDFASTER group were included. The variables measured were: number of prescribed drugs, number of REs, drug group involved, and severity of the RE. The sources of information used were: Electronic Clinical History, APD-Prisma (electronic prescription program) and interview with the patient-caregiver. Patients were included at the time of surgical scheduling, usually in the week prior to hospital admission. The complete list of home medication was collected by consulting the aforementioned sources of information. This list was compared with the prescription provided by the urologist at the time of admission and with the recommendations made by the anesthesiologist. If any discrepancy is found that requires clarification, it is communicated to the doctor for resolution before hospital admission.
Results: 290 patients with a mean age of 72 years were included. 1763 drugs were reviewed, resulting in an average of 6 medications/patient. From all the detected discrepancies, 71% were considered unjustified and required clarification. All them were communicated to the responsible physician and solved before admission. 93% of the patients presented at least one RE. An average of 4 RE/patient were found. The most frequent type of RE was the medication omission (99%).
Medications from 76 pharmacotherapeutic groups were analyzed according to the level 4 Anatomical-Therapeutic-Chemical classification. The main groups involved in REs were: alpha adrenergic receptor antagonists (8%), benzodiazepines (7%), HMG co-A reductase inhibitors (7%), platelet aggregation inhibitors, heparin excl. (5%), selective beta-blocking agents (4%), ACE inhibitors, monodrugs (3%), sulfonamides, monodrugs (3%), angiotensin II antagonists, monodrugs (3%), and angiotensin II receptor antagonists and diuretics (3%).
Conclusion: The contribution of pharmacist in the pharmacotherapeutic reconciliation process and its performance prior to admission in scheduled surgical patients makes it possible to detect and solve potential medication errors before they reach the patient.

PP111

Use of erenumab, galcanezumab and fremanezumab in a first level hospital: experience in real clinical practice

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Background and objective: The recent approval of Calcitonin gene-related peptide (CGRP) monoclonal antibodies (mAbs) implies a new treatment option for prevention of chronic migraine and high-frequency episodic migraine.
The objective of this study was to evaluate the effectiveness and safety in real clinical practice of CGRP in patients with chronic migraine.
Design: An observational, retrospective, real-world evidence study was carried out to analyse the effectiveness and safety of anti-CGRPs monoclonal antibodies marketed in Spain (erenumab, galcanezumab, and fremanezumab). Effectiveness was measured by monthly migraine days (MMDs) reduction after 12 weeks. Adverse events were checked when collecting medication at the outpatient consulting room at the Hospital Pharmacy Service.
Results: 24 patients were on CGRP mAbs: 38% Galcanezumab, 29% Erenumab 140 mg, 16% Erenumab 70 mg and 16% Fremanezumab; 16% were men and 84% women. Most of patients on Erenumab 140 mg (29%) and Galcanezumab (21%) began treatment with Erenumab 70 mg but switched after no improvement. Efectiviness was very similar for the three mAbs as 71% of patients achived 50% reduction in severe headache days.
Though side effects were mild and rare they was only caused by Erenumab: Constipation 12.5% and reaction at injection site 4%. There was no treatment interruption for safety reasons.
Conclusion: Anti-CGRP mAbs were an effective and safe therapy for chronic migraine in this treatment resistant population over 12 weeks of follow up. They mean a valuable option treatment that can improve quality of life for those patient that migraine compromises their daily activity.

PP113

Cancer patients' behaviour towards natural health products

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Background and objective: Natural Health Products (NHPs), including vitamins, minerals and herbal supplements, are the most commonly used Complementary and Alternative Medicine (CAM) among cancer patients. Health Care Providers (HCPs) are generally unaware of patients' use of NHPs because they perceive them as

"safe and natural", unlike conventional medicine. There is a concern surrounding NHPs because of potential drug interactions with conventional treatments. Our survey determined cancer patients' behaviour towards natural complementary therapies in a sample of hospitals in Belgium.
Method: We conducted a survey for cancer patients in four hospitals from October 2020 to October 2021 through an online questionnaire. Participants were recruited by sharing posters and flyers, with a QR code, giving access to the questionnaire, either directly at the hospitals or through social media networks. Data were analysed with descriptive statistics using Excel® version 16.66.1. The $\chi 2$ test of homogeneity was performed with RStudio®.
Main outcome measures: The outcomes were the type and number of NHPs consumed, the source of information and if the patient's consumption had changed since diagnosis. In our study, NHPs included vitamins, minerals, herbs, Essential Oils (EOs), homoeopathy and Bach Flowers (BFs) and other products (i.e., probiotics, gemmotherapy, birch sap and omega 3/6).
Results: Out of 349 questionnaires collected, 59 met the inclusion criteria. 52.5% of patients consumed at least five different NHPs. Vitamins (86.4%) and herbs (84.7%) were the two most consumed supplements. Among the sources of information about vitamins, the general practitioner was the most common (23.8%). In the case of other NHPs, it was family, friends, and close circles (minerals = 24.3%, BFs and homoeopathy = 27.5%, other products = 26.2%, EOs = 36.6%, herbs = 25.4%). The time of diagnosis was associated with a significant change in NHPs consumption for 72.2% of patients ($p = 0.0090$).
Conclusion: Because of the combination and diversity of NHPs, patients and HCPs must be educated about their risks. Patients' varying consumption since diagnosis highlights the need for HCPs to ask frequently about NHPs. A more personalised approach to cancer care occurs in integrative oncology, combining complementary approaches and conventional medicine. To better understand the interactions between NHPs and cancer therapy, additional studies could be conducted using interviews.
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PP114

Consensus on indicators for medication-related readmissions: a Delphi study

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Background and objective: Effective patient prioritization of clinical pharmacy services at hospital discharge is crucial for optimizing the use of limited resources and reducing the risk of medication-related readmissions. We conducted a Delphi Study with the aim of developing a comprehensive set of indicators for 30-day medication-related readmissions to guide patient prioritization for clinical pharmacy services at hospital discharge.
Method: We conducted a two-round Delphi study involving an expert panel of clinical pharmacists, physicians, and nursing experts from Switzerland. The indicators for the first round were based on a self-conducted scoping literature review (n = 20) and additional indicators deemed potentially relevant but not covered in the literature (n = 11). The experts rated the relevance of the proposed 31 indicators on a scale of 1 to 9. An indicator was defined as relevant with a median rating of ≥ 7. Consensus was defined using the RAND/UCLA method. In the second round, experts rerated indicators without consensus and assessed expert-generated indicators. Additionally, for indicators requiring more specifications, such as cutoff values or clinical situations, these specifications were requested.
Main outcome measures: Relevance, consensus, and completeness of the proposed indicators for 30-day medication-related readmissions.
Results: In the first round, 38 experts participated, and 25 indicators were rated as relevant; six were excluded. All 31 indicators reached consensus. In addition, five new indicators were suggested. In the second round, 31 experts participated. Of the five newly proposed indicators, four were deemed relevant and one was excluded. All new items reached consensus. The expert panel prioritized the following indicators as most important: (1) insufficient communication between different healthcare providers, (2) low rate of medication adherence, (3) polypharmacy (seven or more medications), (4) not receiving medication reconciliation at hospital discharge, and (5) overdose of anticoagulants, insulin, and cardiac glycosides.
Conclusion: The developed set of indicators for medication-related readmissions could guide the prioritization of clinical pharmacy services at hospital discharge, leading to improved patient outcomes and more efficient use of resources. Clinical pharmacists may play an important role in collecting and standardizing data on these indicators, thereby highlighting the need for their involvement in patient care. Validation and subsequent prioritization of the identified indicators will be conducted.

PP115

Can pharmacists be useful in a mobile geriatric team? Results of a pilot study

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Background and objective: Patients aged 75 years and older are known to have multiple chronic conditions treated with multiple medications. The management of this polymedication is particularly complicated in this population due to the prescription of potentially inappropriate prescriptions (PPIs), especially at the transition points such as hospital admission and discharge. These PPIs increase the risk of drug adverse events, responsible for 25% of the admissions of this population. In order to secure the drug management of patients aged 75 years and older, admitted in a non-geriatric ward of Saint-Antoine hospital (AP-HP, Paris, France), pharmacists have integrated the mobile geriatric team (MGT). The pharmacists of the MGT perform medication reconciliations on admission and discharge, which are sent to community, and analyze prescriptions daily. The aim of this pilot study is to evaluate the impact of this new organization of the MGT.
Method: Prospective observational pilot study including patients who received a MGT intervention between January 1st and April 31th of 2023.

Main outcome measures: For each included patient, the following data was collected: age, gender, number of completed admission and discharge medication reconciliations, number of drugs indicated in the medication reconciliations (MR), number of pharmaceutical interventions (PI), number of PI linked to the MGT intervention, number of discrepancies and number of discharge MR transmitted to community.
Results: A total of 118 patients benefited from an MGT intervention (mean age 84.7 ± 6.9 years, 64% of women). Among these patients, 67 (57%) had an admission MR, which allowed to detected 31 discrepancies. A total of 106 PI were carried out, including 17 (16%) linked to the MGT intervention. At discharge, 23 (19%) MR were completed and 19 (83%) transmitted to community.
Conclusion: The integration of pharmacists in the MGT improved the securing of the drug management of the patients aged 75 years and older, admitted in a non-geriatric ward of Saint-Antoine hospital, particularly at admission and during hospital stay. In order to evaluate the impact of this new organization on hospital discharge, a feedback from the community is needed.
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PP119

Frozen native stool versus frozen fecal suspension: comparison of two transplant preservation methods on the clinical efficacy of fecal microbiota transplantation in multi-recurrent clostridioides difficile infection

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Background and objective: The study of the effects of storage conditions on stools has significantly improved fecal microbiota transplantation (FMT) hospital circuit. Nowadays, after donations are processed, transplants obtained can be stored for up to 2 years at − 80 °C. [1] However, freezing stools before preparation would allow further optimization of the activity. In this context, the aim of this work was to investigate the clinical efficacy of this new preservation method in patient with multi-recurrent *Clostridioides difficile* infection (who experienced at least two recurrence, CDI2r).
Method: Patients treated with FMT for CDI2r were selected from Saint-Antoine Hospital FMT center patient cohort between November 2021 and March 2023. Batch records were used to create 2 groups, one in which transplants were prepared with frozen native stool (FNS) and a control group in which frozen stool suspensions (FSS) were used (classical method of preparation).
Main outcome measures: Clinical efficacy was defined as the absence of recurrence 10 weeks after administration. Comparison of success rates was performed using $\chi 2$ test with R software ($\alpha = 5\%$).
Results: 130 FMT were performed on 113 patients, 48 of whom met our selection criteria, with an equal distribution. The two groups were statistically comparable (mean age, sex ratio, administration routes). The clinical success rate after 1 FMT was identical in the two groups with 79.2% success rate. There was no significant difference between success rates after catch-up, efficiency being 86.9% in the test group *versus* 90.9% in the control group, which is consistent with the literature [2]. Failures were mainly due to poor preparation of the patient's colon prior to transplantation.
Conclusion: This work shows that the option to freezing donations directly and prepare them at a later is feasible and achieve similar clinical effectiveness of FMT in CDI2r than classical preparation. This method of preservation optimizes pharmaceutical team process, limits waste of stool and material and avoids handling of donations before biological validation.

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PP121

A cross sectional survey of inflammatory bowel disease pharmacists in NHS Scotland: are we meeting the IBD UK standard?

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Background and objective: Inflammatory bowel disease (IBD) services across the UK should include a 0.6 whole time equivalent (WTE) IBD Pharmacist for a typical district general hospital catchment population of 250,000 people. IBD Pharmacists should work as part of IBD multidisciplinary teams (MDTs) to support the delivery pharmaceutical care to patients with IBD, in addition to medicines governance and cost-effectiveness. IBD UK, who sets this standard, is a partnership of 17 professional bodies, royal colleges and patient organisations, including the Royal Pharmaceutical Society. They set the standards for IBD services across the UK to ensure patients with IBD receive high quality care wherever they live. **Aim**: To determine the current WTE resource and clinical activities of IBD Pharmacists across NHS Scotland's 14 health boards, in order to establish if IBD services are meeting this standard.
Design: A cross sectional survey was designed in order to establish the WTE resource and clinical activities of IBD Pharmacists. The survey was piloted in one health board to test the responses. After piloting, the survey was sent to all specialist interest group members of the Scottish Gastroenterology Pharmacist Network (SGPN) and identified acute pharmacy leads where that health board was not a member of SGPN in March 2022. Each health board's target WTE IBD Pharmacist resource was calculated according to the IBD UK standard of 0.6WTE/250,000 people. Responses were grouped by health board and analysed.
Results: 13 out of 14 of health boards responded to the survey, with one non-response. 10 health boards have IBD Pharmacists working within their IBD MDTs, with the remaining 3 having no IBD Pharmacists. **WTE IBD Pharmacist resource—**There are 7.6 WTE IBD Pharmacists working across 10 health boards. The target for all 14 health boards is 12.6 WTE. Only one health board met the IBD UK standard, with the 9 other health boards having less than 0.6WTE/250,000 people. **IBD Pharmacist clinical activities**—5 health boards have established IBD Pharmacist led prescribing of biologic and immunomodulator medicines. Encouragingly, all health boards with IBD Pharmacists support the IBD MDT in delivering medicines governance, in addition to outpatient and inpatient clinical activities. Only 3 health boards have implemented IBD Pharmacist led clinics. Lastly, 5 health boards have their pharmacist resource dedicated to

other parts of the Gastroenterology speciality in addition to IBD e.g. Liver services. Responses indicated that some IBD Pharmacists have operational commitments to their Pharmacy Departments which can lead to their IBD work going on hold.
Conclusion: At present, the majority of health boards across NHS Scotland are not meeting the IBD UK standard of 0.6 WTE IBD Pharmacist per 250,000 catchment population. Only one health board is meeting this standard. Reassuringly, where there are IBD Pharmacists in place across 10 health boards, they are supporting the IBD MDT to deliver pharmacetuical care to patients with IBD and are completing clinical activities in both outpatient and inpatient areas.
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PP122

Implementation of DPYD pharmacogenetic testing in clinical practice to prevent early-onset fluoropyrimidine-related toxicity in oncology patients in North Macedonia

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Background and objective: The dihydropyrimidine dehydrogenase enzyme is essential for the metabolic degradation of fluoropyrimidines. Since DPD is the rate-limiting enzyme in fluoropyrimidine metabolism, fluoropyrimidine-based treatment can result in significant toxicity, such as severe diarrhea, mucositis, and pancytopenia when DPD's enzymatic activity is impaired. The Gastrointestinal Oncology Department at the University Clinic for Oncology and Radiotherapy in Skopje has implemented Pharmacogenomic testing for DPYD polymorphisms prior to chemotherapy treatment initiation as part of the routine clinical practice.
Method: A prospective study of 2229 patients, with colorectal cancer, was performed. The patients were genotyped for four *DPYD* variants (*2A(c.1905 + 1G > A, rs3918290), *13(c.1679 T > G, rs55886062), rs67376798(c.2846A > T), rs56038477(c.1236G > A), which have been associated with fluoropyrimidine—associated toxicity, by allele-speciifc PCR. Genotype-guided dosing recommendations were based on the Clinical Pharmacogenetics Implementation Consortium guidelines for Fluoropyrimidines and DPYD: 2017 Update.
Main outcome measures: In a prospective study of 2229 patients, 39 patients were heterozygous carriers of *DPYD* rs56038477(c.1236G > A), classified as *DPYD* intermediate metabolizers (*DPYD*-AS = 1.5), 14 patients were heterozygous carriers of *DPYD* (*2A(c.1905 + 1G > A, rs3918290), classified as *DPYD* intermediate metabolizers (*DPYD*-AS = 1.0) and 10 patients were heterozygous carriers of *DPYD* rs67376798, classified as *DPYD* intermediate metabolizers (*DPYD*-AS = 1.5). Patients who were heterozygous for DPYD decreased/no function variants received reduced starting doses by 25% to 50%, based on activity score followed by titration of dose based on toxicity.
No homozygous variant carriers were identified.
Results: In a prospective study of 2229 patients,39 patients were heterozygous carriers of *DPYD* rs56038477(c.1236G > A), classified as *DPYD* intermediate metabolizers,14 patients were heterozygous carriers of *DPYD* (*2A(c.1905 + 1G > A, rs3918290), classified as *DPYD* intermediate metabolizers and 10 patients were heterozygous carriers of *DPYD* rs67376798, classified as *DPYD* intermediate metabolizers. Patients who were heterozygous for DPYD decreased/no function variants received reduced starting doses by 25% to 50%, based on activity score followed by titration of dose based on toxicity. No homozygous variant carriers were identified.
Conclusion: Fluoropyrimidines can cause life-threatening toxicity in patients with known DPYD deficiency; therefore, early identification of these patients using predictive indicators may improve patient safety through dosage reduction or an alternate treatment strategy. Since polymorphisms in the DPYD genes are being identified as predictors of fluoropyrimidine-associated toxicity, chemotherapy dose modifications based on the existence of DPYD gene polymorphisms can improve treatment safety for a significant number of patients.

PP124

The effect of clinical pharmacy services in patients with acute coronary syndrome: a randomized controlled study

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Background and objective: Most patients with coronary artery diseases are treated for a long time with a combination of multiple drugs for treatment. Polypharmacy is quite common and can lead to poor quality of life, and non-adherence. The aim of our study is to determine the effect of clinical pharmacy services in patients with acute coronary syndrome (ACS).
Method: This prospective and randomized controlled study was conducted at a cardiology clinic in Istanbul between May 2022-May 2023. The patients hospitalized and diagnosed with ACS were included in the study. Patients were randomized into control and intervention groups. All patients were followed for 6 months. The intervention group received face-to-face clinical pharmacy services (patient education, treatment monitoring) from the clinical pharmacist and the control group received standard care (without a clinical pharmacist). Medication Adherence Report Scale (MARS) and the Turkish version of the Health-related Quality of Life-4 (HRQOL-4) Scale were applied to all patients at zero point, first month, and sixth month of the study. Higher scores on the MARS scale mean more adherence to treatment while a higher score on HRQOL-4 Scale means a poorer quality of life. Data were analyzed with SPSS 15.0.
Main outcome measures: Comparisons of the scores of quality of life and medication adherence between control and intervention groups.
Results: A total of 120 patients were included in the study (60 control, 60 intervention). There was no statistical difference between the two groups in terms of age, gender, education status, medication use, comorbid disease, and cardiovascular risk factor ($p > 0.05$). The mean MARS score of the first and sixth months was found to be higher in the intervention group ($p < 0.0001$). The mean score of HRQOL-4 was found to be statistically significantly lower in the intervention group compared to the control group ($p < 0.0001$).
Conclusion: Medication adherence and the quality of life of patients who received pharmaceutical care from the clinical pharmacist were higher. We think that clinical pharmacy services may contribute positively to the treatment of patients with ACS through patient follow-up.

PP125

Multicenter study: effectiveness and safety of subcutaneous belimumab in systemic lupus erythematosus

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Background and objective: Systemic lupus erythematosus (SLE) is a chronic and autoimmune disease with multisystem involvement that involves a decrease in quality and life expectancy. Belimumab is a monoclonal antibody used for the treatment of patients with active, autoantibody-positive SLE with a high degree of disease activity despite standard therapy. The main objective of the study is to evaluate the effectiveness and safety of the subcutaneous (SC) presentation of belimumab at 24 weeks of treatment, as it is considered the main turning point to assess its continuity.

Design: An observational, retrospective and multicenter study has been carried out in a second and third level hospital. Patients treated with belimumab sc from January 2021 to April 2023 who had reached at least week 24 were included. Variables collected were: sex, age, number of patients who switched from belimumab IV to SC, previous therapies, SLEDAI, anti-DNA, c3 and c4 values before and at week 24 of SC treatment.

Effectiveness was measured by the reduction in hospital admissions, existence or absence of outbreaks, reduction in the dose of corticosteroids and anti-DNA, in addition to the increase in complement (c3 and c4). Safety was evaluated by the existence of adverse events related to belimumab and in addition considering those patients in whom it was necessary to suspend treatment. Information sources: electronic prescription application (Prisma®) and computerized medical record (Diraya®).

Results: This study included 31 patients treated with SC belimumab, 7 of whom switched from IV to SC belimumab. The mean age was 41 years, being 100% women. All patients received prior therapies, with a mean number of drugs per patient of 3.5. All were receiving corticosteroid treatment before starting SC belimumab.

In terms of effectiveness, 2 patients had suffered a flare during treatment with belimumab SC and one of them discontinued treatment due to no improvement in symptoms or laboratory parameters. 87% of the patients managed to reduce the dose of corticosteroids, in addition to reducing hospital admissions. In patients who switched from IV to SC belimumab (n = 7), the median reduction of anti-DNA was 25 mg/dL to 17 mg/dL, and c3 and c4 levels increased, with a median of 85.3 mg/dL to 89.7 mg/dL and from 14 to 17 mg/dL respectively. In patients who started belimumab SC directly (n = 24), the median anti-DNA changed from 28 to 13.5 mg/dL, and the median of c3 and c4 from 74.5 to 92 0.15 mg/dL and from 11.95 to 15.6 mg/dL respectively. No adverse effects were observed in patients that could be associated with SC belimumab.

Conclusion: SC belimumab seems to be effective and safe both in naive patients and in those patients who proceed from IV belimumab, improving their quality of life by reducing the symptoms and morbidity of the disease, in addition to reducing the adverse effects that would mean maintaining high doses of corticosteroids.

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PP126

Anti-CGRP monoclonal antibodies: switching and use of eptinezumab in refractory patients

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Background and objective: Migraine is a primary headache characterized by episodes of pain lasting up to 72 h with hypersensitivity to environmental stimuli. This pathology presents a prevalence of approximately 15% in the European population, being higher in women than in men.

In the therapeutic arsenal for the prophylactic treatment of migraine are monoclonal antibodies directed to block the circulating calcitonin gene-associated peptide (CGRP) (Fremanezumab and Galcanezumab) or its receptor (Erenumab). In the last year, Eptinezumab has been incorporated into this therapeutic group. Despite being widely used drugs, there is little evidence on their sequencing after ineffectiveness or intolerance to one of them.

The first objective was to describe the frequency of switching between anti-CGRP. The second was to analyse the characteristics of the patients being treated with Eptinezumab.

Design: Retrospective observational study of patients diagnosed with migraine and being treated with anti-CGRP, from January 2020 to May 2023. The sequencing between these drugs was analyzed by counting patients who were prescribed a second or third anti-CGRP by the Neurology Unit.

Regarding the use of Eptinezumab, the variables collected were age, sex, previous and concomitant treatments, dosage regimen, migraine days per month (MDM) at baseline, and adverse reactions.

Results: In the period studied, 274 patients received treatment with these drugs. 81% (222/274) were women and the mean age was 47.1 years. A second anti-CGRP was prescribed to 82 patients (29.9%) and a third to 10.9% (30/274). Currently, 205 patients (74.8%) continue in treatment.

Of the total number of patients, 3 (100% women with a mean age of 41.7 [22–50] years), non-responders to Erenumab, Fremanezumab and Galcanezumab, began treatment with Eptinezumab in March 2023. As previous treatments, all they had received anti-CGRP and Botox. In addition, one patient had received topiramate and propranolol. All 3 received concomitant treatment with 5-HT1B/D receptor agonists (zolmitriptan). Eptinezumab dosage used was 100 mg every 12 weeks, administered as a 30-min intravenous infusion on an outpatient basis in the hospital. The MDM at the beginning were 16.6. No adverse effects were recorded in any of the patients during the infusion time or the evaluation period.

Conclusion: The treatment is not effective in the global migraine patients. An adequate clinical evaluation is essential to assess the change of drug or cessation of treatment. Clinical trials of high methodological quality are needed to assess the effectiveness and safety of treatment changes. Whereas, eptinezumab is a novel alternative in patients with migraine refractory to other therapies. However, due to its recent indication, more data on long-term efficacy and safety are necessary.

PP127

Experience using nintedanib in the treatment of interstitial lung diseases

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Background and objective: Nintedanib is a drug authorized by the AEMPS for the treatment of Idiopathic Pulmonary Fibrosis (IPF) and other fibrosing idiopathic lung diseases (ILDs) with a progressive phenotype. The aim of this study is to know the clinical evolution of

the patients treated with nintedanib, thus evaluating its efficacy, safety and tolerability profile.
Design: Retrospective observational study of patients treated with nintedanib from January 2021 to March 2023 in a second level hospital. Patients who started treatment in the last 6 months or less were excluded. Variables collected were age, sex, indication, dosage, concomitant treatments, effectiveness, and adverse effects (AE).
The effectiveness was studied using the variables forced vital capacity (FVC) and diffusing capacity of the lungs for carbon monoxide (DLCO) at baseline and at 6, 12 and 24 months, analyzing the variations with respect to the initial value and assessing the number of patients with reduction values $< 5\%$, 5–10% or $> 10\%$ of the predicted value in FVC and DLCO. Non-response was considered if there was a reduction in FVC $> 10\%$ or DLCO $\geq 10\%$ in an interannual period or less.
Results: The study included a total of 45 patients, of whom 52% were women, with a mean age of 72 $\pm$ 10.5 years. 58% had an indication for IPF, while the remaining 42% had fibrosing ILDs with progressive phenotype. The dosage used was indicated in the data sheet: 150 mg every 12 h. 35% of the patients were treated concomitantly with glucocorticoids, immunosuppressants or biological treatment.
The results obtained showed during the first 6–12 months of treatment a stabilization or decrease in FVC $< 5\%$ in 73% of the patients, a decrease $< 10\%$ in 9% of the patients and 18% progressed with a decrease in FVC $> 10\%$. After 12–24 months of treatment, the percentage of patients who continued stable or with a FVC decrease $< 5\%$ was 60% and with a FVC5-10% decrease in 20% of the cases. Among the patients who had received treatment for more than 24 months, 75% of them presented a decrease in FVC $< 10\%$. Regarding the evolution of DLCO, after 6–12 months of treatment, 85% of patients presented a DLCO decrease $< 10\%$, which decreased to 67% and 40% of patients after 12 and 24 months, respectively.

In relation to AE, 51% of patients suffered gastrointestinal disorders, mainly diarrhoea. This meant reducing the dose to 100 mg/12 h in 44% of patients and even discontinuing treatment in 12% of them (a higher percentage than that observed in clinical trials). In no case did liver enzyme levels or bleeding increase, possible adverse reactions described in the technical data sheet.
Conclusion: The results of the study show that nintedanib favors the stability of lung function during the first 2 years of treatment. However, the safety of this antifibrotic drug is the main limitation, since almost half of the patients presented gastrointestinal disorders requiring, in some cases, the suspension of the antifibrotic. Therefore, the role of pharmaceutical care together with the Pneumology Unit is crucial to carry out a coordinated follow-up of the patient, as well as their education to improve adherence and management of AE and, consequently, their efficacy and safety.
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PP128

Evaluation of global trigger tool as a medication safety tool for adverse drug event detection—a cross-sectional study in a tertiary hospital

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Background and objective: The objective of this study is to describe and analyze adverse drug events (ADE) identified using the Global trigger tool (GTT) in a Finnish tertiary hospital during a 5-year period and also to evaluate whether the medication module of the GTT is a useful tool for ADE detection and management or if modification of the medication module is needed.
Method: A cross-sectional study of retrospective record review in a 450-bed tertiary hospital in Finland. Ten randomly selected patients from electronic medical records were reviewed bimonthly from 2017 to 2021. The GTT team reviewed a total of 834 records with modified GTT method, which includes the evaluation of possible polypharmacy, National Early Warning Score (NEWS), highest nursing intensity raw score (NI), and pain triggers.
Main outcome measures: ADEs per 100 admissions ADEs per 1000 admission days Percentage of admissions with at least one ADE Medication module triggers per patient.
Results: The data set contained 366 records with triggers in medication module and 601 records with the polypharmacy trigger that were analyzed in this study. With the GTT, a total of 53 ADEs were detected in the 834 medical records, which corresponds to 13 ADEs/1000 patient-days and 6% of the patients. Altogether, 44% of the patients had at least one trigger found with the GTT medication module. As the number of medication module triggers increased per patient, it was more likely that the patient had also experienced an ADE.
Conclusion: The number of triggers found with the GTT medication module in patients' records seems to correlate with the risk of ADEs. Also, new triggers, such as polypharmacy, or organizational and patient group-specific modifications could provide more reliable data for ADE prevention.
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PP129

Enhanced free-text search improves the aggregated analysis of medication error reports

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Background and objective: Medication errors (MEs) are considered as a major issue in patient safety. Learning from MEs is one of the key elements of safety and quality improvement. While the aggregation of the data and learning across the ME reports could help to detect and manage organizational risks, the inconsistent and partly missing structural data complicates the analysis. The objective of this study was to examine if a self-performed analysis of free-text data of aggregated ME reports could contribute to the detection of organizational risks.
Method: A retrospective, cross-sectional analysis of ME reports from a tertiary hospital database registered voluntarily into the electronic patient safety incident reporting system, HaiPro, in 2017–2021. Clustering of characteristics and variables of ME reports with an enhanced free-text search of the ten most prevalent active substances (TOP10) related to ME reports using Microsoft Excel®. Validity analysis of the four most prevalent active substances of the search results (TOP4) by assessing whether the resulted ME reports related to the targeted active substances. Evaluation of the possible impact of the enhanced free-text search method on medication safety improvement.
Main outcome measures: Classification of the medication error reports by active substances. Number of medication error reports. Validity of the medication error reports. New medication error findings.
Results: The enhanced free-text search increased significantly the number of relevant ME reports of TOP10 active substances from 698

to 1578 reports. The validity of the enhanced free-text search results in TOP4 active substances was over 74%. The enhanced free-text search revealed also new ME findings.
Conclusion: Self-performed enhanced free-text search can contribute to the aggregate analysis of clustered ME reports and to the improvement of ME detection. The enhanced free-text search method enables more comprehensive analysis of the free-text data with commonly available software and provides new insights into medication safety improvement, which would otherwise have been overlooked.
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PP130

Evolution of the medication reconciliation form: can we improve?

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Background and objective: Medication reconciliations (MRs) are performed by pharmacy students during their university hospital year. These are then recorded on Easily™ prescribing software (Hospices civils de Lyon, France). More than 2,000 medication reconciliations are conducted each year, but some are incorrectly filled in. A more secure computer-based form has thus been developed. The objective is to evaluate the number of incorrectly filled in forms since the update of the form.
Design: We led a retrospective analysis of MRs over 2 periods: before (January to November 2022) and after (January to April 2023) the modification of the form. MRs came from surgery, medicine, obstetrics, and follow-up care services using Easily™ software. Paediatric services were excluded from the study (no medication reconciliation activity). MRs were collected using a query made in Easily™ software and then analysed using an Excel™ spreadsheet. MR was conductied by the pharmacy students after training. The MR are performed according to a standardized process.

