

CONFERENCE ABSTRACTS

## FIP Brisbane 2023

81<sup>st</sup> FIP World Congress of Pharmacy and Pharmaceutical Sciences in Brisbane, Australia,  
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### Pharmacy practice research

#### HMG-CoA reductase inhibitor ameliorates platinum and taxane-induced peripheral neuropathy: A basic research and medical database analysis

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**Background:** Patients with cancer experience chemotherapy-induced peripheral neuropathy (CIPN), an intractable adverse event of anticancer drugs. However, no effective therapeutic drug exists. We have previously reported that simvastatin, an HMG-CoA reductase inhibitor (HRI), can ameliorate oxaliplatin-induced CIPN.

**Purpose:** Here, we demonstrate the efficacy of HRIs in oxaliplatin- and paclitaxel-induced peripheral neuropathy in mice. Additionally, patient safety was predicted using medical claims data.

**Method:** Oxaliplatin or paclitaxel were administered to male C57BL/6J mice. The HRIs (simvastatin, atorvastatin, and rosuvastatin) were administered orally. Changes in cold and mechanical sensitivity were assessed using the acetone test or von Frey tests. The influence of HRIs on the antitumor effect was measured using the survival rate of cancer cells (colon, gastric, ovarian, and lung) treated with anticancer drugs. The incidence of peripheral neuropathy and overall survival were examined in anticancer drug user reports in the JMDC claims database.

**Results:** HRIs did not affect the anticancer drug-induced cold sensitivity. In contrast, HRIs ameliorated the decreased threshold to mechanical stimuli in mice treated with oxaliplatin or paclitaxel. The survival ratio of each cancer cell type was unchanged after cotreatment with the HRIs, oxaliplatin, or paclitaxel. Patients given HRIs had no exacerbation of neuropathy, despite having some neuropathy risk factors. Moreover, overall survival was not decreased by the HRIs.

**Conclusion:** Our results indicated that HRIs are effective and safe for treating CIPN. However, the benefits of HRIs in non-lipidemic patients need further consideration.

#### A systematic review on persistence with anti-dementia medication and its determinants

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**Background:**

The anti-dementia medication such as cholinesterase inhibitors (ChEIs) (rivastigmine, galantamine, and donepezil) and N-methyl-D-aspartate (NMDA) receptor antagonist (memantine) are used for the treatment of dementia. However, the relatively limited benefits of these medications are only possible through continuous treatment (medication persistence).

**Purpose:**

The systematic review evaluated the prevalence (rates), impact/outcomes, and factors that influence persistence with anti-dementia medication in their real-world use.

**Method:**

A comprehensive systematic literature search was conducted using four major electronic databases: Ovid MEDLINE, Ovid EMBASE, CENTRAL and Ovid PsycINFO. The search terms were identified from the broader themes of 'persistence', 'CHEIs', 'memantine' and 'patients with dementia' (all age groups, all stages of dementia). The search strategy was limited to the English language and the search timeline was from January 1995 to April 2023. Real-world studies in any setting that were not interventional and included results on medication persistence (with or without associated risk factors and clinical outcomes) were included. Two reviewers independently assessed all articles. Methodological rigour was assessed through the Joanna Briggs Institute (JBI) checklist for prevalence studies.

**Results:**

The search yielded 737 studies, of which 37 met the inclusion criteria; these accounted for 459,863 patients and covered 16 high-income countries and only 1 low-income country. Thirty-four studies reported 12 months persistence rates (ranging from 20-80%), of which adverse events/poor tolerance (n=21, 62%), perceived inefficacy (n=10, 30%), and older age (n=9, 27%) were the major contributory factors for treatment non-persistence. Studies reported better persistence rates associated with appropriate dosage, frequent physician visits, surveillance of the patients, educating carers and the patients about the disease and treatment, and using patch formulations and pill boxes.

**Conclusion:**

Real-world anti-dementia medication persistence rates were found to be suboptimal (20-80%), which may lead to detrimental effects on treatment outcomes.

### Exploring Australian pharmacists' views towards reducing the risk of medicines-related harm in aged care residents

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**Background:** Medicines-related harm is common in older people living in residential aged care facilities (RACFs). Pharmacists offering services in the aged care sector may play a key role in reducing medicines-related injury. No study has extensively used a qualitative approach to investigate the views of pharmacists towards reducing the risk of medicines-related harm in older residents.

**Objectives:** To explore Australian pharmacists' views towards reducing the risk of medicines-related harm in aged care residents.

**Methods:** Qualitative, semi-structured interviews were conducted with 15 pharmacists providing services (e.g., through the provision of medication reviews, supplying medications, or being an embedded pharmacist) to RACFs

identified via convenience sampling. Data were analysed by thematic analysis using an inductive approach.

**Results:** Medicines-related harm was thought to occur due to polypharmacy, inappropriate medicines, anticholinergic activity, sedative load, and lack of reconciliation of medicines. Pharmacists reported that strong relationships, education of all stakeholders, and funding for pharmacists were facilitators in reducing medicines-related harm. Pharmacists stated that renal impairment, frailty, staff non-engagement, staff burnout, family pressure, and underfunding were barriers to reducing medicines-related harm. Additionally, the participants suggested pharmacist education, experience and mentoring improve aged care interactions.

**Conclusions:** Pharmacists believed that the irrational use of medicines increases harm in aged care residents, and medicines-specific (e.g., sedative load) and patient-specific risk factors (e.g., renal impairment) are associated with injuries in residents. To reduce medicines-related harm, the participants highlighted the need for increased funding for pharmacists, improving all stakeholders' awareness about medicines-associated harms through education, and ensuring collaboration between healthcare professionals caring for older residents.

### People's experiences living with peripheral neuropathy: A qualitative study

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Peripheral neuropathy is a neurological disorder characterised by pain, numbness, or tingling due to nerve damage. Peripheral neuropathy is one of the main health issues in Kuwait and is a rising concern which affects a large proportion of the population, therefore the lived experience needs to be explored to identify areas for improvement in care. This qualitative study explored the experiences of people living with peripheral neuropathy in Kuwait. Semi-structured interviews were conducted with 25 participants recruited from the Neurology Outpatient Clinic of the Ibn Sina Hospital in Kuwait. The interview questions explored their experiences and understanding of pain plus the impact on their daily life. The interviews were audio recorded, transcribed and translated into English then coded using NVivo 12. Thematic analysis was conducted to identify patterns and themes in the data. Three major themes were identified including treatment beliefs (perceived effectiveness of treatment and seeking alternative treatments), the barriers to pain management (medication side effects, relationships with healthcare professionals and lack of information and access to healthcare), and the impact on quality of life (impact on work and social, physical, and psychological consequences). Self-efficacy was a key construct and over-arching theme that was discussed in all aspects. This paper presents the experiences of people living with peripheral neuropathy and reveals there is much scope for improvement of current treatments in Kuwait. Self-

management strategies are recommended alongside prescribed medication and healthcare professionals are encouraged to use a patient-centered approach. More importantly, information and support on the condition to promote coping strategies and self-efficacy should be adopted to improve quality of life. These findings can be implemented locally and globally to improve the quality of care provide to people living with peripheral neuropathy.

### The experiences of people living with peripheral neuropathy in Kuwait: A process map of the patient journey

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Peripheral neuropathy is a neurological disease characterised by pain, numbness, tingling, swelling or muscle weakness due to nerve damage, caused by multiple factors such as trauma, infections and metabolic diseases such as diabetes. In Kuwait 54% of the diabetic population, has peripheral neuropathy. In this exploratory, qualitative study conducted in Kuwait, 25 subjects with peripheral neuropathy took part in one-on-one, semi-structured interviews lasting 45–60 min. Interviews were transcribed, translated into English and coded using NVivo 12. Four individual patient journeys were mapped out in detail, then compared and condensed into a single process map. The remaining 21 interviews were then reviewed to ensure the final map represented all patient journeys. Participants reported similar healthcare pathways for their peripheral neuropathy and faced various difficulties including lack of psychological support, administrative issues (long waiting referral periods, loss of medical documents, shortage of specialists and lack of centralized electronic medical records) and inadequate medical care (shortage of new treatments and deficient follow-ups). Mapping the patient journey in Kuwait showed similar pharmacological treatment to UK guidelines, except that some medicines were unavailable. The map also indicated the need for an integrated referral approach, the use of technology for electronic medical recording and report transmission, alongside education on self-management, coping mechanisms and treatment options for people living with peripheral neuropathy.

### Leadership competencies and behaviours in pharmacy: A qualitative content analysis

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#### Background:

Leadership competencies are essential for effective leadership in any field, including the pharmacy profession.

These competencies consist of skills, knowledge, abilities, and behaviours necessary for successfully performing specific roles and tasks (1). With the healthcare landscape continually evolving and pharmacy practice growing more complex, identifying the competencies required for pharmacy leaders is crucial for optimizing organizational performance and improving patient outcomes. Therefore, recognizing and developing the necessary competencies for effective pharmacy leadership is vital for success in the field.

#### Aim:

This study aimed to identify leadership competencies and the associated behaviours statements specific to the pharmacy sector.

#### Method:

A qualitative content analysis was conducted to identify leadership competencies and associated behaviours. The study followed a systematic process of searching through six databases including; CINAHL, Medline (Ovid), Scopus, Embase, ERIC, and PsycInfo and grey literature including policy documents. The search was limited to English and Arabic language articles without a time frame restriction. Articles were screened based on inclusion criteria and thematic analysis, allowing for the identification of key themes and patterns in the data.

#### Results:

The study analysed a total of 47 articles, with the majority of them being conducted in Western countries. The findings identified 68 leadership competencies essential for effective pharmacy leadership, with vision, communication, and self-awareness as the top-ranked competencies. The analysis also revealed that the list of behaviours associated with these competencies exceeded 200 and varied across different articles according to the country and intended pharmacy role. These results underscore the need for a comprehensive leadership framework that considers the specific competencies and behaviours required for effective pharmacy leadership in different contexts.

#### Conclusion:

This study provides valuable insights into leadership competencies and behaviours specific to the pharmacy sector, serving as a foundation for the development of a leadership framework for pharmacy professionals. The study's findings have practical implications for pharmacy organizations and institutions globally, enabling them to develop effective pharmacy leaders who can drive innovation and positive change within the profession. The project is part of a larger initiative focused on developing a leadership framework for pharmacy professionals in Kuwait. The study's findings serve as a foundation for the development of this framework, which will provide guidance to both existing and aspiring pharmacy leaders, practitioners and students in Kuwait to enhance their leadership skills.

## Safety and efficacy of apixaban in haemodialysis patients

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**Background:** End-stage renal failure (ESRF) patients undergoing haemodialysis are at an elevated risk of both thromboembolic and haemorrhagic events. Traditionally, warfarin has been used for the treatment and prevention of thrombotic events in this population, despite controversy regarding its safety and efficacy. Apixaban, a direct-acting oral anticoagulant, has relatively low renal excretion (27%) and increasing evidence in chronic kidney disease (CKD), with the potential to provide a therapeutic alternative to warfarin in haemodialysis patients requiring anticoagulation. In haemodialysis patients, preliminary pharmacokinetic studies have demonstrated that apixaban has a similar predicted drug exposure to subjects with normal renal function, yet this has not been linked to clinical outcomes. Apixaban in haemodialysis patients remains understudied and off-label in Australia.

**Purpose:** To assess the safety and efficacy of apixaban in ESRF patients undergoing intermittent haemodialysis.

**Methods:** A single-centre retrospective cohort study was conducted on ESRF patients undergoing intermittent haemodialysis and receiving apixaban. Medical records were reviewed and deidentified data was collated and analysed, including patient age, apixaban indication and dosage, duration of treatment, and details of any thromboembolic or haemorrhagic complications.

**Results:** Twenty-five patients treated between 2018 and 2021 were eligible for inclusion in the study. The indications for apixaban were atrial fibrillation (44%), venous thromboembolism (44%) and fistula thrombosis (12%), with an average treatment duration of 1.6 years. The rate of composite bleeding was 16%, including two episodes of major bleeding (8%). Treatment failure was observed in three patients (12%), comprising of one episode of ischaemic stroke and two episodes of recurrent fistula thrombosis.

**Conclusion:** Apixaban is conceivably an alternative to warfarin for haemodialysis patients with comparable safety and efficacy, especially without the added risk of calciphylaxis. This patient cohort is complex and at high-risk of both haemorrhagic and thromboembolic complications, meaning that appropriate risk-benefit analysis, education and monitoring is essential when considering anticoagulation.

## Developing stakeholder consensus regarding priority pharmaceuticals and environmental risk criteria for formulary decision making: Nominal group technique

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### Background:

The prescription of a medicine (pharmaceutical) is the most common healthcare intervention to diagnose, prevent, treat or cure disease. However, this can also negatively impact the environment. Healthcare sustainability targets in Scotland (UK), call for improvements to prescribing and medicine use,<sup>1</sup> as current practices are environmentally, economically, clinically, and socially unsustainable – and healthcare has a social and moral responsibility to reduce its environmental impact.<sup>2</sup> To achieve this, healthcare practitioners and prescribers require robust and comprehensive information on the environmental impact of pharmaceuticals in prescription formularies, to support more sustainable prescribing.

### Purpose:

This study aimed to develop stakeholder consensus on priority pharmaceuticals and environmental risk criteria for modelling eco-directed formulary decision making.

### Method:

A modified version of the Nominal Group Technique (NGT) was used. The NGT was held virtually using MS Teams on 17th and 24th March 2023. Silent generation, round robin and ranking stages were modified using an online questionnaire (Qualtrics), developed based on a CREW report recommendation list<sup>3</sup> and the EU Priority Substances Directive EQS list<sup>4</sup> for priority pharmaceuticals and a literature review on environmental hazard risk criteria. The 1st NGT discussion (clarification stage) was conducted separately in 2 virtual meetings, focusing on; (1) priority pharmaceuticals to consider during modelling, and (2) suitable environmental hazard and risk criteria. Nominal Group panel members were selected considering their individual and organisational expertise in the Scottish water environment, environmental science, pharmaceutical industry, and prescribing formulary development. Levels of agreement were determined using the 9-Likert scale. Agreement was predetermined as a group median between 7-9, an IQR<3, and as no participant scoring <3.

### Results:

In total, 12 members participated in the NGT process (9 members participated in the 1st meeting, and 12 for the 2nd meeting due to availability). For (1) - priority pharmaceuticals to consider during modelling, out of 14 pharmaceuticals identified for the project, 6 were agreed for modelling [Median = 8.0 (range: 5 – 9), IQR = 1.25]. For (2) -

environmental hazard and risk criteria, 13 criteria were agreed for modelling [Median = 8.0 (range: 5 – 9), IQR = 2.0].

#### Conclusion:

The study identified priority pharmaceuticals to focus on during modelling, alongside agreeing suitable environmental hazard and risk criteria. The NGT enabled us to reach consensus among stakeholders through a structured process of engagement. It addressed varying perspectives from different sectors, yet consensus was reached. A formulary support tool will now be developed with the agreed pharmaceuticals underpinned by modelling using the agreed environmental hazard and risk criteria.

### Effects of human albumin infusion on the prevention and treatment of hyponatremia in patients with liver cirrhosis

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#### Background

Hyponatremia is the most common electrolyte disturbance in liver cirrhosis, which significantly associated with a poor outcome. However, it should be noted that the effective and safe treatment of hyponatremia in liver cirrhosis remain lacking. The use of human albumin (HA) on the management of patients with liver cirrhosis and hyponatremia remains controversial among the current practice guidelines due to the poor evidence.

#### Purpose

The current work combined the systematic review and meta-analysis and the real-world data to explore the effects of HA in the prevention and treatment of hyponatremia.

#### Methods

1) PubMed, EMBASE, and Cochrane Library databases were searched. Studies regarding the HA prevent and treat hyponatremia in patients with liver cirrhosis was included. Incidence of hyponatremia, improvement rate of hyponatremia, and serum sodium level were compared between cirrhotic patients received HA infusion or not. A random-effects model was employed.

2) Retrospectively included patients with liver cirrhosis from General Hospital of Northern Theater Command. The development and improvement of hyponatremia were compared between patients who received HA infusion and did not. Propensity score matching (PSM) analyses were performed. Logistic regression analyses were conducted to explore the relationships of HA infusion with the development/improvement of hyponatremia.

#### Results

1) Thirty studies were included. Among them, 18 studies explored the incidence of hyponatremia after HA infusion. Meta-analysis showed that the HA group had a significantly

lower incidence of hyponatremia (OR=0.55, 95%CI: 0.38-0.80, P=0.001) than the control group. Nineteen studies explored the change of serum sodium level after HA infusion. Meta-analysis showed that the HA group had a significantly higher serum sodium level (MD=0.95, 95%CI: 0.47-1.43, P=0.0001) than the control group. Two studies explored the role of HA in the treatment of hyponatremia. Meta-analysis showed that the HA group had a significantly higher rate of resolution of hyponatremia (OR=1.50, 95%CI: 1.17-1.92, P=0.001) than the control group.

2) Overall, 1796 patients were included to the prevention study. Among them, 621 and 1175 patients were assigned to the HA and control groups, respectively. After PSM, 602 patients were included. The HA group had a significantly lower incidence of hyponatremia than the control group (16.30% versus 41.90%, P<0.001). Similarly, logistic regression analysis also showed that HA infusion was significantly associated with decreased risk of developing hyponatremia (OR=0.270, 95%CI: 0.184-0.396, P<0.001). Additionally, 1004 patients were included to the treatment study. Among them, 545 and 459 patients were assigned to the HA and control groups, respectively. After PSM, 394 patients were included. The HA group had a significantly higher rate of improvement of hyponatremia than the control group (82.70% versus 54.80%, P<0.001). Similarly, logistic regression analysis showed that HA infusion was significantly associated with increased rate of improvement of hyponatremia (OR=3.951, 95%CI: 2.484-6.283, P<0.001).

#### Conclusions

Based on the results from the current systematic review and meta-analysis and the real-world study, HA infusion can effectively prevent the development of hyponatremia and improve hyponatremia in patients with liver cirrhosis. In the future, HA should be considered to manage the hyponatremia in liver cirrhosis.

### Who is going to do what? The reallocation of pharmacy activities for the French pharmacy technicians

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**Background:** In France, pharmacy technicians (PTs) are authorized to dispense under the supervision of community pharmacists (CPs). The initial training of PTs has been integrated into the schools of pharmacy for 3 years now. Moreover, the implementation of the pharmacy services and the lack of CPs require to review the activities within the community pharmacies.

**Purpose:** The main objective of the survey is to determine the preferences of the CPs (owners (OCPs) and employed CPs (ECPs)) and PTs on the evolution of the PTs' professional activities in the community setting.

**Method:** The study is based on a MaxDiff type questionnaire. Thirteen activities of the daily pharmacy

practice were identified, related both to the clinical and the management aspects. Each participant was asked to think about a reallocation of the activities in their practice. A total of 13 different choice tests were submitted to the participants. For each choice test, they had to choose among 4 activities which one would suit the PTs the best and the worst. A multinomial logistic regression was performed to estimate the weight of preferences.

**Results:** A total of 97 OCPs, 48 ECPs and 36 PTs responded and 2353 choice tests were analysed. The OCPs and the ECPs preferentially assign to PTs daily order management (OCPs:  $b = 1.31$ , 95%CI [1.37 – 1.48] ; ECPs:  $b = 1.62$ , 95%CI [1.35 – 1.90]), screening interventions (OCPs:  $b = 1.09$ , 95%CI [0.93 – 1.25] ; ECPs:  $b = 0.96$ , 95%CI [0.74 – 1.19]) and supply chain management of the nursing homes (OCPs:  $b = 0.93$ , 95%CI [0.77 – 1.09] ; ECPs:  $b = 0.81$ , 95%CI [0.60 – 1.03]). The PTs preferentially assign to themselves daily order management ( $b = 1.37$ , 95%CI [1.09 – 1.67]), supply chain management of the nursing homes ( $b = 0.75$ , 95%CI [0.51 – 1.00]) and drug dispensation in autonomy ( $b = 0.51$ , 95%CI [0.27 – 0.75]). The weight of the preferences are significantly different for the prescription for minor ailments (OCPs:  $b = -0.16$ , 95%CI [-0.30 – -0.01] ; ECPs:  $b = -0.41$ , 95%CI [-0.61 – -0.21] ; PTs:  $b = 0.32$ , 95%CI [0.08 – 0.57]).

**Conclusion:** The top 3 and the worst 3 in the preferences to reallocate the activities in the community pharmacies are substantially identical for the OCPs, ECPs and PTs. We can assume that the activities in the top 3 correspond to activities that are already in the process of being assigned to PTs. Identifying them allows us to ensure that the PTs initial training is adapted to the current professional practice changes. The pharmacists do not wish that the PTs could dispense drugs in autonomy. These results may appear to contradict what is observed in the community settings and reflect the pharmacists' concern that their pharmacist's diploma may be threatened. These results echo that the PTs' weight preference about the prescription for minor ailments is higher than the pharmacists'. Finally, activities whose preferences are intermediate should attract our attention: they could be reassigned in the near future.

### Exploration of the medication and health-related goals of care of older people with polypharmacy

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#### Background

Polypharmacy (use of 5 or more medications) is associated with poor outcomes in older people ( $\geq 65$  years), such as an increased risk of adverse drug reactions. Emerging evidence

suggests that eliciting the goals of care of older people can improve health outcomes. However, these conversations are often sidelined with a greater focus on disease state management.

#### Purpose.

The purpose of this study is to explore the goals of care of older people with polypharmacy with respect to their medications and overall health, and to explore their digital health preferences to communicate goals of care to their healthcare professionals.

#### Methods.

A qualitative questionnaire was distributed in two settings: (1) hospitalised older people or their carers in an Australian tertiary public hospital; and (2) community-dwelling older people or carers through advertisements in e-Newsletters of consumer groups (e.g., StepUp for Dementia Research) and local councils. Qualitative data were content analysed using an inductive approach, and quantitative data were analysed descriptively.

#### Results.

Data was collected for  $n=36$  hospitalised older people and  $n=72$  community-dwelling older people, with a median (IQR) age 78 (13) and 74 (10), respectively. Identified health-related goals included: (1) enhancing wellbeing, (2) independence, (3) lifestyle measures, (4) survival, (5) reducing doctors' visits, and (6) preventing disease onset. Medication-related goals of care included: (1) addressing medication-related issues, (2) maintaining the status quo, (3) improving medication knowledge, (4) improving pain management and (5) optimising and managing disease state. Older people and carers in the community setting expressed higher interest in documenting goals of care electronically than participants in the hospital setting (71% vs 53%). Participants in both settings collectively preferred emails and websites to communicate goals of care to their healthcare professionals.

#### Conclusions.

This study identified several medication and health-related goals of care of older people with polypharmacy. Participants favoured email and websites as digital health tools that may allow them to self-report their goals of care. Ultimately, this study may contribute to person-centred care and the shared decision-making model of healthcare by increasing knowledge of what older people and carers specifically value with respect to their medications and health.

### A study on safe use of drugs in older adults attending a tertiary care hospital using BEER's and STOPP criteria

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Chronic diseases and polypharmacy are common in the elder ageing population. BEER's 2015 and STOPP's criteria were

used to assess older individuals reasonable pharmaceutical use in a tertiary care institution. At Sri Ramachandra Hospital, Chennai, conducted a six-month prospective observational study on 188 patients 65 and older admitted to the Inpatient General Medicine Ward. Demographics, medical history, diagnosis, and prescriptions were documented. Beers and STOPP criteria assessed medications. The study population had a mean age of  $68.7 \pm 4.7$  years, with a majority aged 65–69. 37.2% had diabetes. Beers criterion identified 18% of potentially inappropriate pharmaceuticals (PIMs) and STOPP criteria 9.6%. Beers criteria revealed PIM use in the sample population: amitriptyline (3.1%), levetiracetam (1.1%), chlorpheniramine (8%), trihexyphenidyl (0.5%), alprazolam (1.6%), chlorthalidone (1.6%), clonazepam (1.6%), and diazepam (1.1%). Diltiazem, glimepiride, alprazolam, chlorthalidone, clonazepam, losartan, aspirin, and clobazam were found by STOPP criteria. Healthcare practitioners should be trained in geriatric pharmacology and use Beers and STOPP criteria in geriatric prescribing. These tools should support clinical discretion rather than replace it.

### Drug-herb interactions and cancer treatment

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#### Background

Herbal medicines are used by people living with cancer prior to, during and following conventional treatments. Herbal medicines are sometimes recommended by Traditional, Integrative and Complementary medicine practitioners. However, most herbal medicines use is self-directed and part of self-care practices and accessed through pharmacies and retail outlets throughout the world. The reasons people report using herbal medicines during cancer are to improve their quality of life and immune function and to reduce symptoms associated with the disease process and treatment side effects. Within the context of cancer, the possibility of herb-drug interactions can have clinically important implications to treatment outcomes and the safety profile of the medicines used. Herb-drug interactions are preventable.

#### Purpose

The purpose of this review was to identify literature reporting herb-drug interactions associated with clinically important implications to patient outcomes.

#### Methods

A review of the published literature reporting interactions between herbal medicines and cancer treatments was conducted from inception to 2022. Data was extracted and summarised into pharmacokinetic and pharmacodynamic interactions to provide an overview of the mechanisms by which these interactions can occur and associated clinical outcomes.

#### Results

To date, herbal medicines documented to be associated with clinically significant herb-drug interactions that alter the pharmacokinetic profile of cancer treatments and cause adverse effects and negative treatment outcomes are: *Curcuma longa* (turmeric) and tamoxifen, grapefruit juice and tyrosine kinase inhibitors, etoposide and sirolimus. *Hypericum perforatum* (St John's wort), *Hydrastis canadensis* (goldenseal) and CYP3A substrates, *Schisandra sphenanthera* and sirolimus. Potentially beneficial pharmacodynamic herb-drug interactions between the Japanese herbal formulation Hangehashinto (TJ-14) and numerous cancer treatments have been reported to reduce treatment-associated diarrhoea and oral mucositis.

#### Conclusion

While research in this area is limited and requires further investigation, the herb-drug interactions identified in this review have clinically important implications and are entirely preventable. Pharmacists are well positioned to identify and advise about the risks and benefits associated with concurrent use of the herb-drug combinations.

### Agile response to the epidemic-pharmaceutical department of a regional hospital in Taiwan

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#### Background

In the year 2020, the outbreak of COVID-19 in various countries introduced uncertainties into all aspects of life. Everyone faced personal and public impacts on everyday life, encountered changes to the environment, and had to make rapid adjustments and responses. This article will detail how private regional teaching hospitals in Taiwan, with limited resources and manpower, quickly adjusted to cope with the impact of the epidemic.

#### Method

This document reviews the impact of the epidemic, from 2020 to 2023, and assesses the medical staff's response to the process, management, application of tools, and management of talent throughout.

#### Results

##### 1. Process

- (1) Prescription delivery service: patients with covid-19 can get prescriptions through telemedicine.
- (2) Combined medical functions: to reduce the risk of cluster infections, a combined service of doctors, nurses, and pharmacists is offered outside the hospital.

##### 2. Management

- (1) Subdivision management: quickly adjusted the manpower structure and predicted the various manpower needs of medical personnel in response to infections.

(2) Material management: adjusted the epidemic prevention materials 2~3 times before the outbreak and deployed them in advance, according to the government's distribution of drugs. Encouraged the public to obtain covid-19 vaccines such as AZ, Moderna, BioNTech and Medigen.

(3) Bottom-up management: In the early days, antiviral drugs such as Remdisivir were controlled by CDC. Later, proposals were made to the government to establish antiviral drug dispensing satellites to speed up the treatment in remote areas.

### 3. Application of tools

(1) Remote teaching and conferences: telehealth can be improved through the use of Jitsi software for health education.

(2) Video consultation: video about using asthma medicine inhalers.

(3) Pharmacists delivering medicines to private homes: healthcare workers must wear masks, gloves, isolation gowns and goggles.

### 4. Talent management

(1) The loss of medical personnel in the hospital: identified a need to provide a more growth-oriented, challenging, and innovative working environment, and retain better medical personnel.

### 5. Innovative positions

(1) Innovative descriptions of positions were needed to give employees a well-defined area of duties and operations, such as information medical personnel who write programs and special case medical personnel with business analysis capabilities; some business adjustments could be Work From Home (WFH).

### Conclusion

The term, agile response, refers to continuous planning, execution, and modification of operations with limited resources and time to create the greatest effect. Only leaders with agile thinking can adapt to the changes required by the challenges presented, maintain an open attitude to meet unknown needs, let the medical field participate in the industry's transformation, and promote the breakthrough and upgrading of medical care and medical services.

## Cost-effectiveness analysis of first-line nivolumab plus ipilimumab combination therapy for unresectable malignant pleural mesothelioma: Based on a multicenter, phase 3 trial

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**Background:** Malignant pleural mesothelioma (MPM) is a rare tumor. The approved systemic treatment of MPM is limited to chemotherapy. The purpose of this study was to evaluate the economic efficacy of an NIV plus IPI regimen for the treatment of MPM in China.

**Methods:** The data estimated were from a multicenter randomized phase III trial that showed an improved survival benefit in patients with MPM treated with a NIV+IPI combination regimen. A partitioned survival model was constructed to estimate the incremental cost-benefit ratio (ICER) from the perspective of Chinese society. The uncertainty in the model is solved by one-way certainty and probabilistic sensitivity analysis.

**Results:** Our base case analysis showed that the total costs of treatment increased from \$28,833.84 to \$236,590.48 with the NIV+IPI combination regimen versus platinum plus pemetrexed chemotherapy. Treatment with NIV+IPI combination therapy was associated with an increase in effectiveness of 0.08 QALYs from 1.08 QALYs to 1.16 QALYs. The incremental cost-effectiveness ratio was \$2,596,958.00/QALY, with a 0% probability of being cost-effective at a WTP threshold of \$36,203.87/QALY. Cost changes associated with grade 3-4 AE management, tests used, or hospitalization costs had little effect on the ICER values predicted by sensitivity analysis.

**Conclusions:** Taken together, the results of this study suggest that the combination of NIV plus IPI is not a cost-effective option from the perspective of Chinese payers as a first-line treatment option for MPM patients in China. Appropriate drug donation programs and social assistance are necessary.

## Cost-effectiveness analysis of modified gemcitabine combined with oxaliplatin in unresectable gallbladder cancer in China

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**Background:** Gall bladder cancer (GBC) is one of the most common cancers of the bile duct, and the incidence varies by geographic region and ethnic group. The purpose of this study was to evaluate the economic efficacy of a modified gemcitabine combined with oxaliplatin in the Chinese setting for unresected GBC.

**Methods:** The data analyzed were from a randomized controlled trial that showed an improved survival benefit in patients with metastatic GBC treated with oxaliplatin combined with gemcitabine. Based on clinical symptoms and disease progression, a Markov model is constructed to estimate the incremental cost-benefit ratio (ICER) from the perspective of Chinese society. The uncertainty in the model is solved by one-way certainty and probabilistic sensitivity analysis.

**Results:** The 10-year simulation results showed that the utility value of modified oxaliplatin combined with gemcitabine increased by 0.22QALY compared with fluorouracil(FU) and folinic acid (FA). Similarly, the cost increase is \$12,312.54 per person and the cost-effectiveness ratio (ICER) is \$55,966.09/QALY, with a 0% probability of cost-benefit at the WTP threshold of \$31,512.00/QALY in a



Chinese healthcare setting. Cost changes associated with grade 3-4 AE management, tests used, or hospitalization costs had little effect on the ICER values predicted by sensitivity analysis.

**Conclusions:** Modified gemcitabine combined with oxaliplatin (mGEMOX) is not an economical treatment option for unresectable GBC in a Chinese healthcare setting.

### Enhancing early detection and management of lung cancer: A pharmacist-led lung health assessment and triage initiative

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**Background:** Lung cancer is the leading cause of cancer-related deaths, with a low 5-year survival rate of 20.5% in 2022. Early diagnosis is crucial for better outcomes. Community pharmacists, often the first point of contact for respiratory presentations, could play a critical role in assessing symptoms and referring patients to GPs for further assessment. However, there has been no active involvement for pharmacists in lung cancer screening in international concerted efforts. Utilising pharmacists as a preliminary assessment and triage step could aid in early detection of lung cancer, ultimately leading to improved patient prognosis and quality of life.

**Purpose:** To scope the existing literature to determine the protocols utilised and evaluate the impact of pharmacists' involvement in lung cancer awareness, screening, or triage programs.

**Method:** A scoping review was performed to systematically explore the literature, map and summarise the evidence on the pharmacists' role in the early detection of lung cancer. The review adhered to the methodological framework for scoping reviews outlined by Arksey and O'Malley.

A comprehensive search strategy was developed in consultation with academic librarian. It was then applied to interrogate Medline (PubMed), Embase, CINAHL, and Scopus databases. Studies were included if they explored pharmacist interventions in information provision, screening for, or referral of patients at risk of lung cancer. Articles published in English between January 2000 to April 2023 were considered eligible for inclusion.

Systematic reviews or studies presenting only pharmacotherapeutic options for lung cancer were excluded. Titles and abstracts were screened initially followed by full article review for those that met the initial screening criteria. A data extraction form was developed, and key study features were mapped onto this form.

#### Results:

Of 178 articles screened, only five studies met the inclusion criteria. These studies included four qualitative studies that were conducted with a range of stakeholders (eg community pharmacists n=30, GPs, nurses, respiratory consultants, radiologist, community service leads) and lung cancer

patients to gather information via focus group interviews and questionnaires. One study investigated the feasibility of a community-based pharmacy referral service that involved 17 UK community pharmacies. In this study, pharmacists invited 12 patients, all consented and 11 were found at risk and referred for a chest x-ray, but no follow-up service was provided.

The barriers and facilitators for the implementation of such services, including the need for workforce capacity and training, well-publicised awareness campaigns, improved communication and referral pathways between pharmacists and other health professionals as well as remuneration, were highlighted by pharmacist participants. Whilst this review provides detailed insights into the role of pharmacists in lung health assessment, especially for early detection of lung cancer, it indicated that research on this topic is, as yet, scant.

**Conclusion:** Our scoping review highlighted pharmacists are willing to play a crucial role in lung cancer surveillance to facilitate earlier diagnosis. However, given the paucity of data, it is recommended that more research is needed to understand how interventions delivered in community pharmacies to facilitate early detection of lung cancer impact patient outcomes and what their cost effectiveness may be.

### Evaluating the impact of an interprofessional education curriculum on pharmacy graduates in Canada

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#### Background:

Health profession education programs around the globe, including pharmacy, are embedding interprofessional education (IPE) into curriculum and accreditation standards in response to evidence that suggests IPE leads to effective and efficient client care. Collaboration amongst health care professionals is associated with improved patient outcomes and satisfaction as well as reduced health care costs. The University of Toronto has an internationally recognized integrated IPE curriculum designed to foster collaborative skills among learners from 11 health care professions, including pharmacy. Throughout the curriculum, learners begin to develop collaborative skills in both classroom and practice settings. Currently, there is limited data evaluating the impact of IPE on pharmacy graduates.

#### Purpose:

The purpose of this study was to determine if the current IPE curriculum is effective in supporting the development of PharmD graduates as collaborative practitioners and to identify learning activities and elements of the IPE curriculum that most helped the development of collaborative competencies.

**Methods:**

This study employed a realist evaluation to assess the impact of the IPE curriculum on pharmacy graduates' collaborative practice competencies. A realist evaluation was used since it is a methodology designed to evaluate complex programs, like IPE curriculum, by offering a framework to understand how, why, and where an intervention works or not, through the generation of an explanatory program theory.

Several data sources were used for this study to ensure a robust data set for analysis. Twenty-seven semi-structured qualitative interviews with PharmD graduates from two class cohorts (2021, 2022) provide the bulk of the data. In addition, IPE learning activity reflections (n=120) were chosen at random from the 2021 and 2022 cohorts, as well as competency assessments, and graduate exit surveys that asked about graduates' experiences with IPE curriculum.