The status was "continue" when the drug was present on the medication history as well as on the first medication order at hospital admission. The status is "change" if there is a difference in dosage or dosing schedule between the 2 prescriptions. Status is added if the medication is "add" to the first medication order. The status is "stop" if a normally prescribed drug is not found on the first medication order.

There is a discrepancy if the status is change, add or stop. These discrepancies were immediately clarified with the medical team to identify whether they were intentional or non intentional.

All the forms were reviewed by 3 pharmacists. Non-conformities possible were: status continue with a discrepancy, correct status with an unintended discrepancy, no status with discrepancy or discrepancy characterisation filled in. Non-conformities were corrected according to the data in the patients' medical records. In case of missing information, the form was deleted.
Results: A total of 2,661 medication reconciliation forms were filled in over the study period (2057 before VS 604 after the form update). Before the update, 315 medication reconciliations forms had at least 1 non-compliance (15.3% of the forms). The non-conformities led to the deletion of 58 forms (2.8% of the forms). The main non-conformities noted were a lack of divergent or correct status (out of 230 forms, i.e. 73.0% of the forms with a non-conformity).
After the update, 50 forms showed at least one non-conformity (8.2% of the forms). Ten forms were deleted (1.6% of the forms). The main non-conformities were the lack of characterisation of the discrepancy (intentional or unintentional).
Conclusion: The update of the MR form allowed a reduction of half of the non-conformities when registering the forms in Easily™ software. Since the update, the main non-conformities encountered are the lack of characterisation of the discrepancy due to a non-communication with the medical team. The students may not have the opportunity to discuss with the prescribers or do not think to update the form once the discrepancy had been reviewed with the medical team.
It remains important to train pharmacy students to ensure the reliability of the information recorded when conducting medication reconciliations. The training by simulation interviews before meeting their first patient could improve the students' performance.
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PP131

The clinical pharmacist's role in medication adherence and treatment satisfaction with direct-acting oral anticoagulants

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Background and objective: Anticoagulant treatment is the first line of therapy for thromboembolic events. Direct-acting oral anticoagulants (DOACs) have emerged as a viable alternative to warfarin and are frequently prescribed. The aim of our study is to evaluate the effect of a clinical pharmacist on medication adherence, treatment satisfaction, and quality of life in patients using DOACs.
Method: This was a prospective and randomized controlled study conducted in a cardiology outpatient clinic between May 2022 and September 2022. A total of 230 patients who were treated with DOACs were included in the study. Patients were randomized as control and intervention groups. All patients were followed-up for 6 months. The intervention group received face-to-face pharmaceutical care from the clinical pharmacist and the control group received standard care (without the involvement of a pharmacist). The Duke Anticoagulant Satisfaction Scale (DASS), the medication adherence report scale (MARS-5), and Health-Related Quality of Life (HRQOL) were applied to the patients at the beginning, 3rd and 6th months of the study. While the higher mean of the DASS score expresses less satisfaction with treatment, the higher score of MARS and HRQOL expresses more medication adherence and better quality of life. Data were analyzed with SPSS 15.0.
Main outcome measures: Comparisons of medication adherence, satisfaction and quality of life between control and intervention groups.
Results: A total of 230 patients were included in the study (115 control, 115 intervention). There was no statistical difference between the two groups in terms of age, education status, gender, and type of DOACs ($p > 0.05$). There was no difference in the score of MARS-5, DASS, and HRQOL scores between the control and study groups at the beginning of the study. The mean of the DASS score was found to be significantly lower in the intervention group than the control group in the 3rd and 6th months of the study ($p < 0.0001$). In line with these results, the mean of MARS-5 and the HRQOL score was significantly higher in the intervention group than in the control group in the 3rd and 6th months of the study ($p < 0.001$).
Conclusion: According to the results of our study, the improvement in medication adherence, treatment satisfaction, and quality of life

scores was statistically significant for the intervention group during six months of follow-up. This study revealed that clinical pharmacist may contribute positively to the management of treatment in patients using DOACs.

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PP132

Drug-related problems in patients with atrial fibrillation and type 2 diabetes: interventions of the clinical pharmacist

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Background and objective: Atrial fibrillation (AF), which is the most common arrhythmia in adults and incidence increases with advancing age (%2-%12), may occur in patients with diabetes (1). The aim of our study is to evaluate the effect of clinical pharmacy services in identifying and solving drug-related problems (DRPs) in patients with AF and diabetes.
Method: Patients with AF and diabetes who admitted to the arrhythmia outpatient clinic of a Dr. Siyami Ersek Cardiovascular Hospital between May 2022 and August 2022 were included in the study and were randomized into control and intervention groups. All patients were followed-up for 6 months and DRPs were recorded. The intervention group received face-to-face pharmaceutical care from the clinical pharmacist and the control group received standard care (without the involvement of a pharmacist). DRPs were identified using Strand's classification of DRPs (2). Data were analyzed with SPSS 15.0.
Main outcome measures: Comparisons of the number of identified, resolved and unresolved DRPs between the control and the intervention groups.
Results: A total of 88 patients were included in the study (44 control, 44 intervention). There was no statistical difference between the two groups in terms of age, education status, and gender ($p > 0.05$). The mean number of DRP per patient was 2.95 (total = 130) in the control group, while it was 3.15 (total = 139) ($p > 0.05$) in the intervention group during the study. The mean number of resolved DRPs was significantly higher in the intervention group compared to the control group [2.98 (total = 131) vs. 0.67 (total = 29), respectively; $p < 0.0001$]. The mean number of unresolved DRPs was significantly higher in the control group compared to the intervention group [2.30 (total = 101) vs. 0.18 (total = 8), respectively; $p < 0.0001$]. Majority (94%) of the DRPs in the intervention group and only 22% of the DRPs in the control group were resolved.
Conclusion: According to the results of our study, the number of DRPs in patients with AF and diabetes was quite high, and clinical pharmacist involvement was found to be effective in the resolution of DRPs. This study revealed that clinical pharmacist had contribution on the management of patients with AF and diabetes.

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PP135

Vorizonazole induced disturbances in colour vision and hallucinations—a case report from a hospital in Bulgaria

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Background and objective: Voriconazole is a second-generation azole widely used for the prevention and treatment of fungal infections of different origins and body localizations. The current report reflects a case of a 32 old-female patient who developed hallucinations and visual disturbance after using voriconazole. These symptoms began acutely after the first application of voriconazole and resolved rapidly when reducing the dose and the infusion rate of voriconazole.
Background and objective: Voriconazole is a second-generation azole widely used for the prevention and treatment of fungal infections of different origins and body localizations. Simultaneous development of hallucinations and visual disturbance caused by voriconazole in adult patients have been rarely reported before and the causes of these ADRs are still unknown. In addition, it could be speculated that the hallucinations and visual disturbance are at least partially related to the dosage and infusion rate of voriconazole.
Design: The current report reflects a case of a 32 old-female patient who developed hallucinations and visual disturbance after using voriconazole. The case has been identified during the therapy monitoring process, performed by the clinical pharmacists.
Results: A 32-year-old female was admitted to a specialized Ob/Gyn hospital with a history of recurrent severe vulvovaginitis microbiologically confirmed to be caused by Candida glabrata. Due to the variety of previously applied therapeutic approaches by various local and systematic antifungal preparations, the patient has been prescribed a venous infusion of Vifend (INN: Voriconazole) 6 mg per kilogram every 12 h for the first day of therapy and 4 mg/kg QD for the following 4 days. Besides the subject has been prescribed oral fluconazole 150 mg QD for 10 days following the voriconazole infusion. On day 1 of voriconazole treatment, she developed hallucinations and visual disturbance. The patient reported that she saw a large field full of crocus flowers through the window of the hospital room. Besides her vision went all in purple shades. The appearance of these symptoms was sudden and unpredicted by trauma or any background condition. No concomitant medications or chronic diseases were reported. After the infusion rate and dose reduction to 4 mg/kg applied by a once-daily infusion, the hallucinations and visual disturbance disappeared completely.
Conclusion: Given that the hallucinations and visual disturbance began acutely after the initiation of voriconazole, the causation between the adverse effect and the medication applied is considered at least possible. Clinical pharmacist interventions may predict and prevent ADRs. Developing a valid tool for dose adjustment and proper therapeutic selection are key determinants for achieving rational drug therapy and ADRs prevention.

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PP137

Pharmacy stakeholders' views and experiences of the credentialing of advanced or specialist pharmacist practice: a mixed methods systematic review

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Background and objective: Credentialing of advanced and specialist pharmacist practice (ASPP) is advocated to recognise that this is significantly different to entry-level practice and to provide quality assurance and public confidence. A global report and a country case study synthesis by the International Pharmaceutical Federation found that several credentialing models are in place or under development internationally, and that credentialing implementation is complex. Synthesis of the views and experiences of pharmacists and other relevant stakeholders on credentialing appears an important research gap. The primary objective of this systematic review was to determine pharmacy stakeholders' views and experiences of ASPP credentialing and to explore contextual facilitators and barriers to credentialing implementation and uptake.
Method: This review followed the Joanna Briggs Institute convergent integrated approach for mixed methods systematic reviews. The review protocol was pre-registered with PROSPERO. Four electronic databases (Medline, CINAHL, Web of Science, Google Scholar) were searched from inception to August 2022 for qualitative, quantitative, or mixed methods studies that reported the views and experiences of pharmacy stakeholders on ASPP credentialing. Included studies were quality appraised using the Mixed Methods Appraisal Tool. Data from included studies were analysed and integrated using thematic synthesis. Screening and data extraction were performed by two reviewers independently, with additional author input where required.
Main outcome measures: Pharmacy stakeholders' views and experiences of ASPP credentialing, and factors contributing as facilitators and barriers to its implementation and uptake.
Results: Sixty studies were included, after screening titles and abstracts (n = 9,061) and full texts (n = 228). Studies represented the views of pharmacists, pharmacy managers/employers and professional/representative bodies in hospital, community pharmacy, primary care, and academic sectors, from 38 countries—predominantly the United States of America, United Kingdom, Australia, and Canada. Four analytical themes were generated describing the factors, including facilitators and barriers, to be considered when developing or optimising ASPP credentialing: (1) Drivers of credentialing, (2) Developing ASPP competence, (3) Optimising credentialing implementation and (4) Enhancing credentialing uptake.
Conclusion: This systematic review has uniquely synthesised the views and experiences of pharmacy stakeholders' regarding ASPP credentialing from a variety of countries and settings. These findings should be considered by pharmacists, policymakers, and other key stakeholders when developing or optimising ASPP credentialing in the future.
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PP139

Medication reconcilitation at the emergency department—improved quality with a pharmacist

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Background and objective: Implementation of pharmacists at the emergency department of Sahlgrenska University Hospital was investigated as a way of obtaining a updated and correct medication report. Step 1: To investigate if the number of incorrect medications decreases when a pharmacist collaborates with the emergency physician. Step 2: Investigate how much time can be saved for physician if instead the pharmacist conduct the medication reconciliation.
Method: The setting: The Emergency department at Sahlgrenska University Hospital, Gothenburg, Sweden.
Participants: 2 pharmacists in duty Monday—Friday. Employed at the Hospital pharmacy department.

Speciality of Medicin: Collaboration with the physicians within the speciality Medicin in charge at the ED.

Working hours of pharmacist: 8 am–18.30 pm.

Inclusion criteria of patients: Triage stage yellow and orange and > 65 years of age.
Main outcome measures: Current situation analysis (before introducing pharmacist at the ED).
Step 1: Physicians at the department of Medicine report for two weeks how many incorrect medications they found in the medical report from the emergency department, when the patient has been enrolled in their department. Step 2: Physicians in the emergency department report during a two-week period how much time they spend conducting medication reconciliations.
Intervention phase (when pharmacists are introduced as an new profession at the ED and working in collaboration with physicans).
Pharmacists conduct medication reconciliation. They communicate, after a thorough review, their results to each responsible physican who finalize the medication report in the electronic system used in the hospital. The pharmacists document their findings and any changes made in the medical journal. During the same period physicians at the department of Medicine report how many incorrect medications they find in the medical report for patients where the medication reconciliation was conducted by a pharmacist.
Results: Current situation analysis:Step 1: 65 patients were included, 77% of the patients had errors in the medication list after enrollment from the emergency room. Step 2: Physicians reported that they in average spent 10 min per patient in obtaining the medication profile.
Intervention phase Assessed by the physicians at the department of Medicine:
29 patients were included, 3% of the patients had errors in the medication lists after

enrollment from the emergency department when pharmacist had conducted the medication reconciliation.
Conclusion: In summary, we see that implementing a pharmacist in the team gives more extensive information in the decision of establishing a valid medication report at admission, of value for the physicans. We note that if you are more thorough and take the time needed to verify the patient's current medication, we increase the safety of the patient. The risk of incorrect treatment during continued care is reduced.
The time gained by the physicians however, are difficult to make conlusions about as they reported only 10 min spent on medication reconciliation in comparison with 39 min (in average) for the pharmacist.

PP140

The added value of internship in a hospital pharmacy. A pilot study

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Background and objective: Internship in a hospital pharmacy is a requirement for a degree in Pharmacy in many European countries. However, curriculum and responsibilities differ, as well as assessment

of learning goals achievement and acquired competences, during the internship. An evaluation of the added value of training pharmacy students in a hospital pharmacy, during their internship, is the objective of this study.
Method: A survey was conducted from July 2017 to January 2023. A questionnaire (4 sections with 24 Likert scale questions and 5 open-ended questions) was developed and implemented. Statistical analysis exhibited reliability and validity of the questionnaire. Questionnaires were filled by 51 students that were accepted as interns, for at least a trimester in the hospital pharmacy. Assessment of their perception of the acquired skills and provided training was based on their responses. Data were analysed by Excel(R) and SPSS(R).
Main outcome measures: Evaluation of general internship aspects, infrastructure and personnel, supervisor guidance (satisfaction of provided services) and fields in skills and training that the students would expect to acquire during their internship (needs assessment) were the main outcome measures. The added value of the offered services was estimated based on correlation of satisfaction and needs.
Results: More than 95% of students was satisfied with their training in general, wheras 90% expected to find better infrastructure and more personnel in the hospital pharmacy. As far as their theoretical knowledge is concerned, there has been a gradual increase of satisfied students through time. More than 96% of the students were satisfied with the guidance of their supervisor and the skills acquired during their internship, resulting in 70% of them being interested to be engaged professionally. Despite the pleasant working environment, students didn't have many opportunities to utilize their full clinical potential, as the internship curriculum focused mostly on their participation in hospital pharmacy logistics and less in clinical interventions. Consequently, 14 out of 51 students (27.45%) would like to develop and empower their knowledge and skills in clinical services provided to patients, during their internship. The main expectation of these students was to be much closer to the hospital pharmacist, so that they could further expand their knowledge of drugs and acquire skills in pharmacotherapy, medication review and the pharmacist's participation in clinical practice. All of them gained an experience regarding the role of hospital pharmacists in our country but none of them could acquire the relative expertise. Despite the difficulties that our pharmacy faces due to understaffing, the students found the work environment amicable, as all staff were willing to be involved in and support their training.
Conclusion: In general, the majority of our students was satisfied with their internship at the pharmacy. However, a modification in the curriculum during the internship is necessary, as guidance on procedures and expected outcomes should be included. Collaboration with academia is important for the development of such a curriculum. Assessment of skills acquired during the internship needs to be included in the survey and is currently under development. The added value of the internship in a hospital pharmacy is achieved by the supervised participation of the students in clinical services provided to the patients and healthcare professionals.
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PP142

Development of simulation-based training on oral anticoagulants for pharmacy students

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Background and objective: In our university hospital, pharmacy students conduct interviews with patients treated by oral anticoagulants (OACs). For this purpose, they receive initial training and e-learning access to update their academic knowledge about these drugs. However, new simulation-based training tools in health care also provide practical experience, without risk to the patient. Thus, to improve the postural skills of pharmacy students and the quality of interviews, we developed a simulation-based training for conducting anticoagulation interviews.
Method: This simulation-based training was developed by a working group composed of two clinical pharmacists (referents for the Cardiology and Neurology wards) and a pharmacy intern, using the Guide to Good Practice in Health Simulation published by the French National Health Authority[1]. The group defined the organisation of the training (duration; methods of implementation; target audience) and the content of the training (support; role plays; evaluation grid).
Main outcome measures: Organisation and content of the training.
Results: Two weeks before the beginning of their hospital internship, students were convened by e-mail to a 2-h practical simulation. The targeted students realised their internship in the pharmacy, cardiology, neurology and geriatrics wards. The simulation session was structured in 3 steps: 1. briefing, 2. role play, 3. debriefing. Four scenarios were defined, each addressing a different indication requiring the prescription of OACs: pulmonary embolism, stroke, atrial fibrillation, and valve stenting. The drug classes concerned were vitamin K antagonist with warfarin and non-vitamin K antagonist oral anticoagulant with apixaban, rivaroxaban and dabigatran. In addition, the scenarios raised specific situations such as swallowing disorders, anxiety, diet and alcohol consumption, contact sports, activities of daily living, self-medication and travel. For each role play, one sheet was given to the student with some information about the patient to be interviewed and one sheet was given to the instructor with information about the patient role to be played. The first three scenarios were played by students as healthcare professional while the fourth was played by the pharmacist as a standard interview. The evaluation grid listed 35 items that should not be omitted during an interview, divided into 4 parts: introduction, interview, summary of the interview and general posture. It allowed to check if the objectives were achieved or not by the student during the role plays. All students were invited to discuss during the debriefing of each role play. Their satisfaction was assessed at the end of the session.
Conclusion: This innovative pedagogical training device aims to complete the necessary skills for the proper conduct of pharmaceutical interviews targeting OACs. It allows students to gain confidence, to practice around different situational scenarios and to progress after retrospective analysis of the role plays. It will be evaluated by comparing the skills of pharmacy students during an individual interview conducted before and after the group simulation training session. This practical training could then be integrated into the existing program, which already includes theoretical training, and lead to an accreditation that will be required for any student carrying out a pharmaceutical interview with a patient treated with an OAC.

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PP143

Development of a pharmacist-led bedside training for acute heart failure inpatients

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Background and objective: Appropriate therapeutic drug adherence (tDA) is challenging for new heart failure (HF) patients. The clinical pharmacist (ClinPhar) can provide education counselling to help them. We aimed to develop a specific training to strengthen HF inpatients' knowledge on their disease and medications and improve their tDA.
Design: The overall scientific process was realized in 5 stages in a user-centered approach inspired from Kern's six-step curriculum development (1).
Results: Patient needs assessment: It was based on interviewing 12 HF inpatients and brainstorming with 2 patients partners (PP) and 3 ClinPhar. We highlighted disease incomprehension, drugs misunderstandings, needs to recognize symptoms and care support after discharge.
Training objectives definition: We conceptualized a 2 modules training (HF disease and medication) considering 10 learning objectives. They were set using Bloom's Revised Taxonomy (2,3).

Educational strategies design: Core HF training contents was built on expert opinions, scientific literature, existing supports. We compiled a brainstorming with 8 ClinPhar and a focus group with an HF expert group (2 ClinPhar, 1 cardiologist and 1 nurse) to identify themes and tools we could use. Working sessions led to an educational scenario. The training was designed to be followed at bedside. The ClinPhar taught in a one-to-one setting with a therapeutic education posture using an interactive learning experience. Each module lasted 60 min. Several supports were used for this training in a playful perspective (video, quiz, card game, board game, learning by images add-ons, writing, drug packages).

Training assessment questionnaire creation: An assessment questionnaire was designed with 17 questions to score knowledge, according to predefined learning objectives, training content and existing validated questionnaire to keep pedagogical alignment. We tested it in 3 iterations with 10 HF patients each round and 2 PP.

Core training contents implementation: The HF expert group validated the training and tested it individually with 2 PP, 2 inpatients and 3 pharmacy students. They fulfilled assessment questionnaire before and after training.
Conclusion: We created a new complete pharmacist led training for HF inpatients following a structured pedagogical methodology. The training impact will be assessed in a randomized clinical trial.
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PP144

Educational consultations led by a pharmacist in the pediatric pneumology department: feedback after implementation

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Background and objective: In Europe, 9.4% of children have asthma, making it the most common noncommunicable disease among children. In France, one third of these children have uncontrolled asthma, often due to poor inhalation technique or poor adherence to treatment. Consultations with a clinical pharmacist were therefore added to the initial medical consultation in the outpatient clinic of the pediatric pneumology department, allowing to address issues around treatments. The aim of this study was to evaluate the impact of these consultations as well as children and parent satisfaction regarding this new outpatient care.
Design: This 2-month study included all asthmatic children over 6 years-old and all parents of asthmatic children who attended a pneumology consultation. Inhalation techniques and treatment adherence were assessed by the pharmacist, using validated evaluation grids and the PMAQ-3W method. The impact of the pharmacist consultation was assessed by: (1) a self-assessment of their knowledge perception (0–10 scale) before and after the consultation; (2) an assessment of patients' actual basic knowledge, evaluated during consultation by 3-questions given orally and after consultation, using a written questionnaire with the same 3 questions. Satisfaction was assessed using age-appropriate questionnaires at the end of the interview (children from 6 to 11 years-old, teenagers from 12 to 18 years-old and parents).
Results: Thirty-three patients aged 6 to 19 years-old and 30 parents were included between February and March 2023. Nearly 60% of patients had uncontrolled or partially controlled asthma. 52% of the 21 teenagers and 17% of the 12 children included, had poor treatment adherence. Of 77 inhalation techniques assessed, 55.8% needed improvement with an average of 4 errors per device evaluated. Patients' perception of their knowledge improved by 123% following the educational pharmaceutical consultation and 75.6% of the patients acquired skills after the consultation, that were not initially acquired. On average, the clinical pharmacist consultation lasted 35 min [$\pm$ 11.2 min] and more than 85% of the participants estimated that the duration was appropriate. 100% of the parents and 90% of the teenagers believed that the information received would help them in their daily lives and wanted to have a pharmacist consultation again.
Conclusion: A comparative study will be conducted to confirm the positive impact of the pharmacist consultations on adherence, technique and asthma control at the patient's next visit. In the mean time, this study has demonstrated the feasibility and immediate utility of educational consultations led by a pharmacist in an outpatient setting.
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PP146

Developing advanced pharmacists through preceptorship: a consensus study

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Background and objective: Pharmacy strategy in Scotland calls for pharmacists to take on advanced roles[1]. Despite this, evidence shows there is a lack of preparedness for pharmacists to deliver[2].
The 2020 Scottish Pharmacist Career Framework Review[3] concluded that a supportive infrastructure is required to develop Advanced Pharmacy Practice. Preceptorship, a type of clinical supervision, may be one strategy to achieve this. Evidence shows preceptorship improves confidence and competence. Research is required to explore its use in a pharmacist context.

This study aimed to design the content of an Advanced Pharmacist preceptorship programme using consensus methods.
Method: Following a structured search of the literature, 58 statements on the core features of preceptorship programmes were developed. These were refined via Nominal Group Technique (NGT) with experts who were identified to fulfil predefined characteristics. Two rounds of Delphi were then circulated to pharmacists in patient facing organisations within the managed service in NHS Scotland. In both the NGT and the Delphi, consensus was set at 75% agreement.
Main outcome measures: The main outcome is consensus agreement, defined as $\geq$ 75% agreement.

Results: Four experts participated in the NGT, resulting in 40 of the original statements reaching consensus, a further 18 reaching consensus after minor re-wording and 3 new statements being added; all affirmed after a second round of voting. All 61* statements went forward to the Delphi. Delphi round one received 194 responses and 37 statements reached consensus. Delphi round two received 144 responses and a further 11 statements receached consensus. Over the two rounds of the Delphi 48 out of 61 statements reached consensus. *One statement presented four interdependent options for programme duration meaning that participants were presented with a total of 64 statements.
Conclusion: The NGT and Delphi process resulted in a high level of consensus. The high engagement in the process shows a willingness of pharmacists to be involved in research in this area.

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PP147

The pharmacist's role in promoting a multidisciplinary approach to improving chronic benzodiazepine use in the population

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Background and objective: Spain is the country with the highest consumption of these drugs (10–13% of the population, 70% women), and it is necessary to raise awareness among citizens and health professionals. The aim is to raise awareness among health professionals and citizens of the problems associated with chronic use of benzodiazepines and the magnitude of the situation reached in our province. To reduce the consumption rate (CT) of benzodiazepines at the level of a primary care district composed of metropolitan area (MA) and urban area (UA) that attends a population of 677,782 inhabitants with drug prescriptions from primary and hospital care.
Design: Prospective intervention study from April 2022 to present. 9 pharmacists carry out the following strategies: at least one training session in 36 primary health-care centers (PHCC) and 673 general practitoners (GPs), 1 provincial multidisciplinary day coordinated from Pharmacy with the participation of: health authorities, pharmacyst, GP, nurse, psychologist, social worker, representative of association of mentally ill patients, community pharmacist and psychiatrist. Distribution of educational material for patients and posters for a campaign disseminated at regional level. 1 training session for hospital mental health professionals. At present, more multidisciplinary training sessions are being held on the pharmacology of benzodiazepines, detoxification strategies, sharing of experiences and difficulties of different health professionals and more hospital sessions are planned. All of this has been carried out with a gender perspective.
Results: At the end of the year 2022 it was found that in the UA 14% of men had consumed benzodiazepines vs. 26% of women and in the MA 15% of men vs. 29% of women. The percentage change in CT 2022 vs 2021 was − 2.28% in UA and − 1.28% in MA. In the first quarter of the year 2023, a reduction of − 4.63% and − 3.18% in the UA and MA respectively has been achieved.

Conclusion:

The multidisciplinary strategy to reduce chronic consumption of benzodiazepines facilitated by the pharmacy is managing to reduce the rate of benzodiazepine consumption. It is necessary to continue working with a gender perspective and to evaluate in order to analyse the evolution of the strategy.

PP148

Two for the price of one: audit of anticholinergic use in dementia and antipsychotic prescribing for non-cognitive symptoms of dementia in St John's hospital

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Background and objective: Dementia is a term to describe a progressive syndrome in which there is a decline in cognitive function believed to be that of beyond normal age related changes. Anticholinergic medications are a large and varied group of medications which have long been associated with a decline in cognition. Regular review for such medications is widely recommended in at-risk patient populations, such as those with dementia. Antipsychotics such as quetiapine are frequently used for the management of non-cognitive symptoms of dementia. Many antipsychotics including quetiapine, are known strong anticholinergics and also carry an increased risk of stroke when used in patients with dementia. The aim of this audit is to evaluate the cumulative effects of anticholinergic use, known as *'anticholinergic burden'* by means of the 2012 Update to the Anticholinergic Cognitive Burden (ACB) score in patients with a confirmed diagnosis of dementia, and to audit the prescribing of antipsychotic medications for the management of non-cognitive symptoms of dementia in line with the Department of Health National Clinical Guideline 21.
Design: This audit was designed as a point prevalence style audit with all inpatients on the day of audit being screened. Inclusion criteria consisted of all inpatients on the day of the audit with a confirmed diagnosis of dementia documented in the Universal Healthcare Records (UHCR). A minimum quota of 10 patients was required. Cumulative anticholinergic burden was calculated using the 2012 Update to the ACB Score. Further review was undertaken in the event that patients were prescribed an antipsychotic for the management of non-cognitive symptoms of dementia.
The following are the standards used for this audit; NICE Guideline: Dementia: assessment, management and support for people living with dementia and their carers, and the National Clinical Guideline 21: Appropriate prescribing of psychotropic medication for non-cognitive symptoms in people with dementia.
Results: A total of 63 patients were screened, of which, 15.8% (n = 10) met inclusion criteria.
80% (n = 8) did not have an aetiology stated, nor a severity as defined by the National Clinical Guideline 21.

50% (n = 5) patients were actively receiving treatment for dementia, in which 2 cases of potentially under-optimised regimens were identified.

60% (n = 6) were prescribed an anticholinergic medication. 4 of which were classified as having a high anticholinergic burden (ACB > 3). The highest cumulative score observed was an ACB of 5, which was observed in 2 patients. Of the contributing medications in these cases, each patient was prescribed one strong anticholinergic (ACB 3), which was subject to optimisation. Both patients with an ACB of 5 were on active treatment with an acetylcholinesterase inhibitor for dementia.

20% (n = 2) of patients were prescribed an antipsychotic for the management of non-cognitive symptoms of dementia. Quetiapine was the agent of choice in both patients. Of these 2 patients one patient was newly initiated on quetiapine on admission to hospital.

Conclusion: The findings of this audit guided recommendations to be made in terms of documentation of dementia aetiology, medication review on admission with an emphasis on anticholinergics as well as a structured approach to prescribing antipsychotics in this population. A plan to re-audit following implementation of these recommendations is also in place.

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PP149

Innovation in medicines information and governance training for newly qualified pharmacists

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Background and objective: The NHS Greater Glasgow & Clyde (NHSGGC) Medicines Information & Governance (MI&G) Team delivers a range of pharmacy-led services aligned to priorities from local prescribing and therapeutics committees. As well as the core element of enquiry answering (EA), MI&G proactively supports safe and clinical effective use of medicines via development and maintenance of resources such as the Formulary, Therapeutics Handbook (TH) and Medicines Update (MU) blogs.

The new NHS Education for Scotland (NES) Post-Registration Foundation programme for Newly Qualified Pharmacists (NQPs) is designed to develop pharmacist independent prescribers with the knowledge, skills and behaviour to deliver safe and effective holistic person-centred pharmaceutical care. The previous NES framework included an MI element with specific tasks to be completed to meet EA outcomes e.g., answer 3 complex MI enquiries. Launch of the new programme without the MI element prompted a review of our EA foucussed approach to training.

A new MI&G placement was designed to support NQPs in acute hospitals to: demonstrate learning outcomes across the domains of the new programme; develop knowledge and skills in areas such communication, answering questions about medicines, workload prioritisation, literature searching; contribute to the different strands of work in the wider MI&G team.

Design: Teams across MI&G collaborated to design the new placement. This included identifying strands of MI&G work that could be undertaken by NQPs during a 4 week placement and mapping these activities to the outcomes of the programme. A placement template was produced to help coordinate the activities and an online survey was used to obtain feedback from NQPs. Microsoft Teams was used for communication.

Results: The new MI&G placement includes:

- EA tasks: receiving MI enquiries, triaging workload, answering complex enquiries
- Proactive work: guideline review, writing MU blogs, TH and Formulary updates, small audits and presenting at committee meetings

10 out of 14 NQPs who completed a placement so far provided feedback:

80% would recommend the placement to colleagues and 20% would maybe recommend.

90% felt:

- more confident to carry out literature searches
- confident to provide evidence-based information on medicines
- more aware of what resources to use to find evidence-based information on medicines

On a scale of 1 to 5 (1 = not very useful/easy; 5 = very useful/easy):

- When asked 'How useful the placement was in meeting learning outcomes from the programme' the average rating was 4.
- When asked 'How easy it was to complete supervised learning events as evidence for the programme' the average rating was 4.

Conclusion: An innovative approach to MI&G training has been successfully delivered in NHSGGC Acute. The NQPs deliver specific pieces of work that support safe and effective use of medicines. This placement supports NQPs achieving the NES programme outcomes and develops their knowledge and skills. It has been positively received by NQPs to date and awareness of the role and wider work of MI&G in NHSGGC has increased. Our collaborative approach to workforce development continues to evolve and next steps are the inclusion of medication safety and medicines planning.

PP151

Views of key healthcare stakeholders on the implementation of a clinical pharmacy competency framework for hospital pharmacists in Austria: a pilot study

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Background and objective: Competency frameworks for clinical pharmacists in hospital practice exist across Europe. In 2017 the EAHP (European Association of Hospital Pharmacists) published their own CTF (Common Training Framework) as a foundation for European countries to adapt to their needs. In a previous study phase, this research team adapted the CTF specifically for Austrian hospital pharmacists. This study now aimed to explore the views of Austrian key healthcare stakeholders on the possible implementation of such a competency framework for hospital pharmacists in Austria.

Method: This qualitative semi-structured interview study was conducted in key healthcare stakeholders across Austria. An interview-guide was developed based on the CFIR (Consolidated Framework for Implementation Research). Question topics included personal experiences; opinions; necessity and legal issues relating to the implementation of the framework, (CFIR domains Innovation, Outer Setting, Inner Setting and Individuals). A participant information leaflet, consent form and letter of invitation was developed. 24 key Austrian healthcare stakeholders from eleven different fields of healthcare practice were identified ranging from patient representatives to officials from the Ministry of Healthcare in Austria. The

recruitment process, and face-to-face interviews were piloted in two stakeholders (hospital pharmacist and education sector). Interviews were recorded, transcribed and analyzed using framework analysis.
Main outcome measures: Barriers and facilitators related to framework implementation.
Results: Results aligned with the five domains of the CFIR, plus one in the Outcomes Addendum. A total of 26 sub-domains were identified. Both participants consider, that defining competencies for clinical pharmacists in Austria is necessary to facilitate interdisciplinary working and improve patient safety. Furthermore, participants stated that a solid education, followed by further education and training and additional qualifications, are of highest importance to fulfil the requirements of the stated competencies. Concerns were raised about the lack of clear definitions around professional boundaries and clinical responsibilities.
Conclusion: Results have captured invaluable information about key concerns that need to be addressed when aiming to implement a competency framework for Austrian hospital pharmacists. This will inform the development of specific implementation recommendations in the future.

PP152

Plasma CA125 levels and acute coronary syndrome: is there a relationship with prognosis?

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Background and objective: In the last few years, biomarkers have played an important role in predicting cardiovascular risks. Risk stratification in patients with acute coronary syndrome (ACS) and identification of high-risk patients are essential for optimal management. The features that make carbohydrate antigen 125 (CA125) a promising prognostic tool in ACS are; it is widely available and much cheaper than other biomarkers. It is also a stable molecule with a long half-life (more than 1 week). With this feature, it can correlate with the clinical status and prognosis of the disease and can be used to predict patients at high risk for adverse outcomes. The aim of our study is to determine the possible relationship between the frequency of major adverse cardiac events (MACE) and CA125 plasma levels in patients with ACS.
Method: This prospective study was conducted at a cardiology clinic in Istanbul between May 2022-May 2023. The patients hospitalized and diagnosed with ACS were included in the study. CA125, pro-brain natriuretic peptide (pro-BNP), and high-sensitive cardiac troponin T (hs-cTnT) levels were measured in the patients during hospitalization. All patients were followed for 6 months. The total number of MACE (cardiac death, recurrent ACS, need for revascularization, decompensated heart failure, hypertensive cardiogenic pulmonary edema) was recorded for each patient. Data were analyzed with SPSS 15.0.
Main outcome measures: To present new statistical data regarding CA125 levels detected during hospitalization can be considered as a risk factor in the prognosis of ACS.
Results: A total of 126 patients were included in the study. The mean age of patients was 60.0 years, 78.5% of them were male. Most of the patients (n = 124) had at least one cardiovascular risk factor. The mean left ventricular ejection fraction (LVEF) of 50.5. The median CA125 plasma level was found as 9.5 KU/L. The median proBNP and hs-cTnT were found as 549.8 ng/L and 67.9 ng/L, respectively. After 6 months of follow-up, a total of 27 MACE had been identified. CA125 plasma levels were positively correlated with the number of MACE, pro-BNP, and hs-cTnT(Spearman's rho: 0.232, $p = 0.029$; Spearman's rho:0.374, $p < 0.001$; Spearman's rho:0.192; $p = 0.031$, respectively). In addition, it was found that CA125 levels were negatively correlated with LVEF (Spearman's rho: $-$ 0.187, $p = 0.035$).
Conclusion: In our study, it was found that CA125 plasma levels were correlated with ACS biomarkers (pro-BNP and hs-cTnT). Another interesting result was the correlation with the prognostic value LVEF. Elevated CA125 plasma levels might be used to identify patients with ACS with a higher risk of MACE at 6 months.

PP153

What do patients know about barrier gestures and monoclonal antibody prophylaxis two years after the start of the COVID-19 pandemic? Results of a survey conducted by pharmacy students at a Parisian university hospital.

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Background and objective: In the context of the COVID-19 pandemic, a hospital-based platform for the injection of monoclonal antibodies by Tixagevimab/Cilgavimab has been set up for patients with solid organ transplants (kidney, liver, heart), who are known to be at risk of COVID-19 according to the recommendations of the French National Authority for Health, and who are non-responders to vaccination.
The objective of this study is to evaluate the degree of knowledge of patients regarding prophylaxis with these antibodies and to verify if the application of barrier gestures is respected two years after the beginning of the pandemic.
Design: During the medical consultation, after the injection, a questionnaire is given to the patients by the pharmacy students, evaluating the knowledge on the treatment and the realization of the daily barrier gestures.
Afterwards, a pharmaceutical interview (PI) is conducted by the pharmacy students to review the less well understood notions.
Results: Between September and December 2022, 84 patients received Tixagevimab/Cilgavimab injections: 18.1% received their 1st injection, 59.0% their 2nd injection and 22.9% their 3rd injection. 66.7% were men and more than half (52.3%) were under 65 years old. Regarding the patients' knowledge of the treatment, the average score obtained was 5.1/10.

91.7% of the patients were confident before the injection. For those who were not, 85.7% were reassured by the team.

Concerning the daily barrier gestures, only 40.5% of the patients answered that they performed all of them (86.9% perform hydro-alcoholic friction, 83.3% air their home regularly, 80.9% respect social distancing, 71.4% wear the mask indoors and 75% outdoors).

On the whole, the patients benefited from a PI.
Conclusion: These results highlight the lack of general information about preventive treatment against COVID-19 and the need for an educational reminder about barrier measures.
The medical consultation is the best time to carry out this action. This was made possible thanks to the involvement of pharmacy students because medical time was limited.
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PP154

Training for pharmaceutical interviews in retrocession: satisfaction survey among hospital pharmacy technicians

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Background and objective: « Retrocession» is a hospital pharmacy activity consisting of dispensing specific drugs to outpatient. These drugs require special monitoring or have specific administration methods preventing dispension in a community pharmacy. Wegovy® (semaglutide) is a treatment developed for weight loss in patients with a body mass index (BMI) > 40 kg/m^2 and administered subcutaneously once a week. For each initiation, a pharmaceutical interview is performed by the pharmacist or hospital pharmacy technicians, after an initial training. Since September 2022, 17 interviews have been conducted by hospital pharmacy technicians. The objective is to measure the satisfaction of hospital pharmacy technicians with this training.
Design: A satisfaction questionnaire was given to the 3 hospital pharmacy technicians of the pharmacy retrocession sector carrying out pharmaceutical interviews on Wegovy®. The questionnaire consisted of 6 questions: 3 Likert-type questions and 3 open-ended questions on initial training and areas for improvement. The results of the survey were collected in an Excel™ table.
Results: All 3 hospital pharmacy technicians responded to the questionnaire. The average score for overall satisfaction with the training and participation in the interviews was 7.7/10 (min = 7, max = 8). For all, the initial training provided the necessary elements for conducting pharmaceutical interviews. The available tools (patient advice sheet, interview follow-up sheet) were fully adapted. The technicians were motivated and enthusiastic about conducting the interviews. The main difficulties encountered were a lack of time and apprehension about the questions that could be asked by the patients. The proposed areas for improvement are better knowledge of the proposed tools, the implementation of simulation interviews during training and a dedicated time for interviews.
Conclusion: The initial training seems to be satisfying for all the staff carrying out these pharmaceutical interviews. These consultations are felt to be motivating and exciting. One of the areas of improvement is the dedicated time to realise interview by organizing appointment with patient before the start of treatment with Wegovy® or by recruting a second pharmacy technician. The first technician will take care of all dispensations to improve the flow of patients and decrease the waiting time whereas the second will be dedicated to interview, with more drugs concerned and the increase in securing patient care.
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PP156

Antimicrobial treatments during therapeutic plasma exchange: a questionnaire on practices

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Background and objective: Therapeutic plasma exchange (TPE) is a procedure to separate plasma from cellular elements of blood (1). Large volumes of plasma are replaced with albumin solution or fresh frozen plasma during TPE, which might affect plasma concentrations and pharmacokinetic patterns of antimicrobials (2,3). There are no guidelines about antimicrobial drug removal by TPE or the appropriate antimicrobial drug dosing in patients undergoing concurrent TPE. This study aims to highlight the present clinical practice on the use of antimicrobial drugs in patients with TPE.
Method: From March 18, 2023 to April 4, 2023 a nationwide questionnaire was conducted by e-mailing Turkish physicians, mainly in infectious diseases and clinical microbiology specialists. The questionnaire included two-sections: physicians' demographics and antimicrobial practices in patients undergoing concurrent TPE. The study-protocol was approved by the local Ethics Committee.
Main outcome measures: Physicians' knowledge and attitudes about antimicrobial treatments in patients with TPE were assessed.
Results: Total of 68 physicians (55.9% male, 52.9% infectious diseases specialists), at mean age of 40.92 ± 11.23 years, answered the questionnaire. Of those, 64.7% of physicians have at least ten years of professional experience, 26.5% of physicians stated having adequate information about the TPE procedure and 71.6% of physicians stated that the TPE procedure might significantly affect the blood levels of antimicrobial agents, but 23.9% had no idea. It was detected that 46.7% of physicians suggest different doses than the standard doses of antimicrobials in patients undergoing TPE and 33.3% of them perform and/or suggest therapeutic drug monitoring, mostly for glycopeptides and aminoglycosides in patients with TPE. In addition, 43.6% of physicians suggest discontinuing antimicrobial drug administration during the TPE procedure. For patients undergoing TPE, 59.3% of physicians stated that they consult with another healthcare professional (47.1% with another physician and 29.4% with a pharmacist or clinical pharmacist).
Conclusion: Due to limited data, drug removal and dose adjustment requirement is not clear in patients with TPE. This study shows that physicians have different perspectives in terms of antimicrobial treatment during TPE. To ensure the therapeutic activity of antimicrobial medicines, the effects of TPE should be considered in treatment planning, particularly in critically ill patients.

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PP158

Pharmacological monitoring of a child with carbamazepine poisoning guided by therapeutic drug monitoring

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Background and objective: The role of pharmacists in managing a pediatric patient on carmazepine therapy through therapeutic drug monitoring (TDM) is rarely repoprted. This case presentation aimed to discuss the role clinical pharmacists in the rescue of child patient with carbamazepine intoxication based on TDM.
Method: The case was presented to the Second Affiliated Hospital Zhejiang University School of Medicine. Clinical pharmacist participated in the treatment of a pediatric patient with carbamazepine intoxication. Revelant clinical parameters were obtained from the hospital electronic medical record system. Clinical pharmacist proposed the approximate dose of carbamazepine to clinicians for clinical resolution. The recommendations were based on the pharmacokinetic characteristics of carbamazepine, TDM, and literature. Clinical pharmacist implemented a continuously pharmaceutical monitoring for the child.
Main outcome measures: The success of the TDM in managing the patient on carbamazepine treatment based on TDM.
Results: The child was successfully rescued and discharged.
Conclusion: Clinical pharmacist participate in clinical practice through TDM and pharmaceutical knowledge which reflect their value.

PP159

Difficulties of therapeutic drug monitoring and adaptation of immunosuppressive drugs in pediatric intensive care unit: example of tacrolimus

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Background and objective: Each year in our center about 20 solid organs were transplanted in pediatrics. Patients were then treated with immunosuppressants (IS) and their therapeutic drug monitoring (TDM) performed to avoid acute rejection or toxicity. In intensive care, the pharmacokinetics (PK) of IS is complex and subject to pharmacodynamic (PD) instability. By analyzing the prescriptions, the clinical pharmacy team has noticed numerous changes in dosages and concentrations of IS that often fluctuate greatly. The objective of this work out was to observe the TDM of patients on IS to understand the meaning of the changes in dosage observed, and to try to identify the factors that vary their levels.
Method: Monocentric retrospective study from March to June 2021, on children with solid organ transplants under IS hospitalized in pediatric intensive care unit. The data were collected thanks to the computerized patient record and computerised prescriptions and to our daily presence in the department.
Main outcome measures: Patient data (age, sex, type and date of transplant), treatment (type of IS, target levels, dosages, CYP450 3A4 inhibiting and/or inducing drugs), biological data (renal clearance, liver enzymes, blood levels of IS, prothrombin level) and clinical data (presence of extra-renal cleansing or ECMO) were recorded.
Results: 5 patients included, mean age 16 years [6–18], sex ratio = 1.5 with various transplants (hepatic, hepatorenal, cardiac, cardiopulmonary). Tacrolimus was studied because it was the only IS to have had a regular TDM. Out of 57 samples, we counted 24 overdoses, 19 underdoses and 14 levels within the targets, i.e. 24.5%. The ratio per patient of the number of dosages on number of days was on average 0.58 [0.15–0.83]. The ratio of number of dosage changes on number of days on tacrolimus was on average 0.3 [0–0.6]. Both of these ratios are frequent, however, of the 43 off-target dosages only 30 resulted in a dosage correction, giving a ratio of number of dosage adjustments on number of off-target dosages of an average of 0.96 [0–3.5].
Conclusion: These ratios were improved by one patient who was no longer immediately post-transplant and balanced (11 of 14 correct dosages). The PK/PD instability and frequency of dosage changes makes it very difficult to identify the sources of variation in tacrolimus levels. Despite the large number of determinations and dosage changes, many off-target determinations were observed without correction. Optimization of TDM could be done by targeting them and then systematically adjusting dosages through the implementation of an interprofessional post-transplant follow-up with the participation of clinical pharmacists and the inclusion of other prescribed IS.
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PP160

Pharmacogenetic testing of frequent polymorphisms of cytochrome P450 in patients with pulmonary arterial hypertension

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Background and objective: Pulmonary arterial hypertension (PAH) is a rare, serious disease characterised by pulmonary vascular endothelial dysfunction and poor prognosis. Furthermore, patients with PAH often use multiple drugs, in addition to the group of drugs indicated for PAH, also take other medicines that are significantly metabolised by CYP450 enzymes. The current strategy for PAH treatment does not include diversities in patients' genotypes and phenotypes. Detection of genetic polymorphism of CYP450 enzymes belongs to an innovative approach in clinical pharmacy in which pharmacotherapy treatment optimization is tailored to the individual patient.
Method: In this pilot study, patients with primary pulmonary hypertension (ICD-10 I27.0) were included in the study (n = 14). The blood samples were collected for pharmacogenetic testing which included: DNA extraction, and the detection of the single nucleotide polymorphisms of CYP2C19*17, CYP2CD6*4, and CYP2C9*2 by the qPCR using TaqMan®. Clinical data were obtained from the patient's medical records. Statistical analysis included a chi-squared test, One Sample Z-test, and Hardy–Weinberg equilibrium. For the interpretation of pharmacogenetic testing, the PharmGKB, DPWG and CPIC databases were applied.
Main outcome measures: comparison of sample allelic frequency with European (non-Finnish) population, percentage of drugs metabolised by CYP450, identification of polymorphic variants of CYP450 in patients with PAH, interpretation of pharmacogenetic recommendations with regard to medication history.
Results: The allele frequency of individual CYP2C19*17, CYP2CD6*4, and CYP2C9*2 variants in our sample did not significantly differ from the expected frequency in the general European (non-Finnish) population (21.4% vs. 23.14%, $p = 0.877$; 14.3% vs. 19.59%, $p = 0.617$; 21.4% vs. 14.7%, $p = 0.479$). The 70% of drugs taken by the patients with PAH were metabolised by enzymes CYP450, while CYP2D6, CYP2C19 and CYP2C9 metabolised 4%, 6% and 9%, respectively of all drugs. Among the most frequent medicines were warfarin (57%), furosemide (57%), and proton pump inhibitors (57%). The potential drug/gene interactions were found in

patients taking warfarin and proton pump inhibitors. For the mentioned drugs, evidence-based pharmacogenetic recommendations exist.
Conclusion: CYP450 enzymes are significantly involved in the metabolism of drugs taken by patients with PAH. The personalization of treatment with respect to a patient's genotype has the potential to significantly improve therapeutic outcomes.
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PP161

Therapeutic monitoring of vancomycin in oncologic patients

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Background and objective: Vancomycin is a glycopeptide antibiotic used in hospital setting for treatment of serious Gram-positive infections including MRSA strains. Vancomycin plasma concentrations display interindividual variations due to differences in patients' pharmacokinetics, particularly reduced or augmented renal function. This can often lead to therapeutic failure, which is of major importance in critically ill patients. Achieving an adequate plasma concentration is therefore an eminent pharmacotherapeutic goal involving TDM.
Method: The aim of this work was to perform a retrospective study of vancomycin dosing in oncologic patients hospitalized in the Oncological Institute of St. Elisabeth. Two dosing protocols were compared, i.e. the trough concentration (Rybak 2009) versus the AUC/MIC based TDM method (Rybak 2020).
Main outcome measures: Vancomycin plasma concentrations were TDM measured by FPIA method and linked to creatinine clearance in 42 oncologic patients. The patients were divided according to the number of vancomycin measured concentrations into two groups, i.e., group A (1 vancomycin measured concentration) and group B (more than 2 vancomycin measured concentrations). Patients in the group B were further subdivided according to creatinine clearance (ClCr).
Results: From the total number of 76 measurements, 39 concentrations (51.3%) targeted by the trough concentration method were in the therapeutic range. However, when reanalyzed using the AUC/MIC TDM method, it corresponded to 25 concentrations (32.8%). The mean values of both vancomycin pharmacokinetic parameters according to both methods were higher in the group A compared to the group B (C_{MIN}: 13.7 mg/l vs. 10.2 mg/l and AUC/MIC 466.6 ± 116, 1 mg h/l vs. 425, 6 ± 113, 3 mg h/l). We observed a strong correlation between residual vancomycin concentrations and AUC/MIC values (R = 0.559, $p < 0.05$), but residual vancomycin concentrations did not correlate with glomerular filtration expressed as ClCr (R = 0.224, $p > 0.05$). All five patients with elevated ClCr had subtherapeutic vancomycin concentrations which did not reach the pharmacodynamic target even after repeated TDM.
Conclusion: AUC/MIC targeted vancomycin TDM is a powerful toll for optimization of vancomycin dosing. The number of TDM measurements needed was increased in patients with augmented and reduced renal functions.

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PP162

Implementation of UGT1A1 genotyping in daily clinical practice

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Background and objective: Irinotecan is a widely used drug for the treatment of colorectal cancer. However, irinotecan therapy is associated with a high incidence of toxicity, including severe neutropenia and diarrhoea. Irinotecan is a prodrug that activates SN-38. UGT1A1 (uridine diphosphate-glucoronosyltransferase 1A1) is the main enzyme responsible for the inactivation of SN-38. According to the UGT1A1 genotype, the effectiveness of irinotecan may differ between normal, intermediate and slow metabolisers and this is useful information for selecting the appropriate treatment dose for each patient. The aim of the study is to describe the implementation of UGT1A1 genotyping in our hospital.
Design: From the end of 2021, oncologists prescribing irinotecan in our hospital ask the pharmacogenetics unit to genotype the *28 and *37 alleles of the UGT1A1 gene for all patients who will receive or may receive irinotecan in the future. According to the Dutch Pharmacogenetics Working Group (DPWG) pharmacogenetic dosing guidelines, depending on the UGT1A1 genotype, patients can be normal metabolisers (UGT1A1 *1/*1, expressed as a phenotype consisting of 6 adenine–thymine (AT) repeats in the promoter region of the gene), intermediate metabolisers (UGT1A1 *1/*28, *1/*37 expressed as a phenotype consisting of one allele with 6 TA repeats in the promoter region and the other allele with 7 or 8 TA repeats in the promoter region of the gene, respectively) or poor metabolisers (UGT1A1 *28/*28, expressed as a phenotype consisting of both alleles with 7 TA repeats in the promoter region of the gene).
Once we receive the request for genetic determination in our unit, we take a saliva sample from the patient and send it to an external laboratory. There, they genotype the possible polymorphisms using Taqman allelic discrimination assay technology. With the results obtained, we formulate a dosing recommendation to the physician within 24–48 h after genotyping. According to the DPWG, we recommend starting with 70% of the standard dose for homozygous carriers of the UGT1A1*28 allele. If the patient tolerates this initial dose, the dose can be increased guided by the neutrophil count. Currently, for heterozygous carriers of the UGT1A1*28 or UGT1A1*37 allele, no dose modification is recommended. **Results:** During the years 2022 and 2023, we performed pharmacogenetic determination of UGT1A1 in 48 patients in the oncology department at our hospital. Of these patients, 24 are normal metabolisers (50%), 18 are intermediate metabolisers (37.5%) and 6 are poor metabolisers (12.5%).
Conclusion: It is possible to genotype UGT1A1 gene polymorphisms and establish irinotecan dose recommendations in poor metabolisers of the drug. UGT1A1 genotype-guided irinotecan dosing reduces the risk of serious adverse events and thus improves individual patient safety. This is increasingly accepted by oncologists.
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PP163

Vancomycin flight simulator: a team-based learning exercise

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Background and objective: Team-based learning (TBL) encourages learners to think critically to solve problems they will face in practice. Pharmacokinetic dosing and monitoring are complex skills requiring the application of learned knowledge. The study sought to assess the impact of a TBL, vancomycin dosing activity in a Pharmaceutical Skills IV course measured with exam question performance during the second professional year. METHODS:
Method: This retrospective, descriptive study relates a TBL activity, assigned to 85 students, which included an individual student pre-preparation quiz, assigned readings, in-class individual and team-based readiness assessments, small group application of a vancomycin patient case, and group discussion/feedback on clinical decisions with supportive reasoning. The class year before and class year of the TBL implementation were compared using the total percentage of points possible earned by the class years, by topic. To minimize potential confounding, the primary outcome was the change in topic performance by the rank difficulty (e.g., the largest possible benefit being the hardest topic becoming the easiest with no other variation in topic rank difficulty).
Background and objective: Team-based learning (TBL) encourages learners to think critically to solve problems they will face in practice. Pharmacokinetic dosing and monitoring are complex skills requiring the application of learned knowledge. The study sought to assess the impact of a TBL, vancomycin dosing activity in a Pharmaceutical Skills IV course measured with exam question performance during the second professional year.
Design: This retrospective, descriptive study relates a TBL activity, assigned to 85 students, which included an individual student pre-preparation quiz, assigned readings, in-class individual and team-based readiness assessments, small group application of a vancomycin patient case, and group discussion/feedback on clinical decisions with supportive reasoning. The class year before and class year of the TBL implementation were compared using the total percentage of points possible earned by the class years, by topic. To minimize potential confounding, the primary outcome was the change in topic performance by the rank difficulty (e.g., the largest possible benefit being the hardest topic becoming the easiest with no other variation in topic rank difficulty).
Results: In the year of implementation, the mean individual readiness assurance test (IRAT) performance was 5.5 ± 1.88 (10 points possible, 55%). The mean team readiness assurance test (TRAT) performance was 10 of 10 points possible (100%). The class exam item performance in the year before (n = 101) and year of (n = 84) TBL implementation showed a general decline in exam scores. However, the vancomycin topic difficultly went from fifth easiest, to second easiest, with less than 1% change in raw score.
Conclusion: Implementation of a pharmacokinetic TBL activity appeared to moderately support the students' vancomycin learning. Additional studies are warranted on APPE readiness and performance.
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PP165

Therapeutic drug monitoring of aprepitant with liquid chromatography–mass spectrometry

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Background and objective: Therapeutic drug monitoring (TDM) is a clinical practice that measures certain drugs at specified intervals in a patient's bloodstream to maintain a constant concentration and thus optimize individual dosage regimens. The TDM process is based on the assumption that there is a definable relationship between dose and plasma drug concentration. The goal of TDM is to optimize clinical outcomes in patients by monitoring the plasma concentrations of drugs (1). Validated analytical methods with very low detection limits are required for TDM. Liquid chromatography–mass spectrometry (LC–MS) methods developed for this purpose are considered the gold standard for TDM due to their high accuracy, specificity, and high analysis speed. The aim of the study was to develop and validate an LC/MS method for TDM of aprepitant.
Method: A specific and validated LC–MS method has been developed for determining of Aprepitant with 0.25 mL of human plasma. A simple liquid–liquid extraction process was used to extract Aprepitant from human plasma. The aprepitant plasma levels of 31 patients with subacute sclerosing panencephalitis were measured (2).
Main outcome measures: To develop a validated method, and to test the method's applicability in human plasma.
Results: An LC/MS method was developed and validated. The plasma concentration of the aprepitant range was found as 0.0125–3.00 μg/mL (r = 0.9999). The limit of detection (LOD) and limit of quantification (LOQ) values were found to be 0.01 μg/mL and 0.03 μg/mL, respectively. The AUC_{0-12} for aprepitant was found to be 6.7 μg h/mL.
Conclusion: This method has been successfully employed for the measurement of aprepitant in preclinical and clinical samples collected from the patients. In conclusion, we developed a sensitive and rapid LC–MS method that can be used for preclinical-clinical translational research exploring exposure–response relationships with aprepitant as well as TDM.

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PP166

Initiation of fluoropyrimidine treatment for patients with digestive cancer: optimization of the safety and effectiveness by using a decision-aid algorithm

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Background and objective: Fluoropyrimidines (FP), anticancer drugs including 5-Fluorouracil (5-FU) and its prodrug capecitabine, are the backbone of chemotherapy regimens for digestive cancer patients. Deficiency of dihydropyrimidine dehydrogenase (DPD), a key enzyme in 5-FU catabolism, increases risk of developing severe 5-FU-associated toxicity.
National recommendations were published in 2019 for managing DPD deficiency (DPDd): FP are contraindicated for uracilemia

≥ 150 ng/mL (complete DPDd) and a reduced starting dose is recommended for 16 ng/mL ≤ uracilemia < 150 ng/mL (partial DPDd).

To our knowledge, there are no further data to guide oncologists in these situations.

Our objective is to propose a decision-aid algorithm based on our clinical practice and the literature, to help oncologists optimize their initial FP prescription in digestive cancer patients.

Design: Initial FP prescriptions in 437 adult patients with digestive cancer were analyzed from 01/01/2021 to 31/12/2022. Data (type of cancer (colorectal, gastric or pancreatic), type of treatment (neoadjuvant, adjuvant, metastatic), uracilemia, FP-based regimen, FP administered dose) were collected from hospital softwares.

An algorithm was designed in collaboration with our oncologists, based on these FP prescription data, our pluridisciplinary consultation meetings in Oncology department and bibliographic information.

Results: Our algorithm representation is a decision-aid tree. 5-FU can be prescribed without considering uracilemia for emergency situations or after considering uracilemia. No DPDd: no FP dose adjustment related to uracilemia is necessary; complete DPDd: FP is contraindicated; partial DPDd: intravenous 5-FU is preferred to capecitabine due to its better tolerance.

For partial DPDd patients, we have set 4 intermediate uracilemia thresholds and differentiated neoadjuvant, adjuvant and metastatic setting. For each of these situations, 5-FU dose adjustment or 5-FU abstention, precautions to take and alternative treatment were detailed depending on type of digestive cancer and uracilemia.

Conclusion: Managing DPDd requires a complex reflection on the risk–benefit balance which has to take into account particularly the type of digestive cancer, the treatment setting and the patient's status. The lack of data to apply the DPDd national recommendations in real life has led us to design this decision-aid algorithm. It was implemented in our hospital as a tool to guide oncologists to optimize the initial FP prescription in their clinical practice.

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PP167

Pharmaceutical interventions on high-impact medicines requests

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Background and objective: The use of high-impact medicines is related to the greater consumption of economic resources in the hospital. The rational use of him through the study of requests of its prescriptions is carried out by the hospital pharmacist. To analyze the adequacy of the prescription of high-impact and/or biological drugs (FAIB) under the criteria established by scientific evidence, the financing of drugs and the instructions given by the Ministry of Health and Health Services. All this within the work carried out by the hospital pharmacist in the FAIB Subcommittee.

Design: Observational, analytical retrospective cohort study. The study was carried out at a regional hospital. The period studied was June 2020-May 2022. The sources of information used were: Excel file with aggregated data, clinical reports submitted by prescribers, meeting reports of the FAIB Subcommittee, documents from the Ministries and Health Services. Primary and objective variable: "initial adequacy of the request" = 2 categories, and secondary variables: "patient in the health area" = 2 categories, "financial criteria" = 2 categories, "technical data sheet criteria" = categories, "previously used non-biological treatments" = 4 categories, "relevant complementary tests" = 2 categories. The variables "requested medication" = 2 recoded categories (Anti-TNF and subsequently biological drugs, for example, anti-IL-23, anti-IL-17, anti IgE, anti-IL-5, anti-Receptor IL-5…) and "requesting service" = 12 recoded categories, have also been studied. All the information has been disaggregated in order to be arranged in an orderly manner and to be able to obtain the necessary data for the variables included in the study. Statistical analysis performed in IBM SPSS V.25 for descriptive analysis and Chi2cross-tables.