**Results:**

The most prominent collaborative competencies identified were role clarification and interprofessional communication. Through exposure to other health professions in the IPE curriculum, graduates understood interprofessional roles and scopes, which prepared them for what to expect in practice. Participants described understanding the differences in interprofessional communication based on the health professions involved, the context, the setting, and the modes of communication. Potential gaps were identified in the IPE curriculum in preparing graduates for interprofessional conflict resolution in certain experiential and practice settings.

The shift to online learning during the COVID-19 pandemic impacted participants' preparation for collaborative practice by impeding the development of interprofessional team functioning and communication. Participants also described how the IPE curriculum helped them build confidence and understand their value and contributions as pharmacists in interprofessional settings. However, they identified challenges with encountering the unofficial "hierarchy" of health care professions in experiential and practice settings.

**Conclusion:** The study illustrates that IPE curriculum does impact the development of collaborative competencies in pharmacy graduates. The study highlights mechanisms that enabled and disabled the development of collaboration competencies such as role clarification and interprofessional communication, as well as the hierarchies within health care. This study provides information that can aid educators in purposively enhancing enabling mechanisms in the IPE curriculum while minimizing disabling competencies.

## Estimation of price variability of different brands of antihypertensive medications in community pharmacies in Kumasi

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**Background**

Hypertension is a non-communicable disease responsible for about 7 million deaths annually worldwide. The significant global incidence of hypertension and the corresponding rise in the risk of complications makes it a global public health concern. Hypertension increases the economic burden on the limited resources of a country. The cost of antihypertensive medications is an economic problem influencing medication adherence. The cost involved in managing hypertension is of essential concern to individuals, families, and organizations. According to a United Nations research, sub-Saharan Africa has a wide range of medication prices, making it difficult for the poor to buy even basic medications.

**Purpose**

The study aims to determine the price variability of different brands of antihypertensive medications in community pharmacies.

**Method**

A cross-sectional survey was employed to collect data from 60 community pharmacies selected at random in the Kumasi Metropolis of Ghana between May and August 2021. Pharmacy managers gave informed consent and were assured of confidentiality before the study. All available antihypertensive medications that met the inclusion criteria were sampled. The data was entered and analyzed using GraphPad Prism v 8 for Windows. All medications were priced in Ghana Cedis. The minimum and maximum prices for 10 tablets of different brands of the same generic medication and the cost ratio were determined. Using one-way analysis of variance (ANOVA), mean prices both within and between drug categories were assessed.

**Results**

A total of twenty-one different antihypertensive medications were identified (18 single and 3 combination preparations), categorized into six main therapeutic classes: beta blockers, diuretics, calcium channel blockers, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers and a miscellaneous group consisting of centrally acting agents and antihypertensive combination medications. The findings revealed 18.8% of medicines had a price variation of less than 100% among the various pharmacies. About 52.1% of the medicines had price variations ranging from 100% to

1000% and the remaining had a variation exceeding 1000%. Amlodipine 5mg and 10mg tablets had the highest number of brands, eleven (11) and Twelve (12) respectively, and a price variation of 7000% and 5400%. Diltiazem tablets recorded the lowest price variation from three different brands. Additionally, Amlodipine 5mg tablets had the highest cost ratio of 70. Category-wise comparison of medication prices using one-way ANOVA showed a statistically significant difference in medication prices among the various classes. The miscellaneous group had the highest mean price of 27.14±24.37, with beta blockers having the least mean price of 10.59±12.56 (p-value < 0.05).

### Conclusion

The large disparity in antihypertensive medication pricing seen in this study may make it more difficult for patients to obtain these necessary medications which could lead to poor disease control. Development and implementation of a joint public and private sector pharmaceutical pricing policy can ensure efficient, effective, and equitable pricing of medicines. This will enable patients to have access to fair-priced medications resulting in improved medication adherence, health outcomes and quality of life.

## Consumer Co-design of medication safety interventions and services in primary care: A scoping review

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### Background

Medication related problems (MRPs) are problems that interfere with or have the potential to interfere with the desired outcome for a consumer. These issues may arise at any stage of the medication process, including prescribing, dispensing, administering, monitoring and usage. Unresolved or potential medication problems can lead to serious harm, yet many of these, including hospital admissions, are potentially preventable. Despite the availability of various medication safety interventions and tools in primary care, there are still approximately 250,000 hospital admissions annually in Australia due to medication related problems. Overseas, positive results have been achieved through multifaceted pharmacist led information technology interventions for the reduction of clinically important errors in medication management. In Australia, healthcare professionals are partnering with consumers, caregivers, and their families to design innovative health services that incorporate their personal experiences, are closely aligned with community needs, and prioritize a patient-centric approach. Engagement of consumers in health service design can lead to reduced hospital admissions, improved quality of life, improved effectiveness, efficiency and quality of health services and improved consumer experience. Although several healthcare services and interventions in the literature have been co-designed

with consumers, it is unclear to what extent consumers have been involved in co-designing medication safety interventions or services in primary care.

### Purpose

A scoping review was conducted to understand the nature and extent of co-design methods used in the development of medication safety interventions or services within the primary care setting. The study aimed to answer the following questions:

1. What approaches to co-design have been used in the design of medication safety services or interventions
2. What methods were used to develop the medication safety service or intervention?
3. Have these co-designed medication safety interventions or services undergone evaluation to determine if they delivered care that aligns with the outcomes and experiences that consumers expect?

### Method

Academic databases were searched for studies that used the co-design approach to develop their medication safety intervention or service in primary care. Studies were included if consumers and other key stakeholders (e.g. doctors, pharmacists, other healthcare professionals) were involved in the co-design process.

### Results

Despite there being a variety of medication safety tools and interventions, few studies draw on the experiences of consumers and professionals working in partnership to design and evaluate the experience of medication safety services/interventions, potentially missing important information.

### Conclusion

Consumers have a unique perspective on their healthcare needs and experiences, including medication related problems, and the social and emotional impact this has on their lives. This perspective can significantly differ from that of healthcare professionals. This review provides an overview of the broad literature on the use of co-design methodology in the development of medication safety services or interventions. It identifies a gap in this research area and highlights the potential for further research to be conducted where consumers, researchers and healthcare professionals collaborate in co-designing medication safety interventions or services.

## An international comparison of deprescribing interventional studies: How to determine factors that contribute to translational deprescribing success?

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**Background:** Globally, researchers have trialled implementation of deprescribing interventions to reduce the risk of patients' medicine-related harm. The definition of deprescribing implementation success varies among studies. This heterogeneity makes it challenging to synthesise findings and identify gaps in the literature.

**Purpose:** We conducted a systematized review of international deprescribing intervention studies to explore how deprescribing success was defined and achieved.

**Method:** We searched scientific databases (e.g., EMBASE, Pubmed), grey literature (e.g., Google Scholar) and snowballing using backwards and forwards citation to determine five landmark articles eligible for inclusion. Our inclusion criteria included pharmacist-led, pragmatic, hybrid, randomised controlled trials (n>100). Participants included were older adults (60-97 years). We extracted data regarding key elements i.e. factors that contribute to deprescribing success of the studies. These included who conducted the intervention, a description and delivery methods of the implementation strategies employed, any government or health policy that promoted implementation of deprescribing into practice and outcomes measured.

**Results:** We included five articles in the final analysis, conducted in North America, Europe and Australasia. All five studies were pharmacist-led with one study using pharmacists with prescribing rights. All five studies were multi-disciplinary. Four studies involved pharmacists and doctors; one study involved pharmacist prescribers and nurses. One study was conducted in residential aged care while the remaining four studies focussed on community-dwelling older adults. While all five studies involve the patient in the deprescribing decision, they varied in the constitution and delivery of their deprescribing implementation strategies. One study focused on patient empowerment by using a patient educational brochure. Two of the five studies provided training to their interventionists with one study providing evidence-based training. The other three studies relied on the pharmacists conducting medication reviews as part of their normal day-to-day scope of practice. All five studies were hybrid interventional studies and included both patient-centred health outcomes [e.g., falls], intermediate health outcome indicators (e.g. Drug Burden Index (DBI)) and process implementation outcomes, such as the uptake of deprescribing

recommendations; with the highest percentage of uptake being 43% of discontinuation of sedative-hypnotics, the proportion of participants who used patient educational brochures and fidelity (adherence to the study protocol). Only one study mentioned government subsidised services to support conducting deprescribing medication reviews. Following up for adverse drug withdrawal events, at three or six months, occurred in all studies. Four of the five studies stated a longer follow up would have aided in fully realising clinical improvements.

**Conclusion:** Our findings have shown that reporting about factors that may impact the success of deprescribing implementation strategies, to improve outcomes and reduce medicine-related harm in patients, varies. In order to synthesise findings, we recommend that reporting on all factors, discussed in this study, is more consistent amongst deprescribing research. Further work is needed to better understand specific factors that contribute to deprescribing "success", such as employing specific implementation strategy components in certain settings. Limited on-going government funding for deprescribing reviews in all countries, where the studies were conducted, may limit the sustainability of deprescribing recommendations beyond the intervention cessation.

## Remote medication-related interventions to reduce readmission rate in hospitals: A systematic review

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**Background:** Transitions of care are at high risk of medication errors, highlighted by the World Health Organisation. In Australia alone, medication-related hospital admissions cost \$1.4 billion annually, with 50% of these admissions considered preventable. Hospital discharge is a significant contributor to these admissions with over 90% of Australians having at least one medication-related problem. Such issues include medication nonadherence, polypharmacy, and missed therapy contributing. To address this problem, telehealth has been proposed as an emerging approach that can provide remote monitoring and consulting, to prevent medication-related hospital readmissions.

**Purpose:** To systematically investigate the effectiveness of post-discharge telehealth medication therapy interventions on hospital readmission.

**Method:** A systematic review was conducted following PRISMA guidelines. Five scientific databases were searched, including PubMed, Scopus, ProQuest, Web of Science, and Embase. Keywords included hospital readmission, medication therapy, and telehealth interventions. The

review included randomised clinical trials, conducted in hospitals, peer-reviewed journal papers, available in English and published between 2000-2023. Conference papers, systematic or other reviews, opinion articles, and editorials were excluded. The data extracted from the studies included information on the population, sample size, intervention type, readmission measure and outcomes, and calibration factors for the randomised trials. Interventions were grouped based on type and outcomes measured and assessed by comparing, intervention approach, and outcomes.

**Result:** In the review process, 1,144 papers were screened resulting in the inclusion of 21 papers. These studies focused primarily on chronic illnesses and included participants aged over 60 years. Various post-discharge remote interventions were reported in these 21 papers, such as post-discharge phone calls, short messages, mobile applications, virtual visits, and home tele-monitoring equipment. The interventions evaluated were mostly multifactorial (18/21) including a combination of medication-related interventions along with diet and exercise reminders, symptom check-ups, and education. The remaining three studies evaluated medication-related interventions only. Most medication-related interventions included adherence support (15/21) with the remaining studies (6/21) also implemented medication reconciliation and medication management services. In total, 8 out of 21 papers were successful in reducing the hospital readmission, 6 studies with a time frame of 3-6 months. Of the eight successful studies, six of them primarily targeted patients with congestive heart failure and incorporated virtual multifactorial services as well as medication adherence support. Additionally, six of the studies involved a multidisciplinary healthcare professional team.

**Conclusion:** Overall, most clinical trials identified in this systematic review showed remote medication-related services do not have advantages over usual care in terms of reducing hospital readmissions. It is important to note that the limited number of studies and variability in equipment used during interventions may have contributed to the lack of significant effectiveness. Furthermore, the small sample sizes, confinement to a single site, and variation in diseases may have also contributed to the lack of statistical significance in some reports.

### Cost utility analysis of a nosocomial denosumab versus zoledronic acid treatment for bone related events in breast cancer

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**Objective:** To conduct a cost utility analysis of denosumab versus zoledronic acid for the treatment of bone-related events in breast cancer, using principles of pharmacoeconomics, to evaluate the economics of both drugs, and to provide a reference for clinical use.

**Methods:** A Markov model was established to estimate the cumulative costs and health outputs of the two drug regimens from the perspective of China, based on partial cost data of a certain tri partite cancer hospital and previously published literature cost and utility values at home and abroad, and compared with the calculated incremental cost utility ratio (ICER) using 1-3 times the gross domestic product (GDP) per capita as the threshold value, Both costs and utility need to be discounted at 5% per year, and finally a univariate sensitivity analysis was performed to test the credibility of the validated model and results.

**Results:** In terms of costs, the mean cost per person in the denosumab arm was 68946 yuan; The zoledronic acid group averaged 61389 yuan per person. Output terms, 1.64 QALYs in the denosumab group; 1.55 QALYs in the zoledronic acid group. Both had an incremental cost utility ratio of 88102, which was below the threshold. Sensitivity analyses supported the robustness of the results and presented the drug cost of denosumab as the largest contributing factor, followed by that of zoledronic acid.

**Conclusions:** From a Chinese perspective, according to the results of long-term model analysis, denosumab has an economic advantage over zoledronic acid for the treatment of bone metastases in breast cancer, providing a cost-effective treatment option for the prevention of SREs in patients.

### Exploring the barriers and enablers to pharmacists-led services in people with disability: Perspectives of pharmacists and disability caregivers

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**Introduction:** People with disability (PWD) face significant medication safety issues. While a role for pharmacists in supporting medicine use is advocated for in contemporary guidelines, it is unclear to what extent pharmacists currently provide medicine-related services to PWD and their caregivers, and what barriers and enablers exist for pharmacist undertaking these clinical activities.

**Aims and objectives:** The objective of this study was to explore the current role for pharmacists in supporting quality use of medicines for people living with disability, and the barriers and enablers to pharmacists meeting their scope of practice from the perspective of pharmacists and disability carers within Australia.

**Study design:** A qualitative study design using semi-structured interviews of pharmacists and disability caregivers was undertaken across six different states or territories in Australia.

**Results:** Ten interviews were conducted with registered pharmacists, and ten with disability workers. Potential

pharmacist activities identified included education and training, medication stewardship through medication reviews, supporting transitions of care, and providing medicine-related information on demand. Barriers to providing services encompassed difficulties faced by the individual pharmacist including time constraints, interpersonal barriers between the pharmacist and other stakeholders such as awareness of HMRs, and systemic barriers, for example government funding. Changes to the current service model of medication reviews such as pharmacists initiating reviews, avenues to expand pharmacist activities including collaboration with NDIS provides, and the practice change necessary to support pharmacists currently or potentially working in this space were seen as enablers.

**Discussion and Conclusion:** This study explored the perceived role of the pharmacist in supporting medication management for PWD and their carers, and the barriers and enablers to optimising this role. Further research is needed to understand the effectiveness of current medication-related interventions for PWD, and feasibility of pharmacist-led activities in the disability sector.

### Pharmacists led population health approach to reduction of cardiovascular disease in Southern Maryland

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**Background:** Cardiovascular disease (CVD) continues to be the number one cause of death, accounting for 930,000 deaths and \$320 billion (15% of healthcare spending) to the United States (US) healthcare system annually. Similarly, on a global scale, CVD is the leading cause of death, as reported by the World Health Organization (WHO). Statin use has been associated with a reduction in the incidence and number of deaths from CVD, but underuse of statins is estimated at 51% to 88%, either from not being prescribed or prescribed at a less-than-optimal dose. Primary care providers cite lack of time, high workload, and complexity of risk assessments as barriers.

Pharmacists are trained and able to address barriers cited by PCPs that provide value-added services and reduce the burden of CVD on the healthcare system by 1) identification of patient populations at risk for cardiovascular events, 2) providing medication review with recommendations to providers for initiation of statin or dose increase in line with calculated (atherosclerotic cardiovascular) ASCVD risk.

The Prince George's County Department of Health established the PreventionLink of Southern Maryland (PL) program to address the high incidence and prevalence of CVD in Southern Maryland. The PL program is a 5-year program funded by the Center for Disease Control that also includes medication therapy management strategies geared

at reducing cardiovascular risk. The University of Maryland School of Pharmacy's Patients, Pharmacists, Partnerships (P3) program was enlisted to deliver medication therapy management services in the PL program.

**Purpose:** To assess the impact of medication therapy management delivered by pharmacists in the prevention of cardiovascular events through the identification of populations at risk of CVD with recommendations for appropriate and optimized medication management.

**Method:** A cross-sectional study of 1632 patients age 20 to 75 years was conducted at a PL primary care clinic. Patients with no clinical ASCVD, and at least one recorded blood pressure, total cholesterol, HDL, and LDL-C level at the time of the study (909 patients) were included in the analysis. A 10-year ASCVD risk was calculated for these patients using the AHA/ACC ASCVD calculator. The 10-year ASCVD risk assessment identified 783 patients (86%) with low risk, 90 patients (9.9%) with moderate risk, and 36 patients (3.96%) with high 10-year risk for ASCVD. Prescriber recommendations for initiation of statin were made for 57 low risk patients due to LDL>190 or type 2 diabetes, 36 moderate risk patients and 12 patients in the high-risk category. No patients in the low-risk category required recommendations for a statin dose increase, while three patients at moderate risk and two patients at high risk were recommended for an increase in statin intensity.

**Conclusion:** Cardiovascular disease continues to be the leading cause of death globally and in the US, making it a public health issue. Pharmacists are well positioned to provide population health initiatives that support primary care providers in the identification of patients at risk of CVD who will benefit from dose increase or the initiation of statin.

### Attitudes of rheumatoid arthritis patients towards disease modifying antirheumatic drug deprescribing

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**Background:** People living with rheumatoid arthritis (RA) may be taking one or more medications that they no longer need. Current literature states the prevalence of polypharmacy in RA is 67.9%. However, there is little evidence about polypharmacy in RA and even less on how patients with RA feel about deprescribing.

**Purpose:** To determine the attitudes and beliefs regarding Disease Modifying Anti-Rheumatic Drug (DMARD) use and RA patients' willingness to have their medications deprescribed.

**Method:** A cross sectional study of RA patients was conducted using a self-administrated survey adapted for people living with RA from the validated revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire.

Participant characteristics such as the number of medications, disease activity and time since diagnosis were also collected. Descriptive analyses were used to analyse and interpret data.

**Result:** To date, we have recruited 76 RA participants; 69.7% were female and the median age was 69.5 years (interquartile range, IQR 60-80.25). The median number of medications was 9 (IQR 6-11), including 3 RA specific medications. Median years since diagnosis was 11 (IQR 5-14.25). The majority of RA patients (83.8%) agreed they would be willing to stop one of their RA medicines if their rheumatologist said it was possible and 52.9% reported that they have not had a bad experience ceasing a medication in the past. Additionally, half of patients believed they spend a lot of money on their RA medications.

**Conclusion:** Most RA patients are willing to have one or more of their DMARDs deprescribed if their rheumatologist supports it, highlighting the importance of discussing deprescribing with RA patients. However, further research is needed to develop tools and solutions to identify and address opportunities for deprescribing in RA patients.

### Pharmacist interventions to improve hypertension management: From trials to implementation

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**Background:** Hypertension guidelines recommend the involvement of pharmacists for the management of hypertension. Different types of interventions can be applied. Because these interventions can be complex and with various components, their implementation is a challenge and their effect size may differ between the type of interventions. As part of a systematic review to estimate the effect of pharmacist care on blood pressure (BP) amongst hypertensive outpatients, we described which types of interventions were tested and their effect on BP.

**Methods:** In collaboration with a medical librarian, a systematic literature search was conducted for any article published up to 05.12.2022 in MEDLINE, EMBASE, CENTRAL, CINAHL, Web of Science, and Trip databases. Randomized controlled trials assessing the effect of pharmacist interventions on BP among outpatients were included. Primary outcomes were the change in BP, BP at follow-up, or BP control. Based on the Cochrane Effective Practice and Organization of Care (EPOC) taxonomy interventions, we

categorized pharmacist interventions by different target levels (patient, healthcare provider) and types (educational approach e.g., targeted toward patients to improve their lifestyle; feedback e.g., to healthcare providers to adapt medication; use of reminder tools e.g., drug adherence aids). Results were synthesized descriptively and, where appropriate, pooled across studies to perform meta-analysis. We have previously published the study protocol in BMJ Open and registered in PROSPERO (CRD42021279751).

**Results:** A total of 2048 study records were identified by electronic database searching and loaded to the systematic review management software Covidence. After removal of duplicates, 2006 were independently screened based on title and abstract by two authors (VG, ST), and 253 full texts were evaluated. A total of 90 studies with 33'425 patients are currently included for data extraction. These studies were published between 1973 and 2022 and conducted in different regions (North America: n=45, Europe: n=17, other: n=28). In 71% of the studies, the intervention was led by the pharmacist alone and in 29% in collaboration with other healthcare providers. The target level of the intervention was directed at patients in 93% and at healthcare providers in 58% of the studies. The type of intervention was based on education in 87%, feedback in 44%, and reminder in 20% of the studies, respectively. All studies pooled, the effect on systolic/diastolic BP was -6.6 (95% CI: -8.0 to -5.2) / -3.2 (95% CI: -4.1 to -2.2) mmHg. Further analyses by intervention types will be computed.

**Conclusion:** Pharmacist interventions help hypertension management. Most interventions tested in the included trials were directed by pharmacists, targeted at the patient level, and had an educational component. Towards the implementation into clinical practice, it is important to test which interventions work best in a given healthcare setting.

### Exploring the impact of medication regimen complexity on health-related quality of life in patients with multimorbidity

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**Background:** Background information: Chronic diseases are a leading cause of morbidity and mortality worldwide, and their prevalence is increasing globally, including in Ethiopia. Patients with multiple chronic conditions often require complex medication regimens, which can negatively affect their health-related quality of life (HRQoL). However, limited evidence exists on the impact of medication regimen complexity on HRQoL in patients with multimorbidity, particularly in resource-limited settings like Ethiopia. Therefore, this research is important as it aims to explore the impact of medication regimen complexity on HRQoL in patients with multimorbidity in Ethiopia. This work will

contribute to filling the knowledge gap and informing policy decisions to improve the care and management of patients with multimorbidity in resource-limited settings. The context of this research is the growing burden of chronic diseases and the challenges faced by patients with multimorbidity in managing their medication regimens in a resource-limited setting like Ethiopia.

**Purpose:** The objectives of this research are twofold: i) to assess the medication regimen complexity in patients with multimorbidity in Ethiopia; and ii) to investigate the impact of medication regimen complexity on the health-related quality of life (HRQoL) of patients with multimorbidity in Ethiopia. The hypothesis of this research is that medication regimen complexity negatively affects the HRQoL of patients with multimorbidity in Ethiopia.

**Method:** A cross-sectional study was conducted at the University of Gondar Comprehensive Specialized Hospital, Gondar Town, Ethiopia, between May 2021 and July 2021. Patients aged 18 years or older, diagnosed with at least two long-term diseases and already on medical treatment for at least six months, were included in the study. Data were collected using two validated instruments, the medication regimen complexity index (MRCI) and the EuroQoL-5 Dimension (EQ-5D) instrument. Data on demographic and clinical characteristics were collected by reviewing patients' medical records, and HRQoL data were obtained through face-to-face interviews. The outcome measures were the MRCI score, EQ-5D Index, EQ-VAS score, and EQ-5D dimensions. The Welch test for unequal variance and Fisher's exact test were used to assess the impact of different variables on HRQoL.

**Results:** The study surveyed 416 participants, with a 98.3% response rate, the majority of whom were female (n=267, 64.2%) and had two chronic conditions (n=215, 51.7%). About 46.4% of patients were taking five or more medications, with a significantly higher proportion at the high regimen complexity level (P=0.001). The average medication regimen complexity index score was  $9.73 \pm 3.38$ , indicating a high level of complexity. Patients with high MRCI scores reported more problems in mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. There was a negative correlation between MRCI score and health-related quality of life as measured by the EQ-5D-Index ( $r = -0.175$ ;  $P < 0.001$ ) and the EuroQoL-visual analogue scale score ( $r = -0.151$ ;  $P = 0.002$ ). Additionally, there was a statistically significant difference in the mean EQ-5D-Index (P=0.001) and EQ-VAS scores (P=0.001) across low, medium, and high MRCI levels.

**Conclusion:** Patients with multiple chronic conditions often have complex medication regimens, which can negatively impact their quality of life. Addressing medication-related issues should be a priority.

## Pharmacy education in traditional and complementary medicines—A systematic review

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**Background:** Traditional and complementary medicines (T&CMs) are not typically covered in medical curricula despite 80% of the world's population using some form of herbal product as part of their healthcare. Concurrent use of T&CMs with conventional therapies is common, and both are primarily accessed in pharmacies in most countries. There is a general expectation that pharmacists can provide professional advice about T&CMs. Despite this expectation, barriers to pharmacists incorporating T&CMs advice into day-to-day practice exist. One deterrent previously identified is pharmacists' lack of knowledge about T&CMs.

**Purpose:** Therefore, the aim of this review was to report on what is currently known about pharmacists' T&CMs education and training to inform developments in pharmacy education.

**Methods:** Eligible studies published between 01/01/2016 and 31/12/2022 were identified across six databases (PubMed, Scopus, Web of Science, EMBASE, ScienceDirect and MEDLINE). Data was extracted from included studies and categorized into four key themes.

**Results:** Studies (n=58) conducted across 31 countries: Australia (n=12), China (n=4), Ethiopia (n=2), Japan (n=2), Jordan (n=2), New Zealand (n=2), Palestine (n=2), Saudi Arabia (n=6), South Africa (n=2), Thailand (n=2), U.S. (n=4), and one study from Canada, Croatia, Eritrea, Ghana, Iran, Italy, Jamaica, Jordan, Kuwait, Lebanon, Malaysia, Nigeria, Norway, Poland, Serbia and Norway, Trinidad and Tobago, Turkey, and United Arab Emirates, containing information about pharmacists' education and training in T&CM were included. Most studies (n=35) focused on pharmacists in the community settings and three studies specifically focused on hospital pharmacists. Most studies aimed to identify the needs (including education and training) of pharmacists who were providing professional services to consumers about T&CM use (n=42).

Theme 1 (Education and training in T&CMs) revealed most pharmacists studied had received little to no training in their undergraduate training (n=20 studies) and had limited or no access to continuing professional education on T&CMs (n=10). Theme 2 (Practice gaps associated with pharmacists' lack of education and training) indicated suboptimal pharmacists' knowledge and confidence towards T&CMs in the pharmacy setting (n=39), and in some studies this was shown to negatively impact day-to-day practice behaviors associated with T&CMs (n=28). Theme 3 (Need for education and training in T&CMs in pharmacy training), multiple studies identified education and training in T&CMs in undergraduate pharmacy programs (n=27) and continuing professional development (n=30) as one of the key measures that would enable pharmacists to fulfill professional practice responsibilities associated with T&CMs.



Recommendations about T&CMs educational topics included, drug interactions, interpreting T&CMs research, advice giving skills, T&CMs use in pregnancy and breastfeeding, and condition-based topics. Theme 4 (Evaluation of T&CM education) highlighted the importance of evaluating T&CM pharmacy education (n=6).

#### Conclusion:

The current gaps in pharmacists' T&CMs undergraduate and continuing professional education, ultimately impact the quality of patient care, and the safe use of T&CMs by the public. The findings of this review can be used by educators and professional associations to inform developments in T&CMs curriculum and accreditation standards that support the training needs of pharmacists who play a role in fostering the safe and appropriate use of these products.

### Multidisciplinary pharmaceutical care in patients with cancer—An impact analysis

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#### Background:

Cancer is a significant global health issue and a major cause of death. Pharmacists' involvement in cross-disciplinary collaborations related to cancer is limited in Taiwan despite their expertise in medication. Pharmacist interventions were found to enhance quality of care, medication adherence, and even survival rates. Besides, it is especially essential to assess drug-herbal, drug-supplement interaction to ensure medication safety in cancer patients due to the high usage rate of alternative medicine among them. To address potential drug-related problems (DRP) in such population, a comprehensive outpatient pharmacy care model is needed. Since August 2021, pharmacists at the National Taiwan University Cancer Center have been participating in outpatient care for cancer patients, and they joined the multidisciplinary integrated outpatient clinic in May 2022 and further established a multidisciplinary integrated medication consultation outpatient pharmacist clinic since November 2022. The service aimed to improve medication safety and reduce DRP and concern of medication for patient newly started cancer treatment.

#### Objective:

To validate the effectiveness of the tumor multidisciplinary integrated medication consultation outpatient pharmacist clinic within the tumor multidisciplinary team.

#### Method:

Drug-related problems (DRP) would be documented by pharmacists providing care using PCNE ver9.1. The impact of DRP toward patients would be analyzed from health professional perspective and patient perspective. Two senior clinical pharmacists will classify DRP as null, minor, moderate, or major based on their potential impact on patients with CLEO tools, with a third pharmacist making the

final decision in case of discrepancies. The satisfaction of pharmaceutical care will be evaluated using the PSPSQ 2.0, a three domain, 22 questions 4 points Likert scale questionnaire.

#### Results:

During the period from November 1, 2022, to March 31, 2023, a total of 56 patients made 128 visits, resulting in the identification of 281 drug-related problems (DRP). Of these DRPs, 5%, 54%, 35%, and 6% were classified as having null, minor, moderate, and major impacts on the patients, respectively. Suboptimal drug treatment accounted for 44 of the 281 DRPs, 16 were untreated symptoms or indications, 118 were adverse drug events that may have occurred, and 23 were unnecessary drug treatments. Pharmacist interventions were found to reduce DRPs and increase patient satisfaction from their perspective.

#### Conclusion:

Current service model of multidisciplinary integrated medication consultation outpatient pharmacist clinic is able to identify and reduce drug related problems for oncology patients.

### Supply of voluntary assisted dying medicine through community pharmacy in the Northern Territory for terminally ill patients: Pharmacists' perspective

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#### Background

Voluntary assisted dying (VAD) allows an individual in late stages of advanced disease to take a medication prescribed by a doctor that will bring about their death at a time of their choosing. The scope and role of pharmacists around Australia are changing as they take on new services in VAD. All Australian states have passed laws to legalise VAD except the North Territory (NT). Enacting the roles and responsibilities of pharmacists similar to the Victorian model of VAD would be challenging in the NT. In the Victorian model if the request for VAD comes from a patient living in a rural or remote area, pharmacists are required to travel to the patient to provide information, support, and deliver the medication. Additionally, the pharmacy service is also required to collect any unused VAD medications. However, such a model is difficult to enact in the NT due to a large proportion of Territorians living in rural and remote areas compared to Victoria.

#### Purpose

Therefore, this study aimed to investigate the perspectives of registered pharmacists in the NT in supplying VAD medications through NT community pharmacies and additionally to identify potential barriers for providing such services in the NT.

#### Method

This cross-sectional survey was distributed through an online survey platform (Survey Monkey) and in person to reach NT pharmacists over a 3-week recruitment period. All registered pharmacists 18 years and older practicing in the NT were invited to participate in this anonymous survey. The survey was divided into three sections: (1) basic demographics; (2) statements on the perceived barriers faced by NT registered pharmacists toward legalising VAD (Likert scale responses) with positively and negatively worded statements for participants to rate their level of agreement with; (3) multiple choice questions about VAD, training, roles, and responsibilities and an open-ended discussion section allowing participants to elaborate on their responses and identify new issues. Descriptive and inferential statistics were used to analyse the data.

### Results

A total of 84 survey responses were received. The findings in the study showed that the respondents had a mixed response to legalising VAD medications in the Northern Territory. Barriers faced by pharmacists in the study were religion, lack of knowledge in VAD and legislation, guidelines, and staffing, as well as concerns around supply through a third party in rural and remote NT.

### Conclusion

This is the first study to assess NT pharmacists' perceptions of future VAD medication supply in the NT. Personal beliefs and professional capabilities were influential factors, and any VAD program used in the NT should recognise and address these where possible to ensure the optimum participation of pharmacists. The study's significant limitations included the low participation of pharmacists from remote areas of the Northern Territory and the use of Likert scale questions that may be influenced by social desirability bias. Future study recommendations from this research revolved around comparative studies on perspectives and barriers faced by pharmacists in different states and a proposal for NT model of VAD.

## Awareness and use of complementary and alternative medicines by adults visiting selected pharmacies in Lagos State

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**Background:** Complementary and alternative medicine (CAM) describes practices and products used as adjuncts or as alternative to western approaches. The interest in CAM has increased over the past decade. The global prevalence of CAM use varies from 9.5% to 76%. In Nigeria, the prevalence of CAM use in the Southwest was 88.5% while in Northwest, it is 84%. CAM is attracting more and more attention in health care, the number of physicians with specific training in CAM therapies is continually growing.

**Methods:** A cross-sectional descriptive survey was carried out in Lagos state. The study was carried out three areas

(Ikorodu, Mushin and Ikoyi) in Lagos with different population densities. 50 participants from each area were conveniently surveyed. A structured questionnaire was developed to obtain required data from adults visiting the largest community pharmacy in each chosen area till the sample size was complete. Data collected was analyzed using the Statistical Package for the Social Sciences (SPSS). Ethical approval was obtained from the Lagos University Teaching Hospital Health Research and Ethics Committee.

**Results:** The proportion of respondents in this study using CAM was 100%. The major source of information on CAM use was through respondents' family members (100%). CAM was used in preventing illness, treating illness and promoting health in general. Majority of the participants used CAM with treatment given by a medical doctor (45.3%). Herbal medicine, aromatherapy and vitamins/minerals were the most commonly used CAM products and therapies.

**Conclusion:** CAM products and therapies are widely used among the respondents. Regular public awareness programs and continuity education training should be carried out to ensure safe and appropriate CAM use by residents in Lagos state.

## Who would be a pharmacist? A national representative cross sectional survey of pharmacists and students to explore personality traits and associations with job satisfaction and career outlook

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**Background:** Advancements in pharmacy practice in recent years have accelerated with expanded responsibilities including vaccination, prescribing rights, and new practice settings. Consequently, pharmacists have expressed responses ranging from apprehension to excitement. It is possible that personality traits may affect this observed behaviour. As such, to explore Australian pharmacist personality traits, the Big Five Inventory (BFI) was utilized to categorize Extraversion, Neuroticism, Conscientiousness, Agreeableness, Openness and build a holistic view of an individual's personality.

**Purpose** To investigate the diversity of personality traits amongst Australian pharmacists, pharmacist interns and pharmacy students and any potential association to their job satisfaction and/or outlook.

**Method** Australian pharmacy students, pre-registration and registered pharmacists were eligible to participate in the cross-sectional online survey that consisted of participant demographics, personality traits (using a reliable validated instrument, the Big Five Inventory) and career outlook statements (three optimistic and three pessimistic

statements). Data were analysed descriptively and using linear regression.

**Results** The 546 respondents scored highly for agreeableness (4.0 +/- 0.6) and conscientiousness (4.0 +/- 0.6) and lowest in neuroticism (2.8 +/- 0.8). Pessimistic career outlook statements were predominantly neutral or disagreement, in contrast to the responses to the optimistic outlook statements that were predominantly neutral or agreement. Just over half (198 out of 368, 53%) the registered pharmacists stated that they intended to practice in the profession for more than 10 years. For pharmacists, age had significant positive associations with the three optimistic career outlook statements and significant inverse relationships with three pessimistic career outlook statements. Neuroticism had significant inverse associations with optimistic statements and positive relationships with pessimistic statements.

**Conclusion** All demographics tested were overall optimistic about the pharmacy profession with the most prevalent traits being agreeableness, conscientiousness, and openness. These traits allude to the average participating pharmacist as being cooperative, compliant and preceptive. These findings mostly line up with pre-existing literature however further research into this area may investigate disparities in the personality traits of Canadian and Australian pharmacists as well as explore.

### Oral anticoagulant use in Australian atrial fibrillation patients with low risk of stroke: A national cohort study

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**Background:** Oral anticoagulants (OACs) are key to prevent stroke in patients with atrial fibrillation (AF) having moderate-to-high risk of stroke. The use of OACs, however, is not usually recommended in patients with a low risk of stroke given the increased risk of bleeding and associated costs.

**Purpose:** The study aimed to describe the prescription pattern of OACs and its associated factors in AF patients with a low risk of stroke, using national data from Australian general practices.

**Method:** A retrospective cohort study was conducted using data collected from general practices enrolled in NPS MedicineWise, MedicineInsight program. We included patients with a recorded diagnosis of AF between 1 January 2011 and 31 December 2018 who had a CHADS-VASc score of 0 for males or 1 for females. Patients were considered OAC users if there was a recorded OAC prescription within 60 days of their AF diagnosis. Predictors were assessed using logistic regression.

**Results:** The study included 2810 patients with a low risk of stroke (62.3% males) with a mean age of 49.3 ± 10.8 years.

Of the total cohort, 25.1% of patients were prescribed OACs within 60 days of AF diagnosis. Multivariable logistic regression found that female sex (adjusted odd ratio [AOR] 1.40; 95% confidence interval [CI] 1.16-1.68), higher socioeconomic status (AOR 1.52; 95% CI 1.12-2.07 for SEIFA quintile 2, AOR 1.32; 95% CI 1.00-1.75 for quintile 3, AOR 1.41; 95% CI 1.05-1.84 for quintile 4 and AOR 1.39, 95% CI 1.05-1.84 for quintile 5 compared to SEIFA quintile 1), presence of chronic liver disease (AOR 3.71; 95% CI 1.10-12.50) and depression (AOR 1.24; 95% CI 1.01-1.54) were positively associated with OAC prescription. Increasing patients' age (AOR 0.97; 95% CI 0.96-0.98) and the year of diagnosis (2015-18 compared to 2011-12, AOR 0.56; 95% CI 0.41-0.77) were negatively associated with OAC prescription.

**Conclusion:** One in four patients with AF received OAC therapy despite a low risk of stroke. Sex, age, socioeconomic status, depression, chronic liver disease, and diagnosis period were the key determinants of OAC prescription in the low-risk patients.

### Pre-post comparison of clinical pharmacist led anticoagulation clinic in cardiac care setting in Pakistan

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**Background:** The beneficial outcomes of oral anticoagulation therapy are dependent upon achieving and maintaining an optimal INR therapeutic range. Evidence show better outcomes achieved when anticoagulation is managed by pharmacist expertise in anticoagulation management. This study compared a pharmacist managed anticoagulation to non-pharmacist in cardiac care settings.

**Rational of the study:** For cardiac care settings managing high risk patients, anticoagulation is integral part in many cases. Anticoagulation management is complex regime which require knowledge. In Pakistan such skilled resources are rare. Pharmacist took charge of anticoagulation clinic from a non-Pharmacist. The study is to do comparison between the two groups.

#### Methods:

A retrospective study was carried out in cardiac care setting involving all patients who were on anticoagulation therapy and registered in INR clinic. The data of INR from Jan2020 – June 2020 is pre-intervention and Jan 2021-June 2021 is post-intervention time was extracted from hospital CPOE. The recorded INR readings of patients will be compared, i.e. using TTR between clinics run by non-pharmacist v/s Pharmacist. The TTR will be expressed in percentages.

#### Results:

The baseline characteristics were similar between the groups. 47% of the non-pharmacist group (NPH) was male and 53% female with a mean age of 65 years; 44% of pharmacist group (PH) was male, 56%female with a mean age of 70 years. The most common indications for warfarin in both groups were atrial fibrillation, Mechanical Heart

valve and coronary artery bypass graft surgery (CABG). The TTR was 7.50% for non-pharmacist group (NPH) and 18.32% for Pharmacist group. The non-maintained TTR for non-pharmacist group (NPH) was 32.2% and 28.20% for PH.

#### Conclusion:

The pharmacist Managed anticoagulation program compared to Non-pharmacist care showed promising results with improved INR hence patients achieved significantly better INR control. This is first private hospital service led by clinical pharmacist in entire country. The physicians and patients showed satisfaction with the service.

### Cross cultural adaptation and validation of the self-management scale from english to malay among HIV-infected individuals in Malaysia

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#### Background:

Human immunodeficiency virus (HIV) self-management is defined as "an individual's ability in unification with their healthcare provider to manage the signs and symptoms, treatment adherence, physical and psychosocial consequences and lifestyle changes living with HIV." To date, no questionnaire has been developed and validated to assess the self-management abilities of HIV-infected individuals in Malaysia.

**Purpose:** To cross-culturally adapt the English HIV Self-Management Scale (HIV-SMS) to Malay (HIV-SMS-Malay) and assess its psychometric properties among HIV-infected individuals in Malaysia, as Malay is the national language of Malaysia

**Method:** The HIV-SMS was translated according to international guidelines to Malay. Face and content validity of the HIV-SMS-Malay was verified by an expert panel, which consisted of one infectious disease physician, two pharmacists and one non-medical academician (representing the view of the public), who were bilingual in both English and Malay; and piloted in ten patients. HIV-infected individuals [having a CD4 count of >200cells/mm<sup>3</sup>], aged ≥21 years, on treatment for >3 months; and able to understand Malay were recruited from May to October 2021, at a tertiary hospital in Malaysia. The HIV-SMS-Malay was then administered to HIV-infected individuals whilst they were waiting to see the doctor at the clinic according to social distancing guidelines (as COVID-19 was still prevalent during this period). Participants were required to answer the questionnaire at baseline and 2 weeks later. At retest, a researcher contacted each participant over the phone to answer the questionnaire again due to the COVID-19 pandemic. Each participant took approximately 15 minutes to answer the questionnaire.

**Results:** 100/115 patients agreed to participate (response rate=86.9%). Majority were male (93.0%) with a median age of 38.0 years. Kaiser-Meyer-Olkin Measure of sample adequacy was 0.705 and Bartlett's Test of Sphericity was 0.000 indicating that our sample size was adequate to perform factor analysis. Exploratory factor analysis revealed that the HIV-SMS-Malay had four domains: (1) daily self-management health practices; (2) support and HIV self-management; (3) chronic nature of HIV self-management; which had another 2 sub-domains (3a) relationship with health-care provider; (3b) burden of HIV on daily life. This was different from the HIV-SMS, which only had three domains. In addition, two items were removed from the HIV-SMS-Malay as they had factor loadings of <0.4. The overall Cronbach alpha was 0.788, and individual domains ranged from 0.773–0.786, indicating adequate internal consistency. At retest 86/100 participated as 14 participants were uncontactable. Sixteen out of 18 items were not significantly different at test-retest, indicating adequate reliability. We were unable to assess the discriminative validity of the HIV-SMS-Malay as only 5/18 items were significantly different between HIV-infected individuals who had HIV for ≥5 years compared to those <5 years.

**Conclusion:** The HIV-SMS-Malay was found to be a valid and reliable measurement to assess HIV self-management skills in Malaysia. However, we were unable to assess the discriminative validity of this questionnaire.

### Evaluating the safety of deprescribing interventions: Lessons from a patient, family member and clinician directed educational intervention

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**Background:** Fear of adverse drug withdrawal events (ADWEs) is a commonly reported barrier to deprescribing for both clinicians and patients. ADWEs may include physiological withdrawal reactions and return or exacerbation of condition. ADWEs are an important outcome that needs to be captured in deprescribing trials and more knowledge is required about the likely risk of ADWEs following deprescribing. However, there is limited guidance on how to assess the safety of deprescribing interventions and capture ADWEs in clinical trials.

**Purpose:** The aims of this study were to determine the safety of an educational deprescribing intervention, and describe the methods used and challenges encountered in capturing ADWEs.

**Method:** The OPTIMIZE study was a pragmatic, cluster randomized trial conducted in 18 adult primary care clinics in the United States. The intervention involved sending an educational brochure to patients with cognitive impairment (or their family members) prior to an upcoming primary care appointment. This was paired with monthly Tip Sheets provided to primary care clinicians. The intervention targeted older adults (aged  $\geq 65$  years) with dementia or mild cognitive impairment, multimorbidity and polypharmacy ( $\geq 5$  chronic medications). Safety outcomes were hospitalization and mortality 4 months after the patient received the intervention. Multivariable Poisson regression was used to compare outcome rates between study arms. A sample of records underwent clinical review by two physicians and a pharmacist to determine the likely causality between deprescribing events and outcomes.

**Results:** A total of 3,012 (1,433 intervention and 1,579 control) participants were included. 269 (18.8%) intervention and 517 (20.1%) control participants experienced one or more hospitalizations. The 4-month mortality rate was 62 (4.3%) intervention and 59 (3.7%) control participants. There was no statistically significant difference between intervention and control groups for risk of either hospitalization or mortality (adjusted risk ratios: 0.92 (95% CI 0.72, 1.16) hospitalization; 1.19 (95% CI 0.67, 2.11) mortality). None of the mortality events in either group were assessed as 'likely' attributable to the preceding deprescribing event. 10 of the 65 (15%) hospitalization events assessed were considered 'likely' due to the deprescribing event (3/30, 10% in the intervention group and 7/35, 20% in the control group). For example, hospitalization for worsening heart failure following reduction in diuretics.

**Conclusion:** The OPTIMIZE educational deprescribing intervention was safe in older multimorbid adults with cognitive impairment. Additionally, only a small proportion of hospitalization events in people who had deprescribing of one or more of their medications were considered to be caused by the medication discontinuation or dose reduction. Causality adjudication required a large amount of work, both in extracting the necessary information and in clinical assessment. Further research is required to inform best practices for safety monitoring in large pragmatic trials, and how ADWEs can be captured in deprescribing trials.

## Strengthening regulatory structures for Covid-19 vaccine safety surveillance in Nigeria: A capacity building approach

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**Background:** Effective vaccine safety surveillance is crucial for maintaining public trust in immunization programs, especially in low and middle-income countries. This study highlights the strategies used to support a regulatory body in strengthening its surveillance for COVID-19 vaccine safety in Nigeria.

**Methods:** Two approaches were used to support the National Agency for Food and Drug Administration and Control (NAFDAC): 1) enhancing the capacity of regulatory staff to analyze COVID-19 vaccine safety surveillance data and 2) providing training on the use of a mobile adverse event reporting system. Pharmacovigilance staff underwent a one-year health informatics fellowship program to learn about vaccine safety data triangulation, analysis, visualization, and technical writing. Trainings were also conducted for facility and local government-based disease and vaccine safety surveillance staff on the use of the Medsafety mobile app to report COVID adverse event data.

**Results:** A total of 3,324 surveillance and immunization officers across five states were trained on adverse event reporting using the Medsafety app, which led to 36 reports of serious adverse events via the mobile app. Furthermore, three pharmacovigilance/regulatory staff underwent a one-year health informatics fellowship program to develop their skills in vaccine safety surveillance data management, analysis, and visualization. They also supported the development of a web-based data analytics and visualization dashboard for COVID-19 vaccine surveillance data.

**Conclusion:** Strengthening the regulatory structures for vaccine safety surveillance is crucial and can be achieved through capacity building and mobile technology training. The strategies used in this study can serve as a model for other low and middle-income countries seeking to improve vaccine safety.

## An environmental scan of patient safety reporting and learning systems in community healthcare for multi-disciplinary teams

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**Background:** Patient safety reporting and learning systems (RLS) are increasingly employed globally as a tool for continuous quality improvement in healthcare. In Canada, although multi-disciplinary RLSs are widely used in hospitals, their use in community care appears to be limited to single professions such as pharmacy. A gap exists in the knowledge regarding patient safety RLS platforms in the community among multidisciplinary healthcare teams.

**Objectives:** Collaborating with the Manitoba Alliance of Health Regulatory Colleges (MAHRC), we aimed to identify multi-disciplinary, community-based RLSs that have been implemented in other jurisdictions in the world, and characterize their lessons learned to inform the implementation of a similar patient safety initiative in the Canadian province of Manitoba.

**Method:** We conducted an environmental scan in formal and grey literature. The formal literature search was performed on Ovid MEDLINE and EMBASE databases, with titles and abstracts of journal articles screened. The grey literature search involved identifying websites and publications from regulatory authorities and policy institutes with a mission on patient safety, and personal communications with subject matter experts. Inclusion criteria were RLSs that are community practice-oriented or involve reporting in two or more health professions.

**Results:** In 2005-2020, 629 articles were retrieved, with 36 included. RLSs meeting our criteria were identified in the United Kingdom, Spain, the United States, and the Canadian province of British Columbia. Poor reporting of safety incidents was often observed, with identified barriers of RLS use including the subjectivity in the definition of an error, lack of time, feedback, and organisational support, and the fear of blame and punishment. We also identified facilitators to reporting such as enhanced feedback, education- and training-centric nature of reporting, and ensuring confidentiality and anonymity. Many of these factors indicate the importance of an established safety culture for adequate user engagement of RLSs. Another identified issue was the analytic power needed to analyze the reports, identify high-priority issues amidst low-intensity incidents, and formulate actionable responses. Effective utilization of collected data to inform responses and actions is a core need for any RLS initiatives.

**Conclusions:** We identified lessons learned that will benefit the MAHRC to inform their future endeavour in a multi-disciplinary, community-based patient safety initiative province-wide. Further research may include a follow-up focus group session with patient safety stakeholders in Manitoba. Healthcare providers' knowledge and training in

patient safety initiatives such as RLSs, an established patient safety culture among practitioners, and effective analysis of and actional responses to collected data, are crucial prerequisites for the initiatives' successful user adoption and operation. Education at the undergraduate and continuing professional development levels can present various opportunities to acquaint and engage healthcare providers in these patient safety efforts. Utilization of innovative technologies, such as artificial intelligence, may help satisfy the needs for large-volume data analysis. We hope our findings will promote further investigations in these areas to advance the global effort of effective patient safety initiatives.

## Clinical impact of antibiograms as an intervention to optimise antimicrobial prescribing and patient outcomes—A systematic review

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**Aim:** To evaluate the effectiveness of antibiograms as an intervention to optimise antimicrobial prescribing and patient outcomes.

**Background:** Overuse and misuse of antibiotics contribute significantly to the development of antibiotic resistance. Furthermore, sub-optimal choice of antimicrobials can lead to poor clinical outcomes. Antimicrobial stewardship (AMS) guidelines advocate for the use of antibiograms (cumulative antimicrobial susceptibility test data) as a tool to guide empirical antibiotic prescribing and inform local treatment guidelines.

**Methods:** Embase, PubMed, CINAHL and IPA databases were searched from inception until September 2022, to identify studies of antibiogram related interventions for optimising antimicrobial use and/ or patient outcomes in all health care settings. Two reviewers independently screened title and abstracts and full articles. The NIH Quality Assessment Tools were used to assess the methodological quality of the included studies.

**Results:** Thirty-seven studies met inclusion criteria and were included for review. Majority of studies were conducted in the United States (n = 25) and in hospital settings (n = 27). All interventions were multifaceted and in 26 (70%) studies, facility specific antibiograms could be considered as an integral component of the interventions. Majority of included studies were of uncontrolled pre-post design. Only one study incorporated randomisation. There was a positive impact on antibiotic consumption trends (17 studies), appropriateness of prescribing (16 studies) and cost of treatment (6 studies), with limited or minimal evidence for

improvement in infection related outcomes, mortality, hospitalisation, and resistance profiles. Due to the heterogeneity in study designs and outcomes, a meta-analysis was not feasible.

**Conclusions:** Clinical use of antibiograms to inform treatment recommendations may be an effective AMS strategy to improve empirical antibiotic prescribing however further studies with rigorous study designs are recommended to evaluate its effectiveness in health care settings such as aged care.

### Exploring role for antibiogram use in Australian aged care settings: An i-PARIHS- guided qualitative study

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**Background:** Sub-optimal empirical antibiotic use may cause infection related harm to patients and increase the use of broad-spectrum antibiotics, leading to antibiotic resistance. Clinicians have a lack of access to information about local resistance patterns to prescribe appropriate antibiotics. Antimicrobial stewardship guidelines advocate for the use of antibiograms, or cumulative antimicrobial susceptibility test data, as a tool to guide empirical antibiotic prescribing and inform treatment guideline development. Antibiograms, when used in conjunction with treatment guidelines, can assist the prescriber to commence the most appropriate empirical antibiotic for infections fulfilling infection criteria, whilst waiting for the return of microbiological investigation results.

**Objective:** To explore the perceptions and knowledge of key stakeholders about the role for antibiograms in aged care settings and determine barriers and enablers of antibiogram development and implementation in this setting.

**Methods:** In-depth semi-structured interviews were conducted with health care professionals working in aged care and infection disease specialists/microbiologists or researchers with antibiogram content knowledge. A purposive sampling method was adopted to identify the interview participants to explore diversity of views, and interviews were conducted until saturation was reached. The interview guide was developed based on the four constructs and sub-constructs of i-PARIHS framework in order to identify key considerations for developing and implementing antibiograms in aged care settings. Using thematic analysis, themes were mapped to the i-PARIHS framework constructs.

**Results:** Twenty interviews were conducted (10 prescribers, five pharmacists, four registered nurses and one researcher). The analysis of the data yielded five major themes which included: 1. Lack of knowledge about antibiogram use and availability, 2. Recognised role of antibiogram for empirical

antibiotic prescribing and surveillance of resistance patterns, 3: Barriers to development of facility specific antibiograms (content experts), 4: Potential role for embedded pharmacist in implementation of antibiograms into aged care and 5. Preference to present antibiogram data in a treatment algorithm or flow chart.

#### Conclusion:

This study identified the perceptions and knowledge of key stakeholders about the potential role for antibiograms in aged care settings. Findings suggest lack of knowledge about antibiogram use in aged care settings however clinicians recognised its potential role in improving empirical antibiotic prescribing, which they suggest would reduce risk of prescribing of ineffective antibiotics and hence hospitalisation. Issues with feasibility of developing facility specific antibiograms were identified by infectious disease physicians with solutions offered, such as pooling pathology data from facilities in the same geographical location, extending antibiogram data to 2 or 3 yearly, or utilising nearby hospital antibiograms. Presenting antibiogram data as part of already available treatment guidelines was preferred, with a potential role for embedded aged care pharmacist highlighted as a driver of educating and promoting antibiogram use.

### A study of antibiotic residues in beef

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The concept of one health shows the linkage between people, animals, and the environment that ought to inform healthcare management. The purpose of this study was to assess for antibiotic residues, the relationship between these residues and the resistance patterns of the isolates from their respective beef samples (liver, kidney and gluteal muscle). Fresh beef samples were analyzed with well diffusion assay to assess the presence of antibiotic residues; 92% of the tested samples had antibiotic residues. With the liver showing the highest prevalence of antibiotic residues, there was no significant difference in the antibiotic residues detected in the three organs ( $p=0.294$ ). Samples that showed presence of antibiotic residues with well diffusion assay were further screened using TLC for presence of Oxytetracycline and Penicillin G with the later showing the highest prevalence of 97.8% and Oxytetracycline 82.6%. Gram negative microbes in the samples were isolated using cultural and biochemical characterization were isolates of *E. coli* (16.8%), *Pseudomonas aurigenosa*,(2.4%), *Providentia alcalifaciens*,(2.4%), *Proteus spp.*,(38%), *Citrobacter spp.*,(26.4%), *Enterobacter spp.*,(12.8%) and *salmonella spp.*,(8.8%) were obtained. The antimicrobial resistance patterns of these isolates were obtained using Kirby Bauer disc diffusion technique against 6 classes of selected antibiotics. The resistance to ampicillin was found to be most prevalent (97.3%), then chloramphenicol 86.7%, tetracycline 82.7%, ceftriaxone 57.3%, ciprofloxacin 54.7%, and gentamicin 6.8%. A strong correlation was established

between presence of antibiotic residues of a given class of antibiotics and the resistance pattern shown towards the same class of antibiotics as seen in tetracyclines and penicillins respectively ( $p < 0.001$ ). This study therefore shows that exposure to food products that have antibiotic residues increases the risk of exposure to resistant food borne pathogens that would in turn cause infectious diseases that may be difficult to treat, hence highlighting the need to observe withdrawal periods in animals for human consumption.

### Survey on patients' experience and quality of care/services provided by the new point of care (POC) Warfarin clinic at the heart centre in RIPAS hospital

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Regular monitoring of the International Normalized Ratio (INR) is essential for warfarin patients to ensure their INR level is within the targeted therapeutic range. Traditionally, patients would go to the laboratory for venipuncture. However, the point-of-care (POC) method for INR monitoring is increasingly being used in hospitals or patients for self-monitoring.

**Objectives:** This study aims to determine the degree of patients' satisfaction with the Warfarin Clinic since implementing the new POC method. We also investigate the factors influencing participants' preference and willingness to use self-monitoring devices in the future.

**Methods:** All patients attending the Warfarin Clinic for their appointment and who fulfilled all the inclusion criteria were invited to complete a satisfaction questionnaires survey. All data collected were entered into Microsoft Excel software and analyzed using the RStudio statistical software.

**Results:** Of 93 participants, 56 (60.2%) were males, and 37 (39.8%) were females with a mean age of 64 years old. Most of the participants were Malays ( $n=83$ ). A total of 93 questionnaires were collected during the study period. The survey revealed that 90 participants (96.8%) preferred the POC method over the conventional laboratory. Reasons for the preference include a convenient process, less waiting time, faster results, less pain, and less blood needed. 94.6% of the participants expressed being very satisfied with the POC method and the clinic's overall performance. However, only 47.3% of the participants were willing to practice self-monitoring in the future.

**Conclusion:** The results of our study strongly indicate a high level of patient satisfaction with the POC method. Using the POC method was revealed to have an easier and more effective workflow than the conventional method.

### Development of a mobile health application to manage oral anticoagulation use for patients with concurrent atrial fibrillation and heart failure

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#### Background

Patients with concurrent atrial fibrillation (AF) and heart failure (HF) are at a higher risk of developing stroke. Hence, these patients require oral anticoagulants (OACs), unless contraindicated. Evidence has shown that mobile health applications (MHAs) that provide education and support on OAC use empowered patients to self-care, thus improving their health outcomes. Several MHAs to manage OAC use have been developed globally, but none were suitable for use in Malaysia.

#### Aim

To develop an Oral anticoagulation assistant (Ola) application to manage the use of OACs among patients with concurrent AF and HF.

#### Methods

The development of Ola was conducted from June to December 2022 at the University of Malaya, Kuala Lumpur. The Agile model was selected to develop Ola as it facilitated quicker development of a customised MHA that would enhance user experience at a lower developmental cost. In Agile, there are five steps: planning, designing, building, testing and reviewing of the MHA. A multidisciplinary steering committee consisting of patients with AF and HF, doctors and pharmacists who managed them, and software developers was convened. Users' preferences were identified based on literature review and findings from a qualitative study which explored the views and perceptions of patients with AF and HF, and doctors and pharmacists who managed them, on the use of a MHA to manage OACs. A mock-up was produced using rapid prototyping. This mock-up was then reviewed by the committee. The first prototype (vP1) was developed and subjected to three rounds of alpha-testing and improved based on feedback given, resulting in versions vP2, vP3 and vP4 at each round. The Mobile Application Rating Scale (MARS) was used to evaluate the quality and content of MHA during each round of testing. All items in the scale were assessed on a 5-point scale (1-inadequate, 2-poor, 3-acceptable, 4-good, and 5-excellent). A higher MARS score indicates better acceptance of the MHA.

#### Findings

The Ola app quality mean score for vP1, vP2 and vP3 were 3.56, 3.90 and 4.60, respectively; indicating a better-quality app as the prototypes progressed. The Ola app subjective quality mean score for vP1, vP2 and vP3 were 3.70, 3.10 and



3.60, respectively. Initially, for vP1, all members of the steering committee were willing to pay for the use of OLa. However, for vP2 and vP3, the healthcare professionals wanted OLa to be free so that it can be accessed by more patients. This reduced the app subjective quality mean score. The OLa app specific average score regarding the usefulness of the app, frequency of using the app, cost, and user satisfaction score for vP1, vP2 and vP3 were 3.93, 4.03 and 4.80, respectively; indicating higher satisfaction as the prototypes progressed. The revised prototype (vP4) included personal health information, risk scoring for OAC use, education modules regarding AF, HF and OAC, emergency contacts, self-monitoring records and modifiable reminders.

#### Conclusion

OLa, an app that could potentially assist in the management of OAC among patients with AF and HF was developed using the Agile model and end-user engagement.

### Perceptions and expectations of health professionals regarding the roles of pharmacists in the hospital setting: A qualitative systematic review

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#### Background:

Pharmacists have become increasingly integrated with hospital teams as their scope of practice has expanded in recent years. However, there is limited research on how their practice is perceived by other health professionals and which pharmacy services are most valued.

#### Purpose/Objective(s):

To critically assess and identify what is currently known about the perceptions regarding the roles of hospital pharmacists, held by non-pharmacy health professionals.

#### Methods:

A systematic literature search was conducted in MEDLINE, Embase, and CINAHL to identify peer-reviewed qualitative research published between 2011 and 2022. Through title/abstract and full-text screening by at least two independent reviewers, the eligible articles were selected for data analysis. The data underwent inductive thematic analysis by two reviewers and merged into overarching themes through a consensus process. The amalgamated findings were assessed to measure confidence in each finding using the GRADE-CERQual criteria. The roles of hospital pharmacists were organised into sub-themes and

mapped to all four domains of the WHO Strategic Framework for Medication Without Harm.

#### Results:

The search strategy resulted in 14718 hits. After removing duplicates, 10551 studies were screened for title and abstract. Of these, 515 studies were eligible for full-text review, and 36 studies were included for analysis. Three main overarching themes emerged: 1) specific roles and activities of hospital pharmacists, 2) personal attributes and behaviours of pharmacists, and 3) benefits/limitations/expectations regarding overall hospital pharmacy services. Most health professionals favoured patient-facing pharmacist roles, with highly valued roles including medication reviews, providing drug information, and education for health professionals. A lack of data from allied health professionals was observed.

#### Conclusion:

This review provides a comprehensive, summary of the wide-ranging roles and activities hospital pharmacists are known to perform worldwide, and other health professionals perceptions and expectations of these roles, which may serve as drivers in prioritising and optimising hospital pharmacy services.

### The effectiveness of drug information service for outpatient cancer patients with opioid analgesics use

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#### Introduction

The World Health Organization (WHO) reports that cancers are among the leading causes of morbidity and mortality worldwide, and are responsible for 18.1 million new interventions and 9.6 million death in 2018. More than 50% of people diagnosed with cancer will experience physical pain and of those people, more than one-third will experience moderate-to-severe pain levels. In Asia, cancer patients are very afraid of using doctor-prescribed opioid analgesics even when they feel pain is unbearable. Therefore, it is important to teach patients how to correctly manage cancer pain and convince them that using an opioid analgesic is the best way to improve cancer patient pain relief.

#### Methods

The research used an Experimental Design involving two groups conducted pretest-posttest intervention. This study compared the difference after drug information service (DIS) between intervention and control groups with the aim of determining how effective is the pain relief in terms of intensity, interfered, and offered positive attitude on pain

and used opioid analgesics. Cancer patients agreed and signed informed consent, then a pharmacist would telephone on Day 1-3 and Day 7-10 to offer our DIS to answer any questions about opioid analgesics. After the two telephone calls, each patient returns to their physician, after which a pharmacist carries out a face-to-face private interview to complete a questionnaire that provides the post-test information. The whole intervention cycle covers 8 week cycle.

### Results

Demographic and clinical characteristics at baseline were no difference. The median age of all patients were 57.96 years old. Use t-test to verify in the post-test respectively, the results show the "Present pain" reaches a statistically significant difference ( $p$  value  $<0.05$ ). In past 24 hours pain interfered "Sleep" and "Recreation" show statistically significant difference ( $p$  value  $<0.05$ ).

### Conclusion

Drug information services have been documented as being effective in reducing barriers and increasing the compliance of cancer pain patients. Providing complete opioid analgesic information, including side effects and side effect management, reduced the hesitation that patients and caregivers showed when using opioid analgesics. Thus, it is important that pharmacist play such a role, it could have great potential to improve the quality of pain management for cancer patients.

## Clinical pharmacist in multidisciplinary teams (MDT) participated in the whole-process pharmacy practice of patients with cancer pain

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**Objective:** To explore the effect of clinical pharmacist in multidisciplinary teams (MDT) participation on the whole-process pharmacy practice of patients with cancer pain.

**Methods:** The Multidisciplinary Pain Clinic (MDPC) consists of clinical physicians, clinical pharmacists, and nurses. The clinical pharmacists play an important role in the MDT, primarily involved in medication evaluation and optimization, and adverse drug reactions management. Pharmacist participation improves patient compliance in taking medications, enhances the effectiveness and safety of drug treatment, and ultimately improves the quality of life for patients. Through the MDPC and online WeChat platform, clinical pharmacists provided continuous comprehensive pharmaceutical services for patients with terminal cancer, ensuring the safety and efficacy of medication therapy.

**Results:** Clinical pharmacists participated in the whole-process pharmaceutical care of cancer pain, providing pharmaceutical services in comprehensive assessment of

cancer pain, optimization of medication and optimization, and adverse drug reactions management, and improving patient medication compliance. As a result, patient medication compliance improved significantly, and the NRS score decreased from 8 to 1 with no severe adverse drug reactions. **CONCLUSION:** Clinical pharmacists in the MDT team could carry out whole-process pharmacy practice in improvement of medication compliance, cancer pain assessment, cancer pain medication re-evaluation, and pharmaceutical care, etc., thus ensuring effective and safe use of medication for patients, and giving play to the value of clinical pharmacists, thus reducing patient suffering, enhancing drug safety and effectiveness, and improving patient quality of life, highlighting the critical role of clinical pharmacists in the MDT.

## The impact of allopurinol adherence patterns on outcomes in people with gout

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**Background.** Adherence to allopurinol in people with gout is often suboptimal. An understanding of the patterns of allopurinol use will inform the development of adherence services targeting gout patients.

**Purpose.** The aims of this research were to identify allopurinol adherence patterns in a cohort of gout patients and to determine the impact on target urate concentration attainment ( $<0.36$  mmol/L), gout flares, and health-related quality of life (HRQoL).

**Methods.** Allopurinol adherence data from 31 people with gout were collected using electronic monitoring (MEMS®, Aardex) over 1 year. Any data prior to a prescribed dose escalation were excluded. Urate concentrations were self-monitored using a point of care device (HumaSens2.0plus). Gout flares were self-reported. HRQoL was collected every 3 months using the EQ-5D-5L survey and converted to health utilities. Urate target achievement was defined as the proportion of days at the urate target. Adherence patterns, assumed to represent medicine taking behaviours during the study, included; no missed doses (MD), occasional or repeated MD ( $\leq 2$  sequential MD followed by  $\geq 30$  or  $<30$  doses consecutively taken, respectively) and occasional or repeated drug holidays ( $\geq 3$  sequential MD followed by  $\geq 30$  or  $<30$  doses taken, respectively). Variability in dosing time was not considered. Each person was assigned to a single

adherence type based on the most common pattern observed. The proportion of days at the target urate, overall adherence rate (proportion of doses taken), and health utilities were compared between the adherence types using a non-parametric Kruskal-Wallis test. Overall adherence was compared in people with and without gout flares using a Mann Whitney test. The odds of gout flares used a Fishers Exact test.

**Results.** The median overall adherence was 91% and the percent days below the urate target was 84%. Fifteen people experienced at least 1 gout flare and 7 recorded multiple flares. Adherence patterns identified included 54 occasional MD, 3 occasional drug holidays, 599 repeated MD and 89 repeated drug holidays. Adherence types included: 1) no MD, 2) occasional MD, 3) repeated MD, 4) both occasional and repeated MD, and, 5) both repeated MD and drug holidays. People in the latter group recorded 6 (40%) gout flares, had a significantly reduced time at the urate target (38% vs 94%,  $p=0.0064$ ) and overall adherence rate (56% vs 95%,  $p<0.0001$ ) compared to the other groups combined. Health utility score was not predicted by adherence type ( $p=0.9142$ ). The odds of a gout flare was not significantly different in those who took repeated drug holidays compared to other types (odds ratio 2.1, 95%CI 0.4-10.9).

**Conclusions.** Our findings suggest that repeated drug holidays of  $\geq 3$  consecutive missed allopurinol doses will adversely impact urate target attainment but we did not observe an impact on gout flares or health utilities. These results are limited by the small number of motivated participants. Future work will confirm these patterns in a larger cohort of gout patients and clarify the impact on flares. An improved understanding of common adherence patterns will aid the development of adherence services to target behaviours most likely to impact outcomes.

### Opportunities and challenges for promoting pharmacy practice research in China

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**Background:** Pharmacy Practice Research (PPR) is a recognized research area by FIP and many countries worldwide. PPR can drive the expanded roles for pharmacists and implementation of innovations which is important for the advancement of pharmacy practice. The concept of PPR is not well recognized or understood yet in China. This research aims to explore the perspectives of hospital pharmacy leaders and professors in academia to identify opportunities and challenges in promoting pharmacy practice research in China.

**Methods:** A qualitative methodology was employed using focus groups discussions. Five focus groups were conducted, including hospital pharmacy directors (n=18) and professors in pharmacy administration (n=5) online. Focus groups were

audio recorded and transcribed verbatim by an independent experienced transcriber and validated by the study principal researcher. Thematic analysis was undertaken to generate key themes and sub-themes.

**Results:** The study participants highlighted a number of opportunities and challenges for promoting PPR in China. Analysis of the results focused on three main categories: opportunities, challenges and recommendations. Overall, six major themes were identified: 1) improving regulatory landscape (healthcare reform, drive for evidence based practice, control on rational use of medicines); 2) intrinsic enabling factors (increasing clinical pharmacy service capacity, increasing interests in conducting research); 3) research capacity (understanding of the concept of PPR, confidence of the PPR methods, infrastructure supporting PPR); 4) resources (time constraints, personnel, competing research areas focused on basic pharmaceutical science research); 5) education and training (continuing education of PPR areas, training of PPR methods in undergraduate pharmacy programs); 6) leadership (advocating for pharmacy research, leading on national PPR campaigns).

**Conclusion:** Pharmacy Practice Research is an important research area to support the healthcare reform and for expanding the role of pharmacists in China. A number of opportunities and challenges were identified. Appropriately addressing the challenges through education, training and leadership may further contribute to the promotion of pharmacy practice research in China.

### Professional stigma towards clients with methamphetamine use disorder—A qualitative study

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**Background:** Methamphetamine use disorder (MUD) has negative healthcare outcomes on the individual and society. Literature reports stigma by healthcare professionals towards clients with other substance use disorders, however the attitude of pharmacists towards people with MUD has rarely been explored. This study aimed to explore pharmacists' perspectives surrounding their potential role in the treatment and management of MUD.

**Methods:** A convenience sampling strategy was used to recruit community pharmacists across Sydney. Semi structured interviews examined views and ideas of pharmacists pertaining to their role in the implementation of methamphetamine treatment programs. Coding of transcribed interview data was performed by all members of the research team, and consensus reached on the generated themes emerging.

**Results:** Nineteen pharmacists (eleven females and eight males) completed the interviews. The main theme identified was stigma held by healthcare professionals towards clients with MUD. The almost unanimous perception amongst

pharmacists was fear and apprehension towards people with MUD. Other perceptions by pharmacists included futility of treatment, and reputational harm of pharmacists involved in treatment of people with MUD. Some pharmacists strongly suggested that education and knowledge surrounding MUD was clearly necessary to enable future engagement in treatment of MUD.

**Conclusion:** A substantial amount of stigma towards people with MUD was found in this group of pharmacists. Negative attitudes by healthcare professionals can perpetuate healthcare disparities and impede the implementation of future treatment programs for people with MUD. Appropriate educational interventions on MUD for pharmacists are needed to address this kind of stigma, and to optimise future MUD treatment programs.

### Implementation of diabetes screening and associated factors in community pharmacy

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**Background:** Considerable international evidence identifies that screening for undiagnosed type 2 diabetes (T2DM) in community pharmacies appears feasible, acceptable and beneficial. However, implementation of diabetes screening remains variable both in terms of quality and activity levels. This study aimed to measure the nature and extent of T2DM screening in Australia, and to identify factors associated with implementation.