Results: 261 requests have been valid for study out of a total of 280. 50.2% of which have not been initially adequate and this has led to a total of 232 pharmaceutical interventions, in the different secondary variables that have been analyzed to cases with initial inadequacy. It has been observed regarding the cross tables, the Chi2 results indicate that there is a statistically significant association between the secondary variables and the primary variable. The largest number of interventions have occurred in the variable "financing criteria" n = 84 and "technical data sheet criteria" n = 71 (with the majority of interventions in the category of "off-label indication"). No association was found between the "requesting service" with the primary variable, presumably due to the multiple categories of variables that produce, in some cases, frequencies so small that they do not give robustness to the Chi2 statistic. There is a statistically significant association between requested medication and the primary variable which indicates that the requests that have had more pharmaceutical interventions are those in which recently commercialized drugs are requested.

Conclusion: The work of the hospital pharmacist is necessary, both for the patient (for their safety, in terms of meeting the criteria for starting treatment with FAIB) and for the health system (for efficiency). The review of each case, according to the drug requested and the patient, places us in a strategic position to lead advanced pharmacotherapy, as is the case of the FAIB.

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PP168

Dangerous drugs administration: recommendations update to be included into the electronic prescription system

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Background and objective: Health professionals can be exposed during their work to carcinogenic, mutagenic and reprotoxic substances with the consequent risk to their health. Therefore, they should receive specific training to prevent possible harmful effects on their health. In 2020, an update to the NIOSH list (The NIOSH Alert: Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Healthcare Settings) was published including a list of drugs considered dangerous in the healthcare environment. In 2022, The ETUI's list of hazardous medicinal products was published, which includes cytotoxic substances and is based on the EU CLP classification system for carcinogenic, mutagenic and reprotoxic (CMR) substances. The objective of this work is describing the process of integrating specific handling recommendations during the preparation and administration of dangerous drugs in an assisted electronic prescription program.

Design: It was careried out a bibliographic review of the drugs marketed in Spain that contain any of the substances considered dangerous according to the NIOSH and ETUI's lists. For each of these drugs available at the hospital, a specific recommendation for handling was established, taking into account those included in the document "Dangerous drugs. Prevention measures for its preparation and administration" published by the National Institute for Safety and Health at Work in 2016. For those drugs marketed subsequently, an individualized assessment was made. These recommendations were incorporated into the electronic prescription program so it is visible to

the nursing staff both in the daily medication administration schedule generated by the program and medication administration record.
Results: 326 commercial presentations that included in their composition any of the substances considered dangerous in any of the mentioned lists were reviewed. 159 of them were found at the Hospital. For all of them these recommendations were included and their visibility for the nursing staff was verified. The recommendations included directions regarding the need to use a gown, double or single gloves, eye protection, respiratory protection, how to proceed when vial manipulation, fractioning or crushing solid forms is required, and what to do in case of having reproductive hazard staff.
Conclusion: The review and update of the information available on the handling of dangerous drugs has made it possible to individualize the recommendations based on the type of drug, its presentation and its administration. Its incorporation into an electronic prescription system provides greater security for the nursing staff who handle it during its administration.

PP169

Potentially inappropriate medications in clinically significant potential drug-drug interactions at prescriptions of nursing home residents

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Background and objective: In this study, we aim to identify rate of potentially inappropriate medications (PIM) involved in clinically significant potential drug-drug interactions (pDDIs) at prescriptions of nursing home residents.
Method: In this retrospective descriptive study, the prescriptions of nursing home residents (people aged 65 and over) have been anonymously evaluated in six pharmacies located in Istanbul and Izmir, Türkiye. Lexicomp® Drug Interaction Software via using UpToDate® was used to identify clinically significant pDDIs (including category D [consider therapy modification] and X [avoid combination]). The Norwegian General Practice-Nursing Home (NORGEP-NH) (1) criteria were used to detect PIMs.
Main outcome measures: Number of pDDIs (D and X category), the rate of PIM involved in pDDIs.
Results: A total of 336 prescriptions were analysed. Out of 336 patients, 55% were female. Participants' mean (standard deviation) age was calculated as 80.0 (8.88) years. The median [IQR] number of medications used by patients was 4 [2–6]. Of them, 39.2% had polypharmacy (≥ 5 prescribed medications used). Seventy-one pDDIs were found of which fifty (70.4%) were in category D, and twenty-one (29.5%) were in category X. A total of sixty-five PIMs were determined from these pairs of pDDIs. Forty-five (69.2%) are category D; the most common PIM was diclofenac (20%) among category D pDDIs. Twenty-one (32.3%) were category X and quetiapine was the most common PIM (38.0%) among category X pDDIs.
Conclusion: PIMs were frequently involved in clinically significant pDDIs among nursing home residents. In future studies, community pharmacist-led medication reviews should be provided for nursing home residents.

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PP170

Elranatamab after car t cells therapy for relapsed/refractory multiple myeloma: about a case of complete and durable response

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Background and objective: Elranatamab is a bispecific antibody that engages B-cell maturation antigen (BCMA) on multiple myeloma (MM) cells and CD3 on T-cells. It induces targeted proliferation and activation of T cells to redirect the immune response against MM.
A phase 2 trial (MagnestisMM-3) demonstrated efficacy and safety in patients with relapsed or refractory (R/R) MM to three lines of treatment and naive to BCMA-directed therapies (preliminary data, unpublished results for cohort with previous exposure).

Elranatamab is available through compassionate access in France, and no data were found on its use in routine clinical practice. In our hospital, 6 patients were treated though this compassionate access.

In this report, we describe a case of multi-refractory MM treated with elranatamab following relapse after anti-BCMA CAR T cells therapy.
Design: Case reported by the hematology department. Data were collected from CHIMIO® software and medical records in May 2023.
Results: A 57-year-old woman had a MM (ISS 3, del17p) diagnosed in December 2012.
She received two proteasome inhibitors (bortezomib and carfilzomib), two immunomodulatory drugs (thalidomide and lenalidomide) associated with dexamethasone, two anti-CD38 antibody (daratumumab and isatuximab) and an autologous stem cell transplant. In April 2021, she received alternately BVD like therapy (ixazomib, bendamustine, dexamethasone) and PAD like (ixazomib, doxorubicine, dexamethasone) because of an extra-medullary localization. In July 2021, she received 3 cycles of melphalan flufenamide.

In October 2021, an anti-BCMA CAR-T cells treatment was decided (ide-cel, ABECMA®). She had a complete response with MRD negativity until August 2022: she relapsed with bone, pleural and lymph node progression.

After 7 lines of treatment, subcutaneous elranatamab monotherapy was initiated in October 2022, despite previous BCMA-targeting treatment. She received 76 mg every week on a 28-day cycle.

After 3 cycles, she achieved a complete response. In May 2023, after 8 cycles of elranatamab (27 injections), she is still in complete response.

Treatment was well tolerated, with a cytokine release syndrome grade 1 after the first injection, and a cytomegalovirus-PCR positive treated by ganciclovir.
Conclusion: This case report shows that elranatamab could be a safe, effective and promising option in R/R MM, even after several treatment lines and BCMA-targeting CAR T cells therapy.
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PP171

The use of behavior change theory in studies of medication error reporting: a scoping review

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Background and objective: Medication errors pose a risk to patient safety, with economic and societal consequences [1]. While medication error reporting impacts error frequency and severity, there is an accumulation of evidence of suboptimal reporting by health professionals [2]. A number of studies have quantified and characterized influences on reporting but with little attention to behavioral theory. Incorporation of theory increases study robustness and rigor, and the relevance of study findings to developing behavior change interventions. This scoping review aimed to collate and characterize studies on medication error reporting which incorporated behavior change theory.
Method: In October 2022, four bibliographic databases (PubMed, EMBASE, Scopus, and Google Scholar) were searched for studies of medication error reporting which incorporated behavior change theory. Two independent reviewers screened the studies and extracted the information. The Theory Coding Scheme (TCS) was used to appraise those studies reporting intervention development.
Main outcome measures: Specific theories used and how applied.
Results: The review included 9 studies, 5 of which used the Theory of Planned Behavior (TPB) and 4 the Theoretical Domains Framework (TDF). Theory was largely used to identify reporting facilitators and barriers. Facilitators to reporting included some of TPB constructs, such as attitude towards behavior, descriptive norms and control beliefs. Moreover, constructs derived from the TDF including capability, opportunity, goals, knowledge and skills, feedback and support, actions, and impact related components were recognized as factors that reinforce reporting, Conversely, emotions, social influences, beliefs of consequences and issues related to the environmental context were perceived as barriers to reporting. Four studies used the findings to discuss intervention development, with little detail according to TCS.
Conclusion: The use of theory to develop behavior change interventions designed to improve medication error reporting is limited.

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PP172

Substances interacting with OATP1B1—potential for drug-drug-gene interactions in statin therapy?

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Background and objective: More than 20% of patients treated with cholesterol-lowering statins experience statin-associated musculoskeletal symptoms (SAMS). This intolerance has been associated with decreased medication adherence, leading to an increased risk of atherosclerotic cardiovascular diseases (ASCVD). The organic anion transporting polypeptide 1B1 (OATP1B1), a liver uptake transporter, has been shown to influence systemic exposure to statins and thus affect their tolerability. The statin transporting capacity of OATP1B1 is influenced by genetic variation in *SLCO1B1*. In addition to statins, other drugs interact with OATP1B1 and thus, when taken with statins, may interfere with statin tolerability. To date, there is a lack of a comprehensive overview of such drugs to consider when evaluating drug-drug-gene interactions in statin therapy.
Method: To identify drugs interacting with OATP1B1, we systematically searched the UW Drug Interaction Database (DIDB, Copyright University of Washington) for in vitro and in vivo data indicating OATP1B1 affinity (inhibition and/or transport). Further, we used natural language processing to analyze Swiss drug labels for information on OATP1B1.
Main outcome measures: The main outcome comprises the availability and analysis of in vitro and in vivo pharmacokinetic data indicating a substance's OATP1B1 affinity (incl. Km $\leq$ 10 μM, IC50 $\leq$ 10 μM, AUCR $\geq$ 1.25), and PGx studies reporting effects on drug exposure.
Results: We gathered a comprehensive overview of drugs validated for the interaction with OATP1B1. These include, among others, antivirals indicated for infections with the human immunodeficiency virus (HIV) or for hepatitis C (HCV), and angiotensin-II-receptor antagonists. The data on in vitro and in vivo (DDI and PGx) studies were further enriched with information available in the corresponding Swiss drug labels.
Conclusion: Multiple drugs, in addition to statins, have been shown to interact with OATP1B1. However, to date, it is not entirely clear which, how, and to what extent a combination of genetic (e.g. *SLCO1B1*) and non-genetic (e.g. co-medication) factors should be considered in the evaluation of statin therapy. Our comprehensive overview provides insight into missing data, and therefore, highlights the need for further studies to support clinical interpretation of drug-drug-gene interactions in the context of cholesterol-lowering therapy.
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PP175

Ethnic inequalities in the provision and engagement with non-surgical interventions amongst patients with COPD: a scoping review

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Background and objective: Poor therapeutic adherence and the contributing factors have been extensively researched in several chronic diseases, including COPD. However, the influence of ethnicity on adherence to non-surgical interventions for COPD is not well understood. This scoping review was performed to explore the variations in adherence amongst patients from minority ethnic communities diagnosed with COPD.
Method: This scoping review was designed based on the refined frameworks of Arksey and O'Malley, developed by the Joanna Briggs Institute (JBI). We systematically searched CINHAL (EBSCO), Medline (OVID), and EMBASE (OVID) for studies assessing the adherence to medications, smoking cessation, pulmonary rehabilitation, influenza vaccination, and oxygen therapy amongst patients living with COPD based on ethnicity. This review was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) guidelines.
Main outcome measures: influence of ethnicity on the adherence to non-surgical interventions amongst patients diagnosed with COPD.
Results: Out of 3654 identified records, 37 studies were identified which were conducted in various countries and involved diverse ethnic groups. The included studies considered provision and/or adherence to: medication (n = 8, 21.6%), smoking cessation (n = 11,

29.7%), influenza vaccinations (n = 7, 18.9), pulmonary rehabilitation (n = 11, 29.7%), and oxygen therapy (n = 2, 5.4%). The majority of the included studies suggested the presence of disparities linked to ethnicity across these interventions.
Conclusion: This review indicated the presence of disparities in adherence to non-surgical interventions amongst patients living with COPD from different ethnic backgrounds. However, due to the heterogeneity in population groups considered and compared, it is challenging to identify and understand the key disparities. Further research is needed to better explore this.

PP176

Patients with suspected pulmonary arterial hypertension who are carriers of the endothelin-1 gene polymorphism RS5370 have higher plasma endothelin-1 concentration compared to non-carriers

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Background and objective: The pathogenesis of pulmonary arterial hypertension (PAH) is still not fully understood despite progress in the understanding of the condition's pathways, including the endothelin-1 pathway. In recent years, there has been a strong endeavour to identify risk variants of genes that contribute to the onset of PAH, including a candidate gene polymorphism of the endothelin-1 gene (*EDN1*) which may potentially lead to increased endothelin-1 (ET-1) synthesis in PAH patients. To investigate this hypothesis, we measured the arterial plasma levels of ET-1 in patients with and without the polymorphism which identification may lead to novel diagnostic procedures in PAH. It is known that treatment with endothelin receptor agonists (ERA) can affect plasma levels of ET-1, which could interfere with our analysis. Therefore we wanted to check for the presence of this effect in our cohort.
Method: Blood samples (n = 61) were collected from the pulmonary artery during right heart catheterisation at the National Institute for Cardiovascular Diseases, Bratislava, as part of the PAH diagnostic procedure. DNA was extracted from blood samples and a single nucleotide polymorphism rs5370 in *EDN1* gene was detected by qPCR. The plasma level of ET-1 was measured by commercially available ELISA kit (QUANTIKINE^{TM} ELISA). Clinical data were analysed from patients´ health records, and statistical analysis included the Mann–Whitney test and a two-way ANOVA.
Main outcome measures: plasma levels of ET-1, rs5370 polymorphism status, treatment with endothelin receptor agonists.
Results: Pulmonary arterial hypertension was diagnosed in 14 patients. The *EDN1* polymorphism was identified in 23 patients, 8 of whom were diagnosed with PAH. The average plasma ET-1 concentration was significantly higher in carriers of the EDN1 gene polymorphism vs. non-carriers (2.65 $\pm$ 1.24 vs. 1.96 $\pm$ 0.73 pg/mL; $p = 0.0468$). However, the presence of polymorphism was not significantly associated with PAH diagnosis. Six PAH patients were treated with ERAs and we have not found an association between plasma levels of ET-1 and the intake of ERA.
Conclusion: The polymorphism of the EDN1 gene (rs5370) was associated with significantly higher plasma concentrations of endothelin-1 in the pulmonary artery, which may have an effect on the new diagnostic procedures and approach to treatment of PAH.
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PP177

Determination of self-reported medication adherence and beliefs about medicines in epilepsy patients: preliminary results

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Background and objective: Epilepsy is one of the chronic neurological diseases and medication adherence is crucial in the control of seizures. The aim of this study is to determine self-reported medication adherence and beliefs about medicines among epilepsy patients.
Method: In this observational study, adult patients over the age of 18 who were followed up in the epilepsy outpatient clinic of a university hospital in Türkiye, were included. Patients completed Medication Adherence Rating Scale (MARS) and Beliefs about Medicines Questionnaire (BMQ).
Main outcome measures: Rate of adherent to medication (if total MARS score was 25), and partially adherent to medication (if total MARS score was 24), patients' groups based on their necessity beliefs, and concerns by using a specific subscale of the Beliefs about Medicines Questionnaire according to the necessity-concern framework.
Results: Among 45 patients, 53.3% of them were female and 55.6% of them had high education levels (12 and more education years). Twenty-seven patients (60%) used alone (n = 11) or a combination (n = 16) of levetiracetam for the management of epilepsy. In the present study, only 40% of patients were found to be adherent, and 31.1% of them was partially adherent to their medications. Based on the necessity-concern framework, 62.2% of them were indifferent (low necessity-low concerns), 22.2% of them were accepting (high necessity-low concerns), 13.3% of them was ambivalent (high necessity-high concerns), and one of them was skeptical (low necessity-high concerns).
Conclusion: Conclusion: A high prevalence of medication non-adherence to epileptic medication was identified in patients with epilepsy. Personalized pharmacist-led counseling and education services should be provided to overcome intentional medication non-adherence problems among patients with epilepsy.

PP178

On the risk of hepatobiliary adverse effects of antidepressants and antipsychotics—results of pharmacovigilance analyses

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Background and objective: The goal is to evaluate the risk of hepatobiliary disorders (HBP) of antipsychotics and antidepressants, which is based on reports of suspected adverse drug reactions in the EudraVigilance database. HBPs are often underestimated and underdiagnosed adverse effects of psychiatric patients.
Method: Analysis of the disproportionality of spontaneously reported adverse drug reactions/events was carried out from the European pharmacovigilance database EudraVigilance. Sub-analyses were performed based on sex, age and HBD phenotype.
Main outcome measures: Reporting odds ratio (ROR) of hepatobiliary disorders, classification and ROC analysis of agreement

between the result of the pharmacovigilance analysis and the HBD undesirable effects reported in SmPC of medicines.
Results: The following drugs have the highest consumption of antipsychotics in Slovakia in terms of number of packages: quetiapine, tiapride, chlorprothixene, olanzapine and haloperidol; and the highest consumption of antidepressants: escitalopram, citalopram, sertraline, venlafaxine and mirtazapine. The overall frequency of spontaneously reported HBD antipsychotics and antidepressants was in the range of 0.8%–8.9% of the total number of reports. Based on disproportionality analyses, we identified agomaletin, sulpiride, and clomipramine with the highest odds of reporting HBD (ROR > 2), and the lowest odds of HBD were observed with cariprazine, paliperidone, and vortioxetine (ROR < 0.5). For most drugs, there is no difference in the incidence of HBD between the sexes, but for the drugs aripiprazole, fluoxetine, chlorprothixene, escitalopram, bupropion, mirtazapine and venlafaxine, the risk is statistically higher in men. When analyzed by age, we identified clozapine, duloxetine, olanzapine, escitalopram, sulpiride and clomipramine with a higher chance of HBD in patients aged 18–64 years than in those aged > 65 years, on the contrary, bupropion and amitriptyline have a higher risk of HBD in the elderly. The occurrence of HBD in SmPC drugs does not correspond to the risk of reporting HBD from pharmacovigilance data (AUC = 0.51, sensitivity = 33%, specificity = 54%).
Conclusion: The results of analyzes of reported hepatobiliary disorders can help in the selection of appropriate antipsychotic and antidepressant pharmacotherapy in patients with an increased risk of liver complications and/or with polypharmacy.

PP180

Antidepressant consumption in central portugal during covid-19 pandemics: an interrupted time series analysis

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Background and objective: Introduction: COVID-19 pandemics and the restrictive policies implemented, from lockdowns to cancellation of events or school activities) produced different effects on healthcare systems and on medicines consumption.
Aim: To evaluate the impact of the restrictive policies implemented during COVID-19 pandemics on the consumption of antidepressant drugs in Central Portugal.
Method: Methods: Data of antidepressant drugs (ATC group N06A) dispensed in community pharmacies between Jan-2010 and Dec-2021 were provided by the Central Region Health Administration (ARSC). To establish two comparator series theoretically not influenced by COVID-19 pandemics, data of anti-Parkinson dopaminergic agents (N04B) and statins alone or combined (C10A, C10B, A10BH) were also obtained. The resident population estimates at the end of each year were obtained from www.pordata.pt. Number of packages was converted into defined daily doses (DDD) using WHO Collaborating Centre for Drug Statistics Methodology. To estimate the causal effect of the pandemics, and interrupted time series was conducted. To predict the counterfactual, a Bayesian structural time-series model with the CasualImpact package on R/RStudio was used. Several analyses were performed with different geographical granularity (9 sub-regions and 78 municipalities). Ethics approval (ARSC 53/2021).
Main outcome measures: DDD/1000 inhabitants/day.
Results: Results: Antidepressant consumption in the ARSC has been continuously increasing from 35 DDD/1000 inhabitants/day (DID) in 2010 to 80 in 2021, with selective serotonin reuptake inhibitors representing 70%. When compared to contrafactual, actual consumption at regional level slightly increased (non-significantly) with a relative effect of + 1.20% [95%CI − 1.6%:3.9%]. Differences appeared between sub-regions with significant increases in three sub-regions with values of 6.5% [1.9%:11%], 4.4% [1.4%:7.4%] and 4.1% [− 0.029%:7.8%], but non-significant variation in the remaining 6 sub-regions. Variability was more obvious at municipality level ranging from increases of + 19.0% [14.0%:25.0%] to decreases of − 11.0% [− 17.00%: − 4.20%]. Relative impact positive correlated with percentage of elderly in the municipality (r = 0.301; $p = 0.007$), and negatively with populational density (r = − 0.243; $p = 0.032$). No other predicting variables were identified.
Conclusion: Conclusions: Antidepressants consumption suffered very slight variations at regional level after COVID-19 pandemics declaration. Analyses with higher granularity allowed identifying municipalities with higher impact (increase or decrease). The absence of clear association patterns obliges to think in other causal hypotheses of the differences.

PP181

Identification of valid indicators for the detection of potentially drug-related hospital admissions in routine electronic data sources: a RAND survey

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Background and objective: Adverse drug events (ADEs) can cause significant harm to patients and, in severe cases, lead to emergency hospital admissions. It is estimated that at least half of these would be avoidable. Policy and research efforts have therefore increased over recent decades, but evaluations of their effectiveness have rarely measured their impact on drug-related admissions, at least partly because of a lack of efficient methods to identify such endpoints. The aim of this study was to develop drug-event pairs as valid indicators for the detection of drug-related hospital admissions in routine electronic data sources.
Method: We conducted a two-stage consensus process based on the RAND/UCLA Appropriateness Method (RAM), in order to prioritise ADEs at hospital admission (stage one) and to identify drug-event pairs as valid indicators for the most important adverse drug reactions (ADRs) (stage two). Each stage consisted of two assessment rounds, with the first-round ratings fed back to the panelists before the second-round ratings were placed. ADEs prioritised in the first stage were considered for the second stage, where the experts were asked to assess on a 4-point Likert scale (1 = Unlikely to 4 = Certain) how likely the listed medication could be assumed to contribute significantly to the adverse event in an average patient. Drug-event pairs with a median rating of ≥ 3 without disagreement were defined as „valid indicators" of ADRs.
Main outcome measures: Consented indicators (drug-event pairs) for the detection of ADR-related hospital admissions.
Results: In the first stage, a total of 6 physicians and 7 pharmacists with clinical and/or scientific background from 11 university sites in

Germany assessed 65 ADEs, 38 of which were prioritised. In the second stage, combinations of 17 ADEs rated with a median of 4 and potentially causative medication are currently being assessed. The results will be available by the start of the congress.
Conclusion: The first stage of our survey led to a set of prioritised ADEs and provided a basis for our second stage, resulting in systematically developed indicators of ADRs for application in clinical practice (e.g., decision support), clinical surveillance and research (e.g., as outcome measures).

PP182

Epidemiology of polypharmacy and medication use among internal medicine patients before and after hospital admission—a retrospective cohort study

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Background and objective: The study aimed to determine the prevalence of pre-admission and incidence of postadmission polypharmacy/hyper-polypharmacy and which medications are most frequently used among internal medicine patients.
Method: A retrospective, population-based cohort study that included all adults ($\geq$ 18 years) hospitalised in internal medicine wards at Landspitali—The National University Hospital of Iceland between 2010 and 2020.
Main outcome measures: Participants were divided based on the number of medications filled in the year, both pre- and post-admission, into non-polypharmacy (< 5), polypharmacy (5–10), and hyper-polypharmacy (> 10).
Results: Among 85,942 admissions (49% female), the median [IQR] age was 73 [60–83] years. The prevalence of pre-admission non-polypharmacy was 15.1% (95% CI 14.9–15.3), polypharmacy was 22.9% (95% CI 22.6–23.2), and hyper-polypharmacy was 62.5% (95% CI 62.2–62.9). Patients with a higher polypharmacy burden were more likely to use multi-dose drug dispensing services and have a diagnosis of adverse drug reaction before and after hospital admission. All other comorbidities, internal medicine subspecialty during admission, and clinical outcomes like length of stay and readmission rate were similar among the different levels of medication use category.
The most common classes of medications filled in pre-admission for the whole group were antibiotics, cardiac medications, and medications acting on the nervous system (of those opioids, antidepressants and benzodiazepines).

Multi-dose dispensing service was used by 46,992 (54.7%) before admission. Patients with hyper polypharmacy were more likely to use multi-dose drug dispensing services (65.9%) compared to polypharmacy (45.6%) and non-polypharmacy (22.0%). Patients who used multi-dose drug dispensing services before admission were more likely to have a previous diagnosis of an adverse drug reaction.
Conclusion: This study highlights that pre-admission polypharmacy and post-admission new polypharmacy/hyper polypharmacy is common among patients admitted to internal medicine wards. A higher polypharmacy burden is not driven by demographic, comorbidity, and admitting speciality, and there is no difference in clinical outcomes between the groups. An increased empathise on optimising medication usage in patients following discharge is needed to prevent hospital admission that may lead to unnecessary polypharmacy or hyper polypharmacy. Increased awareness is needed to ensure the appropriate use of antibiotics and medication acting on the nervous system, like opioids and benzodiazepines, which have been linked to poorer health outcomes.
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PP183

Treatment patterns and characteristics of heart failure patients upon discharge

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Background and objective: Heart failure is a major public health problem due to poor prognosis, frequent hospitalizations related to HF and comorbidities, high mortality, and poor quality of life. The aim of our study is to assess the treatment patterns and characteristics of discharged patients hospitalized with congestive heart failure.
Method: An observational, retrospective, one-center study was conducted among hospitalized patients with congestive heart failure upon discharge. The study included all patients with congestive heart failure (ICD-10 I50.0) discharged from a major regional hospital in Bulgaria in January 2023.
Main outcome measures: Demographic and clinical characteristics; prescribed ambulatory treatment.
Results: 34 patients were included in the study with a mean length of hospital stay of 4 days ($\pm$ 2.3). The average age of the sample was 72.53 years (SD $\pm$ 12.08, range 32–87). The mean number of comorbidities was 3 and 88% of the participants had more than one concomitant chronic disease. 79% of the patients were prescribed upon discharge more than 5 medicines. The average number of medicines per patient is 7.31 (range 1–12). The most commonly prescribed drug classes were loop diuretics (74%), mineral corticoid receptor antagonists (74%), β-blockers (52%), anticoagulants (47%), SGLT2i (41%) and ARNI (21%). Albeit fixed dosage forms were available for some of the treatment regimens, they were not prescribed. In some prescriptions (N = 27) dividing the tablets was required although appropriate dosage forms were available on the market.
Conclusion: Guideline-directed medical therapy was observed among the study sample. The large number of prescribed medicines per patient creates preconditions for errors and poor adherence to treatment. A clinical pharmacist intervention at discharge can improve therapeutic outcomes. Drug therapy optimization by improved dosage form selection and deprescribing when applicable may lead to risk reduction and improved treatment success. Additional research on digital tools for prescribing pattern optimization would benefit patient therapy rationalization.
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PP184

Medication use in people with cystic fibrosis before and after modulator therapy

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Background and objective: Cystic fibrosis transmembrane conductance regulator (CFTR) modulators have revolutionised treatment for cystic fibrosis (CF). CFTR modulators not only improve or slow decline in respiratory function and reduce hospital admissions, but non-pulmonary improvements such as increased body mass index and improved CF related-diabetes control have also been demonstrated. Long-term changes in medication dispensings post CFTR modulator initiation have not been described. We investigated changes in dispensings among people with CF (PwCF) following modulator initiation, using national prescription claims data in Australia.
Method: Using a 10% sample of the Australian Pharmaceutical Benefits Scheme (PBS) data between 2013 and 2022, linear regression was used to analyse dispensings in PwCF who initiated any modulator (cases) and matched PwCF controls not dispensed a modulator.
Main outcome measures: The difference in mean number of total monthly dispensings pre- and post-modulator initiation was analysed, with separate analyses by medication class.
Results: A total of 247 cases were matched 1:1 to controls (case and control median age 21 years (IQR: 13–32), 55.1% male). Immediately after modulator initiation, the mean number of dispensings was 0.9 higher in the modulator group, but then decreased to the level of controls after approximately 5 years. After 7.5 years, cases had decreased opioids compared to the pre-modulator period (β-coefficient: − 0.00131, 95% CI − 0.00164, − 0.00097) whilst controls did not (β: − 0.00014, 95% CI − 0.00042, 0.00014). Over the same time period controls had an increase in psychotropics (β: 0.00389, 95% CI 0.00295, 0.00484) whilst cases remained stable (β: − 0.00014, 95% CI − 0.0006, 0.00031). Women's health medications increased in cases (β:0.00026, 95% CI 0.0001, 0.00042) but decreased in controls (β: − 0.00044, 95% CI − 0.00063, − 0.00025).
Conclusion: Modulator initiation in PwCF was associated with decreased dispensings of opioids and psychotropics and increased dispensings of women's health medications, suggesting improved patient outcomes across multiple clinical domains.
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PP185

Negative outcomes of anticholinergic medications in older nursing home residents- results of the scoping literature review

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Background and objective: The negative outcomes of anticholinergic medications (ACH meds) in older nursing home (NH) residents have been a topic of concern of several pharmacoepidemiologic studies. Understanding already known outcomes may facilitate research using artificial intelligence (AI) methods helping to identify new outcomes and more complex determinants of negative impact of ACH meds. The aim of our scoping literature review was to summarize the existing evidence on ACH meds negative outcomes in older NH population.
Methods: A scoping literature review was conducted in Jan- April 2022 using Pubmed database by evaluating relevant studies published between Jan 2000- Dec 2021. MeSH terms used in search were "anticholinergic AND nursing home" and "65 + " and only English full-text studies were included. Primary search yielded 179 studies of those (after abstract readings) were excluded: randomized control trials (RCTs) and RCT protocols, studies on discontinuation/reduction of use/deprescribing tools and management strategies protocols, studies reporting prevalence of PIMs (incl. anticholinergics), studies on emergency/acutely hospitalized populations, and not investigating older NH residents (or similar chronic population of complex older adults). In total 48 studies were included in the full text literature review.
Main outcome measures: summary of negative outcomes of ACH medications in older NH residents (or similar chronic population of complex older adults).
Results: Central adverse effects of ACH meds were documented by many studies, while evidence on peripheral adverse drug effects was less robust. The majority of studies confirmed the risk of dementia (eg. Chatterjee, 2016; Oudewortel, 2021) and cognitive decline (eg. Landi, 2014; Grill, 2021), correlating with the level of anticholinergic burden (Chatterjee, 2016), as well as delirium (Niznik, 2017; Maclagan, 2017, Gustafsson, 2019; Bali, 2017; Dhalla, 2002). Among other outcomes, functional status decline (Gustafsson, 2019), risk of hospitalization (Bourrel, 2020), higher all-cause mortality (Landi, 2014, Bourrel, 2020) or higher risk of death (Samulesson, 2015) were confirmed, and again, the risk increased with increasing anticholinergic burden. As well as higher risk of falls (Vetrano, 2016; Gustafsson, 2019; Sanders, 2017), fractures (Vetrano, 2016; Gustafsson, 2019; Aalto, 2019), constipation (Palmer, 2015; Herr, 2017), xerostomia (De Vreese, 2018) and higher direct medical costs (Perez-Ros, 2019) have been documented. Linear relationship between the number of ACH meds and poorer psychological well-being was also confirmed by some studies (Luukkanen, 2011; Allen, 2017).
Conclusion: There is a lack of studies using methods of AI in testing ACH drug related outcomes in older NH residents suffering from complex chronic conditions. These methods may help to discover other negative outcomes and to identify their more complex determinants in this vulnerable older population.
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Reliability and validity of Turkish version of medication practical barriers to adherence questionnaire in patients with chronic disease

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Background and objective: The aim of this study is to evaluate the reliability and validity of the Turkish version of the Medication Practical Barriers to Adherence Questionnaire (MPRAQ-TR), which was designed to measure practical barriers to taking medications.
Method: The MPRAQ (1) as translated into Turkish by following the forward and back translation process. An expert panel assessed the linguistic validity of the MPRAQ-TR. A pilot study was carried out with twenty participants to evaluate comprehensibility of each item. An observational study to assess reliability and validity was conducted between August 2022 and March 2023 in a secondary care private hospital located in Istanbul, Türkiye. Adult patients who had chronic diseases, had been using medication for at least 1 month and who were responsible for self-management of their medication were included. Participants completed Turkish versions of the MPRAQ and the Medication Adherence Rating Scale (MARS-TR).
Main outcome measures: Internal consistency of the MPRAQ-TR by calculating Cronbach's alpha coefficient, convergent validity by calculating Spearman's rank correlation between total MPRAQ-TR score and total score of MARS-TR (2), and test–retest reliability by calculating Intraclass Correlation Coefficient between scores within two weeks.
Results: The response rate was 89.6%. Among 380 patients, 43.9% were male, 22.6% had polypharmacy (using five or more medications concomitantly), and 56.3% had high education level. Cronbach alpha of MPRAQ-TR was 0.853. The intraclass correlation coefficient was 0.99 (95% CI 0.98–0.99) for total MPRAQ-TR scores within two weeks ($p < 0.001$). There was moderate negative correlation between MARS-TR and MPRAQ-TR scores (Spearman's rho = − 0.525; $p < 0.001$).
Conclusion: MPRAQ-TR could be used to assess practical barriers facing while taking medications in patients with chronic disease.

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PP187

Post coronavirus infection (SARSCOV2) intracranial haemorrhage in atrial fibrillation: a patient treated with direct oral anticoagulant

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Background and objective: The pharmacy received a report of a suspected serious adverse reaction (intracranial haemorrhage) which resulted in the patient's death due to taking Edoxaban. In the Edoxaban data sheet the adverse reaction ''intracranial haemorrhage'' is expected despite being classified as not common. However the patient had recently recovered from SARSCov2 infection. Intracranial haemorrhage is also counted among the complications of this coronavirus infections. Moreover, even though the use of anticoagulants during coronavirus infections is still debated, it appears to increase the risk of developing intracranial haemorrhage by a factor of 5. Reporting of suspected adverse reactions associated with a reduced dose of Edoxaban in a patient recently recovered from SarsCoV2 led the pharmacist to question whether the infection did sensitise the patient to the drug's effect or not.
Design: The case report presented regards an 87-year-old male patient arrived at the emergency department for sudden left bundle-brachio crural hemisyndrome. On admission the patient was alert, confused and with a score of 15 on the Glasgow Coma Scale. From his clinical history emerges recent SARS CoV 2 infection lasting 10 days (with negative result two days before admission) without relevant symptoms, paroxysmal atrial fibrillation in anticoagulant therapy, chronic ischemic heart disease (multiple revascularization interventions), pacemaker wearer, arterial hypertension, and hyperuricemia. The patient was on home therapy with Edoxaban, Pregabalin, Lansoprazole, Allopurinol, Lisinopril and Bisoprolol. Edoxaban anticoagulant therapy 30 mg q.d. was taken for almost 4 years due to the presence of atrial fibrillation.
Results: A cerebral CT confirmed an extensive intraparenchymal haemorrhage in the right nucleo-thalamic-capsular site with opening into the contiguous lateral ventricle where concomitant moderate blood content was present. A further cerebral CT scan 6 h after the first showed an enlargement of the haemorrhage and periwound edema. In the emergency department, 4-factor prothrombin complex 2000 IU was administered and Edoxaban therapy was discontinued. After diagnostic tests, in light of the severity of the radiological clinical picture and age, it is believed that there was no room for surgical manoeuvres capable of significantly modifying the patient's prognosis. During hospitalisation in the geriatrics ward, given the progressive clinical and radiological worsening, an intravenous infusion of urapidil was administered. The patient died in hospital 10 days after admission for intraparenchymal intracranial haemorrhage.
Conclusion: The patient in our case developed intracranial haemorrhage after recovering from the previous SarsCov2 infection without major symptoms. In the literature there are several cases of SarsCov2 patients with an intracranial haemorrhage as a fatal outcome. These patients manifested severe forms of coronavirus infections and were on anticoagulant therapy (both intravenous and oral), dentally multimorbid. Intracranial haemorrhage is reported as an undesirable effect of DOACs and was also listed among the possible complications of SARSCoV2. We can therefore conclude that in predisposed patients with many co-morbidities (advanced age, hypertension, heart disease, vascular disease) and in prophylactic anticoagulant therapy, SARSCov2 infection could increase the pre-existing risk of bleeding complications. More careful monitoring may therefore be required for these patients.

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Prevalence and influencing factors of probiotic usage among colorectal cancer patients in China: a national database study

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Background and objective: Probiotics have become increasingly popular for cancer patients. However, there is limited data from a real-world setting. This study aims to conduct a retrospective

prescription analysis to understand the trend of Chinese colorectal cancer (CRC) patients receiving probiotics.
Method: Data were collected from National Prescription Database. The Mann–Kendall and Cochran-Armitage trend test were applied to estimate the trend significance. Gephi software was used to identify the combination of probiotic strains. The binary logistic regression investigated influence factors, and the Spearman's rank correlation coefficient calculated correlations between probiotic and certain drug usage.
Main outcome measures: The trend of probiotics prescription and factors related to probiotic prescribing.
Results: The probiotic prescription percent increased from 3.3% in 2015 to 4.4% in 2019 ($p < 0.001$). Analysis of co-prescribed drugs showed that diarrhea was the most common reason for probiotic use (OR 10.39, 95% CI 10.00–10.79), followed by dyspepsia (4.38, 4.17–4.59), constipation (1.44, 1.39–1.49), and gastroenteritis (1.24, 1.20–1.27). Outpatient (1.74, 1.69–1.78), tertiary hospital (1.40, 1.32–1.50), older CRC patients (1.017 per year, 1.016–1.018) were more likely to be prescribed probiotics. *Enterococcus faecalis* (49.8%), *Lactobacillus acidophilus* (38.3%) and *Bacillus subtilis* (27.6%) were the most prescribed probiotic strains. The probiotics co-prescribed with antitumor agents increased rapidly from 6.6 to 12.8% in five years (Z = 9.852, $p < 0.001$). The main risk factors of antitumor drug co-prescribed with probiotic was patient age (1.01 per year, 1.00–1.01), rectal cancer (1.09, 1.02–1.17), use of doxifluridine (2.61, 2.08–3.27), regorafenib (2.07, 1.34–3.19), TGO (1.74, 1.50–2.01). No correlation was found between strain selection and antitumor drug use.
Conclusion: The use of probiotics in CRC patients is associated with gastrointestinal symptoms and antineoplastic drugs. Further studies are needed to guide the use of specific probiotics in CRC patients.

PP190

Economic aspects of clinical pharmacy services—cost avoided by pharmacists' interventions and willingness to pay by patients

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Background and objective: To secure a viable business model for professional pharmacy services, considering the cost implications of the service is essential, given the escalating costs of healthcare and a scarcity of healthcare resources, particularly in developing countries. the present study aimed to evaluate the costs avoided by clinical pharmacist interventions to address TRPs. In a related piece of work presented, the patient preferences for pharmacist-led weight management services and influenza vaccination were evaluated.
Method:

1. TRPs were assessed for patients recruited from outpatient clinics in five major hospitals in Jordan. The interventions provided by the clinical pharmacist to address TRPs were studied and costs avoided by each intervention were collected from the literature. The collected data were used to calculate the overall cost averted by the interventions implemented to address the identified TRPs.
2. A convenient sample of individuals in a large city in northern Jordan were given a survey to determine their preferences for weight-management services offered by pharmacists in community setting. Using the payment card tool, the willingness to pay (WTP) evaluation was estimated, as well as associated factors.
3. A survey was developed, pretested and distributed to the public that included knowledge, willingness to pay, and beliefs regarding the seasonal influenza vaccine.

Main outcome measures: Cost avoided by pharmacist intervention to address TRPs, WTP for weight management services in the community pharmacy and seasonal influenza vaccine.
Results: i. A sum of 2747 patients, with a total of 10672 TRPs, were included in the study. Drug-related interventions were employed in 68.3% of the 568 interventions to address the TRP "change dosage or frequency," which was the most frequent approach for managing TRPs. The total cost avoided over the research period was $142,500.09.
ii. A total of 966 questionnaires (response rate 96.6%) were included in the analysis. A total of 71.2% of respondents indicated that community pharmacy weight-reduction services are useful or very useful. Although 14.8% were not willing to pay for pharmacist services, 20.4% would pay (United State dollar) USD $5, 20.4% would pay USD $10, 14.5% would pay USD $15, 11.9% would pay USD $15, 14.2% would pay USD $20, 9.8% would pay USD $30, and 14.4% would pay USD $50.
iii. A sum of 347 responses formulated the study sample. Responders rated their knowledge of the influenza vaccine as good or excellent were 62.5% of the total received responses. About half (44.7%) of the respondents consult the physician if they had influenza. Next to the physician, 27.7% of the responders consult the pharmacist. Approximately one-half (45.3%) of the responders were willing to pay 5 JD for influenza vaccine. Consulting pharmacists when the respondents had influenza, higher education level and medical occupation were independent predictors associated with WTP to influenza vaccine.
Conclusion: The present study addressed multiple approaches for the financial implications of the clinical pharmacy services. the projected expenditures saved by interventions to address TRPs illustrate the effect of TRPs on patients and the healthcare system. The willingness to pay assessed is important to enhance the uptake of professional pharmacy services and can inform healthcare policy deci.
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Cost analysis of the available multiple sclerosis treatments in an Italian reference centre

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Background and objective: In the past few years the number of treatments for Multiple Sclerosis (MS) has become ever larger, both lines of treatment now list a significant number of drugs available with similar pharmacodynamics and pharmacokinetics, and while this might sound convenient from a therapeutic point of view, the problem of the economic sustainability of the various therapies has become dramatically significant.
Method: Analysis of expenses relating pharmacological treatments of MS; data were gathered from an Italian reference centre for the treatment of MS.

The drugs were divided according to their indication, relapsing–remitting multiple sclerosis (RRMS) or secondary progressive multiple sclerosis (SPMS), line of treatment and route of administration.
Main outcome measures: The therapies were evaluated according to their cost for a treatment period of 4 years, considering also the cost of the starting dose. All the costs presented in this study were extrapolated from the contracts stipulated between the Italian National Health Service and the pharmaceutical industries.
Results: In the group of the orally administered RRMS first-line treatments there was no meaningful difference, considering that after 4 years of therapy the expenses related to Dimetilfumarate and Teriflunomide are 40,178.62€ and 38,304.64€ respectively. Concerning the injectables, it was found that interferone-based therapies are considerably more affordable, the only exception being both the subcutaneous and intramuscular preparations of Peginterferone-β1a (36,134.63 €), while the second most expensive injectable treatment is the Interferone-β1b (18,870.50€). Among the second line injectable treatments, the most expensive was Alemtuzumab (95,888.49€) followed by Natalizumab (73,050.52€) and Ocrelizumab (65,551.38€), while the recently approved anti-CD20 antibody Ofatumumab costs 63,019.56€. Concerning the oral treatments, Sphingosine 1-Phosphate Receptor Modulators showed a comparable cost: Ponesimod (60,776.68€), Ozanimod (59,732.85€) and Fingolimod (59,662.90€). Cladribine was the least expensive (34,320,22€), however a full treatment course comprises two treatment cycles administered 1 year apart, followed by two treatment-free years. On the other hand, the most expensive treatment indicated for SPSM was Siponimod (58,791.48€) and the least expensive Interferone-β1b (18,870.50€).
Conclusion: To conclude, further studies need to be enacted to define a precise willingness-to-pay threshold against the market inflation of MS drugs. Neurologists and pharmacists need to cooperate to discern the most cost-effective solutions among the numerous comparable treatments available.
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Years of life lost due to prostate cancer in Bulgaria, 2008–2021

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Background and objective: This retrospective study aims to calculate the years of life lost due to prostate cancer in Bulgaria and the associated indirect costs.
Method: Data on the number of deaths based on the ICD-10 code for prostate cancer (C61) and country and gender-specific life expectancy was sourced from the National Statistical Institute from 2008 to 2021. Years of life lost were calculated based on the country and gender-specific life expectancy. Indirect costs due to productivity loss were calculated using the human capital approach.
Main outcome measures: Years of life lost, indirect costs.
Results: A 17% increase in the number of deaths by prostate cancer was recorded from 890 deaths in 2008 to 1040 in 2021. However, a decrease of 33% is observed in the group up to 65 years of age (117 in 2008 vs 78 in 2021). For the study period, a total of 112 829 years of life were lost. An average of 8.40 YLLs per person was observed and the difference between 2008 and 2021 is 1.42 years (8.90 in 2008 vs 7.48 in 2021). The indirect costs associated with productivity losses range between 6.5 and 8.75 million euros (EUR) per year based on the lost gross domestic product (GDP) per employed.
Conclusion: Overall, there is an increasing trend in mortality and years of life lost due to prostate cancer in Bulgaria between 2008 and 2021. The indirect costs due to productivity loss are estimated at more than 100 million EUR (200 million Bulgarian levs) for the study period.
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PP193

Enteral nutrition management from automated drug dispensing systems

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Background and objective: Enteral nutrition is a frequently used pharmacotherapeutic option in hospitalized patients. We work with automated drug dispensing systems (Pyxis®), linked to electronic prescription. We carry out a pilot project to manage enteral nutrition like the rest of the drugs, from the automated drug dispensing systems. Our goal is twofold: 1. Efficient management: eliminate stock requests in nursing units (pre-implementation). 2. Prescribed pharmacotherapy: all enteral nutrition must be withdrawn from each patient from automated drug dispensing systems (post-implantation) and they will not be administered without being electronically prescribed, with this we are able to eliminate their use due to patient preferences (educational intervention for nursing staff).
Design: Pilot study that retrospectively analyzes two situations: enteral nutrition requests for stock in nursing units (pre-implantation) and enteral nutrition management through automated drug dispensing systems (post-implantation), in 2 nursing units from Selectronic prescriptiontember 2022 to December 2022 (enteral nutrition requests for stock in nursing units) and later from January 2023 to March 2023 (enteral nutrition management through automated drug dispensing systems). In order to include them, it has been necessary to make different adjustments both in the automated drug dispensing systems and in the nursing units. Physical spaces have been created in the so-called "remote stock", defined as spaces enabled in the nursing units that function as "remote drawers" associated with the automated drug dispensing systems, from which nursing withdraws the enteral nutrition associated with each patient's prescription from the location of the "remote stock".
Results: Post-implementation of enteral nutrition management through automated drug dispensing systems, in these two nursing units enteral nutrition are withdrawn from each patient through the electronic prescription that appears in automated drug dispensing systems, eliminating the way of working with enteral nutrition requests for stock in nursing units. Regarding the economic analysis: for enteral nutrition requests due to stock in a nursing unit (not associated with electronic prescription/pre-implantation) there was an expense of 1092.77 € and for enteral nutrition management through automated drug dispensing systems (associated with electronic prescription/post-implantation) the expense has been 614.47 €, therefore, there has been a saving of almost 500 € (45% less spending).
Conclusion: The change in the work philosophy has had an impact on better economic management (savings and stock control) and an improvement in the safety of enteral nutrition (expiration control), therefore, we must continue to make this change in the rest of the hospital. The concept of dispensing enteral nutrition according to patient preferences has been eliminated in these units.
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PP194

Treatment of type 2 diabetes mellitus- physicians' adherence to the American Diabetes Association guideline in central region, Saudi Arabia

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Background and objective: Diabetes mellitus is a chronic disease that can cause devastating secondary complications, reducing the quality and length of life as well as increasing medical costs for the patient and society. The guidelines recommend both clinical and preventive strategies for diabetes management and are regularly updated.
DM estimated that around seven million of the population are diabetic, and almost three million have pre-diabetes. The aim of the study was to assess the level of adherence of physicians to American Diabetes Association Guidelines.
Method: Observational multicenter retrospective study will be conducted among different Hospitals in central region. of Patient's data will be collected from the records of the last three years (2017- 2020). Records will be selected randomly after a complete randomized design.
Main outcome measures: The study focuses on management of type 2 according to ADA not changing in last three updating, those standards; all patients should be taking Metformin 1500 to 2000 mg/day as recommended dose and should be received high dose of statin if high risk to ASCVD or moderate statin if not at risk, patients with hypertension and diabetes should taking ACE or ARBS.
Results: Study aimed at evaluating the commitment of Physician in central region to the ADA. Out of the 153 selected patients, only 17% were able to control their diabetes with average A1c below 7. ADA stated that to reach the minimum benefit of using metformin, the daily dose should be between 1500 and 2000 mg. Results showed that 110 patients were on metformin where 68% of them are on the recommended dose. ADA recommended the intake of high statin for diabetic patients with ASCVD risk while diabetic patients without ASCVD risk should be on a moderate statin. Results showed that 61.5% of patients with ASCVD risk were at high statin while only 36% of patients without ASCVD risk were at the moderate statin. Results showed that 89 patients have hypertension where 80% of them are getting ACE/ARBs as recommended by the ADA.
Conclusion: It is necessary to implement periodic training course for some physician in to enhance and update their knowledge.

PP197

Deprescribing of antidepressants: validation of indicators for high-risk and overprescribing and their prevalence

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Background and objective: Antidepressants are a group of medications that have seen a dramatic increase in prevalence in recent decades, primarily due to long-term treatment and widespread use for indications other than depression. Antidepressants may increase the risk of serious adverse effects, particularly in older adults with comorbidities and polypharmacy. Potential high-risk or overprescribing of antidepressants may therefore prompt a critical review of antidepressant use, which may lead to discontinuation, dose reduction or switching of antidepressants (deprescribing). The objectives of this study are (1) to develop indicators of high-risk and overprescribing of antidepressants and (2) to estimate the prevalence of the agreed indicators in routine data to support clinicians in identifying opportunities for antidepressant deprescribing.
Method: Using the RAND/UCLA Appropriateness Method (RAM), candidate indicators of high-risk and overprescribing of antidepressants were developed and rated by 10 experts using a 9-point Likert scale (1–3 = not necessary; 7–9 = clearly necessary) to indicate the necessity for critical review of antidepressant prescribing. The RAM involved a three-round rating process, with previous results presented and discussed in a moderated meeting in-between ratings. To determine the prevalence of consented indicators of high-risk and overprescribing of antidepressants, we conduct a cross-sectional study using data from the Bavarian Association of Statutory Health Insurance Physicians.
Main outcome measures: We will report the consented list of indicators of high-risk and overprescribing after the third round of assessment (median of all expert ratings ≥ 7 without disagreement) and estimates of their prevalence.
Results: The participating experts were 10 physicians, including general practitioners, pharmacologists, (geronto)-psychiatrists and geriatricians. The final assessment identified more than 30 indicators of high-risk prescribing. These included constellations of known anticholinergic and cardiovascular risks, as well as (gastrointestinal) bleeding, falls and hyponatremia. More than 20 indicators of overprescribing have been identified, including the appropriate duration of antidepressant therapy for a variety of indications. First results on their prevalence will be presented at the symposium.
Conclusion: Prioritized indicators will be used to develop decision support tools for clinicians, which may be used in deprescribing interventions targeting the safe and appropriate use of antidepressants and/or as outcome measures to evaluate their impact.
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Retrospective evaluation of vitamin D dosing regimen used in the double blind, placebo controlled half-year clinical trial (reinforce-d) based on calcidiol concentration monitoring

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Background and objective: Vitamin D belongs to the most cited vitamins today due to its positive biological effects. Human beeings and some animals are capable to syntetize vitamin D3 (cholecalciferol) in the skin. However this intrinsic synthesis is very variable depending on body weight, age, season, geographical locality, area of sun exposition etc.. and also there is an intake of vitamin D from the food. To check up the deposits of vitamin D in the body, we measure mainly calcidiol blood concentration, because calcidiol is a metabolic interproduct of all pathways of vitamin D metabolism. Although the

optimal calcidiol target level is still not clearly established, generally, patients with a calcidiol concentration under 75 nmol/l are considered as people with deficit who should be supplemented additionaly by drug formulations containing vitamin D. There are many different supplemetation regimens, mainly based on level of calcidiol deficit. Primary objective of our work was to verify, if our vitamin D3 dosing regimen is optimal. The verification was based on measuring an initial and target calcidiol concentration during our 6-months lasting clinical trial REINFORCE-D concepted as placebo controlled, double blind, randomized, monocentric clinical trial for patients with vitamin D hypovitaminosis undergoing cardiac surgery procedure.

Method: Our data was collected from September 2016 till December 2020 in one center. A total of 216 trial subjects were recruited, but just 141 were albe to finish the trial. All the patients who fulfilled the inclusion criteria were randomized and divided to six groups according to their initial calcidiol concentration. Patient whose calcidiol concentration was under 25 nmol/l received 20 000 IU of cholecalciferol solution or placebo, patients under 50 nmol/l received 12,500 IU and patients under 75 nmol/l received just 5000 IU per week.

Main outcome measures: In each subject in the trial, we measured the initial and target calcidiol concentration using the radioimunnoanalytical assay.

Results: Our pilot study randomized together 141 subjects: 69 patients in placebo group and 72 patients in cholecalciferol group. An amount of 32.9% subjects reached a level of 80 nmol/L, even though they were included in the placebo arm. On the other hand, 33.8% of subjects were not able to achieve the target calcidiol concentration even though they were originally randomized in cholecalciferol group. Despite of these facts, statistically significant difference in placebo and cholecalciferol group was demonstrated between those who were and who were not able to achieve the target calcidiol concentration ($p < 0.001$). As for the safety data, only 4 patients did not tolerate our dosing regimen due to mild gastrointestinal disorders, where 3 of them were from cholecalciferol group and 1 of them was from placebo group.

Conclusion: We can assume that our supplementary cholecalciferol regimens were proposed successfully, well tolerated by patients. Dosing once a week supported by reminding SMSes each week has been considered as an effective tool increasing a patient adherence to treatment in the clinical trial.

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PP200

Analysis of the prescription of high-alert medications in a social and health center

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Background and objective: High-alert medications are primary objectives of various institutions in order to issue recommendations and improve medication safety. In Spain, in 2014, a list of high-alert medications for patients with chronic illness (HAMC list) was drawn up.

Objectives: Determine the prevalence and type of high-alert medications in institutionalized patients; analyze which are the most prevalent drugs in institutionalized patients in order to implement practices for preventable adverse drug events.

Method: Cross-sectional, observational study carried out in August 2022 in a social and health center. The following variables were collected; demographic characteristics (sex, age), high-alert medications prescription and classification into therapeutic groups (antiplatelet agents, oral anticoagulants, antiepileptics with a narrow therapeutic margin, nonsteroidal anti-inflammatory drugs, antipsychotics, benzodiazepines and analogs, beta-adrenergic blockers, oral cytostatics, corticosteroids more than 3 months, loop diuretics, oral hypoglycemic agents, immunosuppressants, insulins, opioids, specific medications [amiodarone/dronedarone, digoxin, spironolactone, oral methotrexate (non-oncological use)] and determination of their prevalence.

Main outcome measures: To determine the prevalence.

Results: A total of 294 patients (63.6% women) were reviewed, with a mean age of 81 ± 11 years. A total of 731 high-alert medications prescriptions were found in 259 patients (88%). Breaking down into therapeutic groups; 18.87% of the prescriptions corresponded (n = 138) to antipsychotics, 18.3% (n = 134) to benzodiazepines, 11.6% (n = 85) to platelet antiaggregants, 8.6% (n = 63) to diuretics loop, 8.2% (n = 60) opioids, 7.6% (n = 56) oral anticoagulants, 7.5% (n = 55) beta-blockers, 6.2% (n = 46) oral hypoglycemics, 4.3% (n = 32) to insulins, 3.9% (n = 29) to specific medications, 3% (n = 22) non-steroidal anti-inflammatory drugs, and 1.5% (n = 11) narrow-spectrum antiepileptics. therapeutic margin.

The most prevalently prescribed drugs in our patient cohort were; 11% (n = 80) aspirin, 10.8% quetiapine, 8.7% (n = 64) lorazepam, 8.3% (n = 61) furosemide, 5.6% (n = 41) tramadol, and 5 0.4% (n = 40) metformin.

Conclusion: A high percentage (88%) of patients with high-alert medications prescriptions are found. Identifying high-alert medications for them help to prioritize the interventions with greatest impact for improving medication safety.

PP201

Lenalidomide-induced toxic epidermal necrolysis: a case report and literature review

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Background and objective: Toxic epidermal necrolysis (TEN) is a rare, severe cutaneous reaction characterized by peeling and blistering of extensive skin. TEN is life-threatening without timely identification and treatment, and usually associated with medication. Lenalidomide is an immunomodulatory agent used in the treatment of patients with multiple myeloma (MM). The study aimed to summarize TEN induced by lenalidomide.

Method: We described a pharmacist-participated case of TEN induced by lenalidomide.

Main outcome measures: The characteristics of TEN and proper management.

Results: A 75-year-old female of Chinese Han population diagnosed as MM received the standard first-line Vrd therapy (lenalidomide, bortezomib and dexamethasone). After the first course of treatment, she discharged uneventfully. However, she developed systemic erythema, itching, and joint pain at home. One week later, she was admitted to the hospital due to worsened rash, with blisters on the limbs, waist and back. She also had erosion and ulceration on the external genitalia and lips. With algorithm of drug causality for causality for epidermal necrolysis (ALDEN) and Naranjo's method, clinical pharmacists identified suspicious drugs that cause the rash. Lenalidomide was discontinued, and the patient was treated with hypodermic adalimumab 80 mg once and intravenous

methylprednisolone 40 mg every 12 h. With improvement of the patient's condition, the dose of corticosteroids was gradually reduced over the next two weeks. The patient's prescription switched to oral Id regimen (ixazomib and dexamethasone), and the patient did not complain any further skin reactions.
Conclusion: There are seldom published case reports of clinical pharmacists involved in identification and treatment of TEN while receiving lenalidomide for treating MM. The participation of clinical pharmacists in the medical team can help with the safety and effectiveness of medication.

PP203

Evidence-based drug tapering and discontinuation advices for pharmacists and patients

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Background and objective: Drug tapering is of importance when abrupt drug discontinuation can lead to adverse withdrawal events (ADWEs). Appropriate tapering reduces the risk of aggravating the underlying condition and comorbidities of the patient. It can also be applied to identify the lowest effective dose when continuation of therapy is a necessity. Despite its importance, clear guidelines including tapering schedules regarding many medication groups are lacking or not readily accessible for pharmacists, physicians and patients.
Objectives: To define evidence-based drug tapering and discontinuation advices for pharmacists and to publish them in the Informatorium Medicamentorum, the leading drug information database based on scientific drug information for pharmacists in the Netherlands. To translate the drug tapering schedules and discontinuation advices to comprehensible patient information and to publish these on www.apotheek.nl, a Dutch website containing reliable and independent medication information for the general public.
Design: Guidelines and literature concerning tapering and discontinuation of medication were collected, including the Dutch multidisciplinary guideline Polypharmacy in elderly patients. Relevant drug tapering recommendations were analysed and assembled in order to formulate clear tapering advices to be conveniently applied in daily practice by pharmacists. These advices were then published in the Informatorium Medicamentorum. Subsequently, the defined tapering advices were rewritten and adapted to the reading level of patients, and presented on www.apotheek.nl.
Results: Drug tapering advices were defined for medications within different medication groups. These include drug tapering advices for proton pump inhibitors, antihypertensives, diabetes medication, opiate agonists and antidepressants. The advices are based on existing drug tapering and discontinuation guidelines, literature and the summary of product characteristics (SmPC). They were specified considering their applicability for certain age groups, therapeutic indications and dosages used in daily practice. The advices were then incorporated in the Informatorium Medicamentorum for pharmacists, and translated to appropriate patient information and published on www.apotheek.nl.
Conclusion: We provide evidence-based drug tapering advices for pharmacists formulated in a manner which can be easily applied in daily pharmaceutical practice. We translated these into intelligible language for the general public. For this we have taken into consideration the most important aspect of tapering for patients, namely doing this in consultation with their pharmacist and physician. In this way pharmacists and patients have access to clear and complementary information on drug tapering and discontinuation. This will promote safe discontinuation of medication when necessary.