**Methods:** A cross-sectional survey was undertaken among a nationally representative sample of 415 community pharmacies recruited to the 2017 Pharmacy Diabetes Screening Trial across Australia. Self-reported data from pharmacies explored screening availability, volume, and processes, and also practice characteristics that may influence effective service implementation. Survey data was geo-linked to national spatial datasets outlining socioeconomic- and access-related characteristics of the pharmacy postcode. Descriptive analyses were performed to outline the current state of diabetes screening, and binary logistic regression was performed to identify factors associated with pharmacies that (a) provided diabetes screening (yes and no), and (b) were high-performing (top quintile) in terms of screening activity levels.

**Results:** Overall, 39% of pharmacies conducted diabetes screening, with the top quintile constituting those who performed more than two screenings/week on average. The

most commonly offered form of screening was blood glucose testing (35% of all pharmacies) followed by the paper-based AUSDRISK assessment (19%); HbA1c testing was not commonly offered (4%). Almost all testing and counselling was provided by a pharmacist, pharmacist intern, supervised pharmacy student or qualified health professional. A majority reported having software to guide delivery of professional pharmacy services (72%), pharmacy-based training for pharmacists/staff to implement services (63%), formal training requirements for some services (56%), patient files in pharmacy (61%), and meetings to review and improve professional services (55%), along with other less frequently used implementation strategies. In the adjusted regression models, pharmacies in Queensland and New South Wales were more likely to conduct diabetes screening compared with those in Victoria. Having software-guided service delivery, and written documentation of patient management/results, both doubled the likelihood of conducting screening. Pharmacies located alongside medical centres were significantly less likely to conduct diabetes screening, while those in large shopping centres were five times more likely to be high-performing CPs compared to those located in small shopping centres. Pharmacy-based training for pharmacists/staff to implement services was associated with significantly increased odds of a being a high-performing CP.

**Conclusion:** Our findings suggest that diabetes screening services in CPs can be improved and that policy and funding for standardised diabetes screening are required to complement and expand diabetes screening services.

### An evaluation of psychotropic adverse drug event monitoring tools for use in the long-term care facility setting

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**Introduction.** International guidelines recommend monitoring people with dementia who use psychotropic medications such as antipsychotics, antidepressants or benzodiazepines, for adverse drug events (ADEs), but specific approaches for this are not stated. The new Australian Clinical Practice Guidelines for the Appropriate Use of Psychotropic Medications in People Living with Dementia and in Residential Aged Care, recommend all residents administered psychotropic medications should have a dedicated adverse event monitoring protocol.

**Aims.** To evaluate psychotropic ADE monitoring tools intended for use in nursing homes and other long-term care facilities (LTCFs).

**Methods.** Medline, CINAHL, Embase and PsycInfo databases were searched from inception to August 2022 for studies

reporting the development, validation, or use of tools to monitor psychotropic ADEs. Quality was assessed against the criteria: test-retest reliability, inter-rater reliability, content validity and construct validity.

**Results.** Eight articles describing six psychotropic ADE monitoring tools were included. Tools monitored antipsychotic (n=6), benzodiazepine (n=4) and antidepressant (n=4) ADEs. Tools monitored 4 to 95 items. All tools monitored for sedation. Only 1 tool monitored for postural hypotension, but 5 tools monitored for other signs or symptoms that could potentially lead to falls (e.g. movement issues or dizziness). Tools were designed for use by nurses (n=4), general practitioners (n=1), and multidisciplinary teams (n=1). Two tools reported taking 10-60 minutes to assess potential ADEs. Input about ADE detection was directly sought from residents or their caregivers in 2 of the tools. Five tools described escalation of suspected ADEs. Test-retest reliability and construct validity was not reported for any tools. Inter-rater reliability was reported for two tools. Four tools were deemed to have adequate content validity.

**Discussion.** Psychotropic ADEs may be similar to geriatric syndromes such as cognitive impairment or functional decline. Clinicians or residents may not attribute these syndromes to psychotropic medication use. Conversely, not all potentially concerning signs or symptoms such as falls or dizziness are psychotropic-related. Structured and regular monitoring with a valid and reliable tool may assist clinicians and residents to differentiate signs and symptoms that are psychotropic-related. Data about the type and severity of ADEs can inform prescribing and deprescribing decisions. ADE monitoring in an LTCF setting should consider ADEs that are important to residents. Monitoring of cardiovascular and metabolic parameters is recommended for adults prescribed antipsychotics in mental health settings, but invasive metabolic monitoring may not align with goals of care for residents who are frail, living with dementia, or have limited life expectancy. The complexity of existing tools may preclude their use in routine clinical practice. The tools provide an opportunity for pharmacists to play a greater role in the detection, escalation and assessment of potential or actual ADEs. Our findings may guide the creation of new tools that support guideline recommendations and are specific enough and can be feasibly implemented such that they support the early identification of ADEs and potentially prevent more serious harm.

## Exploring patient experiences with pharmacy-based test-to-treat influenza-like illness management programs in the United States

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**Background:** Seasonal influenza produces an estimated 9 million to 49 million illnesses annually, affecting 5% to 20% of the population of the United States. Community pharmacists are highly accessible with most (~95%) Americans and patients frequent community pharmacies almost twice as often as physician offices. Despite their accessibility, pharmacists are often underutilized care providers in the US due to regulatory restrictions in scope of practice or lack of payment for services rendered. Despite this, there has been a growing demand for pharmacist services by patients in areas of the US where pharmacists have expanded scopes of practice.

**Purpose:** To explore behaviors, beliefs, perceptions, and attitudes of patients who have received pharmacy-based test-to-treat influenza-like illness management services in four regions of the US.

**Method:** A qualitative research approach with in-depth key informant interviews will be used. A semi-structured interview guide will be developed by the study team using existing published literature as a guide that has been employed in similar patient populations when focusing on influenza testing and treatment, including the use of the Theory of Planned Behavior (TPB). A sample of 20-30 participants will be targeted, with "theoretical saturation" serving as the end of recruitment. Each interview will be audio recorded and transcribed verbatim by a professional company. Lincoln and Guba's framework will be used to address and meet criteria for quality and rigor. Participants will be recruited from an ongoing, nationwide research study in the US investigating pharmacy-based test-to-treat influenza-like illness.

**Results:** The TPB assumes that individuals act according to attitudes, subjective norms, and perceived behavioral control. These factors form the backdrop for the decision-making process. Domains of the TPB will be used to conduct deductive thematic analysis.

**Conclusion:** It is anticipated that these results will provide novel findings on patient behaviors and preferences for engaging in pharmacy-based test-to-treat influenza-like illness services. Given the novelty of these services in the US, such data may be used to increase patient awareness, service quality, and overall scalability of the service.

## Voluntary assisted dying (VAD) in Queensland (QLD)—A unique collaborative approach in expanding a pharmacist's scope of practice to provide holistic patient centred, end-of-life care

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### Background

In June 2019, the state of Victoria was the first Australian state to legalise VAD, QLD followed on 01/01/2023.<sup>1</sup> Similarly, to Canada and some European countries, VAD within Australia allows the choice of patient self-administration or practitioner administration of a lethal substance. This aligns with the processes in Canada known as Medical Assistance in Dying (MAID).<sup>2,3</sup>

With the implementation of legislation, new services and roles are being expected of health professionals, including pharmacists. An unfamiliar area of practice for many has resulted in the fundamental question of 'what is the scope of practice for this service for each health professional?'. Woods et.al illustrates the expanding role and adaptive nature pharmacists require to maintain ethical and moral respect for patients and their families.<sup>4</sup>

In Australia, medical practitioners and nurses who want to practice VAD must undergo extensive training to become credentialled. However, similar mandatory training is not available for VAD pharmacists. Furthermore, limited information is published on the pharmacist requirements to practice VAD and their role within a niche service.<sup>5</sup>

### Purpose

1. To review the literature, determine the scope of pharmacist within the VAD space.
2. To discuss the current scope of practice of Queensland pharmacists providing VAD services.

### Method

A literature review was conducted with relevant search terms. Only three articles met the requirements of this review. Information from each article was collected that encompassed the following criteria:

pharmacist scope of practice  
relevant training for the role  
patient and authorised practitioner counselling/education on VAD substances  
discussions surrounding death  
dispensing of substances.

Each article was analysed to evaluate the above criteria. The analysis was compared to the current QLD VAD (QVAD) pharmacist practice.

### Results

As recognised by Isaac et al review, extensive training should be completed prior to commencing in this VAD role.<sup>6</sup> QVAD SPS (Queensland Voluntary Assisted Dying Support and

Pharmacy Services) staff underwent FOUR weeks of training in preparation for the role. The intensive training included comprehension of the VAD Act, understanding VAD substance pharmacology, preparing for death and managing conflict situations with mock scenarios. Services provided by pharmacists within this role have grown to include delivery and counselling of substance, discussions on planning for death and after death care management. QVAD pharmacists are accompanied by support staff (nurse or social worker) when visiting patients. This multidisciplinary approach has been found to deliver a more inclusive service to patients and their families. A central VAD pharmacy service ensures standardised training and supervision by specialised end-of-life care professionals to enable pharmacists' growth and development. This training has allowed QVAD pharmacists to expand their scope of practice and provide tailored patient-centred care.

### Conclusion

Little is known about the role of pharmacists in a patient's journey through VAD. International models imply that all pharmacists who supply the lethal substances are expected to have the adequate knowledge to counsel appropriately on VAD substances without clear guidance. QVAD trained pharmacists have developed the specialised end-of-life skills that expands their scope of practice which may guide future VAD pharmacy service models.

## Evaluation of healthcare professionals' knowledge about high alert medication in Mongolia: A cross-sectional study

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**Background:** Health care interventions are intended to benefit patients, but they can also cause harm. The modern healthcare delivery system is a complex combination of processes, technologies, and human interactions that bring significant benefits, but also involves an inevitable risk of patient harm. As a result, a significant number of patients worldwide suffer harm or even die every year due to unsafe healthcare, which represents a significant public health burden. Medication errors are a common problem in healthcare, and high alert medications account for a significant proportion of these errors. Lack of knowledge among healthcare professionals is a major contributor to medication errors.

**Purpose:** This study aimed to evaluate and compare the knowledge of high alert medication among healthcare professionals in Mongolia.

**Methods:** A cross-sectional questionnaire study was conducted among 781 healthcare professionals (doctors, nurses, and pharmacists) working in specialized referral

hospitals, province hospitals, and district hospitals in Mongolia.

**Results:** Of the total participants, 461 (59%) had insufficient knowledge about high alert medications. The level of knowledge varied significantly based on profession, professional degree, department, and work schedule.

The study found that specialized hospital health professionals had significantly higher knowledge about HAMs compared to those working in district general hospitals ( $p=0.01$ ). Additionally, the results showed that healthcare professionals in the surgical department were 41% more knowledgeable than those in the internal department ( $p=0.043$ ), while those in the pharmacy department were 73% more knowledgeable compared to the internal department ( $p=0.000$ ). No significant difference was found between health professionals and internal departments in the emergency intensive care department ( $p=0.078$ ), children's department ( $p=0.42$ ), maternity hospital ( $p=0.434$ ), infectious disease ( $p=0.21$ ), neurology department ( $p=0.613$ ), or other departments ( $p=0.377$ ). The study did not find any significant effects of gender ( $p=0.288$ ) or years of work ( $p=0.115$ ) on the HAM knowledge of medical professionals.

Only 248 (31.8%) of the respondents had attended training on high alert medications, highlighting the need for further education and training.

**Conclusion:** The study found that healthcare professionals' knowledge of high alert medications in Mongolia was insufficient, highlighting the need for improved education and training in this area to reduce medication errors and improve patient safety.

### Improvement of medication adherence and discharge medication appropriateness of patients diagnosed with acute coronary syndrome followed by clinical pharmacy interventions in a tertiary care hospital in Sri Lanka

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**Background:** Acute coronary syndrome (ACS) is the leading cause of hospital mortality in Sri Lanka. Secondary cardiovascular complications such as angina and reinfarction are common within a year after recovering from ACS,

leading to hospital readmissions and deaths. Errors in discharge medication prescribing and poor medication adherence are considered major contributing factors. Currently, there is no established clinical pharmacy practice in Sri Lanka, but implementing clinical pharmacy services has been shown to improve discharge medication appropriateness and medication adherence in lower middle-income country settings.

**Purpose:** The study aimed to assess the impact of clinical pharmacy interventions on improving medication adherence and discharge medication appropriateness in ACS patients.

**Method:** This is a pseudo-randomised controlled clinical trial conducted by recruiting patients diagnosed with ACS at the Teaching Hospital Peradeniya, Sri Lanka. The intervention group received standard care coupled with clinical pharmacy services while the control group received only standard care. A trained clinical pharmacist carried out these interventions. The clinical pharmacy interventions consisted of a medication history interview, medication review, medication optimisation, discharge medication counselling and continuous follow-up at 1, 3 and 6 months. Medication adherence was assessed using brief medication questionnaire (BMQ) in both groups at baseline and six months. Discharge medication appropriateness was evaluated using the medication appropriateness index (MAI) before patient discharge.

**Results:** Three hundred and sixty-five patients were recruited (control - 180, intervention - 185). Both groups were similar in medication adherence at baseline with a higher mean BMQ (poor adherence) (control: 2.819+/-1.996 and intervention: 2.367+/-1.674,  $p=0.0701$ ). Medication adherence improved at six months followed by the clinical pharmacy interventions (control: 2.289+/-1.727 and intervention: 1.2+/-1.156,  $p<0.0001$ ). The medication adherence improvement in the intervention group (49.3%) was higher compared to that of the control group (18.8%), even though both these changes were significant. The mean MAI score of the control group (0.2796+/- 0.2525) was significantly ( $p<0.0001$ ) higher compared to that of the intervention group (0.1641+/- 0.1135), suggesting improved discharge medication appropriateness in the intervention group.

**Conclusion:** Discharge medication appropriateness and medication adherence at six months improved significantly in the intervention group compared to those of the control group. Implementing clinical pharmacy services for patients with ACS is beneficial for better patient outcomes in Sri Lanka as demonstrated elsewhere. Future research should focus on conducting similar studies in other healthcare disciplines in the country to generate more generalised evidence to establish clinical pharmacy services in Sri Lankan public hospitals.

## A multisite implementation-efficacy trial of a pharmacist-led collaborative care for medication assisted treatment for opioid dependence: Overview and preliminary findings from the EPIC-MATOD trial

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**Background:** Medication Assisted Treatment for Opioid Dependence (MATOD) is highly effective, yet a lack of MATOD prescribers in the community limits access to treatment. Collaborative care arrangements between pharmacists and prescribers are one means of addressing these barriers, but have yet to be trialled in Australia.

**Objective(s):** The Enhancing Pharmacists Involvement in Care (EPIC)-MATOD study will evaluate clinical and implementation outcomes among people with opioid dependence receiving MATOD through a collaborative pharmacist-prescriber model of care across a mix of metropolitan and non-metropolitan areas of Victoria, Australia.

**Methods:** The EPIC-MATOD study is a prospective, multisite, implementation trial of collaborative MATOD care. Participants (patients taking part in collaborative care, and a comparison cohort) are being recruited from a network of primary care services and pharmacies in Victoria, Australia. After commencing collaborative care model, participants will be followed up over 6-months in a hybrid implementation-efficacy study, with outcomes mapped to the RE-AIM framework. Prescribers and pharmacists will be interviewed twice over the course of the study to examine implementation outcomes. The primary clinical efficacy endpoint is patient retention in treatment at 26 weeks. The primary implementation outcome is treatment capacity, based on prescriber time required to provide treatment through collaborative care compared with traditional care. Secondary clinical endpoints include attendance for dosing and clinical reviews, substance use, mental and physical health and overall well-being. Implementation costs, acceptability, and provider engagement in collaborative care will be used as secondary implementation outcome indicators. Time and costs associated with collaborative care, and health service utilisation, will also be estimated.

**Results:** As of April 2023, ten pharmacists and four prescribers are providing collaborative care. We present data on the first 36 participants (20 collaborative care participants and 16 control participants) who have entered

the study. The average age of collaborative care participants was 49 years (SD 13 years) (50% were male), and 44 years (SD 12 years) for the control group (56.3% were male). The average age of first opioid dependence was 24 years (SD 4 years) for collaborative care and 23 years (SD 8 years) for controls, with no significant differences between the groups on demographic variables. Nineteen of the twenty participants in the intervention arm have been retained in collaborative care treatment to date. Qualitative data from participants, pharmacists and prescribers indicate high support and acceptability of the model of care.

**Conclusions:** The study will provide important information on outcomes and acceptability of collaborative care for MATOD, as well as the cost and key considerations in delivering a collaborative model of care in Australia and other countries where similar treatment barriers exist.

## Overcoming barriers to healthcare: An examination of medicine availability and affordability in South Pacific Island nations

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### Background:

Access to essential medicines is a critical issue affecting people worldwide, with an estimated two billion individuals in low and middle-income countries lacking adequate access to medicines. Despite this, medication shortages are prevalent and impact both males and females equally. For the lowest-income countries, it is estimated that over 50% of the population has no regular access to essential medicines.

### Methods:

To assess the availability, affordability, and pricing of essential medicines, the World Health Organization (WHO) and Health Action International (HAI) developed a standardized methodology. This methodology involves collecting quantitative data through cross-sectional surveys from various sectors/sources, such as public, private, and non-government organizations. Data on the formulation, dose, brand and cost of essential medicines were collected from seven South Pacific nations, including New Caledonia, Wallis and Futuna, Fiji, French Polynesia, Cook Islands, Tonga and Vanuatu.

### Findings:

This study found that medication access in the South Pacific region was inconsistent, with significant variations across different nations. Many countries had limited availability of essential medicines, and affordability remained a significant challenge with many medicines costing several days wages.

### Conclusions:

The findings of this study underscore the need for interventions to promote equitable access to essential medicines across the South Pacific region. Addressing these



challenges will require a combination of policy and practice changes, including strengthening supply chains, improving access to financing mechanisms, and promoting greater regional cooperation. Policymakers, healthcare providers, and NGOs can use these insights to improve healthcare outcomes and promote health equity in the South Pacific region. The study provides a critical foundation for further research and intervention efforts to ensure access to essential medicines for all.

### The availability and affordability of insulin within the South Pacific region

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#### Background:

Access to essential medicines is a critical issue affecting people worldwide, with an estimated two billion individuals in low and middle-income countries lacking adequate access to medicines. To date, no data exist to that describes the accessibility of a life-saving essential medication, insulin, within the South Pacific.

#### Methods:

A standardised quantitative methodology was employed in several South Pacific island nations, including New Caledonia, Wallis and Futuna, Fiji, French Polynesia, Cook Islands, Tonga and Vanuatu. This methodology gathered data concerning the formulation, dose, brand and cost on all available insulins in this area.

#### Findings:

The study found that insulin access and affordability within the South Pacific region were varied, with significant disparities across different nations. Many countries had limited availability of insulins, and affordability remained a significant problem.

#### Conclusions:

The study's results emphasize the urgent need for action to ensure fair insulin access throughout the South Pacific region. Effective solutions demand policy and practical modifications, such as strengthening supply chains, enhancing financing options, and boosting regional cooperation. Policymakers, healthcare providers, and NGOs can benefit from these insights to improve healthcare outcomes and promote equitable healthcare in the South Pacific region. This study serves as a fundamental basis for future research and intervention efforts to guarantee access to vital medications for everyone.

### Knowledge of cervical cancer, screening and preventive measures among Ghanaian women

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#### Background

Cervical cancer is currently a significant global public health problem with more than 80% of cervical cancer cases occurring in developing countries. It is one of the leading causes of cancer-related deaths. The Ghana Health Service indicates that an estimated 3,100 women are diagnosed with cervical cancer in Ghana yearly. Although cervical cancer is preventable, screening and vaccination opportunities are underutilized especially in developing countries, thus, putting a significant burden on the country's healthcare system.

#### Purpose

To assess the level of knowledge of cervical cancer, screening and preventive measures among Ghanaian women.

#### Method

A cross-sectional survey was conducted among 191 Ghanaian women aged between 17-60 years in July 2022 in a university community. Informed consent was obtained and participants were assured of confidentiality. A well-structured pretested questionnaire was used in collecting data. Data was analyzed using SPSS v 22. A chi-square test was additionally used to determine any significant associations. Demographic characteristics, awareness of factors related to cervical cancer, knowledge and attitude towards screening and prevention were variables assessed.

#### Results

A total of 191 women were involved in the study. Among these, 2.6% were aged less than 20 years with 35.1% of the participants being between the ages of 20-25 years. Majority (61.8%) of the participants were tertiary students. Furthermore, majority of the participants (96.9%) had heard of cervical cancer mainly via media and health institutions. Again, 92.7% of the participants knew about early and regular screening. However, only 25.6% of the participants had done a pap smear while 45% of them had heard about the prevention of cervical cancer through vaccination. Majority of the participants (62.7%) were aware of the mode of transmission of human papilloma virus. A total of 52.8% of participants were sexually active with 79.1% of the sexually active participants admitting to having unprotected sex. Individuals who were gainfully employed were more willing to take the vaccine ( $p = 0.045$ ). Additionally, individuals who had had a pap smear were more willing to take the human papilloma virus vaccine ( $p = 0.045$ ).

#### Conclusion

Majority of the study population had some knowledge about cervical cancer, however most of them had neither had a pap smear nor a human papilloma virus vaccination before. The findings underscore the need for educational campaigns that increase women's knowledge about access to cervical cancer screening programs and vaccination opportunities to promote positive attitudes towards cervical cancer prevention.

### Factors associated with the use of aphrodisiacs among adult male residents in Korle Klottey Municipality

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#### Background

The demand for aphrodisiacs in Ghana has risen significantly over the past few years. Men are using aphrodisiacs more frequently for recreational purposes to enhance sexual performance. Recreational use of aphrodisiacs has however been linked to risky sexual activities, higher risks of sexually transmitted infections and concurrent illegal drug use.

#### Purpose

To determine factors associated with the use of aphrodisiacs in adult male residents in a municipality in Accra, Ghana

#### Method

A cross-sectional study using a structured and pre-tested questionnaire was used to collect data from men aged between 18 to 65 years, who were sexually active in the Korle Klottey Municipality, Accra. Participants gave informed consent and were assured of confidentiality before the study. Data were analysed using STATA v 14. Univariate and multiple logistic regression analyses were used to determine the association between the use of aphrodisiacs and participant characteristics. The odds ratio (OR) at a 95% confidence level (CI) and p-values were determined.

#### Results

A total of 390 participants were enrolled in the study, out of which 90% had some knowledge on aphrodisiacs while 65.90% had used aphrodisiacs before. Knowledge on aphrodisiacs was obtained mainly from the media by 72.9% of participants. Participant ages ranged from 18 to 65 years with a mean age of 34 years [SD=10.73]. Most of the participants had either secondary (28.5%) or tertiary (26.4%) education. About half (51.3%) of the participants were not married but sexually active while 37.4% were married. In the last 12 months, 63.9% of the participants indicated they had one sexual partner while 36% indicated they had multiple sexual partners. Majority of the participants used orthodox products (66.7%) as against herbal products (17.1%) and

alcohol based herbal extracts (16.2%). Reasons why some participants used aphrodisiacs were identified as early ejaculation (39.5%), the need to prolong sexual intercourse (26.7%), partner satisfaction (15.6%), erectile dysfunction (13.6%), inability to reach orgasm (3.6%) and loss of libido (2.9%). The variables age and marital status were found to be strongly correlated with the use of aphrodisiacs. Participants who had two sexual partners were 4.06 times more likely to use an aphrodisiac than participants with one sexual partner. (95%CI: 2.39-6.90; p=0.000). Moreover, it was determined that using an aphrodisiac was 10.46 times more common in participants with three or more sexual partners compared to those with one partner (95% CI: 1.35-81.16; p=0.025). However, 55.64% of participants did not know much about the side effects associated with the use of aphrodisiacs.

#### Conclusion

Majority of the participants had used aphrodisiacs before. Different factors are associated with the use of aphrodisiacs. There was a high correlation between the use of aphrodisiacs among multiple sexual partners. Health promotion activities should be put in place to provide adequate information on the use of aphrodisiacs.

### Soluble interleukin-2 receptor combined with interleukin-8 is a powerful predictor of future adverse cardiovascular events in patients with acute myocardial infarction

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**Background:** Little is known about the role of interleukin (IL) in patients with acute myocardial infarction (MI), especially soluble IL-2 receptor (sIL-2R) and IL-8. We aim to evaluate, in MI patients, the predictive value of serum sIL-2R and IL-8 for future major adverse cardiovascular events (MACEs), and compare them with current biomarkers reflecting myocardial inflammation and injury.

**Methods:** This was a prospective, single-center cohort study. We measured serum concentrations of IL-1 $\beta$ , sIL-2R, IL-6, IL-8 and IL-10. Levels of current biomarkers for predicting MACEs were measured, including high-sensitivity C reactive protein, cardiac troponin T and N-terminal pro-brain natriuretic peptide. Clinical events were collected during 1-year and a median of 2.2 years (long-term) follow-up.

**Results:** Twenty-four patients (13.8%, 24/173) experienced MACEs during 1-year follow-up and 40 patients (23.1%, 40/173) during long-term follow-up. Of the five interleukins studied, only sIL-2R and IL-8 were independently associated with endpoints during 1-year or long-term follow-up. Patients with high sIL-2R or IL-8 levels (higher than the cutoff value) had a significantly higher risk of MACEs during 1-year (sIL-2R: HR 7.7, 3.3-18.0, p <0.001; IL-8: HR 4.8, 2.1-10.7, p <0.001) and long-term (sIL-2R: HR 7.7, 3.3-18.0, p <0.001; IL-8: HR 4.8, 2.1-10.7, p <0.001) follow-up. Receiver operator

characteristic curve analysis regarding predictive accuracy for MACEs during 1-year follow-up showed that the area under the curve for sIL-2R, IL-8, sIL-2R combined with IL-8 was 0.66 (0.54-0.79,  $p = 0.011$ ), 0.69 (0.56-0.82,  $p < 0.001$ ) and 0.720 (0.59 - 0.85,  $p < 0.001$ ), whose predictive value were superior to that of current biomarkers. The addition of sIL-2R combined with IL8 to the existing prediction model resulted in a significant improvement in predictive power ( $p=0.029$ ), prompting a 20.8% increase in the proportion of correct classifications.

**Conclusions:** High serum sIL-2R combined with IL-8 levels were significantly associated with MACEs during follow-up in patients with MI, suggesting that sIL-2R combined with IL-8 may be helpful biomarkers for identifying the increased risk of new cardiovascular events. IL-2 and IL-8 would be promising therapeutic targets for anti-inflammatory therapy.

### Maternal antibiotic exposure and the risk of developing antenatal depression: Study protocol

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**Background:** Depression is a leading cause of global disability, with an estimated 4.4% of the world's population affected. Several mechanisms are postulated to be involved in its pathophysiology. Of these, the gastrointestinal microbiota dysbiosis theory is increasingly garnering attention. In particular, limited epidemiological evidence suggests a link between antibiotic use and the development of depression. This study seeks to investigate this association in-depth, using a cohort of pregnant individuals. Pregnant individuals were chosen because of their shared medical and biological characteristics, and because up to 20.5% of these individuals are known to use antibiotics during their pregnancy.

**Aims:** To explore any association between antibiotic use during pregnancy and the development of antenatal depression symptoms in the late third trimester period. Furthermore, the study will provide an update on the national prevalence and key predictors of antenatal depressive symptoms in Australia.

**Method:** A national prospective, observational, longitudinal cohort study was designed to consider the relationship between the use of antibiotics during pregnancy, and the development of depressive symptoms (determined by scoring 13+ on the Edinburgh Postnatal Depression Scale (EPDS)) measured once at any timepoint during the late third trimester (32-42 weeks). Data collected using an online survey includes a wide range of variables previously

identified as being associated with antenatal depression (such as level of social support, history of depression, current domestic abuse, current medications and medical conditions) as well as antibiotic and probiotic use. The impact of the COVID-19 pandemic on both participants' pregnancy experience and their mental health will also be explored. De-identified data will be analysed using SPSS (Statistical Package for Social Sciences, IBM®). To explore predictors of categorical outcomes (e.g., EPDS score $\geq$ 13) logistic regression analyses will be used. A sample size of 1,500 pregnant individuals has been sought for the study, allowing for a 30% drop-out rate. Recruitment opened in August 2021, using a combination of online paid and non-paid advertisements. Pregnant individuals who reside in Australia and are 18+ years are eligible to participate. Participants will be excluded prospectively from the study if they are a surrogate, or if upon birth their child/ren will be cared for by someone else either permanently or semi-permanently. They will be excluded retrospectively if they lose their child (for reasons such as miscarriage) or deliver their child, prior to completing the survey.

**Discussion:** This study will provide a much-needed update on the prevalence of depressive symptoms in Australia during pregnancy, and the associated factors. It will also, for the first time, comprehensively explore the potential association between antibiotic use during pregnancy up to the third trimester and the development of antenatal depression. Additionally, it will provide a better understanding of the mental health impacts of the COVID-19 pandemic on pregnant individuals in Australia.

### Can vitamin B6 deficiency contribute to the severity of diabetic peripheral neuropathy? –A cross sectional study

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**Background:** Diabetic Peripheral Neuropathy is one of the most important and significantly prevalent microvascular complications of Diabetes Mellitus. Pyridoxine is a key nutrient for protecting nerve health. The objective of this research is to study the prevalence rate of pyridoxine deficiency in Diabetic neuropathy patients, to understand the correlation between various biochemical and markers of diabetic neuropathy and pyridoxine deficiency.

**Method:** A prospective cross-sectional study was carried out in the general medicine department at a tertiary care teaching hospital. The data is collected from the patient with the help of data extraction form to obtain preliminary data regarding the age, sex, and family history of Diabetes Mellitus, Other parameters include Smoking history, Alcoholism, Duration of Diabetes, Past medical history etc. The Body Mass Index (BMI) of the patients was also assessed. The Glycemic status parameters such as Fasting blood glucose (FBS) and Glycated Haemoglobin (HbA1C)

were recorded using conventional methods. Serum homocysteine, Methyl Malonic Acid is a marker for neuropathy. C reactive protein is an acute phase biomarker of inflammation. Nerve conduction velocity is used to assess neuropathy.

**Results:** 249 patients were selected for the study based on the selection criteria participants. 51.8% prevalence of pyridoxine deficiency in Diabetic neuropathy patients. The nerve conduction velocity significantly reduced in pyridoxine deficiency cases ( $p < 0.05$ ). A strong inverse relationship is observed with fasting blood sugar levels and glycated hemoglobin pyridoxine deficiency might contribute to impaired glucose tolerance.

**Conclusion:** There also exists a strong inverse relationship with glycemic markers. Significant direct correlation is observed with nerve conduction velocity. Pyridoxine also has properties of antioxidant which may be utilized for the management of Diabetic Neuropathy.

### Assessment of medication-related problems among patients with type 2 diabetes mellitus: A snapshot from United Arab Emirates

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**Introduction:** Diabetes mellitus is one of the fastest-growing public health concerns worldwide. Multiple comorbidities, increasing age and prescription of multiple drugs increase the risk of medication-related problems like drug-drug interactions (DDIs) and adverse drug reactions (ADRs) in patients with type 2 diabetes mellitus. This study aimed to assess the prevalence and nature of medication-related problems among patients with type 2 diabetes mellitus.

**Methods:** This cross-sectional study was conducted in the internal medicine department of a secondary care hospital in United Arab Emirates. The study was carried out in 300 type 2 diabetes patients presented to the outpatient and inpatient departments. Electronic patient case records were reviewed and study specific data was documented. Antidiabetic medications received or prescribed to the patients were analyzed for potential DDIs (pDDIs) by using PEPID database. ADRs noted by physician and reported by patients were documented and assessed for causality, severity, predictability, and preventability.

**Results:** Out of 300 patients enrolled in this study, majority were female ( $n=192$ , 64%) with mean age of  $62.62 \pm 12.44$  years. Majority of the study patients ( $n=171$ , 57%) had two comorbidities with hypertension and dyslipidemia as the common comorbid conditions. Furthermore, majority of

them were on combination anti-diabetic therapy ( $n=230$ , 76.7%). Biguanides ( $n=272$ , 90.7%) was the most commonly prescribed anti-diabetic drug class followed by DPP4-inhibitors ( $n=159$ , 53%), SGLT-2 inhibitors ( $n=139$ , 46.3%) and sulphonylureas ( $n=132$ , 44%). Among individual drugs, metformin ( $n=272$ , 90.7%) was prescribed the most. A total of 225 pDDIs were identified in 300 patients, and 50% of the patients had a minimum of 1 pDDI. Majority of the pDDIs were minor ( $n=10$ , 34.48%) and of possible type (10 pairs) with pharmacodynamic nature ( $n=17$ , 58.6%). The most common pDDIs identified in the study were between vildagliptin and gliclazide ( $n=46$ , 20.44%). The incidence of suspected ADRs was 17.7% with majority of suspected ADRs of possible ( $n=31$ , 58.5%), mild severity and not preventable type ( $n=48$ , 90.5%). The use of GLP-1 receptor agonists (OR 3.009, 95% CI 1.074-8.433,  $p=0.036$ ) and sulphonylureas (OR 2.37, 95% CI 1.005-5.594,  $p=0.049$ ) were the independent predictors of occurrence of ADRs in our study population.

**Conclusion:** We report the incidence and nature of DDIs and ADRs in patients with type 2 diabetes mellitus at a secondary care hospital in United Arab Emirates. Clinical pharmacists can play an important role in the identification and resolution of drug-related problems in collaboration with other healthcare professionals for better patient care.

### The new advanced services in community pharmacy, answers to the French public health issues: Inspirations from the international

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**Background:** The emergence of new health needs of populations and their translation into new orientations of health policies call for changes in the role of health professionals, including pharmacists, through new services. Pharmacists have always been resilient in adapting their activity to innovation and patient needs. Advanced services from the most innovative international territories could meet the challenges of the French health system.

**Purpose:** To what extent can French pharmacies respond to current or future public health challenges with new advanced services already implemented abroad? To what extent can a theoretical evaluation of impact and effort be systematised for public health decision-making?

**Method:** This research work allowed, through a qualitative part, to identify 125 new services grouped in 27 reference services developed in 11 foreign territories. Combined with a quantitative methodology, determining the effort and potential impact of each service.

**Results:** This work identified 18 services with a high impact in their ability to respond to French public health issues.

**Conclusion:** It is recommended to prioritise high impact services, especially in terms of prevention and access to care, which seem to be the issues of greatest need. The services, and more particularly those requiring a major effort, will require the use of political support and financial incentives, as well as the involvement of other professionals and patients, in order to ensure uniform deployment throughout France.

### The influence of social and individual factors on medicine use in older adults

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#### Background:

Older adults are at high risk of inappropriate medicines use. Personal experiences, beliefs, and understandings of medicines may also influence peoples' views on medicine utilisation. Suboptimal prescribing is the prescribing of medicines in a way that is less than optimal and not therapeutically appropriate. Understanding and identifying the underlying reasons for potentially suboptimal prescribing is important in reducing the risk of medicine-related harm.

#### Purpose:

The aim was to explore the effects of beliefs, experiences, and health literacy on medicines use in older adults.

#### Method:

A cross-sectional pilot study was conducted between May and October 2020 in Australia. Participants aged 65 years or above with the ability to provide informed consent were invited to participate. Individual structured interviews were completed for each participant. Interview questions were adopted from various questionnaires including the Beliefs about Medicines Questionnaire (BMQ); Health Literacy Questionnaire (HLQ); EQ-5D-5L scale; Barthel Activities of Daily Living Index; Perceived Sensitivity to Medicines Scale; Patients Attitudes Towards Deprescribing (PATD); Medication Related Burden Quality of Life and the Adherence to Refills and Medication Scale (ARMS).

#### Results:

Twenty-four participants (50% female) using a mean of four (SD=2.9) medicines completed the study. Most participants (n=17, 71%) reported using services from one pharmacy only. Polypharmacy (use of 5 or more medicines) and hyperpolypharmacy (use of 10 or more medicines) was observed in five participants (polypharmacy n=4, 25% and hyperpolypharmacy n=1, 6%).

Participants reported a mean BMQ necessity score of 11/25 (SD=3.8), a mean specific concerns score of 19/25 (SD=3.3), a mean general overuse score of 12/20 (SD=3.7), and a mean general harm score of 16/20 (SD=2.4). 'Navigating the healthcare system' was the highest scoring domain in the HLQ, while the lowest scoring domains were 'social support'

and 'having sufficient information to manage my health'. Participants recorded a mean medicine adherence ARMS score of 12.7 (SD= 1.8) ranging from 9 to 16. Most participants (n=18, 75%) reported always taking their regular medicine regardless of how they felt. Using the PTAD tool, 83% of participants agreed that they were comfortable with the number of medicines they had been taking, while 54% of participants agreed that they would be willing to stop one or more of their regular medicines if their doctor said it was possible to do so.

#### Conclusion:

The influence of social and individual factors including beliefs, experiences, and health literacy on medicines use in older adults remains unclear. Participants reported having too many medicines despite most having fewer than five regular medicines. Social support, accessible and easy-to-navigate guidelines, and strong rapport with healthcare professionals may be targeted to enhance medicines use in older people. Future studies with further analysis should investigate the effects of beliefs, experiences, and health literacy on a larger cohort of participants to provide more comprehensive insights.

### Alterations of glycemic parameters in post-Covid diabetic patients

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#### Introduction:

Diabetes Mellitus (DM) is a group of metabolic disorders characterized by hyperglycemia. It is rapidly emerging as an important cause of mortality and morbidity in developing countries. Coronavirus disease 2019 (COVID-19) causes severe acute respiratory syndrome. DM is considered as a common comorbidity of COVID-19. Of many drugs used in the treatment of COVID-19 infection, glucocorticoids (GCs) stand out by reducing mortality amongst hospital admitted severe-to-critically ill patients.

#### Aim:

The aim of the study is to assess glycemic alterations in post-COVID diabetic patients.

#### Objectives:

1. To observe glycemic parameters like HbA1C, PPBS and FBS levels in pre- and post-covid diabetic patients.
2. To observe the relationship between steroid use, altered glycemic parameters and secondary infections in post COVID diabetic patients.

#### Materials & Methods:

It is a retrospective & prospective observational study with a duration of 6 months in the department of endocrinology. Study population: 50 subjects [25 male & 25 female] who are post-covid diabetic patients, visiting as out-patient at the department of endocrinology at our hospital.

Inclusion criteria: Patients who are willing to participate in the study. Patient's age between 18 and 80 years. Any diabetic patient with past history of COVID visiting out-patient department (OPD). Patients who took COVID treatment at home / quarantine Centre.

Exclusion criteria: Patients who are not willing to participate in the study. Patients with age less than 18 and more than 80 years. Pregnant and lactating women are excluded from the study. Patients without history of COVID are excluded.

#### Results & discussion:

In our study, out of total 50 participants 31(62%) were retrospective and 19 (38%) were prospective. Comparison of Means± S.D values of pre-covid vs post-covid for FBS - [125.8±22.03 vs 160.4±42.2]; HbA1C - [1.90 ±0.54 vs 7.72±0.98]; PPBS - [196.12 ±43.13 vs 277.34±83.24]. In our study, 22 patients [44%] did not receive steroids and 28 patients [56%] received. Comparing patients who did or did not use steroids on their blood sugar levels [BS] and on secondary infections were as follows [steroid not used/steroid used]: BS decreased - [0/1]; BS increased -[17/26] and BS no change - [5/1]; fungal infections - [0/7]; mucor mycosis-[0/2]; no infection [21/15] and pneumonia – [1/4]. FBS, HbA1c and PPBS level increases post-covid were statistically significant [P<0.05]. Covid patients who received steroids also demonstrated significantly higher level of secondary infections.

#### Conclusion:

In Present study, Glycemic parameters like FBS, HbA1c, PPBS showed significant increase during post-covid than pre-covid. Using steroids for longer duration of time, caused blood sugar levels to rise demonstrating a connection between steroid usage, elevated blood sugar levels and secondary infections. Using steroids can put Covid patients with diabetes at an elevated risk for developing secondary infections. In order to lower the risk of secondary infections and the mortality rate in diabetic patients, it is necessary to monitor blood sugar levels when administering steroids and it should be judiciously used.

### Cost-effectiveness of screening for type 2 diabetes in community pharmacy: The pharmacy diabetes screening trial (PDST)

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#### Background:

Type 2 diabetes mellitus (T2DM) is a largely preventable chronic condition. Studies have shown that progression to T2DM or to complications for those who already have diabetes can be prevented or delayed by lifestyle changes and pharmacotherapy. These findings highlight the need for more effective screening of the general population to

facilitate risk identification, diagnosis, and early intervention to prevent the development of T2DM and its complications.

#### Purpose:

The Pharmacy Diabetes Screening Trial (PDST) was a cluster randomized controlled trial, recruiting a nationally representative sample of 14,093 people in 339 pharmacies across Australia, to compare diagnostic and economic outcomes for three models of diabetes screening in Australian community pharmacy. The objective of the economic analysis was to assess cost-effectiveness of three different pharmacy-based screening strategies for T2DM, using Australian Type 2 Diabetes Risk Assessment (AUSDRISK) screening alone, point-of-care (POC) HbA1c or small capillary blood glucose test (scBGT) tests after AUSDRISK screening, followed by a referral to GP.

#### Method:

A cost-effectiveness analysis was conducted alongside the PDST from a service funder perspective to address how best to undertake T2DM screening in the community pharmacy. The primary outcome was the difference in newly diagnosed T2DM based on follow-up in primary care. The secondary outcome was diagnosis with impaired fasting glucose (IFG) or impaired glucose tolerance (IGT), considered to have prediabetes if either or both were present.

Cost analysis was conducted using the trial collected data and Medicare data from those providing consents to access their Medicare claims from Australian Medicare Benefits Schedule (MBS). Costs were valued in Australian Dollars (A\$) and estimated during the trial in 2017-18. The cost-effectiveness ratios were estimated by 'net cost per confirmed new T2DM case', 'net cost per confirmed new prediabetes case', and 'net cost per confirmed new case of T2DM or prediabetes'. These ratios were reported both within arms of the trial, i.e. average cost-effectiveness ratios, and across the arms, i.e. incremental cost-effective ratios (ICERs). Uncertainty was analysed using univariate sensitivity analyses for both cost and outcome variables.

#### Results:

In total, 11,228 Medicare consents were obtained to request Medicare data covering 80% of participants taking part in the PDST study, of which 10,896 participants' MBS claims were provided. The 'average cost per new confirmed T2DM case' in each trial arm was A\$8,301 for AUSDRISK alone; A\$7,459 for AUSDRISK followed by POC HbA1c; and A\$9,888 for AUSDRISK followed by POC scBGT. Compared to POC scBGT following AUSDRISK, POC HbA1c following AUSDRISK was more effective, detecting 41 additional T2DM cases at an extra cost of A\$5,624 per new T2DM case, or A\$1,459 with prediabetes included. The ICER was A\$6,747 per additional new T2DM case detected in the group of AUSDRISK followed by POC HbA1c compared with AUSDRISK alone, or A\$4,537 with prediabetes included. Sensitivity analysis showed the HbA1c and AUSDRISK risk score cut-off values for referral were influential on ICERs.

#### Conclusion:

This large trial-based economic evaluation suggests that screening with AUSDRISK followed by POC HbA1c testing is a

preferred option for T2DM screening in Australian community pharmacy.

### Trust, relationship and safety

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**Background:** This pharmacy was in an area of high deprivation, with nearly 50% of its patients with type 2 diabetes mellitus, and a lot of asthma and COPD. Other concerns were alcoholism, hypertension, drug misuse and lack of engagement with immunisation. The top two medicines prescribed were allopurinol and metformin, with stigmatised prescribing for type 2 diabetes mellitus suggested by one pharmacist as there were no electronic blood testing kits or no new diabetic medication prescribed except metformin which has known tendencies to cause nausea, diarrhoea and vomiting and reduce medication adherence.

**Methods:** We recruited 33 patient participants for a face-to-face interview which took place in a private room in their local community pharmacy. There were 14 females and 19 males, with 12 identifying as Māori, nine as Pasifika and 15 as Pakeha/New Zealand European. Interviews were transcribed verbatim and then analysed with an iterative and inductive approach to thematic analysis, with data storage and analyses supported by the use of NVIVO.

**Findings:** Our key findings highlight the need for an authentic relationship with the pharmacy team to feel sufficiently safe with the pharmacy staff to be truthful about how they used or did not use their medicines. The pharmacy itself became a trusted space for the individual patient as they felt seen and heard by team members. They were greeted by name as they entered the pharmacy and asked about their family members, and there was a great deal of good, humoured social banter, which they enjoyed participating in. This all resulted in the person being able to relax within the pharmacy. The admission of not taking medication to a member of the pharmacy team resulted in a one-to-one conversation with the individual and the pharmacist who would use open sentences to enable the person to understand why they should take the tablet. This meant the patient was never told what to do but was guided by the conversation on why the medication was necessary. Patients reported feeling cared for when they knew the whole team was involved in supporting them to take their medication and pick up their repeat prescriptions regularly. As one participant said, "He keeps a note in his head about us all, when we should have collected when we haven't, it makes us all know he is looking out for us." The pharmacist stated, "we remind them of the value of the medication, reminding them what will happen if they don't. But we use open questions rather than telling them what to do."

**Discussion:** Trust, faith and years of banter and communication with the pharmacy team made our participants feel safe enough to ask about their newly

prescribed medicines knowing they would receive the information they wanted this information in words they could understand and knew their pharmacist would tell them about possible adverse effects. This trusting relationship was built over many years and resulted in increased medication adherence, indicating the need for community pharmacists' time allocated to the conversations to be recognised and funded.

### Exposure to Hepatis B Virus (HBV) risk factors and uptake of HBV screening and vaccination among Human Immunodeficiency Virus patients at secondary care hospitals in Ilorin, Nigeria

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**Introduction:** Hepatis B Virus (HBV) infection is one the opportunistic infections affecting Human Immunodeficiency Virus (HIV) infected patients. HBV-HIV coinfections thus constitute a serious public health problem. Knowledge about HBV, minimal exposure to HBV risk factors and maximum uptake of HBV screening and vaccination can reduce the HBV-HIV coinfections burden. This study is necessitated by the paucity of information on exposure to Hepatis B Virus (HBV) risk factors, HBV screening and HBV vaccination among HIV patients assessing care in this study area.

**Objectives:** This study aimed at assessing the exposure to Hepatis B Virus (HBV) risk factors, uptake of HBV screening and vaccination among Human Immunodeficiency Virus patients assessing care at secondary care hospitals in Ilorin, Nigeria.

**Methods:** This multicenter study involved interviewer-administration of pretested structured questionnaire to eligible HIV patients. The sample size of 303 based on Fischer's formular was proportionately allocated to the hospitals. Sample units were consecutively obtained. The exposure to risk factor was classified as high, intermediate, and low if mean exposure was >8%, 2-8% and <2% respectively. The uptake of HBV screening and vaccination were classified as high, intermediate, and low if they were >70%, 50-69%, and <50% respectively. This study was approved by Kwara State Ministry of Health Ethical Review Committee (MOH/KS/EU/777/476).

**Results:** The study participants' (SPs) modal age class was 21 – 40 years (46.5%) and mean age was 42.08 ± 11.0 years. Less than a-quarter were males, of which 67.7% were married and 45.5% had polygamous marriages. The mean

exposure to HBV risk factors was 14.9%. Majority of SPs (82.8%) were sexually active, 65.7% practiced ear or body piercing, 9.9% had multiple sexual partners, and 6.1% drank alcohol. Additionally, 3.3% had body tattoos, 2.7% smoked, 2.3% were injection drug users, 2.3% had history of blood transfusion while 2.0% had worked in the medical field. Only 28.7% had heard of hepatitis B. A minority (14.9%) had screened for hepatitis of which 0.3% tested positive. Only 7.6% of SPs had been vaccinated against HBV and all the vaccinated SPs were fully vaccinated. Most of the SPs were on combination antiretroviral therapy (cART) of tenofovir-lamivudine-dolutegravir (TDF-3TC-DTG) of which 58.9% and 41.1% were switched from tenofovir-lamivudine-efavirenz (TDF-3TC-EFV) and zidovudine-lamivudine-nevirapine (AZT-3TC-NVP) respectively. More than three-fifth (65.7%) SPs had their viral load undetectable and 28.1% had suppressed viral load.

**Conclusion:** The mean exposure to risk factors for HBV was high among the HIV patients. However, the uptake of HBV screening and vaccination were low. To remedy the situation, intensive mass health education on HVB risk factors, HBV screening and vaccination targeted at HIV patients should be instituted. SPs' cARTs are in line with HIV treatment guidelines.

### Strengthening patient safety through multilateral collaborations: Lessons from Covid-19 vaccine surveillance in Nigeria

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**Introduction:** Post-licensure vaccine safety surveillance is critical for maintaining safe vaccination programs and identifying Adverse Events Following Immunization (AEFIs) that may not have been observed in clinical trials. To optimize patient health outcomes, it is essential to establish appropriate partnerships to strengthen vaccine safety monitoring, particularly when introducing novel vaccines. In Nigeria, several agencies are responsible for implementing surveillance for COVID-19 AEFIs. However, these agencies have varying scopes, data systems, and implementation

approaches, resulting in fragmented sources of AEFI data and disjointed AEFI surveillance programs. Therefore, a context-specific approach that establishes an efficient collaboration mechanism, rather than an all-integrated system, can be useful for strengthening patient safety initiatives.

**Method:** To improve AEFI surveillance in Nigeria, a National Technical Working Group (TWG) composed of all agencies and partners managing vaccination and disease surveillance programs in the country was established. The TWG developed a concise work plan outlining the core areas needed to strengthen AEFI surveillance, along with a set of terms of reference. Improving AEFI coordinating structures at all levels, increasing the capacity of healthcare workers on AEFI detection, reporting, and response, increasing community awareness of AEFI reporting, and supporting the implementation of an electronic AEFI data management and monitoring system were among the key focus areas identified. Several meetings were held to consolidate the plan in close collaboration with critical stakeholders from the states.

**Results:** As a result of these efforts, functional AEFI committees were activated across all thirty-six (36) states in the country, and a quarterly state review meeting was institutionalized as a platform for the National TWG to review AEFI activities and provide feedback on AEFIs reported and investigated in respective states. About 22,412 healthcare workers were trained on AEFI detection, reporting, and response, with particular emphasis on the use of DHIS-2 module, an electronic data management tool for reporting AEFIs at the health facility level. Patient sensitization materials were developed and deployed for community sensitization, and webinars were facilitated to improve public perceptions of AEFI. A data analytics and visualization tool (DAVT) was also developed to aid data triangulation of AEFI data from multiple reporting platforms. This tool pulls data from multiple AEFI reporting platforms into a unified database for visualization and data-driven decision-making by all key stakeholders.

**Conclusion:** In conclusion, strengthening AEFI surveillance is critical for maintaining safe vaccination programs and ensuring patient safety. The establishment of a National TWG, activation of functional AEFI committees across all states, and increased capacity of healthcare workers on AEFI detection, reporting, and response have led to significant improvements in AEFI surveillance in Nigeria. The use of electronic data management tools and patient sensitization materials, coupled with webinars to improve public perception of AEFI, has also contributed to the success of the program. These efforts demonstrate the importance of establishing appropriate partnerships and context-specific approaches to strengthen vaccine safety monitoring, particularly in low- and middle-income countries.



### Exploration and practice of home-based pharmaceutical care for an elderly patient with chronic diseases provided by community family pharmacists

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**Objective** To carry out home-based pharmaceutical care for the elderly patients with chronic diseases in the community and to provide reference for grassroots family pharmacists.

**Method** Family pharmacist carried out home-based pharmaceutical care including medication therapy management, individualized patient popularization and education, family medicine kit management, medication reconciliation, individual medication guidance and follow-up evaluation, which can introduce the service content and experience.

**Result** Family pharmacists play an important role in the community home pharmacy service. Individualized home pharmacy service, good communication and humanistic care can effectively solve the problems related to long-term drug use of patients with chronic diseases at home.

**Conclusion** The development of community pharmaceutical care at home can help reduce medical costs, reduce medication errors, improve drug use concepts, and promote safe and rational drug use for patients at home.

### Drug-related problems in liver transplant recipients in the intensive care unit identified during pharmaceutical care and drug consultation: To improve the quality of healthcare

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**Background:** Liver transplant recipients (LTRs) in the intensive care unit (ICU) may have drug-related problems (DRPs) by receiving multiple medications and complex medical care.

**Objectives:** To identify DRPs in LTRs, determine the potential impact of pharmacist interventions, and follow up on the experiences of physicians and pharmacists in managing drug therapy in LTRs.

**Methods:** From January 2020 to December 2021, DRPs identified during pharmaceutical care and drug consultation were investigated to compare and analyze the types and causes of DRPs. Two pharmacists independently reviewed the pharmacist interventions on a six-point scale based on the potential impact of resolving DRPs on treating LTRs.

**Results:** Pharmacists identified 97 DRPs during pharmaceutical care with common "adverse drug event occurring" (51.5%) and "untreated symptoms or indication" (24.7%). The analysis of the causes of DRPs showed that "drug selection" accounted for the highest proportion. However, the problems with the most diverse causes were "adverse drug event" and "effect of drug treatment not optimal," with 10 and 8 reasons, respectively. For drug consultation, pharmacists identified 114 DRPs, 64.0% related to anti-infectives drugs. Physicians were more concerned about "treatment effectiveness and safety," requiring supplementary drug information from pharmacists, or were inclined to consult pharmacists about "appropriate combination of drugs" or "dose adjustment of renal or liver insufficiency." During pharmaceutical care and drug consultation, 64.0% and 52.6% of interventions were rated as "significant," 1.0% and 1.0% as "extremely significant," respectively.

**Conclusion:** Pharmacists can identify and resolve DRPs in LTRs in the ICU, and the interventions positively impact LTRs. In the liver transplant care team, the complementary knowledge systems of physicians and pharmacists are conducive to ensuring the safety and reliability of medication.

### Analysis of the characteristics and risk factors of levofloxacin-induced arrhythmias

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**Background:** The real-world studies of levofloxacin-induced arrhythmias have been inconsistent, and more research is needed to assess the risk of levofloxacin and its cardiac safety in special populations with risk factors for arrhythmias. **Objective:** To investigate the characteristics, clinical manifestations and risk factors of levofloxacin-induced arrhythmias in large hospitalized populations.

**Methods:** Using the "Adverse Event Active Monitoring and Intelligent Assessment Alert System-II" (ADE-ASAS-II), we monitored electronic medical record of inpatients using levofloxacin in 2019 to obtain relevant data for patients with arrhythmias. The data was analyzed using propensity score matching and Logistic regression.

**Results:** The incidence of levofloxacin-induced arrhythmias was 1.64% in 12,879 people who used levofloxacin. The incidence in people over 65 years was 3.22%. The main manifestations of levofloxacin-induced arrhythmias were extrasystole (0.84%), tachycardia (0.63%), QT interval prolongation (0.44%), and no severe arrhythmias such as torsades de pointes and ventricular fibrillation. After excluding known factors such as sex, age, and underlying medical conditions, course of administration (OR: 1.029; 95% CI: 1.009-1.049) and intravenous administration (OR:

2.385; 95% CI: 1.477-3.850) were independent risk factors for levofloxacin-induced arrhythmias.

**Conclusion:** Arrhythmias caused by levofloxacin are common and have various types, among which the occurrence of QT interval prolongation is occasional. In clinical, we should pay more attention to elderly patients who receive intravenous levofloxacin and try to avoid long courses of medication.

### Light transmittance aggregometry and platelet function analyzer are trusty in evaluating antiplatelet effectiveness, while thromboelastography performs poorly

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**Objective:** Antiplatelet drugs are the most important medication in prevention of stroke in patients with stroke. However, their effectiveness is difficult to be evaluated.

**Methods:** On-treatment platelet reactivity of acute minor stroke patients taking aspirin, clopidogrel or both was tested by light transmittance aggregometry (LTA), thromboelastography (TEG) and platelet function analyzer (PFA), as well as CYP2C19 genotype determination. A total of 249 ischemic stroke patients were enrolled to assess the performance of three platelet function tests.

**Results:** All three methods were effective in evaluating aspirin function. As for clopidogrel, LTA and TEG had good correlation and consistency ( $r = -0.37$ ,  $\kappa = 0.634$ ). TEG-ADP was the least sensitive for clopidogrel, as the platelet inhibition ratio did not differ between the clopidogrel-user group and the control ( $P = 0.074$ ), while LTA and PFA were sensitive ( $P < 0.001$ ). Correlations between platelet assays were poor for clopidogrel (the absolute value of  $r$  range from 0.13 to 0.35) and so was the agreement ( $\kappa$  from 0.232 to 0.314). LTA and PFA have a good correlation with CYP2C19 genotyping ( $P = 0.034$  and  $0.014$ ). In the following up of patients using aspirin plus clopidogrel ( $n=127$ ), eight patients (6.3%) self-reported the recurrence and 13 (10.2%) patients self-reported bleeding. Recurrent patients displayed significantly higher on-treatment platelet reactivity when measured with LTA ( $p = 0.030$ ) and PFA ( $p < 0.001$ ). Further ROC analysis demonstrated that LTA and PFA had modest-to-fair ability to predict stroke recurrence (LTA: area under the curve [AUC], 0.765; 95% CI, 0.584–0.945, PFA: AUC, 0.832; 95% CI, 0.658–1.000). However, TEG (measured by the platelet inhibition rate) could not detect the difference between recurrent patients and non-recurrent patients ( $p = 0.515$ ) and predict recurrent events (AUC, 0.569; 95% CI, 0.368–0.770). None of the tests were associated with

bleeding except for PFA ( $p < 0.001$ ), with AUC of PFA reaching 0.772 (0.726–0.818).

**Conclusions:** The predictive accuracies of PFA and LTA were satisfying for aspirin secondary prevention, while TEG's performance was poor, especially in testing the effectiveness of clopidogrel. Only PFA could provide accurate prognostic information for bleeding.

### Off-label use of antimicrobials among hospitalized children: A retrospective study of 3406 patients

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Off-label drug use (Off-label) is a global problem, for which many countries and regions have issued legal provisions or expert consensus. However, the applicability of these consensus in pediatric patients has not been evaluated. Off-label use is sometimes a necessity, especially antibacterial drugs have become one of the most widely used drugs in clinical pediatric settings, and causing antimicrobial resistance has increasingly become an inescapable issue. It also poses additional risks, for example adverse drug reactions. Our study retrospectively analyzed the antimicrobial prescriptions of pediatric inpatients in a large Chinese hospital in the first half of 2021. It was found that Off-label of antibiotics existed in a large number of children ( $n=1665$ , 48.9%), and were most common in newborns ( $n=328$ , 82.8%). Among the commonly used antibiotics in pediatric patients, the cephalosporins ( $n= 2778$ , 40.7%) accounted for a relatively low proportion of Off-label ( $n=360$ , 15.7%), while macrolides ( $n= 628$ , 27.4%) and penicillins (610, 26.6%) accounted for a higher proportion. The Off-label type mainly refers to the appropriate population (46.5%) and dosage (dose 10.0% and frequency of administration 48.3%). There were not only Off-labels due to imperfect labels, but also improper medications or even medication errors. Most of the current consensus were not applicable to pediatric patients. More clinical trials are needed to update the consensus, and the drug labels needed to improve continuously. Doctors' prescribing practices also needs to be regularized.

## Assessment of the knowledge, perceptions and readiness level of pharmacists in Indonesia for the implementation of telepharmacy-based pharmaceutical services

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**Background:** The emergence of the COVID-19 pandemic in 2019 has led to modifications in the delivery of pharmaceutical services worldwide. Telepharmacy, a pharmaceutical service that employs digital technology, has been introduced as a potential solution to this global challenge.

**Purpose:** The objective of this study was to assess the level of knowledge, perception, and readiness of pharmacists toward telepharmacy in Indonesia.

**Methods:** The study employed a cross-sectional method, using non-probability purposive sampling to select respondents who were pharmacists in Indonesia. The Telepharmacy Knowledge, Perception, and Readiness questionnaire, which was translated into Indonesian and administered online, was used to measure the pharmacist's knowledge, perception, and readiness level. Descriptive and inferential data analyses were performed using SPSS version 26, with a p-value of  $\leq 0.05$  considered statistically significant.

**Result:** A total of 278 responses were obtained, with 97.8% exhibiting high knowledge and 66% showing high readiness level toward telepharmacy services. Furthermore, 63% of respondents had a positive perception of telepharmacy services. The results revealed that the pharmacist's knowledge significantly influenced their readiness to implement telepharmacy services in their future practice.

**Conclusion:** In conclusion, most of the study participants exhibited adequate knowledge, positive perceptions, and readiness to implement telepharmacy services in their future pharmaceutical practice.

## Breaking the stigma: How community pharmacists are involved in supporting mental healthcare

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**Background:** Mental disease burden is increasing globally, and a substantial shortage of mental health professionals remains. Community pharmacists can improve the population's mental health outcomes to bridge the mental health care gap. However, there is a paucity of data on community pharmacists' provision of mental health care. Therefore, to improve mental health care through community pharmacy in Arabic-speaking countries, there is a need for a deeper understanding of pharmacists' training, practice, knowledge, skills, and attitudes.

**Objective:** This research had two goals. Firstly, to assess community pharmacist-delivered care to people with mental illness, focusing on dispensing and counseling practices, pharmacists' confidence and comfort in providing care, and attitudes and beliefs towards mental illness. Secondly, to assess community pharmacists' competence and training needs related to mental health.

**Methods:** This multi-stage mixed-method research was conducted in the United Arab Emirates (UAE). In stage one, semi-structured interviews explored community pharmacists' practices, challenges, and strategies to improve care. Data were analyzed thematically and were then used to build the study questionnaire. Community pharmacists in four emirates who had dispensed controlled medications in the past 12 months were invited to participate. The survey was available in paper format and in an online version on Qualtrics. Logistic regression was used to identify the predictors of pharmacist practices. In stage two, a cross-sectional national survey was conducted in community pharmacies in all the emirates of the UAE. The competence assessment was informed by the Framework of Core Mental Health Competencies for All Pharmacy Professionals by the National Health Service, UK. A generalized linear model was used to identify the predictors of pharmacists' competence levels.

**Results:** A total of 914 community pharmacists were enrolled in the two stages of this research. In stage one, 12 community pharmacists described adopting a precautionary attitude and perceived their role as a dispensing one. They reported challenges such as emotional discomfort and lack of training but highlighted the need for a different approach to patients with mental illness. Of the 252 pharmacists who completed the stage-one questionnaire, 74% reported performing at least five counseling practices related to mental health care. Logistic regression showed that pharmacists who performed a higher number of practices ( $\geq 5$ ) were younger, received continuing education on mental health care in the last two years, and had higher confidence

levels. In stage two, most pharmacists reported lower knowledge/skill in the relationship with multidisciplinary teams and other services. They also revealed lower competency in the ability to recognize different forms of stigma and discrimination in society against people with mental illness. Lower competencies in mental health care were found among pharmacists working in pharmacies who do not stock psychotropic medication and those who did not receive previous training in avoiding stereotyping and stigma and motivational interviewing.

**Conclusion:** Community pharmacists performed basic dispensing practices and reported discomfort during encounters with patients with mental illness. Training on patient-centered communication skills and psychiatric therapeutics is needed to improve pharmacist-delivered services, alongside increased collaboration with other providers and services.

### Development and validation of tools in relation to vaccination in autoimmune inflammatory rheumatic diseases patients

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**Background:** Patients suffering from Autoimmune Inflammatory Rheumatic Diseases (AIIRD) are at an increased risk of co-morbidities and infections that could further compromise patients' health and impact their quality of life. Vaccines can be administered to prevent complications such as co-morbidities and/or infections in this immunocompromised cohort.

**Purpose:** To develop tools aimed at capturing clinicians best practice and perception and concern of AIIRD patients in relation to vaccinations.

**Method:** A literature review was carried out to identify tools required to i) capture rheumatologists best practice on national level and ii) assess perception and awareness of AIIRD patients in relation to vaccinations. The Rheumatologists vaccination questionnaire targeting rheumatologists was developed to capture best practice on a national level. The questionnaire was validated for clarity and relevance by 3 pharmacists and 1 medical doctor. The AIIRD vaccination perception and awareness questionnaire was developed in Maltese and English to capture the vaccination status, perception and concerns of AIIRD patients. The AIIRD vaccination perception and awareness questionnaire was validated for clarity and relevance by 3 pharmacists, 1 medical doctor and an AIIRD patient. Ethics approval was sought.

**Results:** The Rheumatologists AIIRD vaccination questionnaire consists of 12 questions capturing clinicians' recommendations on vaccinations, availability of guidelines

and product information targeting AIIRD patients, adverse reactions and patient education/awareness. During the validation process, all members of the panel (n= 4) agreed that the questionnaire was concise, clear and supported its intended use. The AIIRD vaccination perception and awareness questionnaire consists of four sections namely demographics; AIIRD history; medication history and vaccination status focusing on vaccinations taken, compliance to yearly flu vaccine, compliance to Covid-19 vaccine and availability of information sources for patients on vaccines. All members of the validation panel (n= 5) agreed that the questionnaire was concise, clear and supported its intended use.

**Discussion:** The study attempts at providing two separate tools intended for dissemination to clinicians and patients in order to assist in the development of a patient-centred framework on vaccinations for AIIRD taking into account international and national practices whilst addressing patients educational needs.

### Challenges and concerns of type 1 diabetic patients during transitional settings: The pharmacist's role

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**Background:** The transition of Type 1 Diabetes Mellitus (DM) patients from paediatric to adulthood brings about a number of challenges as it coincides with social and psychosocial challenges and peer pressure the patients face in society. The process of transitioning from a paediatric clinic to an adult clinic is an inevitable and fragile process and could lead to loss of control in DM. This raises the need of an efficient transition process to ensure patient and carer are ready for this change and shed light on the potential role of the pharmacist contribution towards an improved transition process.

**Purpose:** To identify the challenges and concerns patients and carers face during the transition into adulthood.

**Method:** Three questionnaires were compiled, reviewed and validated. The Self-assessment questionnaire addressed patients living with Type 1 Diabetes Mellitus between the age of 14 and 30 years of age with the aim of assessing teenage patient's self-management abilities and knowledge of their condition whilst highlighting predictors leading to uncontrolled DM. The Parents' concern questionnaire explored the concern of the patient's carers with T1DM regarding their teenager's control of the condition. The Role of the Pharmacist questionnaire was disseminated to a group of patients, parents and healthcare professionals (HCP) to capture perception of the pharmacist's role during transition.

**Results:** A total of 41 patients (age range 14 -30, mean age:24 years) answered the Self-assessment questionnaire. The commonest insulin products used were insulin aspart (N=37 patients) and insulin glargine (N=36 patients). The combination of insulin aspart as short acting and insulin glargine as long acting was used in 31 out of 41 patients. Eleven patients out of 41 patients had experienced hospitalization at some point in their life with the most common reason being hyperglycaemia and diabetic ketoacidosis (n=7). Twenty two patients were concerned that they will be under the care of a new physician when they transition from the paediatric clinic to an adult clinic. A total of 22 carers (age range: 32-56, mean age: 46 years) responded to the Parents' concern questionnaire. The most common concern by carers was that the child will be under the care of a new physician (N=15). Out of a total of 35 respondents answering the Role of the Pharmacist Questionnaire, 19 participants, agree that the pharmacist should be involved in the transition process because the pharmacist will improve the transition outcome. Out of 19 respondents who agree that the pharmacist should be involved in the transition process, eight believe that the pharmacist's role would reduce medication error.

**Conclusion:** A smooth transition plan which resolves and reduces patients and carers' concern as the patients move into adulthood could result in less challenges faced by the patients at this tender process. This transition could be an opportunity for pharmacists equipped with the right knowledge and skills to extend their supportive role to the patients and their carers.

### **Pharmacists' new role in the management of opioid use disorder with extended-release buprenorphine administration to patients: A qualitative analysis**

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#### **Background:**

Buprenorphine (BUP) is a long-acting opioid that is used to treat pain and opioid use disorder (OUD). In patients with OUD, it is used as a substitute for shorter-acting opioids to minimize discomfort associated with withdrawal. Canadian prescribers are now forwarding prescriptions to Canadian pharmacists for the subcutaneous (SC) administration of extended-release (ER) injectable BUP for treating patients with OUD. This is a novel service provided by pharmacists and a step forward toward collaborative practice.

#### **Purpose:**

To determine how Canadian pharmacists have adapted their traditional job responsibilities while also integrating this new role and the prescribers' perspective regarding the

integration of community pharmacists in ER buprenorphine-assisted OUD patient care treatment.

#### **Method:**

A convenience sample of licensed Canadian pharmacists authorized to provide BUP injections; and licensed Canadian primary care physicians or nurse practitioners authorized to prescribe BUP ER; were invited to attend one-on-one semi-structured qualitative interviews. Recruitment was completed through a Canadian addiction treatment network, a pharmaceutical firm responsible for injection training for health professionals, and word-of-mouth referrals. Interview transcripts were reviewed by two coders to generate an initial coding list. This list was then refined by two researchers independently and collapsed into broader themes and nodes. After extensive reviews and discussion of the transcripts, a final refined list of combined themes and sub-themes was generated. Interviews were conducted until saturation was achieved.

#### **Results:**

To date, 7 pharmacists and 2 prescribers (1 nurse practitioner and 1 physician) have been interviewed. All interviewees are located in the province of Ontario with over half identified as male (n=5) and practicing in an urban setting (n=7). Interviewed pharmacists had on average, 1 year of experience delivering BUP injections and 8 years of pharmacy experience. Preliminary findings suggest that both pharmacists and prescribers feel this service is beneficial to the patient, minimizes long-distance travelling, maximizes time between injections and increases efficiency in prescribers and pharmacists who provide OUD services in their clinical practice, including decreased patient loads for prescribers and more time for counselling and relationship building with patients for pharmacists. Prescribers felt pharmacists were knowledgeable, and with training provided by the manufacturer, best suited to administer this medication to patients. Pharmacists expressed satisfaction with delivering this service but experienced implementation barriers such as lack of reimbursement and private space for patients to lie down during administration.

#### **Conclusion:**

Preliminary results suggest that Ontario pharmacists and prescribers are satisfied with this newly extended collaborative opioid stewardship practice. Benefits associated with pharmacist provision of BUP injections and implementation barriers were identified that can improve service expansion and uptake. Further interviews and analysis of experience between Canadian physicians and pharmacists will be of value.

### Patient-centered pharmaceutical care for patients with chronic diseases provided by community pharmacists in China: A scoping review

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**Background:** With development of aging in China, the demand for pharmaceutical care of chronic patients is sharply increasing. Compared with pharmacists in hospitals, community pharmacists pay more attention to the continuity and accessibility of pharmacy services, patient-centered individualized pharmaceutical care has become the trend of their development.

**Objective:** The aim of this study was to review the literature on pharmaceutical care in community pharmacies for patients with chronic disease in China. Summarizing and analyzing the current situation and potential problems of pharmaceutical care implementation provide reference and suggestions for community pharmacies to develop pharmaceutical care for chronic diseases.

**Methods:** The literatures published between January 1, 2013 and December 31, 2022 were searched from China National Knowledge Infrastructure (CNKI), Wanfang Data Knowledge Service Platform, Pubmed (Mediline), Embase, Scopus and International Pharmaceutical Abstracts (IPA). Search terms included the following: pharmacy/ community pharmacists/pharmaceutical care/medication therapy management/dual impairment/chronic disease/China. Studies were included if pharmaceutical care/medication therapy management were provided by community pharmacists for patients with chronic disease. All study designs were eligible. This was a scoping review and the quality of studies was not formally evaluated.