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PP205

Discrepancies between the different equations to estimate glomerular filtration rates to adjust drug doses

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Background and objective: Different equations to estimate glomerular filtration rate (GFR) were created. Some of them were validated in normalized form (expressed in ml/min/1.73m2) while others were in patient-adjusted form (expressed in ml/min). Studies demonstrated the best suitability of different equations to different populations. Discrepancies between equations may have influence in dose adjustment decisions. The aim of the study was to evaluate the levels of agreement between the different equations to estimate GFR, in adjusted and normalized forms, using a real-world cohort of elderly patients from a primary care centre.
Method: Data required to calculate eGFR from the patients over 65 years old registered in the Lousã health care centre were extracted in March 2022. Approved by ARS Center Ethics Committee (CE-19/2022). eGFR was calculated using the following equations: Cockcroft-Gault (CG) (with real and ideal weight), Modification of Diet in Renal Disease (MDRD), CKD Epidemiology Collaboration (CKD-EPI), and the Berlin Initiative Study-1 (BIS1). Bland-Alman analyses were conducted.
Main outcome measures: Agreement between eGFR calculated with different equations reported as: bias, percentage of error, Bland-Alman regression equation, and value of x when $y = 0$ in the regression.
Results: A cohort of 1886 patients with a mean 76.5 years (SD 7.9) and 57.1% females were included. Bias in paired comparisons ranged from − 20.9 ml/min in CG_IBW vs. CKD-EPI to + 18.6 ml/min in MDRD and CG_IBW. In four comparisons the GFR where the equations shifted the overestimation position were in the range where dose adjustments are required, namely CG vs. CG_IBW in 21 ml/min, BIS1 vs. MDRD in 30 ml/min, CG vs. BIS1 in 50 ml/min, and CKD-EPI vs. MDRD in 60 ml/min. The greatest differences of overestimation across the GFR range were between MDRD and BIS1, CG and BIS1, and MDRD and CG.
Conclusion: The different equations created to estimate GFR produced different estimates in a cohort of older patients in ambulatory care. These differences should be taken into account when comparing with dose adjustment cut-offs provided in medicines information sources.

PP206

Change in the mode of administration of betalactams to intravenous electric syringe in pediatric intensive care unit and settings of the prescription assistance software

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Background and objective: Settings of a prescription assistance software is a key element of the quality and safety of the prescription. The creation and monitoring of drug protocols are the result of cooperation between software referent pharmacists and physicians. The addition of an intravenous electric syringe administration mode (IVES) for Betalactamins (BL) has motivated new settings. The problem was to secure this mode of prescription in pediatric intensive care, we will describe the process of settings.
Design: 7 BL were set up for administration in IVES preceded by a loading dose (LD): Amoxicillin, Cefepime, Cefotaxime, Ceftazidime, Cloxacillin, Piperacillin-Tazobactam and Meropenem. The main sources used were the summary of product characteristics (SPC), references (Pediatric & Neonatal dosage Handbook®, Stabilis®), protocols: HUG children, adult intensive care units (Lille, Paris, Marseille) and publications from Pubmed®. The following data were collected: reconstitution solvent, volume, dilution solvent, concentration, length of stability, dosage.
Results: 4 medico-economic issues were identified during multidisciplinary consultations: dosage, concentration with a high stability, and the quantity of product used in order to save money. It was necessary to combine the problems of concentration, stability and the number of syringe changes. To reduce the volumes injected the highest concentration were chosen. For an economic/ecological consideration, the longest stability involving less frequent syringe changes were also preferred. An initial current dosage was chosen in agreement with the physicians. We were confronted with the problem of the LD not given in the SPC, but after studying the literature and consulting the adult resuscitation protocols, we identified that the LD corresponded to 1/4 or even 1/3 of the daily dose. During prescription tests, minimum and maximum weight bounds were assigned to the different BL vials to reduce costs and decrease vial wastage. The selected presentations were then added to the thesaurus and staffed in the department.
Conclusion: Setting up IVES in a prescription assistance software is complex and required pharmacists and physicians to find a compromise between the constraints of concentration, stability, cost and volume administered while remaining consistent with the limited literature available.
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PP207

Prescribing review of anticoagulation in atrial fibrillation in primary care

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Background and objective: It is estimated that there are 145,000 people in Scotland with Atrial Fibrillation (AF). Over 96,000 have been diagnosed with AF and therefore 50,000 are undiagnosed and at risk of stroke[1]. Treatment with anticoagulation reduces the risk of AF-related stroke by approximately two-thirds. Despite this, evidence suggests that uptake of anticoagulation may still be suboptimal[2].
Objectives: (1) To ensure all patients with a diagnosis of AF who meet NICE criteria (males with CHA2DS2-Vasc of > = 1, females > = 2) are offered anticoagulant therapy, unless contraindicated. (2) To ensure stroke risk and decisions on anticoagulation are documented in patient records (3) To design and deliver education sessions and material to train and equip the pharmacy primary care team to consult and counsel patients on AF and its treatment.
Method: The Scottish Therapeutics Utility (STU) Polypharmacy indicator 162 was used to identify patients meeting criteria and not on anticoagulation in the HSCP GP Practices (n = 72). A data collection sheet was designed and piloted to collect data relevant for anticoagulation assessment, including CHA2DS2-Vasc, Has-Bled and Orbit scores. Absolute and relative contraindications to anticoagulation were agreed by a senior pharmacist, a consultant cardiologist and a stroke consultant. Education sessions were delivered via Microsoft Teams and recorded for future reference and training resource. A Q&A session was hosted by the consultants during the patient review process and a Tailored Talk package on AF was prepared and training provided on its use by the stroke consultant for pharmacists to use in patient consultations.
Main outcome measures: Percentage of patients identified as meeting criteria from STU data reviewed and suitability assessed for anticoagulation. Percentage who had absolute contraindications for anticoagulion, percentage who were candidates for consideration of anticoagulation and of those eligible percentage started on anticoagulation. Number of tailored talks individualised for patients.
Results: 1766 patients were identified as meeting criteria from STU data. 53 (80%) GP Practices took part. 1328 (75%) patients were reviewed and suitability assessed for anticoagulation in conjunction with an identified GP in each practice. 510 (38%) patients had absolute contraindications for anticoagulation. 759 patients were candidates for consideration for anticoagulation. 55 (7% of those eligible, 4% of those identified) were commenced on an anticoagulant. 14 Tailored Talks were individualised for patients, all of whom agreed to commence anticoagulation. Comments received on Tailored Talks were positive from pharmacists and patients. Documentation of intervention was coded in records of all patients. Previous documentation of risk was only collected for 365 patients, 60% of whom had no previous documentation of stroke risk assessment. Education sessions were attended by 121 pharmacy staff and to date recordings have been referenced 358 times.
Conclusion: Although a small percentage of patients were commenced on anticoagulants, a large number were reviewed, risk assessed and outcomes documented in records. Dilemmas around anticoagulation in specific groups of patients and conditions leading to decisions not to anticoagulate may be addressed by delivering the education sessions to GPs and other members of the team involved in anticoagulation monitoring. The Tailored Talk package exists as a resource for all clinicians to use in discussing anticoagulation with patients.

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PP208

Can pharmacist intervention improve cardiometabolic monitoring for adult patients taking oral anti-psychotic medication? A primary care service improvement initiative

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Background and objective: People with severe mental health illness die prematurely, often due to preventable cardiometabolic disease which can be exacerbated by antipsychotic medicines that are effective for treating mental illness. Literature demonstrates that physical health monitoring, as recommended in guidelines, for people receiving antipsychotics is substandard. Therefore we aimed to scope and assess the potential of a general practice clinical pharmacist (GPCP)-led multidisciplinary intervention for improving adherence to cardiometabolic monitoring guidelines and delivering polypharmacy reviews.
Method: Prospective intervention scoping cohort study in three urban general practices. Patients 18–65 years old prescribed oral antipsychotics were identified from records, January 2022. Patients were invited for cardiometabolic monitoring and medication review with the pharmacist, March to December 2022. Interventions and onward referral were recorded and collated. Anonymised pre- and post-review data were analysed. Review actions were graded for clinical importance.
Main outcome measures: Monitoring care bundle (glucose/glycosylated haemoglobin, lipids, blood pressure plus body mass index) was compared pre- and post-intervention. Post-intervention care bundle was compared to 'usual-care' practice.
Results: 1.5% (210/14,159) of patients aged 18–65 years met inclusion criteria; usual care practice (n = 58) and intervention practices (n = 152). From baseline, the usual care practice achieved a 7% increase in the cardiometabolic monitoring care bundle (glucose/glycosylated haemoglobin, lipids, blood pressure plus body mass index) versus 24% to 58% in the intervention practices. Two-thirds (92/152) of patients participated in medication reviews, requiring pharmacological and/or non-pharmacological clinical actions. The majority of actions were graded as moderate importance. 7% of patients were identified as new pre-diabetic/diabetic and 6% at high risk of cardiovascular disease requiring statin initiation.
Conclusion: A pharmacist-led multidisciplinary general practice based approach can be effective at improving cardiometabolic monitoring; identifying and treating diabetic and cardiovascular risk factors.
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PP211

High exposure of older nursing home residents to polypharmacy, psychotropic polypharmacy and nongeriatric benzodiazepine prescribing—opportunities for development of clinical pharmacy services

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Background and objective: Nursing home (NH) residents are more affected by polypharmacy (PP)/hyperpolypharmacy (HPP), psychotropic PP/HPP and potentially inappropriate medication (PIM) prescribing compared to the general older population due to the higher prevalence of complex health conditions.
The aim of our study was to assess the prevalence of PP/HPP, psychotropic PP/HPP and nongeriatric BZD prescribing in Croatian NH residents and describe patterns of inappropriate BZD use and determinants of PP/HPP.
Method: A multicenter cross-sectional study was conducted on 226 NH residents (65 +), assessed in public NHs in three regions of Croatia (City of Zagreb (COZ), Slavonia, and Dalmatia) (Aug-Dec 2022).
Data were collected using the standardized and validated interRAI Long-Term Care Facilities (LTCF) Assessment tool.
Main outcome measures: To estimate the prevalence of PP/HPP, psychotropic PP/HPP, and inappropriate BZD prescribing in older NH residents, and determine specific patterns of nongeriatric BZD prescribing and risk factors associated with PP/HPP in the NH setting.
Results: 49.6% of NH residents used PP (5–9 drugs), 25.7% HPP (10 + drugs), and 55.8% at least one BZD. The odds of being prescribed a higher number of medications were significantly increased mainly in higher stages of geriatric frailty (Clinical Frailty Scale, CFS $\geq$ 5; proportional odds ratio POR = 4.31), with pain (pain scale $\geq$ 1; POR = 2.50), depression (Depression Rating Scale, DRS $\geq$ 3; POR = 2.31), coronary heart disease (POR = 5.41), type 2 diabetes (POR = 5.22), acid reflux (POR = 4.62) and loss of appetite (POR = 3.20). 28% of 126 BZD users were prescribed inappropriate doses of BZDs, 75% used too long therapy, and 48% risky drug combinations of BZDs.
Conclusion: NH residents are frequently exposed to PP/HPP, psychotropic PP/HPP, and inappropriate BZD prescribing. Educational, clinical, and regulatory measures, including BZD and PP/HPP deprescribing clinical pharmacy services, should be implemented in NHs in order to improve the quality and benefit/risk ratio of medication use in older NH residents.
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PP212

Renal impairment and drug-related problems in the best possible medication history

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Background and objective: The glomerular filtration rate decreases with age and accelerates after the age of 65. Decreased renal function and older age require an individualized approach and adjustment of pharmacotherapy. The Institute for Healthcare Improvement emphasizes the need for accuracy in obtaining the Best Possible Medication

History (BPMH), a comprehensive list of all home medications that a patient has taken before admission to the hospital. BPMH needs to be obtained at the time of admission and appropriately communicated during hospitalization in order to prevent drug-related problems (DRPs). The objective was to determine DRPs and pharmacist interventions with respect to patients' renal impairment.
Method: An observational prospective study was conducted at the Clinical Department of Internal Medicine, University Hospital Dubrava. Patients older than 65 who were taking prescription medication were eligible for inclusion. BPMH was obtained by clinical pharmacist to identify DRPs associated with impaired renal function. CKD-EPI, creatinine clearance and creatinine were considered for evaluation of renal function. Drugs that required dose adjustment and drugs with contraindicated use with regard to renal impairment were designated as renal risk drugs (RRDs).
Main outcome measures: Prevalence of RRDs in hospitalised elderly patinets in BPMH.
Results: A total of 383 patients were included in the study. Renal impairment was found in 43.6% of participants, of which 64.7% had at least one drug that required intervention, regarding impaired renal function. In analysed BPMH data, we identified 279 renal risk drugs, of which 183 drugs needing dose adjustment and 96 drugs are considered as contraindicated. The analysis showed that 47% of drugs needing dose adjustment were properly prescribed while 53% drugs were inappropriate. Clinical pharmacist interventions regarding drug dose or drug change were referred to the prescriber. The most common group according to the ATC classification of drugs that required intervention was group C (Cardiovascular system). The drugs that most commonly required intervention were perindopril (separetly and in fixed combinations), moxonidine, metformin and ramipril.
Conclusion: DRPs can cause negative health outcomes and jeopardize patient safety, especially in patients with renal impairment. Admission is one of the critical points for patient safety and for obtaining BPMH. BPMH is a valuable and irreplaceable support to the clinical pharmacist in identifying and rectifying DRPs.

PP213

Evaluation of drug-drug intercations of psycholeptics and antidepressants in outpatients

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Background and objective: Mental health is an important segment for preserving the overall health of the individual and society. Mental disorders and use of psycholeptics and antidepressants are on the rise. Psychotropics DDIs can lead to treatment failure and serious harm. Considering the length of administration and possible comorbidities in such patients, risk of drug-drug interactions (DDIs) should be regularly reviewed. The aim of this study was to determine the exposure to DDIs of psycholeptics and antidepressants in outpatients and to determine possible differencies between elderly and younger patients.
Method: The retrospective study included 492 outpatients who were prescribed at least two drugs, of which at least drug one was from the observed ATC groups (antipsychotics—N05A, anxiolytics—N05B, hypnotics and sedatives—N05C and antidepressants—N06A). The analysis was performed on the basis of patients' pharmacotherapy cards, and the Lexicomp program was used to identify interactions. GraphPad Prism and Excel Office programs were used in data processing. The Shapiro–Wilk test was used to test the normality of the distribution, and the Mann–Whitney test was used to test the statistical difference. The conducted tests were considered statistically significant if $p < 0.05$.
Main outcome measures: Prevalence of DDIs of psycholeptics and antidepressants in outpatients and possible differencies between elderly and younger patients.
Results: This research included 492 patients, and the average age was 67.7 years. The average number of psychotropic drugs was 1.64 per patient, and the number of drugs from other ATC groups was 4.65. Younger patients had higher number of psychotropics per patient ($p = 0.0275$) while elderly patients had higher number of prescribed other drugs ($p < 0.0001$). A total of 2,285 potential clinically significant interactions were determined, of which almost half of DDIs (47.6%) were determined with psychotropics. The most commonly identified psychotropics involved in DDIs were benzodiazepines, promazine and zolpidem. Elderly patients had higher number of all potential clinically significant DDIs ($p = 0.0095$) but no statistically significant difference was found in the exposure to DDIs of psycholeptics and antidepressants between patients younger than 65 and patients older than 65 ($p = 0.5077$).
Conclusion: Almost 50% of all determined DDIs in outpatients were DDIs of psycholeptics and antidepressants. Younger patients use more psycholeptics and antidepressants compared to the elderly. The elderly had higher number of all DDIs while the exposure of DDIs of psycholeptics and antidepressants was equal in both age group.

PP214

Pharmacists intervention models in drug-drug interactions management in prescribed pharmacotherapy in outpatients

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Background and objective: With the ageing population, number of comorbidities and medications arises, making polytherapy almost unavoidable in contemporary medicine. Polytherapy increases the possibility of drug-drug interactions (DDIs). DDIs are one of the most common problems related to drug administration often causing medication errors and, therefore, represent an important factor in patient safety. DDIs are big challange for any healthcare system. There is an increased need for the health system to involve pharmacists more in the prevention and maangement of DDIs. The aim of the study was to set potential pharmacists intervention models.
Method: This was retrospective study which consecutively analyzed prescribed outpatient pharmacotherapy from 40 randomly selected community pharmacies in Croatia. Pharmacies were randomized by the Research Randomizer program according to the official register of community pharmacies in the Republic of Croatia. Equal number of pharmacies were included from Continental and Adriatic region of Croatia and their urban and rural areas according to the Eurostat classification. DDIs were identified using Lexicomp™ Online which categorizes interactions into five classes. Levels C, D and X are considered clinically significant. Pharmacists intervention models were setermined for identified DDIs. Models were catagorized to independent pharmacists interventions (category I) and pharmacists interventions in cooperation with physicians (category II).
Main outcome measures: Outpatients exposure to DDIs. The types of pharmacists intervention models and their representation in DDIs.
Results: In total, 4107 patients were enrolled in the study. Mean patient age was 67.46 years, they were mostly women (56.5%) and had 3.42 and 5.52 diagnoses and prescription drugs on average, respectively. Overall, 14,175 clinically significant DDIs were identified − 83.3% of C, 15.4% of D and 1.3% of X level. At least one DDI was found in 78.6% of patients. The most frequent models of

pharmacist interventions were of category II (pharmacists interventions in cooperation with physicians): 57.5% in C level, 97.8% in D level and 100% in X level of DDIs. Independent pharmacists interventions (category I) were less represented: 42.5% in C level and 2.2% in D level od DDIs. The number of drugs was the most significant predictor for DDIs, followed by the number of diagnoses and male gender.

Conclusion: The study found high outpatients exposure to potential clinically significant DDIs. The stuidy gives an insight to possible models of pharmacis interventions which could improve pharmaceutical care and increase patient safety. Most dominant model of pharmacists interventions involved cooperation with physicians. This indicates the need for platform development to ensure easy information exchange between pharmacists and physicians regarding pharmacotherapy and DDI management whivh will improve and enable safe, equal and optimal level of DDI mangement to all patients.

PP215

Real-world analysis of the safety profile of ibrutinib in chronic lymphocytic lEUKEMIAORLD

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Background and objective: Ibrutinib is currently one of the drugs recommended for the first-line treatment of Chronic Lymphocytic Leukemia (CLL)[1]. However, concerns about its safety profile have been raised in recent years (Cardiovascular and hemorrhagic toxicity). The aim of this study is to describe the safety profile of ibrutinib in real life and compare it with those published in some different clinical trials (CT).

Method: This is a retrospective study that includes all patients diagnosed with CLL treated for at least one week with ibrutinib in a tertiary hospital, at first and subsequent lines.

Demographic variables (sex, age), number of previous lines, genetic alterations, adverse effects (AE), dose reductions, and treatment suspensions were collected.

Main outcome measures: The primary outcome was to compare the safety results of ibrutinib in our center with what has been published in different CT.

Safety profile was defined as the percentage of patients with any CTCAE grade 3 or 4 (G3-4) AE and the percentages of patients requiring dose reduction or treatment discontinuation due to AE. They were all determined and compared with three different CT (Resonate trial[2] (Re1), Resonate-2 trial[3] (Re2) and a phase II trial comparing ibrutinib against rituximab plus ibrutinib[4] (P2R)). AE were compared as a whole and by type. In the case of infections and bleeding, several CTCAE categories were grouped into one to facilitate comparison.

Results: A total of 85 patients were included, 67% men. Median age at the time of the study was 71 years. Median follow-up was 25.8 months. 42 (50%) patients were receiving ibrutinib as first line of treatment, 27 (32%) as second line, 8 (9%) as third line and 8 (9%) fourth or posterior lines. Nine patient presented mutations of the genes codifying for the immunoglobulin heavy chain variable region, 15 patients presented a 17p deletion, 18 presented a 11q deletion and 4 presented mutations in TP53.

Total grade 3–4 AE were more frequent in our experience (34% of patients agains 29% in Re1 and 22.2% in P2R). Discontinuations due to toxicity were similar (25% vs 16% in Re1, 24% in Re2 and 14% in P2R). Dose changes due to toxicity were less common in our patients (12% vs 17% in Re1 and 23% in Re2). Three EA were more frequent in our experiencie: G3-4 Infections (34% vs 29% in Re1 and 22.2% in P2R), G3-4 bleedings (10% vs 6% in Re1, 7% in Re2 and 5.7% in P2R) and G3-4 anemia (14% vs 9% in Re1, 7% in Re2 and 1.9% in P2R). Some AE were similar in our study and in CT: Atriall fibrilation of any grade (12% vs 11% in Re1 and 12.5% in P2R), G3-4 neutropenia (15% vs 23% in Re1, 13% in Re2 and 9.6% in P2R) and G3-4 thrombocytopenia (8% vs 8% in Re1 and 4.8% in P2R). G3-4 arterial hypertension was inferior to reported in CT: 7% vs 8% in Re1, 12% in Re2 and 30.8% in P2R. Missing data were due to not being reported in the CT.

Limitations: First, we compared our results from pre-treated and naïve patients, against CT designed for specific lines of treatment. It is possible that the existence of prior lines could influence toxicity. Second, we do not quantify the number of times an individual suffers each adverse effect, so we cannot distinguish recurrent AE from punctual AE.

Conclusion: With the limitations of a retrospective and real life analysis that includes Ibrutinib as first and subsequent lines of treatment, the results reported regarding safety and side effects are similar to those published in CT, showing that an expertise management of the disease can achieve comparable results outside of CT.

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PP216

Effectiveness and safety of abiraterone in the treatment of metastatic castration-resistant prostate cancer

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Background and objective: Prostate cancer is the most commonly diagnosed cancer in men in Spain, and the third most common cause of death. For this reason, the search for new drugs that increase survival is necessary. Abiraterone is indicated for adults with metastatic castration-resistant prostate cancer. The objective is to evaluate the effectiveness and safety of abiraterone in this pathology.

Design: It is a retrospective observational study of patients who started treatment with abiraterone from January 2017 to June 2019 included. The data was obtained from the PRISMA-APD® external patient care program, and by reviewing clinical and analytical records in Diraya®. The variables collected were: age (years), duration of treatment (months), initial dose, reduction of doses, status of patient (ECOG), PSA basals values (ng/ml), adverse reactions and exitus date. The efficacy criteria considered were the overall survival (OS) and the progression-free survival (PFS), obtained by the Kaplan–Meier method and defined as the time from the initiation of the treatment to death or disease progression respectively. Safety was assessed by describing adverse effects (AE) according to the CTCAE classification.
Results: The study was done in 31 patients. Nine of these patients were excluded: six due to the lack of information about his clinical record, and three for not having metastasis at the start of treatment. The mean age was 72.5 years. Thirteen patients had ECOG = 0, eight ECOG = 1 and one ECOG $\geq$ 2. The median of PSA basals values was 4.29 ng/ml. The dose initial of 20 patients was 1000 mg daily (18 with prednisone 10 mg daily and 2 with dexamethasone 0.5 mg daily) and the rest 500 mg daily (due to impaired liver function, one with prednisone 10 mg and other with prednisone 5 mg). The median of follow-up time was 10.68 (0.80–38.90) months. The mean of OS was not reached and the mean of PFS was 19.3 (95% CI 13.22–25.38) months. The AE described with Grade $\geq$ 3 were hypertension (23%), astenia (5%) and blood bilirubin increased (5%). The treatment was temporarily discontinued in 3 patients (one due to upper gastrointestinal hemorrhage, other due to acute renal failure in the context of renal colic, and other due to inflammation and epigastralgia, improving after stopping medication) and in 1 patient discontinued treatment permanently due to hemicolectomy with paralytic ileus, stopping all oral medication. During this period without treatment PSA levels dropped, so with the patient's situation, it was decided not to continue taking Abiraterone until progression.
Conclusion: Abiraterone is effective in treating prostate cancer while maintaining a good safety profile. Although the small sample size is a limitation of our study, based on our clinical experience, enzalutamide is effective and safe drug that improve the life expectancy of patients with prostate cancer.

PP217

Effectiveness and safety of enzalutamide in the treatment of metastatic castration-resistant prostate cancer

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Background and objective: Prostate cancer is the most commonly diagnosed cancer in men in Spain, and the third most common cause of death. For this reason, the search for new drugs that increase survival is necessary. Abiraterone is indicated for adults with metastatic castration-resistant prostate cancer. The objective is to evaluate the effectiveness and safety of enzalutamide in this pathology.
Design: It is a retrospective observational study of patients who started treatment with enzalutamide from January 2017 to June 2019 included. The data was obtained from the PRISMA-APD® external patient care program, and by reviewing clinical and analytical records in Diraya®. The variables collected were: age (years), duration of treatment (months), initial dose, reduction of doses, status of patient (ECOG), PSA basals values (ng/ml), adverse reactions and exitus date. The efficacy criteria considered were the overall survival (OS) and the progression-free survival (PFS), obtained by the Kaplan–Meier method and defined as the time from the initiation of the treatment to death or disease progression respectively. Safety was assessed by describing adverse effects (AE) according to the CTCAE classification.
Results: The study was done in 28 patients. Eight of these patients were excluded: five due to the lack of information about his clinical record, and three for not having metastasis at the start of treatment. The mean age was 75.5 years. Three patients had ECOG = 0, 11 ECOG = 1 and 6 ECOG $\geq$ 2. The median of PSA basals values was 13.04 ng/ml. The dose initial of 17 patients was 160 mg daily and the rest 120 mg daily (1 of them due to intolerance to previous treatment with Abiraterone and 2 for age, ECOG and cardiovascular comorbidities). The median of follow-up time was 5.55 (0.77–28.87) months. The mean of OS was 23.03 months (95% CI 21.90–36.1) and the mean of PFS was 10.07 months (95% CI 3.63–17.7). The AE described with Grade $\geq$ 3 were astenia (15%), hypertension (10%) and anemia (5%). The treatment was temporarily discontinued in 2 patients (one due to gastric intolerance, and other due intense asthenia with nausea, vomiting and epigastralgia (subsequently starting at 120 mg)) and in 2 patients discontinued treatment permanently (one due to loss of lower limb strength with gait instability and the other patients due to hot flushes and moderate headaches).
Conclusion: Enzalutamide is effective in treating prostate cancer while maintaining a good safety profile. Although the small sample size is a limitation of our study, based on our clinical experience, enzalutamide is effective and safe drug that improve the life expectancy of patients with prostate cancer.

PP218

Effectiveness and safety of abiraterone versus enzalutamide in the treatment of metastatic castration-resistant prostate cancer

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Background and objective: Prostate cancer is the most commonly diagnosed cancer in men in Spain, and the third most common cause of death. For this reason, the search for new drugs is necessary to increase survival. Abiraterone and enzalutamide are indicated for adults with metastatic castration-resistant prostate cancer. The objective is to evaluate the effectiveness and safety of abiraterone versus enzalutamide in this pathology.
Design: It is a retrospective observational study of patients who started treatment with abiraterone or enzalutamide from January 2017 to June 2019 included. The data was obtained from the PRISMA-APD® external patient care program, and by reviewing clinical and analytical records in Diraya®. The variables collected were: age (years), duration of treatment (months), initial dose, reduction of doses, adverse reactions and exitus date. The efficacy criteria considered were the overall survival (OS) and the progression-free survival (PFS), obtained by the Kaplan–Meier method and defined as the time from the initiation of the treatment to death or disease progression respectively. Safety was assessed by describing adverse effects (AE) according to the CTCAE classification.
Results: The study was done in 22 patients with abiraterone and 20 with enzalutamide. The median age was 72.5 years and 75.5 years respectively. The median of follow-up time was 10.68 (0.80–38.90) months with abiraterone and 5.55 (0.77–28.87) months with enzalutamide. The median of PFS was 19.3 (95% CI 13.22–25.38) months with abiraterone and the median PFS with enzalutamide was

10.07 months (95% CI 3.63–17.7) (HR = 0.632 (CI95%: 0.262–1.523), $p = 0.306$, not statistically significant). The median of OS with abiraterone was not reached and the median of OS with enzalutamide was 23.03 months (95% CI 21.90–36.1) (HR = 0.566 (CI95%: 0.342–0.936), $p = 0.026$, statistically significant). The AE described with Grade ≥ 3 were hypertension (23%), astenia (5%) and blood bilirubin increased (5%) with abiraterone and astenia (15%), hypertension (10%) and anemia (5%) with enzalutamide. In the patients with abiraterone, the treatment was temporarily discontinued in 3 (one due to upper gastrointestinal hemorrhage, other due to acute renal failure in the context of renal colic, and other due to inflammation and epigastralgia, improving after stopping medication) and in 1 patient discontinued treatment permanently due to hemicolectomy with paralytic ileus, stopping all oral medication. During this period without treatment PSA levels dropped, so with the patient's situation, it was decided not to continue taking Abiraterone until progression. In the patients with enzalutamide, the treatment was temporarily discontinued in 2 patients (one due to gastric intolerance, and other due intense asthenia with nausea, vomiting and epigastralgia (subsequently starting at 120 mg) and in 2 patients discontinued treatment permanently (one due to loss of lower limb strength with gait instability and the other patients due to hot flushes and moderate headaches).

Conclusion: In our study, although the median PFS with Abiraterone is higher than with Enzalutamide, it was not statistically significant. In contrast, the median OS was statistically significant. In terms of safety, both drugs had an acceptable adverse effect profile, as they were generally tolerable and/or manageable. The small sample size is a limitation to our study, for this reason more extensives studies are necessary.

PP219

Identification of combination prescription effect of oral hypoglycemic agents on cancer risk: nationwide retrospective cohort study with Korean national health insurance service database

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Background and objective: Several studies have reported the cancer risk-lowering effect of Metformin when used as a single prescription. However, it is often prescribed together with second-line medications, and there has been limited research comparing the cancer risk associated with each second-line drug added to metformin. This article aims to identify the combined effect of metformin with dipeptidyl peptidase-4 (DPP4) inhibitor, sulfonylurea (SU), or thiazolidinediones (TZD) as a second-line drug.

Method: According to data obtained from 2009 to 2019 by The National Health Insurance Service-National Sample Cohort (NHIS-NSC) in South Korea, 11,798 individuals who had never had cancer before added second-line medications to metformin. Patients were divided into three groups based on the types of second-line drug added to metformin for subgroup analyses. 3,833 patients were analyzed after propensity score matching. They consisted of 1,699, 1761, and 373 with DPP4 inhibitor, SU, and TZD prescription, respectively. Incidence rate (IR) was estimated by dividing the number of cancer events in each group by the person-year (day) at risk. The proportional hazards regression model was used to calculate hazard ratios (HRs), and a subdistribution hazard model was used considering competing events of death.

Main outcome measures: The main outcome was defined as incidence of cancer. Participants with the same C-code three or more within a year was considered as cases and the date of first diagnosis was taken as the date of diagnosis. Each subject was followed up until the exit date or the date of cancer diagnosis. The exit date was defined as the date of change in diabetes medications, the date of death, or the end of the study period (December 31, 2019).