**Results:** Seventy-four studies were included. The locations involved in the study were mainly distributed in middle and eastern regions of our country, including Shanghai (n=19), Guangdong (n=14), Beijing (n=10) and other developed areas. Research types mainly include controlled study (n=23), status investigation (n=15), introduction of experience (n=14). Among the 42 literatures on specific diseases, diabetes was the most involved (n=31), followed by hypertension (n=28), COPD(n=8), coronary artery disease(n=6). Among all the articles, 46 of them demonstrated that the pharmacists played the main service for the patients without the collaboration of medical professionals, pharmaceutical services were achieved through team work in 28 publications and 6 of them mentioned medical treatment alliance. The main services carried out by pharmacists included counselling (81.1%), monitoring and follow-up (56.8%), solution of drug treatment problems (55.4%). However, service regarding

collection and reporting of drug adverse reactions (13.5%) and medication reconciliation (10.8%) were relatively less. A few studies involved hierarchical medical system of patients (10.8%) and the development of disease specific intervention plans (3%).

**Conclusion:** Pharmaceutical care for patients with chronic disease in community pharmacies is still mainly concentrated in first-tier cities in China. Services cover a limited range of diseases and pharmacy practice, and medical cooperation between pharmacists and other healthy professionals has not been widely popularized, which may be related to the competency of community pharmacists or policies. In the future, the establishment of targeted pharmaceutical care programs and hierarchical diagnosis and treatment based on different diseases should become the focus of services.

### Physicochemical compatibility of sildenafil injection with intravenous drugs used in the neonatal intensive care setting

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**Background** - Intravenous (IV) sildenafil is used to treat persistent pulmonary hypertension, a life-threatening neonatal condition. Due to limited IV access and fluid restrictions in neonates, multiple drugs are often co-administered at high concentration in a single IV line. If physicochemical compatibility data are limited, dedicated IV lines are required to separately infuse drugs, which increases the complexity of patient care and the risk of adverse events.

**Purpose** - To investigate the physicochemical compatibility of sildenafil with a wide range of IV drugs commonly used in the Neonatal Intensive Care Unit (NICU) setting.

**Method** - Sildenafil 600 mcg/mL or 60 mcg/mL was mixed with the secondary drug solution at 1:1 volume ratio in glass vials. To determine physical compatibility, the combinations were visually observed against black and white backgrounds and under polarized light for 2 hours, for changes in colour, precipitation, haze and evolution of gases. To determine chemical compatibility, sildenafil concentrations were evaluated using a validated, stability indicating High Performance Liquid Chromatography (HPLC) assay.

**Results** - The majority of drugs tested were compatible with sildenafil injection, including inotropes, caffeine, gentamicin and midazolam. Several drugs were found to be physically incompatible with sildenafil 600 mcg/mL, due to precipitation; for example, aciclovir, furosemide, ibuprofen,

amoxicillin and sodium bicarbonate. Some drugs, including aciclovir, amoxicillin and ibuprofen lysine (but not ibuprofen injection), were shown to be physically and chemically compatible with sildenafil 60 mcg/mL.

**Conclusion** - Several drugs are incompatible with sildenafil injection at concentrations used in the NICU setting and co-administration via Y-site should be avoided. Our study demonstrates the importance of concentration-specific and physicochemical IV compatibility data.

### Drug use evaluation in a tertiary hospital in Nigeria based on the World Health Organization (WHO) indicators: A cross-sectional facility-based design

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**Background:** Medicines are integral parts of the health care system and modern health care is unthinkable without the availability of necessary medicines. Irrational use of Medicines is a global phenomenon and it is not specific to a region, rather it may vary from one region or health settings to another.

**Purpose:** We evaluated the utilization of essential drugs in a tertiary healthcare facility using the WHO core drug use indicators as a benchmark.

**Methods:** We carried out a cross-sectional study in the tertiary healthcare facility. The study lasted from June 2022 to March 2023. The data of 120 randomly selected patients folders with 300 prescriptions and 828 prescribed drugs were extracted using a structured proforma. Data was evaluated based on WHO core prescribing indicators, patient care indicator, and facility indicators. The data was summarized with descriptive statistics.

**Results:** The average consulting time was 1050 seconds (WHO;  $\geq 600$  minutes) while the average dispensing time 92 seconds (WHO;  $\geq 90$  seconds). The percentage of drugs actually dispensed was 77%. There was neither essential drug list nor a drug formulary in the hospital against WHO's recommendation of at least one essential drug formulary. However, the percentage availability of key indicator drugs was 100% and consistent with the WHO's specification. The mean drugs per prescription was 2.76 (WHO standard= 1.6 - 1.8). The percentage of drugs prescribed by generic names was 78.02% (WHO standard= 100%), while the percentage of injections prescribed was 1.67% (WHO recommended value =13.4 – 24.1%).

**Conclusion:** The prescribing indicators, patient care, and facility indicators were predominantly inconsistent with the WHO core drug use indicators for healthcare facilities.

However, the availability of key drugs was consistent with the WHO benchmark.

### Prevalence and correlates of self-medication among pharmacy, medical and nursing students in a Nigerian university

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**Background:** Irrational drug use and self-medication practice is high among students and a cause of concern. A good understanding of the correlates underscores the initiation of intervention process.

**Purpose:** This study investigated the prevalence, knowledge, attitude and practice of self-medication and associated factors among undergraduate pharmacy, medical and nursing students in a Nigerian university.

**Method:** We carried out a descriptive cross-sectional survey in the university campus through stratified and two-stage cluster sampling technique was utilized. A sample size of 422 was obtained and 405 analyzable questionnaires were returned. Data was obtained by pilot tested and structured questionnaire via face to face exit interviews after the respondents informed consent and ethical approval had been obtained. The study lasted between May 2022 and March 2023. The data was analysed with descriptive statistics and Pearson correlation using SPSS (Version 22). The level of significance was measured at  $p \leq 0.05$ .

**Results:** From a total of 405 (96.0%) participants, 143 (35.3%) were male and 262 (64.7%) were female. More than half of the respondents (58.3%) indicated they prefer taking drugs without seeing a professional for perceived illness such as common cold (82.9%), headache (77.8%), cough (60.2%) and abdominal discomfort (48.1%), using mainly analgesics (Acetaminophen) (60%), antibiotics (48.1%), antacids (44.2%) and cough syrup (38.5%). Their reasons were mainly to save time (48.1%), affordability and cost effectiveness (45.2%) and is readily available (29.9%). Majority of the respondents were knowledgeable about self medication and strongly agreed that self-medication should be encouraged. There was a significance relationship between sex and knowledge of self-medication, ( $p = 0.047$ ); department and knowledge of self-medication ( $p = 0.004$ ); levels and knowledge of self-medication ( $p = 0.028$ ), and sex and attitude to self-medication ( $p = 0.038$ ). There was no relationship between age and attitude of self-medication ( $p = 0.076$ ). The relationship between sex and practice of self-medication ( $p = 0.063$ ) while that of department and practice of self-medication ( $p = 0.027$ ).

**Conclusion:** Self medication was prevalent among the students' population. Analgesics were the most utilized. Most of them were knowledgeable and have a positive attitude towards self-medication. This study will serve as the basis and template for intervention studies targeting this ever-growing population.

### Sustainable cold chain vaccine delivery

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#### Background:

Vaccines are required to maintain cold chain (2-8°C) during the distribution process. Maintaining cold chain can present a unique challenge in remote Australia due to large distances, fluctuating temperatures, and transport methods. Breaching cold chain can prevent essential vaccines being available for remote citizens, therefore potentially increasing the burden on the health care system as less people are vaccinated against preventable disease. Polystyrene containers with gel ice bricks were traditionally used to transport vaccines to maintain cold chain throughout distribution. A pilot study, in 2020, demonstrated feasibility, acceptability, and potential efficacy of implementing a re-usable vaccine cold-chain shipper (vaccine shipper).

#### Purpose:

To reduce environmental, vaccine, financial, and time wastage by implementing a vaccine shipper for distribution.

#### Method:

A multidisciplinary governance group facilitated the purchasing, implementation, and communication required to implement a vaccine shipper across an Australian health service. Five hospitals servicing approximately 70 remote communities utilised a vaccine shipper for distribution during the 2022 influenza season (Feb-Aug). Data from incident reporting system were collected to compare sustainability indicators pre-implementation (2021) and post-implementation (2022). Indicators included number of cold chain breaches, vaccine wastage, and staff effort for redistribution. Vaccine distribution plans were used to predict single use polystyrene container waste. Quality improvement actions and risks were recorded by the governance group.

#### Results:

In 2021 77,686 influenza vaccines were distributed. 32 influenza vaccine cold chain breaches were reported resulting in 3,086 (4%) influenza vaccines being destroyed at a cost of \$26,511 (AUD). In 2022, 79,000 influenza vaccines were distributed with 7 influenza vaccine cold chain breaches, 470 (0.001%) influenza vaccines being destroyed, and \$3,394 cost of wastage. Vaccine shipper use in 2022

achieved a 78% reduction in cold chain breaches, cost savings of \$23,117, and prevented 24 redistributions. This resulted in more vaccines arriving on time and intact, thus increasing timely access for patients, reducing work pressure and workload for staff. Utilising re-usable vaccine shippers in 2022 prevented approximately 325 single use polystyrene containers being sent to landfill. A key risk identified was manual handling by staff due to the size and weight of vaccine shippers.

#### Conclusion:

Implementing vaccine shippers for distribution increased sustainability of a health service by ensuring essential vaccines were available for remote citizens. In addition, vaccine shippers prevented vaccine and environmental waste, provided financial savings and reduced duplication of effort by staff. Additional mitigation and education strategies to reduce manual handling risk have been included in the 2023 influenza vaccine season plan.

### Interprofessional education: Pharmacists supervising medical student research

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Research is essential within health services and considered a professional obligation for pharmacists. Research is required to improve patient outcomes, identify risks, review costs, evaluate practice, and understand outcomes of treatment. Without evidence of evaluation, Australian health services would fail to meet accreditation standards, however, balancing research and clinical practice can be challenging. Australian medical students are required to undertake a research project during 4th year of the Doctor of Medicine Program. Interprofessional education (IPE) is a critical for preparing students to enter the health workforce. International organisations have promoted IPE to support increasing pressure on healthcare systems, limited financial resources, and to improve quality of care and health outcomes. To facilitate sustainable research, and contribute to IPE, a 'train the trainer' model was developed to support pharmacist's identifying ideas for, and supervising medical student research projects.

#### Purpose

Embed an IPE research collaboration between pharmacists and medical students to upskill both cohorts and enable clinicians to conduct research, meet professional obligations, and health service accreditation standards.

#### Method

Two pharmacists with research experience (RE) developed a pilot in 2021. The RE pharmacists supervised 4 medical students in quality use of medicines (QUM) evaluations



conducted in a tertiary hospital. The RE pharmacists developed research questions which would result in QUM improvements of services and provide evidence against Australian accreditation standards. The students chose their research question based on their interests. The pilot identified University requirements, student research skills, supervisor time requirements, and training gaps. The RE pharmacists utilised these learnings to develop a train the trainer approach for ongoing, sustainable research. In 2022, six pharmacists with varying research experience, undertook the education facilitated by the RE pharmacist to become supervisors. Six medical student conducted QUM research self-selected from a range of developed research questions. A multimodal evaluation of IPE collaboration was conducted; a survey of supervisor experience, student university outcomes, and ongoing commitment of partners for continued collaboration.

### Results

All medical students (n = 4, 2021; n = 6, 2022) successfully completed and met university requirements to pass the compulsory research module within the Doctor of Medicine program. All projects provided evidence against the Australian accreditation Standards. 6 pharmacist supervisors in 2022, 67% (n=4) completed the evaluation survey. 2 supervisors were on leave or had left the health service at the time of the survey. 75% (n=3) were first time supervisors and supervisors spent an average of 2 hours per week with students. All (n=4, 100%) stated they were likely or very likely to supervise another research project. Improvements suggested from supervisors, such as continuing supervisor support, has been included in the 2023 IPE program. Ongoing commitment from the university and the tertiary hospital to continue to partner with pharmacist supervisors for 4th year medical students has been achieved.

### Conclusion

Conducting research with pharmacists and medical students facilitates IPE collaboration and is mutually beneficial. It improves research skills, balances clinical work and research outputs, prepares students for the workforce, and QUM activities are aligned to the requirement of the health service.

## Evaluation of remote pharmacist-led outpatient service for geriatric patients on rivaroxaban for nonvalvular atrial fibrillation during the COVID-19 pandemic

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**Objective:** This study was designed to evaluate the efficacy of remote medication management of rivaroxaban by pharmacists for geriatric patients with nonvalvular atrial fibrillation during the COVID-19 pandemic.

**Methods:** A single-site, prospective cohort study was conducted among patients with non-valvular atrial fibrillation who received rivaroxaban therapy from July 2019 to December 2019. Patients in the pharmacist-led education and follow-up service (PEFS) group were managed remotely by a pharmacist. In contrast, those in the usual care (UC) group were managed by other providers. Data of routine blood tests, coagulation function tests, which also included cardiac function parameters were collected. The number and type of provider encounters, interventions related to rivaroxaban therapy, the occurrence of thromboembolism or bleeding, and the time of the first outpatient visit after discharge were recorded.

**Results:** A total of 600 patients were recruited, and results of 381 patients were analyzed in the end, of which 179 patients were from the PEFS group and 202 were from the UC group. There was no significant difference between the two groups in terms of the occurrence ratio of systemic thrombosis, heart failure (LVEF < 40%), and left atrial dilation, which was defined as enlargement of left atrial diameter (LAD) > 40 mm. The cumulative incidences of bleeding complications, such as gastrointestinal tract and skin ecchymosis, were significantly higher in the UC group (12.4% vs. 6.1%, P=0.038; 4.5% vs. 0.6%, P=0.018). There was no significant difference after pharmacist intervention in terms of thrombosis occurrence ratio between the two groups (P = 0.338, HR: 0.722, 95%CI: 0.372-1.405). Remote instruction by a pharmacist reduced outpatient service frequency within the first 30 days after discharge (23.7% vs. 1.1%, P < 0.001). However, more patients in the PEFS group presented for the first outpatient revisit later than 40 days post-discharge (12.8% vs. 21.3%, P < 0.001).

**Conclusion:** Remote pharmacist-led medication instruction of rivaroxaban could reduce bleeding complications of the gastrointestinal tract and skin ecchymosis and postpone the first outpatient revisit after discharge.

## Patient perceptions of prices and costs of biological medicines and their significance

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**Background:** The use of biological medicines has increased over the last decade. Less expensive biosimilars are promoted through education, guidance regarding prescribing practices, and pharmaceutical legislation to curb increasing medicines costs. Relatively little is known about the patient perceptions of biological medicines and their switching, and the relating economic aspects.

**Purpose:** To study patients' perceptions of prices and costs of biological medicines and their importance. The perceptions were studied from three perspectives: 1) patient's preferences between the therapeutic value and cost when a biologic medicine is prescribed (primary outcome) and for the societal benefits of cost savings for biosimilar use, 2) medicine prices and switching (associations between patients' economic background factors and perception of switching, and willingness-to-accept/pay for switching), and 3) affordability of medicines.

**Methods:** University Pharmacy and the University of Helsinki carried out a cross-sectional survey in January 2021. Invitations were sent to University Pharmacy's loyalty customers and via the communication of two patient associations. The study was aimed at adult patients with a rheumatic condition, IBD (inflammatory bowel disease) or skin psoriasis using biological reference medicine (BR), biosimilar (BS) or traditional small molecule medicine (TM). Statements with 5-point Likert scale and background questions were used. Differences between the medicine user groups and association of other background variables concerning the outcomes were analyzed by bivariate and multivariate analyses.

**Results:** 1,338 patients responded to the survey (226 BR, 71 BS and 1,041 TM patients). The majority (83%) of patients claimed that the cost of treatment should not be the determining factor in the prescribing of a biologic. 62 % saw that biosimilars would help save money for healthcare systems and using less expensive biosimilars would result in more patients being treated with biologics. According to the multivariate analysis, the patients' economic background was not related to an interest in switching or attitudes towards switching biological medicines in general. Of the BR users, 62% would consider biosimilar switching. Preliminary willingness-to-accept biosimilar instead of reference medicine and willingness-to-pay for the reference product instead of a biosimilar were determined in Euros. 38% of BS users would prefer to pay additional cost for a BR medicine. Users of biological medicines (36% of BA and 44% of BS 44 users) had financial problems in purchasing medicines more frequently than users of traditional medicines (25%).

**Conclusions:** Patients were positive about biosimilar use to curb medicine costs but considered the therapeutic rationale to be more important. The patients' economic background was not related to perceptions regarding medicine switching. Over half of patients were interested in switching to a less expensive biosimilar while over a third of biosimilar users would be willing to pay additional cost for a reference product. The results emphasize the importance of medicines information regarding biological medicines and their switching.

## Updates on pharmacological intervention for smoking cessation: A systematic review of systematic reviews

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**Introduction:** Smoking is one of the main causes of mortality globally, causing approximately eight million deaths yearly. According to the Malaysian Clinical Practice Guidelines (CPG) on Treatment of Tobacco Use Disorder 2016, the pharmacological interventions consist of nicotine based and non-nicotine based agents. This systematic review was conducted to update the CPG with the most recent evidence of these interventions starting from 2016 till 2022. The aim includes to review the existing systematic reviews discussing the effectiveness and safety of the pharmacological agents and their combination medications for quitting conventional cigarette smoking.

**Methods:** Databases such as Scopus, PubMed, and Cochrane Library were used. Only systematic reviews from 2016 onwards were included. The study selection, quality assessment and data extraction were performed by two reviewers. The finding was narratively synthesised.

**Results:** There were 17 systematic reviews included. All types of NRTs are shown to be effective for smoking cessation at the longest follow-up (RR 1.55 95% CI 1.49 to 1.61). Varenicline, bupropion and nortriptyline are beneficial for long-term smoking abstinence (RR 2.24, 95% CI 2.06 to 2.43), (OR 1.52, 95% CI 0.67 to 3.41) and (RR 2.03, 95% CI 1.48 to 2.78) respectively. Also, various type of combination therapies can increase the smoking abstinence, but more research is required. NRT, bupropion, varenicline, and nortriptyline are beneficial for long-term period of smoking cessation. Combination therapies can increase the rate of smoking abstinence effectively.

**Conclusion:** Updated evidence regarding pharmacological intervention for conventional smoking cessation including on combination therapies and interventions in special populations should be incorporated into the clinical practice guidelines to assist healthcare providers delivery of more effective services.

## Updates on interventions for electronic cigarette smoking cessation

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**Introduction:** Electronic cigarettes (e-cigs) smoking or vaping has been promoted as an alternative to conventional cigarettes or a harm reduction strategy despite the absence of high-quality evidence and approval by authorised bodies such as the US FDA for such claims. Malaysia is one of the countries with a high prevalence of e-cig smokers. However, it is unclear how healthcare professionals can assist in e-cig cessation. The aim of this study is to evaluate the body of evidence regarding quality, safety, and efficacy of available pharmacological and behavioural interventions for quitting e-cigs smoking.

**Method:** A systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement guidelines. An electronic search was carried out using different databases from 2016 onwards using PubMed, Scopus, and the Cochrane Library. Google Scholar was also used to locate additional relevant studies. There were no restrictions specified during the search strategy. Key terms include pharmacological or behavioural intervention, as well as e-cigarette/vape/vaping cessation/quit. The Boolean Operator "OR" and "AND" have been used to connect the keywords and themes together. The data were extracted and analysed using a narrative synthesis technique. Eligible studies were assessed using various risk of bias tools depending on the type of article.

**Results:** Eight studies out of 232 articles were identified. Studies on interactive text message was shown to be significantly successful in e-cigarette quitting at both 30-day and 7-day point prevalence abstinence (ppa) at three- and seven-month follow-up. Vape-taper and varenicline studies were helpful in aiding people quit vaping at three months treatment. Nicotine replacement treatment (NRT) increased the risk of vaping cessation at three and six months in half of the included studies. Counselling had successfully assisted in the discontinuation of vaping by pairing with other interventions. Side effects were found to be low. Overall, more research is needed to determine the optimum option for e-cigarette cessation.

**Conclusion:** Given the rising problem of vaping globally, limited evidence available on interventions found to be effective and safe for e-cigarette cessation will be useful to assist healthcare professionals deliver services for optimum results.

## Updates on behavioural interventions for smoking cessation: A systematic review of systematic reviews

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**Introduction:** In Malaysia, the Clinical Practice Guidelines on Treatment of Tobacco Use Disorder 2016 is utilised to support effective and safe conventional cigarette smoking cessation services for smokers to quit successfully. Since its launch, there have been new evidence regarding behavioural interventions for tobacco smoking cessation.

**Method:** A comprehensive literature search was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement guidelines, which include developing inclusion criteria, designing a search strategy, searching through databases, articles screening and selection, quality assessment, data extraction and results presentation. A comprehensive literature search was conducted using the Cochrane Library, PubMed and Scopus databases. Key terms related to behavioural interventions (e.g., 'behavioural therapies', 'behavioural treatments', 'counselling'), and smoking cessation (e.g., 'tobacco cessation', 'tobacco smoking cessation', 'quit smoking') were combined using Boolean Operators. Filter for English language, type of study (systematic reviews) and the publication year (January 2016 to November 2022) was applied. Only full-text systematic reviews in English language with retrievable full-text articles were included. Two reviewers performed the study selection, with disagreements resolved by consensus or the involvement of another reviewer. Quality assessment and data extraction are performed by one reviewer and checked by another. AMSTAR-2 tool was used to perform the risk of bias assessment. A narrative synthesis of the data extracted was provided.

**Results:** The search resulted in a total of 276 articles and out of these, 23 systematic reviews were included. The included studies incorporated various smoking cessation interventions. Smokers were of all ages and from the general or special population. Fourteen reviews were rated as of high quality, while others were moderate (n=2), low (n=4) or critically low (n=3). The analysis found that counselling sessions, online interventions, self-help materials and motivational interviewing may increase cessation rates. It is unclear which intervention is best for the general and special populations. The strongest evidence of benefit is demonstrated when any counselling is offered. Findings that are considered as new behavioural interventions include app-based, incentives, competitions, feedback on spirometry results, mindfulness-based, exercise and behavioural interventions for HIV and AIDS patients, COPD patients, and underprivileged older smokers.

**Conclusion:** Updated evidence on behavioural interventions for conventional cigarette smoking cessation should be incorporated into existing clinical practice guidelines to assist health professionals effectively deliver cessation services and achieve optimum results.

### Evaluating the impact of partnered pharmacist medication charting in the emergency department on time to administer pre-admission time-critical medicines, adverse drug reactions, medication order completeness and venous thromboembolism risk assessment

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**Background:** Ensuring quality and timely medication use is an ongoing concern in the emergency department (ED) due to the emergency-driven nature of disease and care given. To improve the quality use of medicines and enhance interdisciplinary collaboration, a partnered pharmacist medication charting (PPMC) model was trialled in the ED of a tertiary hospital.

**Purpose:** The study aimed to evaluate the impact of PPMC on time to administration of time-critical medicines, the occurrence of in-hospital adverse drug reactions (ADRs), the completeness of medication orders and the conduct of venous thromboembolism (VTE) risk assessment.

**Methods:** This was a retrospective controlled concurrent study among adults ( $\geq 18$  years), conducted in the ED setting between June 1, 2020, and May 17, 2021. The PPMC model included documentation of a best-possible medication history (BPMH) at the earliest possible point in the ED, followed by a clinical conversation between a PPMC-credentialed pharmacist and a medical officer to jointly develop a treatment plan. After the pharmacist charted medications based on the plan, the ED medical officer endorsed them before being administered by the nursing staff. Medication charting written using the PPMC model (PPMC group) was compared with the traditional medical charting written by medical officers in the ED (early BPMH group or usual care group). The early BPMH group included BPMH followed by the traditional medication charting approach in the ED, whereas the usual care group included BPMH on the inpatient ward after the medication charting in the ED. Time elapsed from ED presentation to the first dose administered for hospital-specific time-critical medicines was assessed. In-hospital ADRs were identified using the documented International Classification of Diseases codes. Completeness of medication orders and VTE risk assessments were extracted from medical records.

**Results:** The median times (interquartile range), in hours, from ED presentation to the first dose administration of time-critical medicines were 8.8 (6.3 to 16.3) in the PPMC group, 17.5 (7.8 to 22.9) in the early BPMH group and 15.1 (8.2 to 21.1) in the usual care group ( $p < 0.001$ ). The PPMC was also associated with an increase in the proportion of patients having complete medication orders and receiving VTE risk assessments in the ED ( $p < 0.001$ ). However, documented in-hospital ADRs did not differ significantly between the groups ( $p = 0.59$ ).

**Conclusions:** The PPMC model facilitated a quicker administration of time-critical medicines, and improved the completeness of medication orders and VTE risk assessments in the ED. However, the model did not significantly reduce the occurrence of documented in-hospital ADRs. The collaborative charting model generally added value to the quality use of medicines, and the findings support its continuation in the ED.

### Adverse drug reaction-related hospitalisations among people with dementia: Implicated drugs and predictors

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**Background:** Adverse drug reactions (ADRs) are common among people with dementia; however, little is known about the magnitude and predictors associated with ADR-related hospitalisation among people with dementia.

**Purpose:** The study aimed to determine the types, drugs implicated and predictors of ADRs associated with hospitalisation among people with dementia.

**Methods:** This study utilised the Admitted Patient Care National Minimum Dataset (APC-NMDS) and Digital Medical Records (DMR) of people aged  $> 65$  years who had a medical admission at one of the Tasmanian public hospitals between July 2010 and July 2021, with a primary or secondary diagnosis of dementia. The identification of ADRs and implicated drugs involved a two-step process. Firstly, external cause codes and diagnostic codes in the APC-NMDS were utilised. Secondly, the identified ADRs and implicated drugs were cross-checked and verified using the information provided in the DMR. Binary logistic regression analysis was used for determining the predictors of ADR-related hospitalisation.

**Results:** The most common type of potential ADRs were renal (38.9%), followed by neuropsychiatric (16%), haematological (14.8%) and cardiovascular (12.5%). Diuretics, Renin-angiotensin-system inhibitors and antithrombotics constituted the main drug classes implicated in causing ADR-related hospitalisation in patients with dementia. Three predictors associated with ADR-

related hospitalisation were pre-existing renal impairment (OR 2.73, 95% CI 1.53-4.86,  $p < 0.001$ ), ethnicity (OR 1.52, 95% CI 1.02-2.26,  $p=0.038$ ) and the number of medicines (OR 1.10, 95% CI 1.05-1.15,  $p < 0.001$ ).

**Conclusions:** Renal ADRs were the most frequent, with diuretics being the most implicated drug class. Pre-existing renal impairment, ethnicity and number of medicines were identified as predictors for ADR-related hospitalisations among people with dementia.

### Developing a patient centred Incident reporting medical device framework

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**Background:** In Malta, there is a significant rate of under-reporting in of medical device related incidents. Implementing an incident reporting (IR) framework that encourages communication and transparency with stakeholders will reduce risk and improve the quality of medical devices on the market.

**Purpose:** To develop a patient-centred IR framework that allows for communication and transparency with stakeholders in concluding IR for the benefit of patient safety.

**Method:** The methodology is divided into 3 phases namely i) needs assessment, ii) development of a quality management system supporting the IR framework iii) implementation of the IR framework. During Phase 1, IR systems of European Member States available on the respective National Competent Authority (NCA) websites were reviewed. Common themes and data fields used were identified and discussed through an expert panel consisting of 2 clinicians, 2 pharmacists and 2 representatives from medical device stakeholders (N=6). An IR Form for healthcare professionals and another for patients were developed and validated by the same expert panel. Phase 2 focused on the development of SOPs that focused on the receipt and processing of IRs, the liaison with other NCA and notified bodies as necessary. As well as the procedure for discussion through an Incident Action Group consisting of representatives from the national procurement unit of medical devices, the clinicians as end users and the NCA. Economic operators are invited accordingly for their input. The SOPs compiled was reviewed by the same expert panel. Phase 3 focused on the pilot implementation of the IR framework.

**Results:** Study findings from Phase 1 resulted in 8 themes which were included in the IR Forms respectively namely: i) device and patient data, ii) incident details, iii) adverse events; iv) suspected cause v) device performance and malfunction vi) user error vii) follow up actions and viii) reporter details. All the expert panel agreed that the

respective IR Forms were clear, concise, easy to complete and served their intended purpose. During Phase 2 a total of 3 SOPs were compiled. All the expert panel agreed that the SOPs were clear, concise, robust and served its intended purpose. Study findings from Phase 3 indicate that between January 2022 till March 2023, a total of 216 IRs were reported. Out of the 216, 207 were received from healthcare professionals within the National Health System. A total of 14 Incident Action Group meetings were held with approximate 2 hours duration each meeting. 186 IR have been successfully closed.

**Conclusion:** The pilot implementation of the framework showed positive results, with a significant number of healthcare professionals reporting incidents, and the Incident Action Group successfully closing most of the reported incidents. The implementation of the patient-centred IR framework can contribute significantly to reducing adverse events, promoting patient safety, and enhancing the quality of healthcare services. Future research should aim to assess the long-term impact of the framework on patient outcomes and its effectiveness in different healthcare settings.

### Perception of Maltese healthcare professionals on cannabis for medicinal use

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**Background:** Cannabis sativa is a plant containing 2 major components: cannabidiol which exerts pharmacological properties without the psychotropic properties exhibited by the second major component, tetrahydrocannabidiol. In Malta, the Drugs Dependence (Treatment Not Imprisonment) Act was amended in 2018 to allow prescribing by doctors and dispensing by pharmacists of authorized medicinal cannabis products.

**Purpose:** The aim of the research is to assess the perceptions and concerns of Maltese doctors and pharmacists on the clinical use of medicinal cannabis.

**Method:** A 25-item questionnaire entitled: 'The Healthcare Professionals Questionnaire on use of medicinal cannabis' was developed and validated. It aimed at capturing the respondents' knowledge on use of medicinal cannabis, ethical aspects, suitability of care, the need for education platforms to provide updates and sharing of expertise with respect to indications, patient-reported side effects and contraindications. Ethics approval was granted. The questionnaire was disseminated via Google Forms to registered healthcare professionals in Malta.

**Results:** A total of 200 respondents consisting of 98 doctors and 88 pharmacists answered the questionnaire. Medical professionals (n=130) agreed that patients can benefit from medicinal cannabis. Participants (n=127) stated that they

would feel comfortable discussing the clinical use of medicinal cannabis with patients while 81 agreed that medicinal cannabis had therapeutic benefits and 63 participants were aware of the side effects of medicinal cannabis. The majority of the respondents (n=184) agreed that there is not enough knowledge about medicinal cannabis among the public. More than half of the respondents, (n=120) strongly agreed that pharmacy and medical students need to be given better education and training about medicinal cannabis in their respective curricula.

**Conclusion:** Healthcare professionals agreed on the beneficial use of medicinal cannabis, but it was a tepid acceptance as many see the need for enhanced education on the subject, for themselves and patients.

### A framework for understanding sources of bias in medication adherence research

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**Background:** Suboptimal medication adherence is recognised as a major determinant of poor treatment response. Research to understand the causes and consequences of medicine-taking behaviours that deviate from the prescribed regimen as well as management strategies to support optimal adherence has been steadily growing for the past 50 years. Unfortunately, the outputs from much of this work are limited by methodological concerns, prompting a call for researchers to address the unique challenges of generating a reliable and accurate evidence base related to measurement and management of adherence. Of particular importance is better understanding of the biases inherent in the design and interpretation of adherence studies.

**Aim:** The aims of this study were to: (1) identify biases expected to affect adherence research and (2) develop a framework for mapping biases onto the phases of adherence (initiation, implementation, and persistence) and the measurement methods and summary metrics commonly used in adherence research.

**Method:** A literature search was conducted, key papers were reviewed, and the Oxford Catalogue of Bias was consulted. Biases specifically relevant to adherence

measurement methods (e.g. pill counts) and metrics (e.g. Proportion of Days Covered) were mapped onto the phases of adherence using a tabular matrix. We considered adherence 'measures' (i.e. the methods used to collect adherence information) separately from adherence 'metrics' (i.e. the quantitative data that capture adherence behaviour for each person).

**Results:** Twenty-three biases relevant to adherence research were identified, of which 11 were specifically relevant to adherence measurement methods and metrics. The mapping framework showed differences in the numbers and types of biases associated with each adherence measure and metric, while highlighting those common to adherence study designs (e.g. apprehension bias, unacceptability bias).

**Discussion:** The bias mapping framework is intended to inform the design of future adherence studies and to facilitate the development of tools to assess biases and mitigate their effects in medication adherence research.

### Impact of pharmacy-based interventions for limited health literacy patients with chronic disease: A systematic review

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**Background information:** Health literacy is a dynamic process that involves both the patient and the healthcare

provider. Limited health literacy (LHL) can have profound consequences for individuals and health systems. Pharmacy-based interventions have been proposed as a promising approach to improve medication management and health outcomes among patients with LHL.

**Purpose:** This review synthesised evidence on the effectiveness of pharmacy-based interventions for patients (aged  $\geq 18$ ) with LHL and any chronic disease diagnosis. The primary aim was to establish whether controlled pharmacy-based interventions lead to a change in any clinical and/or humanistic outcomes.

**Methods:** MEDLINE, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL), PsycINFO and Embase were searched from inception till January 2023. Papers were excluded if they were not available in English, did not report full peer-reviewed results or did not measure health literacy. It is worth noting that several excluded papers described interventions which could benefit patients with LHL but did not collect patient's health literacy data and thus were ineligible for inclusion.

**Results:** Our initial search captured 8282 studies. After duplicates were removed, two authors independently screened 5947 abstracts and titles, followed by 38 full texts. Six studies with 1855 patients were included in the final review. The majority of studies ( $n=5$ ) were conducted in the United States. The interventions were diverse and mostly targeted medication and/or disease knowledge; this included interventions involving the use of "talking pill bottles" that delivered audio-assisted medication instructions, medication labels that utilised the Universal medication schedule (UMS) with or without illustrations, educational sessions on identifying and understanding critical elements of a medication label, use of educational brochures, medication refill reminder postcards, pharmacist assisted medication reconciliations, tailored pharmacist counselling, provision of low-literacy adherence aids, individualised telephone follow-up after hospital discharge and use of the teach-back method to access chronic disease comprehension. Health literacy was measured in these studies using the Short version of the Test of Functional Health Literacy in Adults (S-TOFHLA) [ $n=3$ ] Newest Vital Signs (NVS) [ $n=1$ ], Rapid Estimate of Adult Literacy in Medicine (REALM) ( $n=2$ ) and a short 4-item health literacy screener ( $n=1$ ). There is some evidence that pharmacy-based interventions have the potential to improve functional health literacy, the ability to read and act upon medication instructions such as those on medication labels and to improve health outcomes (such as blood pressure and HbA1c levels) among patients with LHL. Most studies ( $n=5$ ) had high to moderate risk of bias, while one study had a low risk of bias. As there was considerable heterogeneity due to the diverse intervention types and populations, a meta-analysis was not performed.

**Conclusion:** This review highlighted the limited number of studies evaluating the impact of pharmacy-based interventions among patients with LHL. Most studies were conducted in the USA, which limits the generalisability of the findings to other countries with different healthcare systems

and social structures. Heterogeneity of assessed outcomes were noted, which limited comparison of the results and interventions.

### Provision of vaccination service in the community pharmacy—Impact on pharmacists' job satisfaction and well-being

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**Background:** Vaccine hesitance and inaccessibility to vaccines remain a global health threat. Hence, the scope of practice for pharmacists has expanded and currently pharmacists in many developed countries provide vaccination services to the public. Previous studies have reported the advantages of the provision of vaccinations via community pharmacies and the consumers' and pharmacists' experience of this service. However, there is a lack of understanding of the impact of providing the vaccination service on pharmacists' job satisfaction and well-being

**Objectives:** This study aimed to evaluate Australian pharmacists' job satisfaction and well-being regarding the provision of vaccination services. In addition, it aimed to determine the barriers to administering vaccines by pharmacists in Australia.

**Methods:** A self-reported questionnaire was distributed to pharmacists in Australia. The questionnaire included 36 items, and gathered both quantitative and qualitative data.

**Results:** A total of 188 participants were recruited. The study found that community pharmacists experienced moderate job satisfaction levels with mean job satisfaction and well-being scores of 17.0 ( $\pm 6.50$ ) and 17.6 ( $\pm 6.2$ ), respectively. A correlation was identified between job satisfaction and well-being, indicating that lower job satisfaction corresponded to lower well-being. Factors such as years of experience, confidence in administering vaccines, confidence in managing adverse events and workload influenced job satisfaction and well-being levels. The two key barriers to provision of vaccination service was reimbursement concerns and insufficient resources (including staff members).

**Conclusions:** The study highlights the correlation between pharmacists' willingness to administer vaccines and their job satisfaction and well-being. Additionally, the findings demonstrate the need for additional support and reimbursement for pharmacists to continue to provide high quality vaccination service to the public.

### Optimising community pharmacy workflow to enhance professional service implementation: A deprescribing case study

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**Background:** Evidence supports pharmacists undertaking professional services to optimise medication use, reduce patient harm and generate system savings. SaferMedsNL was a theory-driven, province-wide initiative to implement evidence-based pharmacist-led deprescribing across Newfoundland and Labrador (NL), Canada. Although evidence supports professional services like deprescribing, the implementation and uptake of evidence-based professional services in "front-line" community pharmacies remains low.

**Purpose:** The aim of this study is to identify and describe changes in workflow that facilitated the implementation of a new deprescribing professional service in community pharmacies across NL, Canada.

**Method:** Pharmacy students and community pharmacists from across NL were invited to participate in focus groups to explore the uptake of a newly funded deprescribing professional service across NL. Each focus group investigated the question, "What actions or processes support the implementation of deprescribing into the daily workflow of your practice?"

Focus groups were recorded and transcribed verbatim. Additionally, field notes were generated by researchers during each focus group. Transcripts and field notes were analysed to identify processes and actions that supported the professional service, which were then mapped to key steps within the community pharmacy workflow.

**Results:** Five pharmacy students and 11 pharmacists (including seven pharmacy owners and four employee pharmacists) were recruited. Several areas were identified where workflow could be changed to support the implementation of the deprescribing professional service. Optimisation of workflow began before the patient entered the pharmacy noted some participants. Patient interest in the service was fuelled by the creation of social media campaigns that aligned with the government-led promotion of the professional service.

Practical strategies for improving workflow within the pharmacy were provided by participants across four key areas, 1) the pharmacy entrance, and prescription drop-off counters, 2) prescription verification and dispensing of medication, 3) collection of the medication by the patient, and 4) provision of follow-up professional services.

To support these workflow changes, participants highlighted that building team capacity through education, time management and providing adequate staffing was essential to the successful implementation of the professional service. Similarly, building relationships with local prescribers reduced workflow challenges by clarifying the professional roles of the service.

Numerous practical examples were provided, however, no pharmacy used every strategy, suggesting workflow changes need to be adapted to the contexts of each pharmacy.

**Conclusion:** This study generated clear, concise and practical examples of where and how pharmacists and pharmacy owners can make small changes to the workflow to support the successful uptake of professional services. Some external factors remain out of the control of individual pharmacists, such as the funding of professional services. Despite this, most of the actions that led to the successful implementation of the professional service came from within the pharmacy and were considered to be modifiable. Synergistic workflow changes were applied in accordance with the individual community pharmacies' context, enabling pharmacists to successfully implement the deprescribing professional service. These workflow changes should be considered by pharmacists and pharmacy owners when implementing new professional services in their community pharmacies.

### A study of clinical pharmacist-led medication reconciliation practice in cancer patients: A prospective observational study

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#### Background

Numerous worldwide patient safety organizations, including TJC, IHI, and WHO, have recognized the value of medication reconciliation in attaining pharmaceutical safety. It is the process of creating the most accurate list possible of all medications a patient is taking and comparing that list against the physician's admission, transfer, and/or discharge orders with the goal of providing correct medication to patients at all transition points within the hospital.

#### Purpose

To prevent the prescription errors like omissions, duplication, dosage errors, or drug interactions in cancer patients.

#### Method

The study was conducted in the tertiary care cancer center after taking the IRB approval. The patients who are available in the hospital as inpatients were included in the study and



patients who are declared bought dead and dead at arrival will be excluded from the study. The investigators enrolled 261 patients who met the inclusion and exclusion criteria. The data was collected from the case records of the patients in a data collection form. It includes the details like demography, presenting complaints, past medical and medication history, drugs prescribed and treatment details, co morbid conditions and ADRs. Compared the medication list with previously obtained list and performed reconciliation by making necessary clinical decisions.

### Results

From the study we observed that cancer is more prevalent in female patients 138 (53%) than male counterparts 123 (47%). A total of 103 treatment charts with discrepancies were identified, from which the major discrepancy identified was medication errors 79 (76.7%). It was observed that the majority of the medication errors identified were caused by prescribing errors (38.3%) and documentation errors (29.7%). Various other errors that were identified are administration errors (12.12%), monitoring errors (9%), omission errors (3.03%), dispensing errors (2%) and other errors (5%). A total of 22 drug interactions (21.3 %), 17 adverse drug and few drug duplications 2 (1.9%) were also identified during the evaluation of 261 patients.

### Conclusion

Various medication discrepancies were identified in various transitions of cancer care. The highest number of discrepancies identified from the patient's treatment chart was medication errors. The most common medication errors observed were prescribing errors and documentation errors which probably is the result of increased patient burden and increased healthcare workload. By implementing double checks, reconciling medicines, standardized reconciling form, electronic solutions medication errors can be prevented. In addition, emphasis should be placed on healthcare professionals collaborating and communicating with one another as well as urging patients to learn more about their prescriptions.

## VaxCheck: The development and testing of a clinical decision-making adult vaccine tool for community pharmacists

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### Background:

Community pharmacists practice in highly accessible community pharmacy immunization hubs. Competing patient care priorities, multiple sources of vaccine information, and lack of a multi-vaccine decision-making tool are ongoing challenges.

### Purpose:

To develop VaxCheck, a community pharmacy vaccine clinical decision-making tool, and use quality improvement methods to test VaxCheck feasibility.

### Methods:

Community pharmacy teams from an independent pharmacy banner group (Wholehealth Pharmacy Partners) participated. VaxCheck was created reflecting the Canadian and Ontario Immunization recommendations, vaccine indications and provincial funding and was implemented through three rapid quality improvement cycles. Patients completed satisfaction surveys. Semi-structured pharmacist interviews explored VaxCheck feasibility. Vaccine recommendations and uptake at 3 months were collected.

### Results:

77 patients were enrolled to date (65% female, average age 61). VaxCheck was initiated because patients received another vaccine (66%) or were seeking vaccine information (57%). Interviews indicate that pharmacists welcomed a concise, comprehensive tool for reviewing vaccinations and guiding recommendations. Pharmacists differed in their need for patient specific details of vaccine decisions. Time, workforce capacity and collecting sufficient vaccination history were obstacles. Patient demonstrated vaccine fatigue, concern regarding vaccine cost and risks, an increased awareness about the need for additional vaccines, and confusion about different vaccine providers. Benefits expressed by both groups included giving structure to vaccine advisory services and addressing an unmet patient care need. Pneumococcal and Herpes Zoster vaccines were the most recommended but COVID-19 and influenza vaccines were the most administered.

### Conclusions:

The VaxCheck approach provided a tool and workflow process for community pharmacists to methodically identify and close vaccination gaps. Future iterations will need to address digital implementation and management of vaccine history deficits to support scalability and spread.

## Burnout and resilience in the Singapore pharmacy workforce: National surveys (2023)

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**Background:** Increasing healthcare demands have led to high burnout levels in Singapore pharmacists and pharmacy technicians (PTs). While organizational factors influence burnout, real-world studies of the impact of modifying such

factors remains unclear, with limited published research on this issue.

**Objectives:** To (1) evaluate burnout among patient-care pharmacists and PTs, (2) compare burnout prevalence, contributing factors, significant relationships associated with burnout, coping strategies, and its impact against earlier 2020 Singapore burnout studies, and (3) describe current institutions' initiatives adopted to reduce burnout.

**Methods:** Cross-sectional surveys were conducted among patient-care pharmacists and PTs in Singapore healthcare institutions from January to February 2023. Participation invites to the surveys were disseminated by pharmacy managers in patient care areas across all healthcare institutions in Singapore. A separate survey was also sent to Pharmacy managers to understand the organizational initiatives that have been adopted to address burnout. The Maslach Burnout Inventory Human Services Survey (MBI-HSS), Brief Resilience Scale (BRS), and Jefferson Scale of Physician Empathy (JSPE) were adopted to evaluate the prevalence of burnout, levels of resilience, and levels empathy, respectively. Demographic characteristics were also collected and summarized. Multivariate logistic regression explored associations between burnout and potential risk factors. Impact from burnout was also assessed as part of the questionnaire. Burnout was defined as a high emotional exhaustion (EE,  $\geq 27$ ) or depersonalization (DP,  $\geq 10$ ) score on the MBI-HSS. Description of organizational initiatives were collated from the pharmacy managers.

**Results:** Whilst most institutions had implemented various organizational initiatives to combat burnout since 2020, burnout was still found to be prevalent in the 2023 surveys. Burnout was reported in 67.8% of pharmacists and 62.9% of PTs, and were higher than previously reported. Among pharmacists, significant factors associated with burnout included resilience levels, empathy levels, working hours, patient care hours, and institution of practice. For PTs, these included resilience levels and nationality. The group with burnout showed an increased intent for job change, lowered job satisfaction, and worsened sleep quality. There were some similarities and differences in the significant perceived contributing factors and coping strategies compared to the earlier 2020 surveys. Both groups indicated "work overload" and "fast pace of work" as the most common contributing factors for burnout. The largest absolute differences in contributing factors were observed in "mistreatment from patients", "emotional burden", and "insufficient recognition at work". Significant coping strategies associated with reduced burnout included "having good time management", "finding meaning in work", "managing personal stressors", and "having a healthy diet". Whilst there were increased establishment of wellness programmes and workplace peer support activities amongst patient-care institutions, these are likely under-utilized, with less than 5% of surveyed respondents stating the use of these coping strategies despite the high prevalence of burnout.

**Conclusion:** Burnout continues to be prevalent in pharmacists and PTs in Singapore. Stronger efforts are

needed to support individuals and spur organizations to critically improve strategies and resolve barriers. This is to strengthen resilience and tackle the high levels of burnout among patient care pharmacists and PTs for a healthier sustainable healthcare workforce.

## Role of the clinical pharmacist in a cardio-oncology multidisciplinary team

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### Background

More and more clinical pharmacists are directly involved in pharmaceutical care services such as participating in multidisciplinary team (MDT). Pharmacists can particularly play an important role in cross-disciplinary MDTs. Cardio-oncology is an emerging cross-discipline focusing on increased number of cancer patients and survivors with cardiovascular disease.

### Purpose

To promote better participation of clinical pharmacists in MDT, we summarized and shared our practical experience of participating in the first cardio-oncology MDT in East China.

### Methods

Cardiologists, oncologists, and clinical pharmacists worked together as MDT responsible for the diagnosis and treatment of ambulatory cancer patients. Three-year data of cardio-oncology MDT ambulatory patients in our hospital from January 2019 to December 2021 were collected. The information included demographic characteristics, oncologic diagnosis, anti-tumor therapy, comorbidities and adverse drug reactions (ADR). The role of clinical pharmacists in cardio-oncology MDT was analyzed and summarized.

### Results

During the 3 years of cardio-oncology practice, a total of 427 ambulatory patients were admitted, including 262 females and 165 males with an average age of (60 $\pm$ 12) years. The most primary tumor types were breast cancer (35.1%), lung cancer (23.2%), liver cancer (6.1%) and gastric cancer (5.6%). The role of clinical pharmacists was mainly divided into four categories covering the identification and management of ADR (256 cases), risk assessment and scheme formulation of anti-tumor therapy (including operation, chemotherapy, targeted therapy, immunotherapy and radiotherapy) with cardiovascular diseases (179 cases), therapeutic regimen adjustment of primary cardiovascular diseases (15 cases), warning and handling of drug-drug interaction (12 cases), The most ADRs are arrhythmia (108 cases), Immune-associated myocarditis (40 cases), cardiac dysfunction (30 cases), hypertension (16 cases) and coronary artery disease (13 cases), etc.

**Conclusion**

Clinical pharmacists applying pharmaceutical expertise to participate in MDT can help patients avoid unreasonable use of drugs, ensure the effectiveness of anti-tumor treatment, reduce or avoid adverse drug reactions, improve the prognosis and quality of life of cancer patients and survivors with cardiovascular disease which reflect pharmacists' value.

### Combination of rivaroxaban and amiodarone increases bleeding in patients with atrial fibrillation

**Dr Zi Wang**<sup>1</sup>, Prof Xiaoye Li<sup>1</sup>, Prof. Qing Xu<sup>1</sup>, Prof. Xiaoyu Li<sup>1</sup>, Prof. Qianzhou Lv<sup>1</sup>

<sup>1</sup>Zhongshan Hospital, Fudan University, Shanghai, China  
Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

**Background**

Rivaroxaban and amiodarone are both commonly used in atrial fibrillation patients. Drug-drug interaction of rivaroxaban and amiodarone may lead to increased exposure of rivaroxaban and bleeding risk. However, the clinical relevance of this drug-drug interaction still remains controversial.

**Aim**

To explore the risk of bleeding in patients receiving combination of rivaroxaban and amiodarone.

**Methods**

This was a single center, prospective observational study including patients diagnosed with atrial fibrillation and treated with rivaroxaban. Patients were divided into two groups based on medication: rivaroxaban group and combination of rivaroxaban and amiodarone group (combination group). Propensity score matching (PSM) and inverse probability of treatment weighting (IPTW) were performed to adjust between-group difference. The risk of bleeding was assessed during a 3-month follow up.

**Results**

A total of 481 atrial fibrillation patients were included. After PSM, 154 patients in rivaroxaban group were matched with 154 patients in combination group. The primary outcome occurred in 26.0% in combination group and 10.4% in rivaroxaban group (hazard ratio 2.76, 95% CI 1.55-4.93,  $P < 0.001$ ). Additionally, the bleeding risk remained significantly higher in combination group compared with rivaroxaban group both in IPTW and stabilized IPTW analyses (hazard ratio 2.17, 95% CI 1.32-3.56,  $P = 0.002$ ). The subgroup analyses investigating the effect of renal function and rivaroxaban dose on bleeding were consistent with the main results.

**Conclusions**

Combination of rivaroxaban and amiodarone increased the risk of bleeding in patients with atrial fibrillation. Physicians co-prescribing rivaroxaban and amiodarone should consider the potential bleeding risk.

### What do healthcare providers value the most about collaboration with the school of pharmacy clinic at the University of Otago, New Zealand?

Ms Tara Wheeler<sup>1</sup>, Dr. Sharon Leitch<sup>2</sup>, **Professor Carlo Marra**<sup>1</sup>

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Posters Monday, September 25, 2023, 12:30 PM - 2:30 PM

**Background:**

The University of Otago School of Pharmacy Clinic (the Clinic) is a campus-based non-dispensing clinic led by a small team of registered pharmacists. Established in 2019, the Clinic aims to pilot a novel pharmacy practice in New Zealand, provide pharmacy students with unique learning experiences, and to work collaboratively with local healthcare providers to deliver high quality patient-centered care. Patients may be referred to the Clinic by their healthcare provider across primary and secondary care or may opt to self-refer for a free-to-patient complex medication review consultation. Following the consultation pharmacists identify drug-related problems and propose plans to address them. A formal report documenting each clinic encounter and the pharmacist's suggestions is sent to both the referrer and the patient's general practitioner. While patients appreciate the opportunity to consult with a pharmacist, it is not known what happens to the consultation reports, nor what impact they have on patient management.

**Purpose:**

Referrer feedback is a key component of a formative service evaluation. This research project aimed to understand the experiences and views of healthcare providers who have collaborated with the Clinic.

**Method:**

Healthcare providers who had referred a patient to the Clinic were identified through purposive sampling. Eligible participants were invited to complete one semi-structured interview. Fifteen participants across five health disciplines (Dietetics, Nursing, Medicine, Pharmacy and Physiotherapy) were included in the study. All interviews were completed either virtually or in-person during May-July 2022. Interview recordings were transcribed verbatim and coded. Reflexive thematic analysis was used to construct, define, and name themes from codes. The Normalization Process Theory (NPT), commonly used in implementation science to evaluate the implementation of complex interventions, was used as a data collection and analysis framework.

**Results:**

Themes describing the impact of the Clinic were framed within the NPT construct of reflexive monitoring (assessing and understanding how a new intervention affects the user and others around them). Healthcare providers identified ways in which collaboration with the Clinic has or can benefit their own practice, patient care, and the wider health system.

Opportunity to engage in interprofessional practice was highly valued by referrers who prioritised teamworking and multidisciplinary care. Referrers felt supported in their clinical practice through collaboration with the Clinic and valued the addition of a pharmacist's expertise to the care package available to their patients. Referrers identified interactions with pharmacists at the Clinic to be useful opportunities for continuing professional education and professional development. Patients were perceived to benefit from the delivery of patient-centred care at the Clinic and subsequent medication and health optimisation. It was thought that collaboration with the Clinic could benefit the wider healthcare system by improving efficiency of resourcing and patient flow between specialist services.

#### Conclusion:

This research will inform ongoing service development to better meet the needs of referrers and maximise patient benefit.

### Does insulin-related hypoglycemia depend on the level of the hospital? A study protocol from three government hospitals in Sri Lanka

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

#### Background

Insulin is an effective treatment for the maintenance of the blood sugar level of diabetes patients. Hypoglycemia is the most common and serious side effect of insulin treatment. There is limited findings on insulin using patients' knowledge, attitudes and practices on experienced hypoglycemic episodes in relation to the level of patients' treating hospital in Sri Lanka.

#### Purpose

To assess the knowledge, attitudes and practices on experienced hypoglycemic episodes of insulin using diabetes patients attending to diabetes clinics in three government hospitals in Sri Lanka and identification of factors contribute to significant differences in knowledge, attitudes and practices on experienced hypoglycemic episodes of insulin using diabetes patients in three hospital settings.

This study will help to investigate whether insulin-related hypoglycemia is influenced by the resource availability in the different levels of government hospitals in Sri Lanka and to inform strategies for future improvements.

#### Method

A descriptive cross-sectional study will be conducted for 03 months in three government hospitals representing primary care, secondary care and tertiary care hospitals in Sri Lanka, each with varying levels of physical and human resources with different expertise. Ethical approval will be obtained to

conduct the study. Male and female patients diagnosed with diabetes mellitus and prescribed insulin for the treatment and attending diabetes clinics, in selected hospitals during the study period will be included in the study. Patients with a history of psychiatric disorders, hearing or speaking disabilities, severely ill patients and patients under 18 years of age will be excluded from the study.

Informed consent will be obtained from selected patients at the commencement. A self-developed interviewer-administered questionnaire will be used for the data collection. The questionnaire consists of patient demographic characters and questions on knowledge, attitudes and practices regarding insulin related hypoglycemia. The resources available in three hospitals will be recorded separately.

The data will be entered into MS Excel and transported to Statistical Package for Social Sciences version 25 (SPSS) for the analysis.

#### Results

Patients' data will be descriptively analyzed according to the hospital and analysis of variance (ANOVA) will be used to compare data from three hospitals to determine whether there is a significant difference between the means of analyzed variables being compared in three different levels of hospitals. The resources available in the hospitals will be qualitatively analyzed.

#### Conclusion

This study will evaluate the patient's knowledge, attitudes and practices on insulin related hypoglycemia in three different levels of hospitals in Sri Lanka. The findings will help to identify the existing gaps where improvements can be suggested. Strategies to improve the availability of resources, healthcare provider training and patient education to reduce insulin-related hypoglycemia in different levels of hospitals in Sri Lanka can be suggested. It would be a valuable finding to optimize insulin use process among patients by minimizing hypoglycemic episodes.

### Living with cystic fibrosis: What role does the pharmacist play?

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

#### Background

Clinical pharmacy services to ambulatory patients is increasingly common in adult practice but rare in paediatrics, including in managing complex diseases such as cystic fibrosis (CF). A new position for a pharmacist to provide care for Queensland children with CF was established in January 2022.

#### Purpose

This study aims to describe the implementation of the

service and activities completed by the CF pharmacist in the first three months of implementation.

#### Method

Pharmacists identified patients for review prior to their scheduled outpatient clinic appointment during pre-clinic multidisciplinary team (MDT) meetings. They were followed up in a face-to-face, phone and/or telehealth consultation. During the review, the patient's medication list was updated & medication related problems identified and shared with the MDT. Retrospective data collection from electronic medical records were combined with manual data collection of standard clinical pharmacy activities from 1st March to 31st May 2022.

#### Results

A total of 142 patient reviews were recorded, in 142 patients who attended outpatient clinic. This included 410 interventions to improve medication management. There was a median of 3 interventions per patient (range 1 to 7). All patients had their home medications updated. Common areas of intervention included medication education and information (n=129), immunisation (n=103), monitoring and optimising therapy (n=94) and medication supply (n=84).

#### Conclusion

Pharmacists are well placed in the CF clinic to support patients through their medication journey. Further research is required to evaluate the patient's perception of a pharmacist as part of the multidisciplinary CF team and their impact on patient care.

### Preliminary exploration study of colorectal cancer pharmacist outpatient clinic based on information collaboration platform

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

**Aim:** Colorectal cancer is the third most common cancer in the world and the incidence increases with increasing age. With the improvement of the diagnosis and treatment level, the survival period of colorectal cancer patients is gradually prolonged, and many patients have entered the stable stage. Considerable evidence shows that pharmacist service for colorectal cancer patients can improve early diagnosis of colorectal cancer and reduce mortality.

**Method:** Since 2021, the colorectal cancer pharmacist outpatient clinic established information collaboration platform (ICP) in our hospital. With the ICP, the colorectal cancer clinical pharmacy specialists developed a pharmacist-led internet follow-up pharmacy clinic to improve posthospitalization follow-up care through physical assessments, medication consultation, medication education and specialty services in addition to performing medication

reconciliation, disease state management, compliance assessment, and evaluation of adverse drug events for colorectal cancer patients with stable states.

**Result:** Early colorectal cancer clinical pharmacy specialists intervention has an important role for prevention and treatment for colorectal cancer. The information collaboration platform shares knowledge and resources in which can greatly enhance the monitoring and management of colorectal cancer in one of the more relevant clinical and practical, more powerful colorectal cancer information Sites, improve efficiency and strive to reduce colorectal cancer morbidity, mortality, hospital-wide 30-day readmission rates and medication-related problems.

**Conclusion** A pharmacist-led clinic effectively reduces morbidity, mortality, readmissions and prevented medication-related problems for stable colorectal cancer patients.

### The efficacy and cost-effectiveness of physician-pharmacist collaborative clinics for T2DM management in primary healthcare centers: A multicenter randomized controlled trial

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

**Background** International Diabetes Federation estimates that the global prevalence of diabetes was 10.5% in 2021, and would increase to 12.2% by 2045 due to ageing of the population. China has the largest number of diabetes population in the world, with approximately 1.39 million people dying from diabetes or its complications in 2021. Accumulating evidence has demonstrated the efficacy and cost-effectiveness of physician-pharmacist collaborative clinics to manage type 2 diabetes mellitus (T2DM) in developed countries, but little is known in China, especially in under-resourced areas.

**Purpose** This study aims to evaluate the 12-month efficacy and cost-effectiveness of physician-pharmacist collaborative clinics tailored to patients with T2DM in primary healthcare in China.

**Methods** We conducted a multicenter randomized controlled trial in 6 counties in China. A total of 6 primary healthcare centers were randomly assigned to the intervention (physician-pharmacist collaborative clinics) and control (usual clinics) group, stratified by per-capita income. Guided by the theory of planned behavior, pharmaceutical intervention programs were used to maintain the long-term curative efficacy. Primary outcomes included glycemic and weight-related measurements, while secondary outcomes included blood pressure, blood lipid measurements, and

patient satisfaction, collected at baseline, 3rd, 6th, 9th and 12th month, respectively. Generalized estimation equations, Dunnett's t test, and Mann-Whitney U test were used to analyze the data. Cost-effectiveness analysis was implemented to evaluate the economic efficiency.

**Results** This study included 510 patients from 6 primary healthcare centers. Compared with the control group, patients in the intervention group had significant reductions in waist circumference, diastolic blood pressure, and fast blood glucose at 3 months, waist-to-hip ratio and systolic blood pressure at 6 months, glycated hemoglobin since at 9 months, and 2-hour postprandial blood glucose, triglyceride, total cholesterol, and high-density lipoprotein cholesterol at 12 months. Over 12 months, hospitalization costs and the total costs of patients significantly decreased in the intervention group.

**Conclusion** Physician-pharmacist collaborative clinics effectively achieved a comprehensive improvement in blood glucose, waist circumference, blood pressure, and blood lipid among patients in primary healthcare centers over 12 months. Patients with T2DM, especially those with central obesity or high cardiovascular risk, may benefit more from collaborative clinics. Physician-pharmacist collaborative model is a promising approach to improve the quality and efficiency of diabetes management and reduce costs in under-resourced areas globally.

### A new score for predicting intracranial hemorrhage in patients using anticoagulant drugs

Mr. Fuxin Ma<sup>1</sup>, Mr. Wenlin Xu, Mr. Chengfu Guan<sup>1</sup>, **Prof Jinhua Zhang<sup>1</sup>**

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

**Background:** Anticoagulant drugs in patients increase the risk of intracranial hemorrhage (ICH), which can seriously affect patients' quality of life and even endanger their lives. Aim: We aimed to identify factors associated with ICH in patients on anticoagulant drugs and to construct a predictive model that would provide a validated tool for the clinical assessment of ICH.

**Methods:** Data were obtained from the patient medical records inpatient system. In the development cohort, prediction models were built by logistic regression, the area under the curve (AUC), and column line plots. Internal validation, analytical identification and calibration of the model using AUC, calibration curves and Hosmer-Lemeshow test.

**Results:** This single-center retrospective study enrolled 617 patients treated with anticoagulant drugs. The development cohort consisted of 431 patients, the validation cohort consisted of 186 patients. Multifactorial analysis showed

that male,  $\beta$  receptor blockers, leukoaraiosis, higher risk of fall, APTT  $\geq 45.4$  s and FIB  $\geq 4.2$  g/L were independent risk factors for ICH, and  $\beta$  receptor blockers was a protective factor. The model was constructed using these six factors with an AUC value of 0.883. In the validation cohort, the model showed good discriminatory power and calibration.

**Conclusion:** Based on 6 factors, we derived and validated a predictive model for ICH with anticoagulant drugs in patients. It may be an effective tool to help reduce the occurrence of ICH. (The hospital Ethics Committee approved the study. The registration number of this study is ChiCTR2000031909, and the ethical review number is 2020KY087.)

### The Alfalfa-inpatient-CAT assessment model: A thrombotic risk assessment model for inpatient oncology patients

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

**Background:** Existing models for assessing the risk of oncologic VTE in hospitalized patients are inadequate. This study aims to construct a venous thromboembolism (VTE) risk assessment model specifically for inpatients with cancer.

**Patients/Methods:** Patients were included according to the inclusion criteria. Univariate and multivariate analyses of all variables were included to develop a VTE risk assessment model applicable to the derivation cohort. Hosmer-Lemeshow test and receiver operating characteristic (ROC) curve were used to test the fit degree and identification validity of the model. The patient data from separate validation cohorts verified the external population.

**Results:** A total of 944 tumor patients were included in this study. Alfalfa-inpatient-CAT model, a risk assessment model for VTE in hospitalized tumor patients, was established, which mainly includes hypertension, surgical history (nearly one month), history of VTE, peripherally inserted central venous catheters (PICC), chemotherapy, PT < 12.85 sec, D-dimer  $\geq 1.805$   $\mu\text{g/mL}$ , hemoglobin  $\leq 114.5\text{g/L}$ , CRP  $\geq 7.575$  mg/L. Hosmer-Lemeshow test results showed  $P = 0.353 > 0.05$ , ( $\chi^2=8.872$ ,  $v=8$ ). The area under ROC curve was 0.906 [95%CI (0.881-0.930),  $P < 0.001$ ]. The authenticity evaluation in the model database showed that the risk of thrombosis in the high-risk group (score  $\geq 3$ ) was 72.63%, significantly higher than that in the low-risk group (score 0-2) (27.37%) [ $\chi^2=144.00$ ,  $V=1$ ,  $P < 0.001$ ].

**Conclusions:** The Alfalfa-inpatient-CAT model has a good fitting degree and discriminant validity. It is expected to provide some reference for the clinical treatment of inpatients with tumors through continuous optimization.

### New score for predicting thromboembolic events in patients with atrial fibrillation using direct oral anticoagulants from a multicenter real-world study in China

Mr. Fuxin Ma<sup>1</sup>, Mr. Chengfu Guan<sup>1</sup>, Mr. Wenlin Xu<sup>1</sup>, **Prof Jinhua Zhang<sup>1</sup>**

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

**Background:** Determinants of thrombotic events remain uncertain in patients with atrial fibrillation (AF) treated with DOACs. Our aim was to identify risk factors associated with thromboembolism in patients with AF on direct oral anticoagulants (DOACs) and to construct and externally validate a predictive model that would provide a validated tool for clinical assessment of thromboembolism.

**Methods:** In the development cohort, prediction model was built by logistic regression, the area under the curve (AUC), and Nomogram. External validation and calibration of the model using AUC and Hosmer-Lemeshow test.

**Results:** This national multicenter retrospective study included 3,263 patients with atrial fibrillation treated with DOACs. The development cohort consisted of 2390 patients from 3 centers and the external validation cohort consisted of 873 patients from 13 centers. Multifactorial analysis showed that heavy drinking, hypertension, prior stroke/TIA, cerebral infarction during hospitalization were independent risk factors for thromboembolism (TE). The Alfa-TE risk score was constructed using these four factors (AUC=0.84), and in the external validation cohort, the model showed good discriminatory power (AUC=0.74) and good calibration (Hosmer-Lemeshow test P value of 0.649).

**Conclusion:** Based on 4 factors, we derived and externally validated a predictive model for TE with DOACs in patients with AF (Alfa-TE risk score). The model has good predictive value and may be an effective tool to help reduce the occurrence of TE in patients with DOACs.

### A systematic review of self-medication practice during the COVID-19 pandemic: implications for pharmacy practice in supporting public health measures

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

#### Background:

Since the COVID-19 pandemic, self-medication has become highly popular due to the risk of virus infection and the overwhelming demand for medical resources. Inappropriate self-medication may lead to irrational use of drugs, increase in polypharmacy and delays in treatment. Pharmacists are well-positioned to provide public health education and disease prevention, but there is limited information on their role in relation to self-medication during the pandemic.

#### Purpose:

This study aims to provide an overview of the research about self-medication during COVID-19 and the role of pharmacists in ensuring the drug safety related to self-medication.

#### Method:

Databases (PubMed, Google Scholar, Scopus, EBSCO host, and Web of Science) were searched for published studies on the practice of self-medication during the COVID-19 pandemic without restriction in population and location. Primary search terms included "self medication", "self care", "self management", "nonprescription drugs", "2019nCoV" and "covid 19". Studies conducted during the pandemic but not exclusively for COVID-19 disease were eligible for inclusion. The PRISMA guidelines was used to select articles for this review.

#### Results:

The database search yielded a total of 4,752 papers. After screening, 62 articles met the inclusion criteria. Most of the studies were cross-sectional in nature. The review revealed a substantial prevalence of self-medication during COVID-19, with rates ranging from 7.14% to 88.3%. The purpose of self-medication was mainly to prevent COVID-19 or to treat symptoms including fever, body aches, cough, headache, and sore throat. Categories of drugs commonly used in self-medication included antibiotics, herbs, vitamins, and analgesics, most of which were obtained from community pharmacies. Information about self-medication was usually obtained from relatives and friends, social networks and, to a lesser extent, healthcare professionals. Common reasons for self-medication included fear of contracting the COVID-

19 virus, poor access to doctors, saving time and money, prior experience, and mild illness. Gender, age, education, marital status, and concern about COVID-19 were found to be associated with self-medication. The role of pharmacists in self-medication involved providing information on medications, doses, dosing intervals, administering advice, and managing adverse reactions.

#### Conclusion:

Self-medication practices were widespread and varied across countries and populations during the COVID-19 pandemic. The significant prevalence of self-medication during this time underscores the importance of maintaining counselling efforts and providing guidance on medication use. Pharmacists, with their professional knowledge and community accessibility, can play a pivotal role in public health interventions to regulate self-medication practices. For future pandemics, pharmacists should proactively engage in discussions with patients regarding the use of medications for prevention and treatment of infectious diseases, and provide appropriate instructions. Further research is needed to explore the value of pharmacists in guiding people to self-medicate, as well as how pharmacists can better contribute to public health measures.

### Research on medication errors in children based on adverse drug reaction reporting database (FAERS)

**Dr Hailong Li**<sup>1,2,3,4</sup>, Ms Panda Qiu<sup>1,2,3,4,5</sup>, Mr YuanMing Ni<sup>1,2,3,4,5</sup>, Prof Liang Huang<sup>1,2,3,4,5</sup>, Prof Lei Zhang<sup>6</sup>, Prof Wei Zhang<sup>7,8</sup>, Prof Lingli Zhang<sup>1,2,3,4,5</sup>

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

**Objectives:** To characterize adverse reactions reported in the US Food and Drug Administration Adverse Event Reporting System (FAERS) related to medication errors (ME) in children, and to identify the potential signals related to ME for different drugs.

**Methods:** ME in children under 18 years old associated Individual Case Study Reports (ICSRs) in FAERS from January 1, 2004 to December 1, 2022 were collected. In this study, ICSRs were categorized by patient age groups, types of ME and Anatomical Therapeutic Chemistry (ATC) classification system, aiming at ICSRs that were reported as primary

suspect drugs. Disproportion analyses were performed for different age groups, most reported drugs and corresponding ME in children.

**Results:** A total of 16515 reports related to ME in children were retrieved. Psychostimulants and immunosuppressants were most frequently involved. Administration errors (72.4%) were reported most frequently, followed by prescribing errors (7.1%) and storage errors (3.9%). In infants, ibuprofen and acetaminophen were the most reported drugs, in both of which ME signals were found for extra dose administered, incorrect dose administered, and drug administration error. In children, methylphenidate and somatropin recombinant were the most reported primary suspect drugs, in both of which ME signals were found for drug dose omission and prescribing errors. In adolescents, somatropin recombinant and adalimumab were the most reported drugs, in both of which ME signals were found for drug dose omission and incorrect dose administered.

**Conclusions:** Using spontaneous reporting system for identifying MEs is encouraged to reduce unnecessary patient harm and to encourage more investigators to focus on ME in children. Our study can help to understand the current situation of ME in children, and provide evidence for clinical rational use of drugs.

### A new score for predicting intracranial hemorrhage in patients using antiplatelet drugs

**Prof Jinhua Zhang**<sup>1</sup>, Mr. Fuxin Ma<sup>1</sup>, Mrs. Shijie Chang<sup>1</sup>, Mr. Chengfu Guan<sup>1</sup>

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Posters Wednesday, September 27, 2023, 12:30 PM - 2:30 PM

**Background:** Antiplatelet drugs in patients increase the risk of intracranial hemorrhage (ICH), which can seriously affect patients' quality of life and even endanger their lives. Currently, there is no specific score for predicting the risk of ICH caused by antiplatelet drugs.

**Aim:** We aimed to identify factors associated with ICH in patients on antiplatelet drugs and to construct and validate a predictive model that would provide a validated tool for the clinic.

**Methods:** Data were obtained from the patient medical records inpatient system. Prediction models were built by logistic regression, the area under the curve (AUC), and column line plots. Internal validation, analytical identification and calibration of the model using AUC, calibration curves and Hosmer-Lemeshow test.