Results: For overall cancers, both IR and cumulative incidence were highest in the TZD group and lowest in the DPP4 inhibitor group (IR = 2.80/100,000 person-year, cumulative incidence $\pm$ s.e = 0.0966 $\pm$ 0.0351 for TZD; IR = 1.26/100,000 person-year, cumulative incidence $\pm$ s.e = 0.0525 $\pm$ 0.0136 for DPP4 inhibitor). In pairwise comparisons, the DPP4 inhibitor group demonstrated a lower crude cancer risk (HR = 0.55, 95% CI = (0.35, 0.86), $p = 0.0089$) and adjusted SHR (0.55, 95% CI = (0.35, 0.87), $p = 0.0102$) against the SU group. The DPP4 inhibitor group also had a lower cancer risk compared to the TZD group but with less statistically significant (HR 0.44, 95% CI 0.22 to 0.88, $p = 0.021$; SHR 0.44, 95% CI 0.22 to 0.88, $p = 0.0203$). No significant difference was found in cumulative incidence and HRs between the SU and TZD group.

Conclusion: The prevalence of diabetes is increasing, and combination therapy based on metformin is currently widely used. The addition of a DPP4 inhibitor to metformin resulted in the lowest cancer risk. When TZD was added, both the cumulative incidence and IR were the highest, and the HRs were higher than in the DPP4 inhibitor group; however, the relationship with the SU group was not significant. This suggests that DPP4 inhibitor may be a suitable second line medication option.

PP220

Improving patient safety by designing tools to support antibiotic prescribing: pharmacotherapeutic algorithms

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Background and objective: Spain is characterised by a high use of antibiotics (ATB) and, in parallel, high rates of resistance, whose consequences in terms of health are characterised by therapeutic failures and associated morbidity and mortality.

Since 2014, the National Plan against Antibiotic Resistance (PRAN) has been in place and most of the Autonomous Communities have implemented an Antibiotic Optimisation Programme (PROA).

Currently, the Antimicrobial Therapeutic Guide of the National Health System developed within the framework of the PRAN is not accessible from the Digital Health Record, so it is not used as a prescribing tool by our prescribing professionals.

Our objective is to develop tools to help decision making when prescribing antibiotics, to be used in real time.

Design: Using the NHS Antimicrobial Guide as a reference, the Primary Care Pharmacy Unit has developed decision algorithms for the most prevalent infectious processes in Primary Care, which have been disseminated to all family medicine, paediatrics and emergency departments.

Results: Due to the evolution of antibiotic consumption rates in recent years: 2018 (13.63), 2019 (13.65), 2020 (10.35), 2021 (9.58) and 2022 (12.54), the following algorithms have been developed:

- Pharyngotonsillitis in adults
- Acute community-acquired pneumonia

- Acute bronchitis
- COPD exacerbation
- Odontogenic infections
- Symptomatic UTI in institutionalised elderly
- Cystitis in women
- Cystitis in pregnancy
- UTI in men
- Pneumonia in institutionalised elderly

Conclusion: Algorithms, as prescription support tools, provide quick access, without limitations, as well as basic information on the treatment of the most frequent infectious processes.
The use of these algorithms facilitates compliance with the objectives of the PROA (optimising the use of antibiotics, minimising adverse effects, improving bacterial resistance and ensuring cost-effective treatment).

It would be desirable that the development of Information and Communication Technologies allows access to the recommendations of the PRAN Antimicrobial Guideline.

PP221

Pharmaceutical intervention in the implementation of a clinical audit programme for diabetic patients over 80 years of age

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Background and objective: In type 2 diabetes mellitus (T2DM) patients aged 80 years or older, or with limited life expectancy, hypoglycaemic treatment should be used with caution given the uncertain benefits of intensive glycaemic control and risks of adverse events (hypoglycaemias). The objective was to assess the impact of a safety intervention to improve the appropriateness of intensive treatment in people over 80 years of age with T2DM2.
Design: Intervention study applied to a population of 660,000 inhabitants and targeting.
T2DM patients $\geq$ 80 years (insulin and/or an oral antidiabetic secretagogue and/or two or more non-insulin antidiabetics) prescribed from primary or hospital care, during the year 2022.

The intervention consisted of:

Training sessions in health centres.

Dissemination of material with treatment appropriateness recommendations.

List of involved patients´s distribution for doctors.

Pharmacotherapeutic assessment reporting.

Individual interviews with family physician.

Encourage review with or without changes to be recorded in the Digital Health Record.

The outcome variables were:

% of patients reviewed.

Number of treatment´s modification (change of dose and/or regimen, start of new drug and/or cancellation).

Results: In January 2022, 4920 patients > 80 years of age with T2DM in intensive treatment were identified and 99.72% of them were reviewed during the year.
A change was made in 22.22% of the revisions, so that in 524 patients the dose or regimen was changed, in 160 patients new treatments were started and in 512 patients a treatment was cancelled.

Conclusion: There is a high number of patients over 80 years of age with intensive T2DM treatment and their adequacy needs to be assessed. Treatment review has been carried out in virtually all patients. These patients often have chronic kidney disease, so de-intensification of hypoglycaemic therapy and adjustment of drugs according to renal function helps to improve the safety of these medications.

PP222

Simple tool for identifying appropriateness of NSAID prescribing in nursing homes

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Background and objective: The objective of study was to develop a simple research tool to evaluate the rationality of analgesic use and the potential for deprescription of NSAIDs in older adults residing in nursing homes (NH).
Method: A non-interventional, cross-sectional study was conducted in NH across three regions of Croatia, including older adults (65 + years). Data collection was carried out using interRAI™ Long-Term Care Facilities (LTCF) Assessment form. To identify inappropriate analgesic prescribing, we developed a simple tool (phase 1) and used it to analyse data for 225 participants (phase 2). Descriptive parameters were used for statistical analysis (frequency tables (number and percentage), arithmetic mean and standard deviation).
Main outcome measures: The appropriateness of NSAID therapy in nursing home residents (NHR) using simple, novel tool.
Results: In phase 1 we developed the tool based on a comprehensive literature review, which identified the main sources for establishing criteria for the appropriateness of NSAID prescribing in older adults. We synthesized recommendations for NSAIDs use from Beers Criteria, START/STOPP Criteria, guidelines for pain management in older adults, and guidelines for NSAID deprescribing and incorporated into an Excel spreadsheet using multiple conditional functions. This resulted with 14 criteria and allowed for the immediate analysis of NSAID therapy when patient data was entered. In phase 2 we conducted an analysis of therapy appropriateness in 225 older NHR (76.90% female; mean age 83.00 $\pm$ 6.22 years). Of these participants, 42.67% (N = 96) reported pain at least once in the last three days, and 29.8% (N = 67) were prescribed NSAIDs, with diclofenac (n = 23) and ibuprofen (n = 19) being the most prescribed NSAIDs. In most patients taking NSAIDs, at least one inappropriate prescribing criterion was identified (n = 61, 91.0%). The most common reasons for inappropriate prescribing were prolonged duration of therapy and low dose (ineffective analgesic therapy).
Conclusion: The study highlights high inappropriateness of NSAID prescribing in NH in Croatia. Developed novel tool can be useful in improving and expediting the process of identifying potentially inappropriate NSAID prescribing.
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PP223

Antimicrobial de-escalation in intensive care unit: theory and the reality?

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Background and objective: Antimicrobial de-escalation (ADE) is an integral part of antimicrobial stewardship to decrease the emergence of bacterial resistance. This study aimed to evaluate how often ADE of empirical treatment is performed in the intensive care unit (ICU).
Method: Adult ICU patients receiving empirical antimicrobial therapy for bacterial infection were studied retrospectively from September 2020 until December 2021. ADE was defined as (1) discontinuation of an antimicrobial in case of empirical combination therapy or (2) replacement of the antimicrobial to narrow the antimicrobial spectrum, within the first 3 days of therapy according to test results and clinical picture.
Main outcome measures: The percentage of antimicrobial de-escalation is the primary output of this study.
Results: Overall, 99 patients were studied. The number of patients who received empirical combined therapy (38.4%) was less than those who received monotherapy (61.6%). Piperacillin-tazobactam was the most preferred (45.9%) in monotherapy and meropenem was preferred most in combination treatments (22.7%). Patients who underwent ADE, no change, or change other than ADE change for their empirical antimicrobial treatment within the first 3 days were %3, %61.6, and %35.4, respectively. Procalcitonin level was below 2 μg/l on the 3rd day of treatment in 69.7% of the patients. Culture or culture-antibiogram results of 50.5% of patients were obtained within the first 3 days of empirical treatment. There was no growth in the culture results of 21 patients (21.2%) during their ICU stay.
Conclusion: It is clear that ADE practice in our intensive care patients is much lower than expected. Clinical, laboratory, and organizational conditions must be evaluated objectively together with patient characteristics to reduce the significant difference between theory and reality.
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PP224

An essential problem in antimicrobial stewardship: multi-drug-resistant gram-negative bacterial infection in the intensive care unit

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Background and objective: Gram-negative bacilli (GNB), particularly multidrug-resistant strains (MDR-GNB), represent the main infectious problem in the intensive care unit (ICU) and are therefore a target for antimicrobial stewardship programs.
Method: Data were collected retrospectively relating to all episodes of GNB infection that occurred in an adult ICU between September 2020 and December 2021. GNB infections were divided into two groups for comparison: (1) infections attributed to MDR-GNB and (2) infections attributed to non-MDR-GNB.
Main outcome measures: The primary outcome of this study is the percentage of patients with MDR-GNB.
Results: Overall, 180 patients were studied. Of these, 55 (30.6%) had MDR-GNB infection. There was no growth in culture results during ICU stay in 34 patients (18.9%). There were significant differences between MDR-GNB and non-MDR-GNB patients for the following variables: length of stay in the hospital until admission to the intensive care unit and duration of care with antibiotics in the ICU. Two hundred and eighty-three monomicrobial episodes of primary bacteremia because of *Klebsiella pneumonia* (45.2%), *Acinetobacter baumannii* (31.1%), and *Escherichia coli* (11.3%) were recorded.
Conclusion: Length of hospital stay before ICU admission and duration of antimicrobial treatment in ICU are important risk factors for emerging MDR-GNB. The increase in the frequency of MDR *Klebsiella pneumonia* infections in intensive care units is remarkable. Recruitment of patients to intensive care units, isolation measures, restriction of antibiotic usage times and strict application of other antimicrobial stewardship components are essential.
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PP225

The impact of clinical pharmacist in geriatric drug-related problems: a scoping review

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Background and objective: Geriatric patients are at a higher risk of developing drug-related problems (DRPs) due to polypharmacy associated with comorbid conditions and age-dependent alterations in pharmacokinetics and pharmacodynamics. To identify and describe the core services provided by clinical pharmacists for drug-related problems in geriatric patients.
Design: A scoping review of the literature was performed. The review was conducted following the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews (PRISMA-ScR). The following keywords were searched in PubMed, Ovid Medline, and Scopus: "pharmacist," "drug-related problem," and "geriatric". Articles published in English between January 2018 and December 2022 were included in the study. Three independent authors performed study selection and data extraction by consensus. The pharmacist's intervention identified in the included studies was described based on critical domains in DEPICT v.2.
Results: Of the 193 articles found, 28 publications were evaluated within the scope of the study in accordance with the inclusion criteria. The studies were conducted in hospitals (78.6%) and long-term care facilities (10.7%). The prevalence of DRP was between 29.6% and 93%. "Unnecessary drug use" was the most common cause of DRP. The clinician acceptance rate of interventions was 11–91.9%.
Conclusion: Clinical pharmacy services can contribute to the identification and prevention of drug-related problems in geriatric

patients. The pharmacist's involvement in the multidisciplinary team may improve health outcomes in geriatric patients.
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PP228

Budgetary impact of the use of orphan drugs in a second level hospital

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Background and objective: Orphan drugs are those intended to treat rare diseases (they affect less than 5/100,000 inhabitants). The objective was to analyze the impact of the use of orphan drugs in a second level hospital.
Design: The consideration of an orphan drug was made based on the ORPHANET databases and the drug information center (CIMA). All patients receiving orphan drug treatment during the year 2022, were included. The data was obtained through the corporate application ATHOS-PRISMA®, FARMIS-ONCOFARM® and the analysis of medical records in Diraya®.
Results: A total of 61 patients were included. The treatments used were: chenodeoxycholic in cerebrotendinous xanthomatosis (1 patient; €4579/year), cannabidiol in Lenoux- Gastaut syndrome (1 patient; €10,183/year), pirfenidone in pulmonary fibrosis idiopathic (4 patients; €46,986/year), Ivacaftor/Tezacaftor/Elexacaftor in cystic fibrosis (9 patients; €625,557/year); Daratumumab in multiple myeloma (27 patients; €931,270/year), Pomalidomide in multiple myeloma (3 patients; €105,560/year); sebelipase alpha in lysosomal acid lipase deficiency (1 patient; €216,968/year), carfilzomib in multiple myeloma (3 patients; €37,239/year); Obeticholic acid in primary biliary cholangitis (2 patients; €42,957/year); macitentan in idiopathic pulmonary hypertension (6 patients, €86,657/year); teduglutide in short bowel syndrome (1 patient; €85,445/year) and idebenone in ataxia Friedrich´s (1 patient; €1,400/year). The total cost of orphan drugs for the year 2022 was €2,194,801, which accounted for 7.8% of total annual spending and the percentage of patients seen in the pharmacy unit treated with orphan drugs for the same period it was 1.23%.
Conclusion: The use of orphan drugs has a high impact economical in our hospital. A small number of patients consume a high proportion of the budget, so it is of special importance a rigorous follow-up in the validation, adherence and management of these medications.

PP229

Comparison of adherence with subcutaneous versus oral administration

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Background and objective: Adherence to medication in chronic patients is directly related to the achievement of greater effectiveness, which may be affected by the route of administration used. The objective was to analyze and compare the influence of the route of administration on adherence to pharmacological treatment.
Design: descriptive retrospective observational study. Patients diagnosed with rheumatoid arthritis on active treatment with adalimumab, tofacitinib, and baricitinib were included. The data was obtained from the ATHOS-PRISMA® programs, and from the review of medical records using the DIRAYA® corporate application. Patients with duration of treatment less than one year were excluded. The adherence of each patient was evaluated based on the quotient between the number of days with medication dispensed and the total number of days elapsed. The results of adherence to subcutaneous versus oral administration were analyzed. The Student´s T- test for independent samples was performed on the two data series.
Results: 143 patients (90 women and 54 men) with a median age of 53 years were included. Adhesions from two cohorts were analyzed and compared: 121 patients treated with subcutaneous adalimumab versus 8 patients treated with tofacitinib and 14 with oral baricitinib. The arithmetic mean of the percentages of adhesions obtained for the cohort of subcutaneous administration was 91.8% (85.2–98.4) and for the cohort corresponding to oral administration of 98% (96.4–99.6). After performing the Student´s T test, a value of 30.2 was obtained.
Conclusion: In our study, the adherence of the cohort with oral treatment administration was higher than for subcutaneous administration, in absolute values. After performing the Student´s T correlation test, a normal distribution was verified between the two data series, so no differences were observed between the two types of administrations. It is necessary to carry out new multicenter studies that include a greater number of patients to achieve more conclusive results.

PP230

Use of upadacitinib for atopic dermatitis in a first level hospital

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Background and objective: Upadacitinib is an oral JAK1 inhibitor approved in 2022 for adults and adolescents aged 12 + years with moderate to severe atopic dermatitis (AD) whose disease is not adequately controlled with other systemic drug products, including biologics, or when use of those therapies is inadvisable.
The objective of this study is describing the results of prescribing upadacitinib for AD in a first level hospital.
Design: Data were collected from electronic clincal history and electronic prescription system. It was included age, time of evolution of the disease and previous systemic treatments. Disease severity was measured by SCORAD and EASI at follow up week 16. Adverse effects were checked at the time of collecting medication in the outpatient consulting room at Hospital Pharmacy.
Results: 16 patients were on Upadacitinib since it was approved, 9 on 15 mg and 7 on 30 mg. The dose of upadacitinib was either 15 or 30 mg per day, depending on clinical criterio.
The mean age of our series was 32 years old (18–52). 56% of the patients were male. The median time of evolution of the disease was 16 years (6–35). Some of them suffered from concomitant atopic diseases such as asthma 20% and allergic rhinitis 40%. 100% of the patients had received previous systemic corticosteroids, 87% cyclosporine, and 19% Dupilumab.

The mean baseline SCORAD was 59 and EASI 29. In thefollow-up visits, SCORAD reduced to 12 and EASI to 5 at week 16. 87% of the patients reached an EASI 75 at week 16 and 68% an EASI 90. No adverse events were reported. None of the treatments were discontinued.
Conclusion: Upadacitinib has proved to be an effective and safe treatment for patients with moderate to severe dermatitis not controlled with conventional and biological treatments. Simple

management and oral dosage make it highly convenient for being precribed.

PP231

Healthcare professionals' views on antipsychotic use: a qualitative study

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Background and objective: The benefits of antipsychotics have been shown to outweigh the potential side effects and thus are an integral part of the treatment of psychosis. Nonetheless these medications have significant side effects and require continual monitoring. (1–2) Healthcare professionals (HCPs) support patients who take these medicines and have insights into the issues, challenges and benefits that they see in this patient cohort. The British Association of Psychopharmacology (BAP) have recommended a tiered approach to manage antipsychotic induced weight gain (AIWG) in this cohort using (1) lifestyle interventions (2) change of antipsychotic and (3) commencing the patient on a medication e.g. metformin, that could reduce or limit weight gain in conjunction with lifestyle interventions. (4) The aim of this study is to examine HCPs knowledge, perceptions and experiences of managing patients prescribed antipsychotic medication with specific focus on the tiered approach to AIWG.
Method: Inclusion criteria were doctors, nurses, pharmacists and dietitians who currently provide care to patients receiving antipsychotic medication. Participants were recruited through professional contacts initially followed by a snowball sampling approach. Semi structured interviews were conducted using Microsoft Teams from November to December 2022 and were analysed using the Theoretical Domains Framework (TDF). (4) Local ethics approval was received.
Main outcome measures: Knowledge, perceptions and experiences of HCPs of managing patients prescribed antipsychotic medication with specific emphais on the tiered approach to AIWG.
Results: Six participants (5 female, 5 nurses) were interviewed. Interviews took approximately twenty minutes. Six TDF domains were identified as influencing behaviours around antipsychotic use. Participants reported efforts to achieve a balance between risk and benefits and a holistic approach to patient care plans. Participants reported that olanzapine was associated with the most significant weight gain but was also "the agent of choice". A tiered approach to manage antipsychotic weight gain was viewed positively across all interviews, but in practice, was not implemented. Roles and responsibilities of different staff were not defined in relation to antipsychotic monitoring. Knowledge of the tiered approach to manage side effects was inconsistent. There was a lack of formal pathways for physical health monitoring for patients receiving antipsychotics.
Conclusion: Implementing a tiered system to manage AIWG for patients with psychosis is a challenge for healthcare professionals. Results of this study highlighted the barriers that require attention to facilitate improvements across diverse practice settings.

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PP232

Systematic review of international guideline recommendations on the safe use and discontinuation of antidepressants

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Background and objective: The use of antidepressants has increased over the last decades due to new indications and long-term prescriptions. Clinical guidelines typically specify whether and when to start antidepressants, but clear recommendations on when to stop or to avoid them are also important. The objectives of this systematic review are therefore (1) to compare recommendations by different guidelines on durations of therapy and any safety concerns and (2) to investigate to which extent clinical guidelines provide information on when antidepressant deprescribing should be attempted in the management of different psychiatric disorders.
Method: We searched online guideline registries, websites of national and international organisations for clinical practice guidelines in Germany, UK, United States, Canada, Australia and New Zealand. We identified recommendations on potential *overprescribing* of antidepressants by considering the duration of antidepressant therapy for depression as well as anxiety- and panic disorder. In order to identify recommendations on *high-risk prescribing* of antidepressants we considered any mentioning of contraindications as well as cautions for use on accounts of patient age, co-prescription or comorbidity.
Main outcome measures: Guideline recommendations on *overprescribing* of antidepressants and of *high-risk prescribing* of antidepressants.
Results: We found eight specific statements on when to stop antidepressant therapy. Most of the selected guidelines (n = 11 out of 16) lack specific recommendations on when to deprescribe antidepressants. Recommendations on when to avoid or monitor antidepressants are mentioned in all guidelines, but vary and are not consistent. Of all antidepressants, most (consistent) warnings are stated towards MAOI and TCA.
Conclusion: Overall, we found an inconsistency regarding recommendations on when to stop antidepressant therapy as well as when to avoid antidepressants. This systematic review synthesises guideline recommendations on precautions for antidepressant use, thereby providing a basis for the development of more specific guidance on

deprescribing antidepressants in future guidelines and decision support tools.
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PP233

Medication at risk of inducing delirium in dementia patients

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Background and objective: Acute states of confusion including symptoms such as hallucination, altered state of consciousness and awareness, disorientation, encephalopathy, serotonin syndrome and malignant neuroleptic syndrome. These are commonly recognised under the umbrella term delirium. Dementia patients have a fivefold higher chance of developing a delirium and an overlapping symptom profile making diagnosis particularly difficult. One known risk factor for the development of delirium in this patient group is medication. However, medication that carry a specific risk of delirium in Alzheimer and dementia patients are not extensively reported as any medication is considered to carry a potential risk for these patients. The aim of this study was to provide a narrative overview of the available evidence as reported by product and manufacturers characteristics (EMA website & Medicines Complete) and pharmacovigilance reports in EUDRAVIGILANCE and FEARS.
Design: A narrative literature review hand searched any incident reports on the Pharmacovigilance databases EUDRAVIGILANCE and FAERS as well as product characteristics of all generic and branded products using the EMA website and Medicines complete. A relative risk assessment based on the number of reported cases in EUDRAVIGILANCE and FAERS was additionally conducted using EXCEL 365. All information was presented in a pocket guide format based on an existing list of medication at risk of inducing a delirium, developed by expert clinical practitioners at the University Hospital Innsbruck.
Results: 26.955 cases associated with delirium were identified in FEARS and 14.228 in EUDRAVIGILANZ. The product characteristics of 201 drugs across 29 drug classes were included in the study. Antipsychotics in particular are associated with high numbers of cases of delirium, hallucinations, disorientation and confusion. Among the active substances, olanzapine, clozapine, zolpidem, oxycodone and procyclidine are those that have been associated with a high delirium-inducing property. Only 11 drugs were identified to increase the risk of delirium in dementia. These include transdermal buprenorphine, diphenhydramine, valproate, olanzapine, risperidone and its main metabolite paliperidone, mianserin, oseltamivir, memantine, refecoxib and gatifloxacin.
Conclusion: This narrative review is the first to report on both pharmacovigilance sites and product characteristics. It's focus on medication at risk of inducing a delirium in dementia patients adds unique information to the treatment of this high-risk patient group.
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PP234

Development and validation of an algorithm for the assessment and monitoring of drug-induced QTC prolongation in the psychiatric population

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Background and objective: Drug-induced QTc prolongation (QTcP) can lead to serious consequences, and is often a concern for mental health practitioners as access to experts, such as cardiologists, for consultation is time-limiting and can delay treatment decisions. This research aimed at validating the content of an algorithm for the assessment, management and monitoring of drug-induced QTcP in the psychiatric population.
Method: This was a two-phase investigation which evaluated the appropriateness, safety and evidence to support the decision steps in the QTcP algorithm (QTcPA), using both, qualitative (semi-structure interview of cardiology experts) and quantitative [surveys of health practitioners to assess the content validity index (CVI)]. CVI for the steps and decision processes in the QTcPA were calculated from responses to the surveys.
Main outcome measures: Themes and subthemes emerging from the interviews with cardiologists' in regards to the assessment process used in the QTc prolongation algorithm.
Content validity index (CVI) for the steps and decision processes embedded in the QTc prolongation algorithm based on the assessment by cardiologists, pharmacists and mental health clinicians.
Results: Cardiology experts and mental health practitioners found the QTc prolongation algorithm to be appropriate, safe, and evidence based as indicated by the CVI scores and reliability ratings of the references used in its development. Individual item-CVI analysis indicated high validity of the QTcPA as it scored 0.89 to 1 for all of the steps/decision statements in the three aspects assessed: appropriateness, safety, and reliability of the references used.
Conclusion: These results suggest that the QTc prolongation algorithm may be a useful tool for clinicians to use at the time of prescribing drugs with a risk of prolonging the QTc interval. The implementation of the algorithm into clinical practice using computerized decision support tools through web-based and mobile applications is currently under development.

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PP237

Prevalence and risk factors of metabolic syndrome among female outpatients in Jordan

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Background and objective: Metabolic syndrome predispose suffers, to some degree, to an increased likelihood of diabetes and cardiovascular disease. The role of a pharmacist in the identification and management of metabolic syndrome is associated with improved health outcomes in patients. The goal of the current study was to estimate the prevalence, risk factors, and health outcomes of

metabolic syndrome among Jordanian females. This will allow for identification of the challenge posed by metabolic syndrome and associated factors, which is instrumental in developing pharmacist-based services to address metabolic syndrome.
Method: A multi-center, cross-sectional study that was carried out in the outpatient clinics (endocrine, respiratory and cardiology) of major public hospitals in different geographical locations in Jordan. Recruited patients were assessed for presence of metabolic syndrome using ATPIII definition. Patient-related drug-related problems were also screened for the patients. Associations between demographic and clinical data and various outcomes was attempted and logistic regression analysis was used to identify the independent predictors associated with metabolic syndrome, as well.
Main outcome measures: Prevalence and risk factors of metabolic syndrome.
Results: A total of 994 females were included in the analysis. It has been revealed that 68.2% (n = 678) were qualified to have metabolic syndrome. A sum of 81.1% of the participants has hypertension, 62.9% of the participants fulfilled the diabetes criteria, 86.4% of the participants had waist circumference above 89 cm, 13.7% of the participants had HDL lab test results less than 50 mg/dL, 18% of the participants has triglycerides lab result more than 150 mg/dL and 55.4% of the participants prescribed dyslipidemia drugs. It was revealed that a statistically significant association was noted between being non adherent to self-care and non-pharmacologic interventions and metabolic syndrome. Increased age, increased number of medications, increased body mass index, non-adherence to self-care and non-pharmacologic interventions, prescribed cardiovascular drug, prescribed endocrine drug and attained secondary education or less were independent predictors associated with metabolic syndrome.
Conclusion: The high prevalence of the metabolic syndrome identified highlighted the proposed impact of metabolic syndrome on the patient outcomes, e.g., cardiovascular risk. Multifaceted efforts by different healthcare professionals, including pharmacists, are needed to mitigate these risks.

References
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PP238

Public patterns and determinants of antibiotic self-medication and antibiotic knowledge in Southern Jordan

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Background and objective: Antibiotic self-medication, which refers to acquisition and using antibiotics to treat infections based on personal experience and/or without a doctor's advice or prescription, is a significant public health issue jeopardizing patient health outcomes. The purpose of the present research was to assess the frequency of self-medication among the general public in various geographical locations in southern Jordan, as well as to examine the determinants to self-medication.
Method: A cross-sectional online survey was distributed to lay public in southern Jordan over the period November–December 2022. The survey includes participant demographics, included use/abuse of antibiotic therapy, and assessment of the public knowledge about appropriate antibiotics. Chi-square test and logistic regression were adopted to carry out the statistical analysis.
Main outcome measures: Public patterns and determinants of antibiotic self-medication and antibiotic knowledge.
Results: A sum of 752 of the 984 participants had been using antibiotics during the last year. However, the self-medicating was noted in 413 of the 752. The main source of information about utilizing antibiotics between participants in the questionnaire was the pharmacists. Most of the participants (36%) tended to use antibiotics until the symptoms disappear. Nearly half of the respondents usually take antibiotics for treating runny nose (rhinorrhea). It has been Indicated that self-medication with antibiotics was significantly associated with female patients ($p = 0.016$), basic educational level ($p = 0.001$), location ($p < 0.001$), those who don't have health insurance ($p = 0.002$) and being unemployed ($p = 0.005$). While age had no significant relationship of self-medication ($p = 0.067$). Finally, the results revealed poor understanding of appropriate antibiotic usage which inevitably influences the self-medication practice.
Conclusion: The present study highlighted some of the challenges that hinder prudent antibiotic use and require an action of the healthcare policy makers and regulatory and professional bodies to address.

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PP239

High prevalence of potentially inappropriate prescribing in older nursing home residents from Croatia

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Background and objective: Older adults residing in nursing homes are more vulnerable to negative outcomes (clinical, social, and economic) of potentially inappropriate prescribing (PIP) due to the higher frailty levels. Therefore, our study aimed to determine the prevalence of PIP in nursing home residents from Croatia.
Method: We conducted a cross-sectional multicentric study in nursing home older residents from Croatia, from three regions, the City of Zagreb, Slavonia, and Dalmatia, in the period August-December 2022. We prospectively assessed older residents aged 65 years and older using the standardized and validated interRAI Long-Term Care Facilities (LTCF) Assessment tool. This tool enabled us to comprehensively assess nursing home residents. To determine the prevalence of PIP, we used several tools − Norwegian General Practice (NORGEP) criteria, Laroche's list, EU(7)-PIM list, PRISCUS list, McLeod criteria, and different versions of Beers criteria—2003, 2012, 2019, and 2023. We used in this preliminary analysis the R-software version 4.1.1.
Main outcome measures: The main outcome measure was the prevalence of PIP in nursing home residents from Croatia.
Results: This study included 226 nursing home residents. They were of higher age, 49.6% of them were aged 75–84 years, and 40.3% were aged 85 years and over. Furthermore, most of the residents were women, 76.5%. The total prevalence of PIP using all tools was 91.2%.

There was no statistically significant difference between the different regions in PIP prevalence determined by the chi-squared test (88.0% in Slavonia, 90.7% in the City of Zagreb, and 94.7% in Dalmatia, $p = 0.340$). The lowest prevalence of PIP prescribing was determined by McLeod criteria, 33.2%, and the highest by the EU(7)-PIM list, 89.8%.

Conclusion: Our results show that the prevalence of PIP is concerningly high among nursing home residents from Croatia and that a number of changes need to be made in the near future.

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PP240

Patients' adherence during the COVID-19 pandemic

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Background and objective: During the COVID-19 pandemic, access to healthcare and health professionals was limited[1], and patients were exposed to numerous and even contradictory information about the pandemic and medicines[2]. An observational, cross-sectional study was conducted to evaluate possible changes in patients' adherence during this period.