**Results:** This single-center retrospective study enrolled 753 patients treated with antiplatelet drugs, including 527 in the development cohort. Multifactorial analysis showed that male, headache or vomiting, hypertension, cerebrovascular disease, CT-defined white matter hypodensity, abnormal GCS, fibrinogen and D-dimer were independent risk factors for ICH, and lipid-lowering drugs was a protective factor. The



model was constructed using these nine factors with an AUC value of 0.949. In the validation cohort, the model showed good discriminatory power with an AUC value of 0.943 and good calibration (Hosmer-Lemeshow test P value of 0.818).

**Conclusion:** Based on 9 factors, we derived and validated a predictive model for ICH with antiplatelet drugs in patients. The model has good predictive value and may be an effective tool to reduce the occurrence of ICH. (The registration number is ChiCTR2000031909)

### Leveraging telepharmacy to extend the scope of pharmacist practice, reduce pharmacist burn-out and mitigate the impact of global workforce shortages: A case study

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

**Background:** The global pharmacist workforce is under immense pressure, from the impact of climate change to pandemics; the pressure on pharmacists is palpable. This calls for a solution that allows pharmacists to provide continuity of patient care while enduring sector pressures and prioritizing their well-being. Telepharmacy has been under the spotlight recently, but little has transpired about how it may apply in clinical pharmacy practice.

**Purpose:** This study aims to investigate the potential of telepharmacy to expand the scope of pharmacists to remote areas, embed them in various healthcare settings, ensure continuity of patient care, alleviate workforce shortages, and reduce pharmacist burnout. Specifically, the hypothesis is that telepharmacy, when fully leveraged with the use of digital telecommunication and information technologies, can be a feasible solution for expanding the scope of pharmacists by integrating them remotely into any healthcare setting, to provide pharmacist-led services.

**Method:** A case study of my current role as a primary care digital pharmacist was used to test the hypothesis. I embedded virtually in a general practice setting to remotely provide medication management and patient counselling services. Over two years, I virtually undertook medicine optimization activities, such as medicine reviews, medicine reconciliation, medicine counseling, clinical education for clinicians, and responding to clinical queries. Qualitative feedback from patients, prescribers, and nurses and quantitative data around medication adherence and pharmacist interventions were obtained throughout the 2 years. Patient consultations and prescriber interactions were undertaken virtually via a fit-for-purpose, collaboratively designed, secure medical application.

**Results:** The feedback received from 10 practitioners and 30 patient follow-ups strongly supports the case for the remote integration of a pharmacist in general practice through

telepharmacy. Prescribers reported reduced administrative task burden, nurses reported a reduction in time spent answering medicine-related patient queries and medicines reconciliation activities, and patients reported a better relationship with their provider, increased medicines understanding and adherence, and improvements in biomarkers (e.g., HbA1c, BP).

The pharmacist reported better work-life balance and productivity, better clinical decision-making, and greater job satisfaction.

The significance of this model of care is that it could be replicated to allow pharmacists to collaborate and integrate remotely into community pharmacies and various healthcare settings. It can enable patient access to pharmacist services during unprecedented events such as pandemics or natural disasters and can alleviate workforce shortages.

**Conclusions:** The results of this case study indicate that telepharmacy is a feasible solution for embedding pharmacists remotely within general practice or any healthcare setting to provide pharmacist-led services. However, it is limited by a small sample size and is a case study. Further research is needed to build on this hypothesis, inform policy, and develop a bigger strategy around managing and extending the scope of the pharmacist workforce using telepharmacy.

The findings also suggest the potential benefits of telepharmacy beyond the primary outcome of being accessible to and improving patient outcomes; it enables access to a scarce workforce and reduces pharmacist burnout.

Future research could explore how to optimize telepharmacy integration into clinical practice and identify potential barriers to its implementation.

### Assessing implementation fidelity of an on-site pharmacist intervention within Australian residential aged care facilities: A mixed methods study

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

**Background:** An on-site pharmacist (OSP) intervention was implemented in 7 residential aged care facilities (RACFs) in Australia as part of a cluster randomised controlled trial (cRCT) to improve medication management. Implementation fidelity, defined as the extent to which an intervention was delivered as intended, has been sparsely reported within the peer-reviewed international literature evaluating pharmacist interventions conducted in real world RACFs.

**Purpose:** This mixed methods study evaluated the implementation fidelity of the OSP intervention within the context of a cRCT and determined the moderating factors which influenced delivery of this intervention.

**Method:** This convergent parallel mixed methods study was underpinned by Hasson's conceptual framework for implementation fidelity. Implementation fidelity for 7 intervention RACFs was quantitatively assessed using 3 quantitative data sets: (1) range of OSP intervention activities delivered; (2) random sample of 10% of medication reviews assessed for quality; (3) proportion of residents who received at least one medication review. Semi-structured interviews with RACF managers (n= 8) and OSPs (n= 6) across the intervention RACFs were conducted to identify moderating factors which may have influenced OSP intervention delivery. Qualitative data was analysed using framework analysis with themes deductively derived based upon Hasson's conceptual framework for implementation fidelity.

**Results:** The OSP intervention was generally delivered as intended with overall medium levels of implementation fidelity. Delivery was supported by a range of facilitation strategies with most participants perceiving that the intervention was delivered to a high standard. RACF managers and OSPs were mostly well engaged and responsive. A number of potential barriers (including the part-time OSP role, COVID-19 pandemic, RACFs spread out over a large area with significant distance between resident dwellings) and facilitators (including the pharmacist support meetings, OSPs who took time to establish relationships, RACF managers who actively supported OSPs and worked with them) for OSP intervention delivery were identified.

**Conclusion:** In this study, the implementation fidelity of OSP intervention delivery was assessed with overall medium levels of fidelity found across the intervention RACFs. This suggested that the OSP intervention can generally be delivered as intended in real world RACFs. OSP intervention delivery was influenced by a range of moderating factors, some of which posed barriers and others which facilitated the OSP intervention being delivered as intended.

## Defining and supporting a professional role for pharmacists associated with traditional and complementary medicines—A cross-country survey

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

**Introduction:** An estimated 80% of the world's population use traditional and complementary medicine (T&CM) products as part of their healthcare, with many accessed through pharmacy. This cross-cultural study posed a set of core responsibilities and actions to pharmacists related to T&CM products with a view towards developing consensus among the profession, and safeguarding, and promoting the health of the public.

**Methods:** Data was collected from over 2000 pharmacists across nine countries during 2022 via a cross-sectional online survey reported in accordance with STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) guideline and the Checklist for Reporting Results of Internet E-Surveys (CHERRIES).

**Results:** Of the 2341 participants across nine countries, most agreed (69%) that T&CM product use was common in the community they served but most did not have adequate training to support consumer's needs. Over 75% acknowledged there were known, and unknown safety risks associated with T&CM use. Of 18 professional responsibilities posed 92% agreed pharmacists should be able to inform consumers about the potential risks including T&CM side effects and drug-herb interactions. The provision of accurate scientific information on the effectiveness of T&CM products, skills to guide consumers in making informed decisions, and communication with other healthcare professionals to support appropriate and safe T&CM product use were all ranked with high levels of agreement. To facilitate being effective in these responsibilities, pharmacists agreed regulatory reforms, development of T&CM education and training and access to quality products supported by high quality evidence to support their use were needed.

**Conclusion:** General agreement from across nine countries on eighteen professional responsibilities and several stakeholder actions serve as a foundation for discussion and development of international T&CM guidelines for pharmacists with a view to fostering the safe and appropriate use of these products by the public.

## Implementation and evaluation framework for equitable pharmacy minor ailment services in Aotearoa New Zealand

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

### Background

Access to medicines for both minor, self-limiting conditions and chronic conditions in Aotearoa New Zealand (NZ) is inequitable. Māori, the Indigenous people of NZ, have reduced access to medicines across a spectrum of clinical conditions compared to non-Māori. Internationally, pharmacist minor ailment services have been developed with the expectation that they will improve equity of access to medicines yet robust mechanisms to implement and evaluate equitable pharmacist minor ailment services are lacking. Although pilot work is occurring in some regions of NZ, pharmacist minor ailment services are not available nationally. There is opportunity to centre Māori in the development of these services from the outset, to facilitate the design and implementation of services that deliver equity.

### Purpose

To develop an implementation and evaluation framework for equitable pharmacy minor services in Aotearoa New Zealand.

### Method

In this mixed methods study, 64 Māori adults who access medicines from pharmacy and 12 stakeholders involved in the commissioning, designing, development and/or provision of medicines-related services were interviewed. Audio recorded semi-structured interviews were transcribed. Themes were developed using general inductive analysis with the application of kaupapa Māori theory. Kaupapa Māori theory situates the findings within the political, social, historical and cultural contexts for Māori and aims for positive transformative benefits. During an in-person, full day meeting, six research team members used both deductive and iterative approaches to map themes and develop an implementation framework. An advisory group comprising national pharmacy and health sector stakeholders supported the work.

### Results

The pharmacist minor ailment service implementation framework consists of four focus areas: community partnership, cultural centredness, enabling ecosystems, and action from shared knowledge. Overarching all the focus areas was the need for Māori-identified and Māori-led solutions that fostered self-determination, autonomy and equity. Actions included in the implementation framework include development of relationships between pharmacists, community members and Māori health providers, suggested regulatory changes to support care delivery outside the

pharmacy, and methods for assessing and designing physical, technology, and professional environments. Methods for evaluating services, including equity of access, are also included in the framework.

### Conclusion

Indigenous voices were centred in the development of an implementation framework for pharmacist minor ailment services in NZ. The methodology and implementation framework have potential for international relevance, particularly for other marginalised groups.

## Patients' and community pharmacists' acceptance of prescribing pre-exposure prophylaxis (PrEP) for Human Immunodeficiency Virus (HIV) in Nova Scotia, Canada

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

**Background:** Pre-exposure prophylaxis (PrEP) for human immunodeficiency virus (HIV) prevention is highly effective. PrEP is currently recommended for high risk groups such as gay and bisexual men who have sex with men and persons who inject drugs. Pharmacists may increase PrEP accessibility to these vulnerable populations through prescribing services in community pharmacies. Independent PrEP prescribing (without a collaborative practice agreement) is not currently part of community pharmacists' scope of practice in most world regions, including Canada. In the context of increased workloads and responsibilities during the COVID-19 pandemic, it is unknown how accepting community pharmacists are towards providing prescribing services for PrEP. It is also unknown how patients view a PrEP prescribing service and what concerns they may if implemented within community pharmacies.

**Purpose:** This study aimed to determine patients' and community pharmacists' acceptance of a PrEP-prescribing service by pharmacists in Nova Scotia, Canada.

**Method:** Two triangulation mixed methods studies were conducted that consisted of online surveys and qualitative interviews with patients eligible to receive PrEP and Nova Scotia community pharmacists. The surveys and interview guides were underpinned by the seven constructs of the Theoretical Framework of Acceptability (affective attitude, burden, ethicality, opportunity costs, intervention coherence, perceived effectiveness, and self-efficacy).

Survey data were analyzed descriptively and with ordinal logistic regression to determine associations between variables. Interview transcripts were deductively coded according to the same constructs and then inductively coded to identify themes within each construct. Data for patients and community pharmacists was analyzed separately.

**Results:** A total of 148 patients completed the survey and 15 completed the interview. Patients were overwhelmingly positive about PrEP prescribing across all domains of the Theoretical Framework of Acceptability. Patients appreciated the convenience of community pharmacies and believed that this service would enhance their relationship with their existing prescriber (doctor or nurse practitioner) by reducing appointment time required for prescribing PrEP. A total of 214 community pharmacists completed the survey and 19 completed the interview. Pharmacists were positive about PrEP prescribing in the constructs of affective attitude (improved access), ethicality (benefits communities), intervention coherence (practice alignment), and self-efficacy (role). Pharmacists expressed concerns about burden (increased workload), opportunity costs (time to provide the service), and perceived effectiveness (education/training, public awareness, laboratory test ordering, and reimbursement). No significant demographic predictor variables were found within each domain assessed.

**Conclusion:** A PrEP prescribing service was highly acceptable to patients yet had mixed acceptability to Nova Scotia pharmacists. Based on these findings, it can be concluded that PrEP prescribing by pharmacists represents a model of service delivery that may increase PrEP access to underserved populations. Implementation of this service must consider pharmacists' workload, education and training, and system factors relating to laboratory test ordering and reimbursement for optimal buy-in from community pharmacists.

### Pharma-CCC: How integrating a pharmacist into the network COVID care centre (CCC) benefited South Australia's state-wide pandemic response

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

#### Background:

COVID-19 continues to be a devastating pandemic experienced around the world. The pandemic response within a large Adelaide metropolitan health network included the development of a dedicated COVID Care Centre (CCC), which provided outpatient COVID-19 treatment to the greater Adelaide community, as well as COVID-19 related hospital avoidance.

#### Action:

A dedicated pharmacist was integrated into the COVID Care Centre, a service model unique to South Australia. The

pharmacist was essential in ensuring ongoing CCC service provision, promoting evidence-based practice in an area of rapidly evolving information, and facilitating timely and efficient COVID-19 treatment access, which contributed to medication safety and hospital avoidance. No other state or territory in Australia had a specialised CCC, instead employing a hospital or general practitioner-led COVID-19 response, without including a dedicated pharmacist.

#### Discussion:

The CCC pharmacist supported the health network pioneer many areas of outpatient COVID-19 management in Australia. They were successful in increasing consumer access and prescriber understanding of novel, complex, and heavily restricted COVID-19 treatments in South Australia. Furthermore, the pharmacist's role in managing logistical stock issues, communicating evidence changes, upskilling primary healthcare prescribers, developing workflows, and expanding CCC capacity through other initiatives (such as utilising "Hospital in the Home" for at-home treatment administration and supporting CCC establishments in other networks) was invaluable.

#### Implications:

Integration of a pharmacist into a pandemic response service such as the CCC can provide significant benefit to consumers and the greater healthcare system. Pharmacists should be considered in future integrated care and pandemic response models.

### National roll-out of the goal-directed education review electronic decision support System (G-MEDSS)© in practice: A longitudinal study

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

**Background:** The Goal-directed Medication review Electronic Decision Support System (G-MEDSS)© provides guidance for healthcare practitioners conducting comprehensive medication reviews, to tailor care to meet their patients' goals and preferences. G-MEDSS consists of The Goals of Care Management Tool (GCMT), The Drug Burden Index (DBI) Calculator© (a measure of anticholinergic and sedative medication burden), and the revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire.(1) A recent implementation study of G-MEDSS within medication reviews did not reduce patients' DBI at 3 months compared with usual care, but medication review recommendations to reduce DBI were significantly greater in the intervention group.(2)

**Hypothesis:** To understand the factors that influence the implementation of deprescribing anticholinergic and sedative medications using G-MEDSS, a national roll-out will identify users and settings where G-MEDSS can be implemented. Purpose: This study aimed to describe the 1) users of G-MEDSS; 2) clinical settings where G-MEDSS was used; and 3) patients for whom G-MEDSS was used; during a national longitudinal implementation study.

**Method:** Prospective evaluation (period: 1st May 2020 – 19th April 2023). The study was advertised to Australian registered medical practitioners, pharmacists and nurses through relevant professional organisations, and through a national anticholinergic burden campaign delivered by NPS MedicineWise (October 2021 – June 2022)(3). Participants were invited to register to use G-MEDSS within their clinical practice settings. De-identified data about the users and their patients were collected through the website and descriptively analysed.

**Results:** A total of 544 participants (374 pharmacists, 133 medical practitioners and 37 nurses) registered to use G-MEDSS, with most participants from New South Wales (n=173,31.8%). The median (IQR) number of patients for whom G-MEDSS was used per participant was 2(3). These participants used G-MEDSS for 974 patients (mean age(SD) 75.3(15.0)), predominately during medication reviews in the home and residential aged care (n=419, 43.0% and n=402, 41.3%, respectively). The 5269 medication recommendations made by G-MEDSS users consisted of 3817 (72.5%) for no change, 1199 (22.8%) to deprescribe the medication, 49 (0.9%) to increase the dose, and 94(1.8%) for general practitioner or pharmacist review.

**Conclusion:** G-MEDSS is being used within clinical practice primarily by pharmacists to support medication review in the home and residential aged care. Future research may identify factors preventing G-MEDSS to be used more frequently and how to better integrate G-MEDSS within usual care.

### A cross-sectional analysis of pharmaceutical industry funding of Australian patient groups before and during the COVID-19 pandemic

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

#### Background

Pharmaceutical industry funding of patient groups (also known as 'health consumer organisations') has become increasingly common. Concerns about potential conflicts of interest arising from the relationships between patient groups and the pharmaceutical industry have been in the spotlight. Patient groups are non-profit entities focused on

representing the interests of health consumers such as patients and their caregivers. Pharmaceutical companies fund patient groups representing conditions for which they market treatments. Although both have an interest in development of effective new treatments, companies' need for profitability can conflict with patient interests, for example over pricing, effectiveness, and safety concerns. These competing interests may impede patient groups' independence.

#### Purpose

This study describes the pattern of pharmaceutical industry funding of Australian patient groups before and during the Covid-19 pandemic (years 2017 to 2021). We also compare these payments to an earlier analysis of payments in 2013 to 2016 (1)

#### Method

A descriptive analysis was performed on 133 transparency reports, downloaded from the website of Medicines Australia, the pharmaceutical industry trade group representing research-based companies, covering the period January 2017 to December 2021 (reports for the year 2022 are not yet available). In these transparency reports, member companies of Medicines Australia report all payments to patient groups, specifying amount paid, types of funded activities, and timing.

#### Results

In the years 2017 to 2019, 30 pharmaceutical companies provided 963 sponsorships to 186 patient groups, spending a total of AU\$ 22, 927, 828. In the years 2020 and 2021, 27 pharmaceutical companies provided 580 sponsorships to 163 patient groups, spending a total of AU\$14, 668, 689. During the pandemic years (2020-21), total funding provided to patient groups increased compared to in the year 2019, with a shift in the types of funding provided. The clinical areas of the three patient groups that received the most funding in the years 2020- 2021 were cancer, musculoskeletal and eye health. In the years prior, the clinical areas of the three patient groups that received the most funding were cancer and musculoskeletal.

#### Conclusion

This analysis provides useful insights into the interactions between the pharmaceutical industry and Australian patient groups before and during the Covid-19 pandemic. The extent and patterns of pharmaceutical industry engagement with patient groups changed in terms of an increase in total financial support provided during the pandemic years and there was a shift in the clinical areas of patient groups receiving the most funding to including eye health, in addition to musculoskeletal and cancer.

## Empowering pharmacists to generate evidence in practice

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RFTU-02 - Rapid Fire Session Tuesday, M1-M2, September 26, 2023, 11:00 AM - 12:30 PM

**Background:** The International Pharmaceutical Federation (FIP) Development Goal 11 (“Impact & Outcomes”) aims to promote the generation of evidence on the impact of the pharmaceutical workforce within health systems and health improvement.

Aligned with the aforementioned FIP development goal, the South and Autonomous Regions Branch (SARB) of the Portuguese Pharmaceutical Society (PPS) created in 2022 the “Centre of Studies for the Pharmacy Profession”, based on three domains that align with the One FIP concept: Education, Practice and Training. The main objectives of the Centre are to share information about the value of the professional activities of pharmacists and to train pharmacists to produce and use scientific evidence. Embedded in the “Training” domain of the Centre, PPS developed a “Scientific Capacity Building Programme” which aims to raise awareness and train pharmacists to generate and use evidence in their professional practice.

**Purpose:** To describe the development of a “Scientific Capacity Building Programme” and to share preliminary results.

**Methods:** To set up the “Scientific Capacity Building Programme”, the PPS team benchmarked other initiatives and held several meetings to discuss the content and format of the learning modules. Once structured by the PPS team, the programme was presented to partners with the aim of involving them and receiving feedback.

**Results:** The Programme comprises a learning pathway divided into five modules over two years. The learning modules include a diversity of formats (i.e., webinars, asynchronous and synchronous courses) that are applicable to different participants according to the level of knowledge (from basic to advanced level) with the aim of reaching all interested pharmacists (from community pharmacists to PhD students, or event academics).

The first module aims to raise awareness about the importance of generating and using scientific evidence in the professional practice. The second module is dedicated to training pharmacists in the basics of scientific research. The third module focuses on tools to be used to produce scientific material. The fourth module aims to train

pharmacists how to communicate the scientific material produced. The last module seeks to display options for the initiation and progress in a scientific career.

A promotional webinar about the programme was held online on March 2023. The initiative consisted of a basic knowledge level webinar on “Pharmaceutical Services and Evidence Generation”. From the 440 registered participants, 128 attended and took part in the discussion around the topic.

The speakers provided a framework of the current scenario of pharmaceutical services in Portugal, highlighting successful examples, namely vaccination and Covid-19 antigen testing in community pharmacies. In addition, the speakers identified the lack of human and financial resources as a barrier to the generation of evidence, as well as the need to adapt digital resources for the registration and documentation of professional activities.

**Conclusion:** Pharmacists has shown interest on the “Scientific Capacity Building Programme”. PPS considers this programme as an important step towards the development of practice-based research, thus contributing to the recognition of the impact of the pharmaceutical workforce on health systems and, ultimately, on the improvement of populations health.

## Comparing traditional counting tray with AI image recognition application in prescription preparing

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RFWE-01 - Rapid Fire Session Wednesday, M1-M2, September 27, 2023, 11:00 AM - 12:30 PM

### Background

Fully automated pill-dispensing machines can improve the medication dispensing process. However, such equipment is expensive and difficult for small regional hospitals or clinics to afford. In recent years, the development of artificial intelligence (AI) image recognition systems has flourished. To reduce the burden on pharmacists, it is important to find alternative solutions that are affordable, easy to obtain, and easy to operate.

### Purpose

This study uses a mobile app that provides AI image recognition for counting medications. Comparing the time and error rate of medication dispensing by pharmacists using traditional medication counting trays versus the AI image recognition app.

### Method

This study conducted in February 2023 in regional hospital. Five pharmacists were involved in the study, and they compared the traditional manual counting method (control) with an AI image recognition app (intervention) for counting medications. The medications have three groups, 28, 56, and 112 pills, each consisting of three types of pills: round tablets, capsules, and irregular tablets. The study compared

the time required and the rate of counting errors between the two methods. The statistical analysis used a paired t-test to compare whether there was a significant difference.

#### Results

This study included 45 sets of data for each method. The average time required for the control group was 43.51 ( $\pm 32.12$ ) seconds, and the average time required for the intervention group was 33.40 ( $\pm 21.04$ ) seconds. The results showed a significant difference of 10.11 (95% CI= 3.91~16.31;  $p=0.002$ ).

Subgroup analysis was conducted for the three groups, 28, 56, and 112 pills. The average time required for the control group was 17.33 ( $\pm 2.97$ ) seconds, 30.67 ( $\pm 10.61$ ) seconds, and 82.53 ( $\pm 24.07$ ) seconds. The average time required for the intervention group was 20.67 ( $\pm 4.03$ ) seconds, 26.67 ( $\pm 9.35$ ) seconds, and 52.87 ( $\pm 25.69$ ) seconds. The results of the tests were -3.33 (95% CI= -6.04~-0.62;  $p=0.019$ ), 4.0 (95% CI= -3.20~11.20;  $p=0.253$ ), and 29.67 (95% CI= 11.05~48.29;  $p=0.002$ ), respectively.

The control group had a 0% error rate, while the intervention group had a 4.4% (2/45) error rate. The cause of the errors in the intervention group was misidentification of the image due to unclear separation between the reflection and the edge of the pill.

#### Conclusion

In this study, when the pill count is less than 56, the traditional counting trays are more advantageous than the AI app, while when it reaches 112 pills, the AI app can improve the dispensing speed more than traditional counting trays. Although the error rate is higher than that of traditional methods, errors can be avoided if the causes of errors are well understood. In addition, such apps have no restrictions on drug shape and counting tray quantity, fast recognition speed, and the ability to serve as an alternative solution for fully automated pill-dispensing machines. After the end of this study, several pharmacists at our hospital downloaded and used this AI image recognition app, the potential of AI app in dispensing is undoubtable.

### The drug burden index intervention bundle involving a stewardship pharmacist to facilitate deprescribing of anticholinergic and sedative drugs

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RFWE-01 - Rapid Fire Session Wednesday, M1-M2, September 27, 2023, 11:00 AM - 12:30 PM

**Background:** The Drug Burden Index (DBI) measures exposure to anticholinergic and sedative drugs, which are commonly associated with harm in older adults. We piloted a novel in-hospital intervention bundle including the DBI in electronic Medical Records (eMRs) and a stewardship pharmacist, to facilitate deprescribing of sedatives and anticholinergics in older adults.

**Purpose:** Following implementation of the bundle, to explore i) uptake of the stewardship pharmacist's deprescribing recommendations by the hospital medical team, ii) hospital clinician experiences of using the bundle, and iii) patient, carer and General Practitioner's (GP's) experiences of in-hospital medication review and deprescribing.

**Method:** Hospital clinicians in the target services of Geriatric Medicine and General Medicine at the Royal North Shore Hospital, Australia were educated on the bundle during the study period of July 13, 2021 to October 31, 2021. To increase uptake of the bundle, the stewardship pharmacist reviewed eMRs of target service patients aged  $\geq 75$  years with a DBI score  $> 0$  and made deprescribing recommendations to the medical team. Semi-structured interviews were conducted with hospital clinicians, patients and carers to understand stakeholder experiences. Hospital clinicians in target services were eligible. Patients aged  $\geq 75$  years with high-DBI (DBI  $\geq 1$ ) in the target services, and their carers were eligible. Surveys were distributed to consenting patients' GPs. Uptake of the stewardship pharmacist's recommendations and survey responses were summarised using descriptive statistics. Qualitative interview data was thematically analysed. Clinician interviews were mapped to domains from the Human Organisation Technology-fit Framework. Patient interviews were mapped to the National Health Service Patient Experience Framework.

**Results:** Out of the 256 patients reviewed, the stewardship pharmacist made 170 recommendations for 117 patients, most commonly due to falls ( $n=82$  recommendations, 48.2%). The medical team agreed with 141 recommendations (82.9%) for 95 patients (81.2%) and actioned 115 recommendations for 80 patients. The 115 actioned recommendations resulted in 125 changes, most commonly antidepressants and opioids, with 44 changes to the inpatient drug chart and 81 changes recommended post-discharge in the Discharge Summary. Eight hospital clinicians comprising of medical consultants, registrars, interns and ward pharmacists completed the interviews and mainly reported themes around the subdomain of system use. Seven patients and two carers completed the interviews and mainly reported themes around information, communication and education. Four GPs completed the survey. Hospital clinicians indicated that the bundle supported in-hospital communication such as facilitating medication review during ward rounds but reported challenges such as heavy workload, with suggestions to further integrate the bundle into existing workflows. Most patients with deprescribing reported feeling better or no different. Patients, carers and all surveyed GPs described poor communication from hospital clinicians regarding in-hospital medication changes and rationale behind changes.

**Conclusion:** This study demonstrates a novel role which pharmacists can undertake utilising their clinical skills and a decision support tool such as the DBI, to optimise medications in older adults. The intervention bundle was well accepted by hospital clinicians but requires further integration into existing workflows for sustainability. Future studies should aim to facilitate communication of in-hospital

medication changes and rationale for changes with all medication management stakeholders.

### Knowledge, attitude and practices of healthcare professionals and public towards medical packaging waste management in Singapore

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RFWE-01 - Rapid Fire Session Wednesday, M1-M2, September 27, 2023, 11:00 AM - 12:30 PM

**Background:** Healthcare contributed to 5% of global carbon footprint in 2017 in the form of medical waste. Medical waste can be classified into hazardous and non-hazardous waste. The former includes infectious, radioactive waste and sharps while the latter includes paper cartons and packaging materials. Non-hazardous medical waste in turn accounts for 85% of total global medical waste generation. Proper medical waste management is necessary to reduce environmental harm, including pollution and climate change. In Singapore, only hazardous medical waste is disposed of through rigorous waste disposal protocols while there is no specific recommendation for disposal of non-hazardous medical waste. Non-hazardous medical waste is thus disposed of as general waste currently. At present, there is no information on the knowledge, attitude and practices (KAP) of healthcare professionals (HCPs) and public towards non-hazardous medical waste management, in particular medical packaging waste management (MPWM) in Singapore. Since these medical packaging waste contributes to significant global footprint, an understanding of this can aid in facilitating strategy for better MPWM and help Singapore move towards a zero-waste nation.

**Purpose:** This study aims to investigate the knowledge, attitude and practices of HCPs and public towards MPWM in Singapore.

**Method:** HCPs and public were surveyed using two separate anonymous surveys respectively. Each survey comprised a knowledge, attitude, and practices section towards MPWM. The questions on knowledge and attitude were similar for both surveys. For the practices section, the questions were different between the two surveys with that for the HCP survey tailored to MPWM in healthcare institutions. The data were evaluated, classified, and submitted to descriptive analysis.

**Results:** A total of 613 participants completed this study. Among them, 213 (34.7%) were HCPs and 400 (65.3%) were from the public. Majority of the HCPs were female (85.4%), with pharmacists forming majority of HCPs surveyed (42.3%), followed by nurses (32.9%), pharmacy technicians (20.2%) and doctors (4.7%). For the public, 65.8% were female with 69.5% taking long-term medications and 30.5% not taking long-term medications. Both the HCPs and the public had a median knowledge score of 1.00 (IQR: 1.00-

1.00) out of a maximum score of 3. The median attitude scores of HCPs and public were 9.00 (IQR: 8.00-10.00) and 10.00 (IQR: 9.00-12.00) out of a maximum score of 12 respectively, indicating positive attitude towards MPWM. For the HCPs and public, 56.2% and 54.3% reported disposing medical packaging waste into general waste bins respectively. Common barriers identified by both HCPs and public towards recycling of medical packaging waste include lack of recycling collection points, inaccessibility to recycling collection points and inadequate knowledge towards MPWM. Nonetheless, 94.1% of HCPs and 98.5% of public expressed willingness to recycle medical packaging waste.

**Conclusion:** HCPs and public in Singapore showed positive attitude and willingness to recycle medical packaging waste. This can be facilitated by increasing their knowledge of MPWM with various campaigns and education materials as well as by increasing number of recycling collection points.

### Co-designing the PRIME tool to empower people living with dementia and their carers to initiate deprescribing conversations

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RFWE-01 - Rapid Fire Session Wednesday, M1-M2, September 27, 2023, 11:00 AM - 12:30 PM

**Background:** The process of shared decision-making about deprescribing (reducing or stopping potentially inappropriate medications) between people living with dementia and their carers (consumers), and clinicians, is complex.

**Objective:** To co-design a consumer-centric, educational tool to empower people living with dementia and their carers to initiate a deprescribing conversation with their HCP.

**Methods:** We formed a stakeholder steering group (SG) consisting of 6 consumers and clinicians (two geriatricians, a general medicine clinician, a nurse practitioner, and a social worker) from Australia and the United States. Five one-hour SG meetings were held. These involved: 1) Introductions and familiarisation; 2 & 3) selecting key elements and co-designing the PRIME tool (using a baseline draft tool based on an existing validated patient questionnaire and previous work of members of the research team); 4) pilot testing an interview guide to test the usability and comprehensibility of the PRIME tool; and 5) co-designing the implementation of the PRIME tool in real-life practice.

**Results:** We have co-designed the PRIME tool which consists of three main sections (background; reflection; call to action). Each section consists of various key elements selected by the SG. For example, consumers suggested including "key phrases" to prompt a deprescribing



conversation and designated spaces to reflect and write down medicines they would like to discuss with their clinician. We have conducted one-to-one semi-structured interviews and a focus group session with 35 participants (people living with dementia, carers, and clinicians) to determine the usability and comprehensibility of the PRIME tool. Iterative changes were made to improve the content and layout of the tool. With feedback from the SG, we have planned future steps which involve pilot-testing the implementation of the tool in real-life practice.

**Discussion:** The PRIME tool draft was co-designed with comprehensive input of an engaged international stakeholder SG. We tested the usability and comprehensibility of the tool by analysing feedback from 35 people living with dementia, carers and those who care for them.

**Conclusion:** Consumers using the PRIME tool may be more empowered to initiate deprescribing conversations with their clinician. Future studies will involve further refining and pilot testing of the tool in real-life clinical practice.

### Evaluating potential outcomes of general practice pharmacist-led activities in the Australian setting

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RFWE-01 - Rapid Fire Session Wednesday, M1-M2, September 27, 2023, 11:00 AM - 12:30 PM

**Background:** Pharmacists have been co-located in general practice teams to support the quality use of medicines and optimise patient health outcomes. Evidence of the impact of pharmacist-led activities in Australian general practices is sparse. This study aimed to evaluate the potential clinical, economic, and organisational outcomes of pharmacist-led activities in general practices.

**Methods:** A prospective observational study was conducted in eight general practices in the Australian Capital Territory, where each general practice employed a pharmacist on a part-time basis for 18 months. A recommended, but flexible, list of activities was provided for pharmacists. Descriptive information on general practice pharmacist-led activities, collected with an online diary, was analysed. The potential clinical, economic, and organisational impact of pharmacist-led clinical activities was evaluated using the CLinical Economic Organisational (CLEO) tool, with a modified economic dimension.

**Results:** Nine pharmacists reported 4,290 activities over 3918.5 work hours in general practice. Medication management services were the primary clinical activity of pharmacists. In medication reviews, 75% of pharmacists' recommendations were fully accepted by general

practitioners. Conducting clinical audits, updating patients' medical records, and providing information to patients and staff were other major activities of pharmacists. Of 2,419 clinical activities, around 50% had the potential for a moderate or major positive clinical impact on patients. Sixty-three per cent of activities had the potential to decrease healthcare costs. Almost all the pharmacist-led clinical activities had a positive organisational impact.

**Conclusion:** Most pharmacist-led clinical activities in general practice had the potential for a positive impact on patients and reduction in healthcare costs, supporting the expansion of this relatively new model in Australia.

### Instagram social media influencers—Evaluating the quality of posts on weight loss

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RFWE-01 - Rapid Fire Session Wednesday, M1-M2, September 27, 2023, 11:00 AM - 12:30 PM

#### Background and Purpose

Social media is home to many things, from stick-thin fashion models, and love-island stars promoting weight loss gummies, to real people looking for real weight loss solutions and real support. Research to date shows that social media use can have damaging effects on body image, which can in turn lead to mental health issues and eating disorders. Furthermore, it has been found that those who are most likely to seek weight loss information on social media are most likely to be negatively influenced by it. Misinformation is becoming a growing concern on social media, and social media influencers (SMIs) have a significant and growing impact on their followers. This study, therefore, aimed to investigate the quality of weight loss posts made by SMIs on Instagram.

#### Methods

Posts containing weight loss advice from a sample of five SMIs were analysed to determine whether they were posting within the realm of their qualifications, whether their claims were cited by evidence and if the references were used correctly, and if the information they shared was in-line with government approved guidelines on weight loss and health. Both NHS (National Health Service) and NICE (National Institute for Health and Care Excellence) guidelines were utilised as comparators. Where posts did not align with government approved guidance, alternative sources of scientific evidence were sought using PubMed and Google Scholar, as well as Google to search relevant grey literature.

#### Results

This study showed a clear lack of referencing and evidence-based claims, a substantial amount of information not in line with government approved guidance and SMIs making posts beyond the realm of their qualifications, with no disclaimer to let their followers know that this is the case. No clear trend could be determined between the qualification level of the SMI and the quality of their posts.

**Conclusions**

The weight loss information accessed via Instagram varied drastically in quality and has the ability to undermine government approved guidance. Overall, the variety in quality of the posts analysed, highlights the need for thorough, life-long online media literacy and health literacy education to aid patients, should they choose to access healthcare information via social media. In addition, the role of the healthcare professional in protecting patients from misinformation online must be carefully considered and updated regularly to keep up with this everchanging landscape.