Method: The study included patients older than 18 with at least one chronic disease and two prescription drugs. The study was conducted from October to December 2021 in community pharmacies across Croatia through a pre-piloted, validated questionnaire assessing medication adherence in chronic patients and the impact of the COVID-19 pandemic.

Main outcome measures: Adherence was measured by the Croatian versions of MARS—Medication Adherence Report Scale© Prof. Rob Horne, and MAQ—Medication Adherence Questionnaire.

Results: During the study period, 200 participants were included. The average age was 64, and there were more females (56%). All participants were diagnosed with at least one chronic disease, most often hypertension (71%). On average, participants had four diagnoses and 6.40 prescription drugs. 57% used at least one over-the-counter drug. The results obtained on the MAQ and MARS scales indicate a high degree of adherence among patients (MAQ 2.45 $\pm$ 2.05 on the scale of 0–12; MARS 22.38 $\pm$ 2.64 on the scale of 5–25). A statistically significant difference in adherence was found according to the place of residence, whereby subjects living in rural areas were less adherent than those in urban areas. Regarding the diagnosis, a statistically significant difference was found for patients suffering from asthma and rheumatoid arthritis (RA), whereby asthmatics were less adherent than others, and patients with RA were more adherent. A few patients stopped taking their medication during the pandemic caused by the COVID-19 virus, which is mainly related to patients with RA. 39% of respondents avoided healthcare facilities due to fear of infection, and 34% had problems getting in touch with a family medicine doctor.

Conclusion: More than a third of patients have stated they had difficult access to healthcare facilities and family medicine doctors during the pandemic. Asthma patients had the lowest adherence, while people suffering from RA were more adherent than others, but most often discontinued certain medications due to fear of the impact of the COVID-19 disease.

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PP241

Medication waste delivered by citizens to Danish community pharmacies

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Background and objective: In Denmark, a lot of health care spending is used on medications, but many medications end up not being used, which threatens patient safety, the environment, and the health economics. Medication waste can originate from many sources such as production, packaging, logistics, and from use at both hospitals and in households. This study concerns discarded medications from households, and the objective was to describe the amount and type of medication waste delivered by citizens at Danish community pharmacies.

Method: An electronic registration form was sent to 39 Danish community pharmacies. The pharmacies were well distributed between urban and rural areas and accounted for 7% of the total number of 524 community pharmacies in Denmark. For 1 week during spring and summer 2022, the pharmacies documented all discarded medications received from citizens at the counter. At 30 pharmacies, pharmacy interns managed the collection and documentation as part of their internship. Guidelines for handling medication waste were composed to secure the work environment at the pharmacies.

Main outcome measures: Number of discarded medications collected at the participating pharmacies.

Results: In total, 4,384 registrations of discarded medications were completed, ranging from six to 546 medications per pharmacy (average 112). Of these medications, 21% were unopened packages and 57% were not expired. Most medications were tablets (55%). Of the discarded medications 3,655 (83%) were identified with item number, and these consisted of 1,614 different item numbers. The primary group of discarded medications were painkillers (9%). The price for the discarded medications totaled 75.000 €, however, this figure is attached with uncertainties.

Conclusion: The amount and type of discarded medication delivered at Danish community pharmacies was very fluctuating. However, if the same amount was delivered at all Danish pharmacies all year around, it would correspond to 5 discarded medications every minute. Generally, a fair amount of medication was still present in the packages delivered as medication waste, and most of the discarded medications were not expired.

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PP242

Unicollection of drugs—educating and influencing the community of pharmacists in the area of the environmental dimension of pharmaceutical care

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Background and objective: The total amount of pharmaceutical waste increases significantly every year mainly due to the aging population, which naturally has an increased consumption of used drugs. From the point of view of protecting the environment and the health of patients, this question is essential and important in the field of pharmacy, especially due to the increasing drug resistance and the overproduction of pharmaceutical waste. The amount of collected drugs in Slovakia is growing every year, yet we do not reach the average of EU countries. The aim of the study was to raise awareness about the proper handling and disposal of unused and expired medicines to protect the health and life of people and nature.
Method: The "UNICOLLECTION" of drugs is organized by the University of Veterinary Medicine and Pharmacy in Košice (UVMP in Košice) and the Association of Pharmacy Students in Košice (APSK) from 2021 regularly twice a year in the University Pharmacy at UVMP in Košice. Patients bring unused and expired medicines to the collection point, and they complete a short questionnaire how they deal with pharmaceutical waste.
Main outcome measures: The amount and structure of the pharmaceutical waste collected during the UNICOLLECTION event, and the respondents' knowledge of how to handle with the pharmaceutical waste.
Results: In 2022, in three days, we managed to collect 40 kg of medicines, 2 kg of injections, 8 kg of municipal waste, 7 kg of paper, and 2 kg of plastic brought by 42 patients. The completed questionnaires show insufficient information on patients in the field of proper disposal of expired and unused medicines. From the survey (n = 35/83.3%), we learned that 20% of the participants threw away medicines in municipal waste. Among the most common reasons, they stated that pharmacies did not take expired drugs or considered it the easiest way to dispose of them.
Conclusion: We consider education in this area to be an important factor in reducing the waste of medicines. It is advisable that pharmacists when providing the pharmaceutical care, in addition to professional instructions, also provide patients with information about the environmental aspects of drugs. Today's times require education in this area, either as part of the undergraduate education of pharmacy students or continuous education of pharmacists.

PP243

Understanding the impact of socioeconomic inequalities on polypharmacy in England

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Background and objective: Polypharmacy is associated with multiple risks, such as adverse drug events, non-adherence and increased likelihood of falls. This study aimed to understand the association of socio-economic factors, particularly education, with polypharmacy ($\geq$ 5 medications).
Method: Data were drawn two population-based cohort studies of people aged $\geq$ 65 years—Cognitive Function and Ageing Studies I and II (CFAS). Participants were recruited from three English Centres (Newcastle, Cambridgeshire, and Nottingham), baseline at 1991 (CFAS I) and 2011 (CFAS II). Individuals were categorised on the number of years in full time education, and baseline cohorts from each study were compared. Logistic regression was used to assess the association between polypharmacy and education.
Main outcome measures: The primary outcome measure was the number of individuals with polypharmacy across different educational categories. Secondary outcomes investigated the change in polypharmacy across different medication groups, with respect to education.
Results: Greater number of years of full-time education was associated with a decreased risk of polypharmacy. There were no difference in risk within each education category in CFAS I. However, In CFAS II those with $<$ 10 years of full-time education had a higher risk of polypharmacy, when compared to individuals with 10–11 years of full-time education, OR 1.61 (95% CI 1.44–1.80). Results obtained across different medication groups were similar.
Conclusion: Education had a greater influence on polypharmacy in CFAS II than in CFAS I, which suggests that health inequalities were widening. Understanding the impact of socio-economic factors, can help healthcare practitioners target medication reviews and the safe prescribing of medications, ultimately improving quality of life.
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PP245

Mental health first aid Ireland: a case study of the adaptation and implementation of a public mental health educational programme

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Background and objective: Mental Health First Aid (MHFA) is a skills-based training programme which equips members of the public with knowledge, skills and confidence to provide support to those experiencing mental health problems or a mental health crisis. The objective of this report is to describe the rationale for, and steps involved in adapting and scaling MHFA in Ireland. We also aimed to evaluate the pilot phase training and understand if the course content was relevant and acceptable to pharmacists.
Design: A research derived framework for scaling public health interventions was used to guide the adaptation and implementation strategy. This included a scalability assessment in which the adaptability, feasibility of scale up and policy significance of MHFA for Ireland were considered. Stakeholder engagement was undertaken. MHFA materials were then adapted for Ireland. An evaluation framework was planned to ensure quality and continued acceptability. A mixture of convenience sampling and purposeful recruitment approaches were used for the pilot phase with evaluation using post-course questionnaires. The results of evaluations from pharmacist

participants were compared with participants who were not healthcare professionals.
Results: Pilot phase evaluation of MHFA training in Ireland demonstrated that the programme achieved its aims of increasing knowledge of participants (n = 288) regarding how to help a person experiencing a mental health problem (mean 3.57 point increase on 10 point Likert scale) and their confidence to do so (mean 3.79 points on 10 point Likert scale). Pharmacists comprised a large proportion (n = 64) of the pilot phase participants and the programme was found to be relevant and acceptable. MHFA is a sustainable, publicly and privately funded, public mental health educational intervention in Ireland with over 15,000 people trained since its introduction in 2016.
Conclusion: MHFA is an evidence based public mental health initiative supporting strategic objectives of Irish health policy with potential to improve health professions education. It has been successfully adapted and implemented in Ireland attracting multi-annual public funding. Frameworks for scaling public health interventions can be useful in planning and implementing educational initiatives. Results of post-course evaluation in Ireland are positive and comparable with international MHFA programmes. MHFA is now being incorporated in national strategies, is embedded in a pharmacy undergraduate curriculum and supports a programme of further research into mental health education.

PP247

Mapping health disparities in 11 high-income nations: when geography matters

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Background and objective: Healthcare delivery faces a myriad of challenges globally with well-documented health inequities based on geographic location. Yet, researchers and policymakers have a limited understanding of the frequency of geographic health disparities. Our objective was to describe geographic health disparities in 11 high-income countries.
Method: We analyzed results from the 2020 Commonwealth Fund International Health Policy (IHP) Survey—a nationally representative, self-reported, and cross-sectional survey of adults from Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, the United Kingdom (UK), and the United States (US). We compared the association of area type (rural or urban) with ten health indicators across three domains: health status and socioeconomic risk factors, affordability of care, and access to care. Logistic regression was used to determine the associations between countries with area type for each factor, controlling for individuals' age and sex. This was a population-based study and adults over the age of 18 from 11 countries were included, using random sampling.
Main outcome measures: The main outcomes were geographic health disparities as measured by differences in respondents living in urban and rural settings, in ten health indicators across three domains.
Results: There were 22,402 survey respondents, a 14–49% response rate, depending on the country. Across the 11 countries and 10 health indicators, there were 21 occurrences of geographic health disparities; 13 of those where rural was a protective factor and eight of those where rural was a risk factor. The mean number of geographic health disparities in the countries was 1.9. The indicators with the most occurrences of geographic health disparities were in the "access to care" domain.
Conclusion: This analysis has identified geographic health disparities across ten indicators in 11 high-income nations. The US had statistically significant geographic health disparities in five of ten indicators, the most of any country, while Canada, Norway, and the Netherlands had no statistically significant geographic health disparities. Health policy and decision makers should look to Canada, Norway, and the Netherlands to improve geographic-based health equity.
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PP248

Attitudes towards deprescribing among older psychiatric outpatients

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Background and Objective:
Psychotropic deprescribing can be a complex process and successful deprescribing requires insight into patients' attitudes towards deprescribing.

We aimed to explore attitudes towards deprescribing among older psychiatric outpatients.
Method:
The study was conducted in the Region of Southern Denmark. Patients were recruited from three geriatric psychiatry outpatient clinics and were eligible for participation if they were aged $\geq$ 65 years, deemed medically stable by a leading physician (i.e., with no recent psychotropic treatment initiation or change) and had an Orientation-Memory-Concentration (OMC) score of $\geq$ 8. Patient attitudes were explored by interview using the validated Danish version of the revised Patiens' Attitudes Towards Deprescribing (rPATD) questionnaire.
Main outcome measures:
Attitudes towards deprescribing.
Results:
A total of 72 patients were included in the study. Sixty-eight percent (n = 49) of patients were women and they had a median age of 76 years (interquartile range [IQR] 73–79). Patients used a median of 8 medications (IQR 6–12), with 88% using antidepressants, 49% using antipsychotics and 24% using anxiolytics. More than two thirds of patients (69%, n = 50) felt they were taking many medications but at the same time 52% (n = 37) considered their medication necessary and 77% (n = 55) were satisfied with their medications. Ninety-two percent of patients (n = 66) would be willing to stop one of their regular medications if their physician said it was possible and about half (51%, n = 37) would try to stop one of their medications on their own. Further, 75% (n = 54) of patients would be worried about missing out on future benefits if one of their medicines was stopped and 37% (n = 27) had previous bad deprescribing experience. Use of antipsychotics was not associated with any pronounced differences in rPATD factor scores.
Conclusion:
Older psychiatric outpatients are open to the idea of deprescribing but may have specific concerns and past bad experiences related to deprescribing. Such concerns and experiences should be considered

during the deprescribing process to ensure a patient-centered approach.

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PP249

A scoping review of medicines optimisation for pain management and race/ethnicity

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Background and objective: Patient race and ethnicity has been associated with health disparities in the management of pain (Kwok & Bhuvanakrishna, 2014). Medicines optimisation, the process that healthcare professionals use to support patients to get the best outcomes from their medicines is an ideal framework to examine pain management and ethnicity to inform care provision (NICE, 2015).
Objectives:
To map studies that describe pain management in the context of race and ethnicity, linking findings to the four principles of medicine optimisation and identifying any evidence for disparities.
Method: The Arksey and O'Malley (2005) scoping review framework was used. Full text articles written in all languages, from 2012 were included if they involved pain management, medicines and described race/ethnicity. Data was extracted and tabulated.
Main outcome measures: Description of pain management, medicine optimisation principle, identification of disparities.
Results: Seventy-four studies were included, n = 72 (97%) originated from the USA, alongside two European studies. Forty four out of fifty two (85%) studies identified disparities in medicine optimisation principles application related to patient ethnicity in adults, with a further twelve out of twenty (60%) studies identifying disparities in children. Medicine optimisation (MO) was evident in particular principle 2 (evidence based medicines) was identified in 92% (n = 68) of papers, MO principle 1 (patient's experience) in 58% (n = 43), MO principle 3 (medication safety) in 4% (n = 3) and MO principle 4 (routine practice) in 0.7% (n = 1) of papers. Papers that described acute pain managed by standard protocols were less likely to be associated with pain management disparities. Children of any age obtained evidence based pain management at a greater degree than adults.
Conclusion: Pain management disparities exist when in the context of race/ethnicity. Disparities minimised with the use of protocols and guidelines, which are associated with paediatric care, acute pain management and palliative care.

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PP251

A cross-sectional survey of facemasks induced allergies during COVID-19

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Background and objective: The use of facemasks have been mandated globally amid the COVID-19 pandemic. Several studies reported the occurrence of multiple allergies with users, of most concern is dermal and nasal allergies [1]. The incidence of allergic reactions in relation to history of allergic conditions, specific facemask use habits, such as duration of use and frequency of changing, is yet to be investigated in general population in United Arab Emirates (UAE). The aim of this research is to investigate the incidence of facemask related allergic conditions (dermatologic or nasal) in general population during COVID-19 pandemic in UAE.
Method: Cross-sectional online survey was used to collect data from general population through convenience sampling. Data collected include; (1) participants demographics, (2) face mask use habits and (3) incidence of different forms of dermal and nasal allergies. Survey was offered in both English and Arabic to maximise the response rate. Data collection continued for four weeks then responses were extracted using Excel sheets and transferred to IBM SPSS software for descriptive and inferential statistical analysis.
Main outcome measures: Evaluation of the allergic response incidence associated with the use of face masks.
Results: A total of 379 responses were received of which 344 (90.8%) were females and 35 (9.2%) were males, age range (18–29) years. The median % score of incidences of skin allergies due to the use of facemask was 35.0 (20.0–100.0). For skin allergies, the most commonly reported type was eruption of acne pimples (mean = 2.49), this was followed by sweating (mean = 2.42), then itching and redness. For nasal allergies, median % score of incidence was 34.55 (20.0–100.0). According to ranking, the most frequently reported nasal allergy was itchy eye, nose and throat (mean = 2.22). The differences between reported means for skin and nasal allergies was found to be statistically significant ($p \leq 0.05$). According to calculated median, incidence of skin and nasal allergies was found to be higher in young females with history of allergy and taking continuous medical treatment for their allergic condition. This association was found to be statistically significant ($p \leq 0.05$). Of note, the type of facemask did not show any statistically significant association to occurrence of allergies. Incidence was higher in participants with prolonged daily use of face mask (more than 8 h) and those who change their facemask several times per day.

Conclusion: This study identified the impact of history of allergic reaction along with receiving chronic allergy medications on occurrence of facemask related allergies. Those who are at risk of developing such allergies should avoid wearing their mask continuously without interruptions.

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PP252

Hospital readmissions of elderly patients initially admitted for fall: are there differences between 7-day and 8-to-30-day readmissions?

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Background and objective: Every year, up to 25% of elderly people are admitted to hospital for traumatic injuries, such as falls and fall related injuries (FFRI), which are the leading cause of non-fatal injuries in elderly people. These admissions will lead to readmissions in 17% of the patients.
Interestingly, readmissions can be classified in two categories: 7-day hospital readmissions (HR7) which reflect the quality of intra-hospital care and 30-day hospital readmissions (HR30) which reflect the capacity of all health caregivers to ensure continuity in the caregiving. HR7, all causes combined, are preventable by in-hospital interventions, while HR30 are more amenable to community interventions. In order to optimize in-hospital interventions, risk factors for HR7 after an index admission for FFRI have been explored in the present study.
Method: We conducted a retrospective case–control study using the clinical data warehouse of 11 hospitals of the Greater Paris University Hospitals.
Cases were FFRI admissions of elderly patients, who experienced a HR7, whereas controls experienced an unplanned readmission within 8 and 30 days of discharge. A multivariate logistic regression model was constructed.
Main outcome measures: Hospital readmissions were assessed within seven days and between 8 and 30 days after discharge.
Results: In 2019, 127 admissions for FFRI of elderly patients were followed by an HR30. Among them, 64 (50.4%) occurred within 7 days after discharge.
An abnormal serum bicarbonate concentration (OR = 2.36, 95%CI = 1.06–5.34), a heart condition (OR = 2.55, 95%CI = 1.14–5.95), an admission directly from home (OR = 2.57, 95% CI = 1.05–6.60) and a potentially inappropriate medication (PIM) prescription (OR = 3.13, 95%CI = 1.15–9.34) were associated with a HR7 ($p < 0.05$). On the contrary, obesity (OR = 0.31, 95%CI = 0.10–0.91) was associated with an 8-to-30-day readmission, after adjustment for traumatic injury.
Conclusion: Our study showed that HR7 account for half of all HR30 of elderly inpatients initially admitted for FFRI. These hospital readmissions are known to be more easily preventable and respond better to in-hospital interventions. Patients readmitted within 7 days after discharge have specific profiles and, so, could benefit from priority interventions in order to reduce hospital readmission.
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PP253

Influences on health professionals' reporting of medication errors: a systematic review of qualitative evidence using the theoretical domains framework

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Background and objective: Medication error reporting systems and processes have potential to impact professional practice, medication safety and patient care. However, extensive evidence of under-reporting by health professionals highlights the need for behaviour change. The UK Medical Research Council guidance for developing and evaluating complex interventions advocates theory driven interventions as being more effective than those developed pragmatically.[1]This review aimed to retrieve, critically appraise and synthesise the qualitative evidence on influences on health professionals' reporting of medication errors. The evidence from qualitative studies will illuminate the behavioural determinants of not reporting errors, as a first stage in intervention development.
Method: In April 2023, Pubmed, Embase, Scopus and Cumulative Index to Nursing and Allied Health Literature were systematically searched. Qualitative studies reporting influences on health professionals' reporting of medication errors were included. Full-text screening, quality assessment (Critical Appraisal Skills Programme) and data extraction were independently undertaken by two reviewers. Reported influences were mapped to the Theoretical Domains Framework (TDF), an integrative framework of 33 theories of behaviour change.[2]
Main outcome measures: Key, recurring TDF domains to be used as target(s) for intervention development.
Results: The review included 14 studies, 6 from Asia, 5 from Europe, 2 from North America and 1 from Africa. Seven studies included mixed health professionals, 4 nurses only and 1 each of doctors, pharmacists, and paramedics. Sample sizes ranged from 8 to 54 with a total of 344 participants. Facilitators of reporting mapped to key TDF domains of: knowledge; social/professional role and identity; and beliefs of consequences. There were more themes of barriers, which mapped to key TDF domains of: beliefs of consequences; environmental context and resources; emotions; and knowledge.
Conclusion: The pooled data from this theoretically driven qualitative evidence synthesis can be used in the development of behaviour change interventions. The identified TDF domains identified as barriers will now be mapped to behaviour change techniques, defined as 'observable and replicable components designed to change behaviour'.[3] These will then be tested via feasibility/piloting studies prior to further evaluation.

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PP254

Parental knowledge, views, and perceptions of human papilloma virus infection and vaccination: a cross-sectional study

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Background and objective: Human papillomavirus (HPV) is a highly contagious virus that is linked to cervical cancer which is considered to be a major public health issue at the national and international levels. Cervical cancer is listed as one of the most common cancers in females in Saudi Arabia and has become the third most common type of gynaecological cancer in the country [1,2]. Vaccines against HPV types 16 and 18 are now available and can reduce the incidence of cervical and other anogenital cancers [3]. The HPV Working Group of the International Agency for Research on Cancer advised routine HPV vaccination for females aged 11 to 12 years in Saudi Arabia [4].
This study aims to explore parental knowledge, views, and perceptions around HPV in Saudi Arabia.
Method: The study was conducted from June to August 2021 at King Abdul-Aziz University Hospital in Jeddah, Saudi Arabia, a teaching hospital with 1,067 beds capacity. Parents of daughters aged 8 years or less were approached at pediatric and gynaecology outpatient waiting areas and invited to complete the questionnaire.
A cross-sectional descriptive study. A pre-piloted online questionnaire was used through direct interviews to collect information from a group of parents, with the researcher reading out questions and recording the responses to promote inclusion. In compliance with the Declaration of Helsinki, written consent was obtained from each participant including participants who were identified as illiterate with their mark accepted in place of a signature.
Main outcome measures: The questionnaire contained 20 items (4 open questions, 11 multiple choices, and 5 yes or no questions) and was categorized into four sections: (1) demographics (sex, age of parent, education, marital status, social status, number of daughters); (2) parental knowledge; (3) perceptions; and (4) views about HPV and HPV vaccinations, including questions on how to increase public awareness about the importance of HPV vaccination.
Results: Of the 500 parents who participated in this study, only 54 (11%) had heard about HPV being associated with cervical cancer. The majority of the participants reported being from the middle social class (n = 472, 94.4%). The vast majority (n = 483, 96.8%) had never heard of the HPV vaccine and (n = 470, 94%) were unwilling to vaccinate their daughters. The primary reported reason behind refusing the vaccine was the lack of information on the importance of HPV vaccination (n = 426, 85.2%). The majority (n = 419, 83.8%) believed that there was insufficient information regarding vaccine safety and efficacy. Participants suggested ways to increase vaccination acceptance like social media awareness (n = 369, 73.8%), educational seminars in schools (n = 254, 50.8%), and a governmental platform (n = 218, 43.6%) providing information on HPV infection and promoting vaccination.
Conclusion: Parents in the present study demonstrated a substantial lack of knowledge about HPV infection and vaccination, which may necessitate the establishment of national awareness campaigns.

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PP255

Impact of drug coverage on medication use and adherence disparities

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Background and objective: Prescription drug cost-sharing policies, including copayments, coinsurance, and deductibles, may serve as a barrier to medication adherence, particularly among low-income and minority populations. Our study objective was to conduct a systematic review of the impact of drug cost-sharing and policies to reduce cost-sharing on racial/ethnic, income, or education disparities in medication adherence.
Method: We conducted a systematic literature review, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) reporting guidelines. Using combinations of controlled vocabulary, title, and abstract keywords, we conducted comprehensive literature searches of PubMed and JSTOR to identify papers focused on the concepts of prescription drug coverage and disparities. From our initial master list, we included peer-reviewed, quantitative research, published in English between 2020 and 2023, but not limited to US studies. Articles must have included an analysis that would allow us to assess the interaction between drug cost-sharing and race/ethnicity, income, or education. Thus, we included papers with the following designs: cross-sectional regression models with interaction effects, stratified models, difference-in-differences (DID) models, or models that included measures of disparities, unadjusted and adjusted for cost-sharing policy exposure. Qualitative studies or those that included only US Medicaid populations were excluded as this program typically has no cost sharing.
Main outcome measures: Our primary outcomes of interest were disparities in medication adherence by race, education, or income.
Results: The total number of studies identified through PubMed, JSTOR, and subsequent searches of paper reference lists was 2,162. We identified 19 papers that met our inclusion and exclusion criteria. We find weak evidence that policies to lower drug cost-sharing are associated with reduced disparities in medication adherence. Ten

papers suggest lower cost-sharing was associated with decreased disparities, seven studies suggest that lower drug costs had no effect on disparities, and two studies find increased disparities associated with policies to reduce cost-sharing (14,19). Studies varied considerably in their ability to identify the impact of cost-sharing policies on disparities in medication adherence. Some of the strongest evidence came from six papers that used DID models to examine the impact of Medicare Part D. Of these papers, three found that Part D significantly reduced disparities (16–18), two found no change (13,15), and one found increased disparities. Two other papers used DID models to assess the impact of copayment changes in employer-sponsored plans. These papers found that reduced copayments were associated with decreased disparities in medication adherence.
Conclusion: We find weak evidence that reduced cost-sharing is associated with reduced disparities in medication adherence. The literature consistently shows that lower copayments are associated with better medication adherence. In those cases with disparities increased, minority or low-income beneficiaries benefitted from the policy change, but white or higher-income beneficiaries benefited more. Future studies, using strong study designs should further investigate the impact of cost-sharing policies on disparities in medication adherence, and whether particular cost-sharing policies are better suited to reducing disparities.
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PP259

Nanoparticle formulation for the enhancement of oral bioavailability of a hydrophilic mast cell stabilizer; a litterature review

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Background and objective: Background
Cromolyn Sodium (Sodium cromoglycate) belongs to a class of drugs known as cromones which act to inhibit the release of inflammatory mediators from mast cells. The administered drug is typically the disodium salt of cromoglycate, which is a Biopharmaceutical Classification System Class III drug with reported intestinal bioavailability of approximately 1% (Shah et al., 2011) and a biological half-life of 45–100 min. Poor oral bioavailability and rapid clearance of cromoglycate from the body has resulted in finding alternative route of administration such as nasal administration as the dominant regimen for clinical dosing, with a reported bioavailability of 7% (Abruzzo et al., 2019). Oral administration remains the most accepted delivery route for patients, resulting in high compliance to prescribed dosing programs (Yeh et al., 2011). It is, however, a challenge to achieve therapeutically relevant blood drug concentrations following transport across gastrointestinal epithelia for hydrophilic ionic molecules such as cromoglycate, since the drug molecules cannot diffuse freely across epithelial cell membranes due to their high molecular weight, charge and hydrophilicity. Recent Pharmaceutical approaches succeeded to enhance the encapsulation efficiency of Cromolyn sodium within nano-carriers, with consequent 30% increase of the drug oral bioavailability.
Aim
The current review focuses on reviewing several approaches that have been used for the oral delivery of Cromolyn sodium using nano-carrier technology.
Method: The method of data search follows the next criteria. PubMed database searches were conducted from 2010 to January 2022 using the search terms: Cromolyn sodium, oral absorption, nano carrier, nanoparticles, chitosan, hydrophilic drug, mast cell stabilizer. Bibliographies of relevant review articles and information from the manufacturer were reviewed for additional references. Study selection and data extraction: Available English-language literature, including abstracts, preclinical, and clinical trials, review articles, and scientific presentations were examined.
Main outcome measures: Evaluation of possible modifications that could be used in combination with cromolyn sodium nanoparticles in order to maximise its oral absorption and bioavailability.
Results: The preparation of Cromolyn Sodium nanoparticles was successful as per the following techniques; Core–shell polymeric-lipid hybrid (PLGA- Lecithin- Core shell) nanoparticles (Patel et al., 2015), Solid lipid nanoparticles using Glyceryl monostearate as the encapsulating polymer (Patel et al., 2016) and Chitosan nanoparticles (Joyce et al., 2022). An Ex vivo intestinal permeation and a pharmacokinetic animal test are performed after oral administration. According to the results obtained, the encapsulation of Cromolyn sodium in the core shell PLGA-Lecithin and chitosan nanoparticles have shown increased in intestinal permeation and oral absorption relative to the pure form of the drug. The most efficient bioavailability is correlated to the core shell PLGA—Lecithin nanoparticles which was attributed to the high lipophilicity imparted to the hydrophilic drug. The oral bioavailability of the drug—nanoparticle reached 11.9 folds compared to the pure drug.
Conclusion: In order to further improve the oral bioavailability of Cromolyn sodium, combinations of formulation attempts should be candidates for further investigations.

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The impact of simulation based education on the tolerance of ambiguity of general practice clinical pharmacists

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Background and objective: General Practice Clinical Pharmacists (GPCPs) are clinicians who function at an advanced clinical level using independent prescribing (IP) skills involving clinical risk management and complex decision making.[1,2] Ambiguity is inherent within such clinical practice and tolerance of ambiguity is an essential quality in clinicians. The aim of this work was to investigate the impact of Simulation Based Education (SBE) on GPCP tolerance of ambiguity.

Method: IP qualified GPCPs undertook SBE with four advanced practice scenarios incorporating elements of ambiguity. An adapted 'Generic' Tolerance of Ambiguity for Medical Students and Doctors (TAMSAD) Scale[3] was completed by the GPCPs pre and post SBE. The TAMSAD scoring system including reverse scoring for some items was employed. Differences were analysed using the Wilcoxon Signed Ranks Test. Ethics approval was granted by RGU PALS Ethics Review panel.

Main outcome measures: 'Generic' TAMSAD scores before and after the SBE course were used to test the hypothesis that SBE for GPCPs can increase tolerance of ambiguity shown through increased 'Generic' TAMSAD scores.

Results: Thirty-one GPCPs participated in the SBE with 30 completing pre and post 'Generic' TAMSAD. The median (IQR) scores for pre and post were 57.3 (53.2 to 61.2) and 62.1 (55.2 to 71.8) respectively. Scores of 25 increased, 2 decreased and 3 were unchanged. There was a statistically significant difference between pre and post values, $Z = -4.233$, $p < 0.001$.

Conclusion: Following the SBE, GPCPs tolerance of ambiguity, as measured by TAMSAD scoring, increased. Further research will help determine whether the observed increase in tolerance is an effect of SBE or other factors. A limitation in this work is that the 'Generic' TAMSAD tool has not been fully psychometrically validated in a wide array of clinician groups. However, the results seem to indicate potential for this TAMSAD tool to be used to facilitate the development and evaluation of both individual clinicians and SBE innovations.

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