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Monday 6 December | 12.00 – 2.35pm

Australian Eastern Daylight Time (AEDT)

9.00 – 12.00	**Time to view posters and visit the sponsors' portal**	**Poster sponsor:** Lonza
12.00 – 12.14	**Meeting opening and Acknowledgement of Country** Dr Peter Moyle, Conference Co-Chair Dr Meng-Wong Taing, Conference Co-Chair	
12.15 – 12.46	**Opening keynote presentation** **Making vaccines at pandemic speed** Prof Trent Munro, The University of Queensland **Chair:** Dr Peter Moyle, Conference Co-Chair	**Premium sponsor:** Bellberry Limited supporting research and ethics
12.46 – 12.55	**Mini break**	
12.55 – 1.14	**Networking session topic 1:** Placement experiences for pharmacy students – the role of in-course (or in program) placements versus the intern training year **Facilitator:** Prof Sarah Roberts-Thomson, The University of Queensland **Networking session topic 2:** Compounding in the curriculum **Facilitator:** A/Prof Kathryn Steadman, The University of Queensland	**Networking sponsor:** vaxxas
1.15 – 2.15	**Concurrent 1 symposium sessions**	

Symposium 1: Scientists march to combat COVID-19 278	**Symposium 2:** Drug repurposing: Beyond hydroxychloroquine
Supported by: University of Otago Te Whare Wānanga o Otāgo New Zealand | School of Pharmacy He Rau Kawakawa	
Chair: A/Prof Shyamal Das, University of Otago	**Chair:** Dr David Shackleford, Monash University
New Zealand's successful Covid-19 response: The critical importance of science-informed policy Prof Michael Baker, University of Otago	**Enabling innovations of MIDD in drug repurposing: A case in practice** Dr Rajesh Krishna, Certara
Early response to SARS-CoV-2 and current efforts to combat COVID-19 in New Zealand Prof Miguel E. Quiñones-Mateu,University of Otago	**Lessons from COVID 19 repurposing: Educating researchers, funders and media for the next pandemic** Prof Carl Kirkpatrick, Monash University
Second generation mRNA vaccines against SARS-CoV-2 variants of concern Prof Colin Pouton, Monash University	**Redevelopment of polymyxin antibiotics for vulnerable patient populations using pharmacometrics** A/Prof Cornelia Landersdorfer
Inhaled treatment for COVID-19 A/Prof Shyamal Das, University of Otago	**The science underpinning repurposing of beta blockers in breast cancer treatment** A/Prof Erica Sloan, Monash University
2.15 – 2.35 **Break**	

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Monday 6 December 2021 | continued 2.35 – 5.35pm

Australian Eastern Daylight Time (AEDT)

2.35 – 3.40	Concurrent oral presentations 1	
Pharmacy Practice - Extended roles 1	**Pharmacy Practice – Pain**	**Pharmaceutical Science 1**
Sponsored by: Educating Future Pharmacists		**Sponsored by:** The University Of Queensland Australia
Chair: Dr Nazanin Falconer, University of Queensland	**Chair:** Dr Vijay Suppiah, University of South Australia	**Chair:** Dr Peter Moyle, Conference Co-Chair
A systematic review of the acceptability of community pharmacist-led screening 200 Ms Duha Gide, University of Sydney	**Medicinal cannabis for patients with chronic non-cancer pain: Analysis of safety and concomitant medications** 204 Ms Elise Schubert, University of Sydney	**Ultra-small silica nanoparticles for the treatment of brain cancer** 208 Ms Taskeen Janjua, The University of Queensland
Pharmacy student's attitude, knowledge and self-reported confidence about general nutrition counselling in practice 201 Ms Clare Carter, University of Sydney	**Effectiveness of organisational interventions on the appropriate use of opioids for non-cancer pain upon hospital discharge: A systematic review** 205 Miss Katelyn Phinn, University of Sydney	**Multifunctional peptide/phospholipid hybrid system for target-specific delivery of oligonucleotides** 209 Dr Anjuman Ara Begum, The University of Queensland
Australian pharmacist's knowledge and ability to assist athletes in avoiding the unintentional ingestion of prohibited substances 202 Ms Deborah Greenbaum, University of Sydney	**Prevalence and predictors of opioid use before orthopaedic surgery in an Australian setting** 206 Ms Shania Liu, University of Sydney	**Understanding the permeability-solubility interplay of γ-cyclodextrin-based formulations for poorly aqueous soluble benznidazole** 210 Mr John Ndayishimiye, The University of Queensland
Community pharmacist-led perinatal depression screening: a mixed methods study to explore acceptability among perinatal women and pharmacists 203 Ms Lily Pham, University of Sydney	**Trends in prescription opioid initiation and use in Australia during the COVID-19 pandemic** 207 Ms Monica Jung, Monash University	**Microfluidic assembly of pomegranate-like hierarchical microspheres for efflux regulation in oral drug delivery** 211 Mr Aun Raza, The University of Queensland
3.40 – 3.50	Mini break	
3.50 – 4.20	Plenary session	
3.50 – 4.20	**PSA Lecture** **Call to action: The role our academic community can play in shaping health policy** A/Prof Chris Freeman, Pharmaceutical Society of Australia **Chair:** Dr Meng-Wong Taing, Conference Co-Chair	**Sponsored by:** Pharmaceutical Society of Australia
4.20 – 4.30	Mini break	
4.30 – 5.35	Concurrent oral presentations 2	
Pharmacy Practice - Pharmacy practice methods and tools	**Pharmacy Practice - Improving health outcomes**	**Pharmaceutical Science 2**
Chair: A/Prof Pauline Lai, University of Malaya	**Chair:** Prof Timothy Chen, The University of Sydney	**Chair:** Dr Sophie Stocker, The University of Sydney
Validation of the Amharic version of ARMS and MGLS among Ethiopian people with cardiovascular diseases 212 Mr Henok Tegegn, University of New England	**Identifying effective interventions to improve metabolic monitoring of patients taking antipsychotics** 216 Ms Sarah Dinh, NSW Therapeutic Advisory Group	**Impact of lipid functionalisation on polyethylene glycol polymer albumin binding, pharmacokinetics and lymph uptake** 219 Mr Mohammad Abdallah, Monash University
The development and validation of the awareness and knowledge of diabetes distress questionnaire among doctors in Malaysia 213 A/Prof Pauline Lai, University of Malaya	**Deprescribing anticholinergic and sedative medications in older New Zealanders living in the community: A Randomized Controlled Trial** 217 Dr Nagham Ailabouni, University of South Australia	**Insights into surfactant–influenza virus interactions** 220 Mr Abdulsalam Alharbi, University of Sydney
Cross-cultural adaptation and psychometric properties of patient-reported outcome measures in Arabic speaking people 214 Ms Sundos Al-Ebrahim, Auckland University	**Conversations about cannabis: the supply process** 218 Ms Katherine Yuet Ching Cheng, University of Sydney	**An analysis of the efficacy and adverse effects of cannabidiol and tetrahydrocannabinol used in the treatment of anxiety disorders** 221 Ms Sophie Stack, University of Sydney
Development of a tool to evaluate medication management guidance provided to carers of people living with dementia at hospital discharge 215 Dr Mouna Sawan, University of Sydney		

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Tuesday 7 December 2021 | 12.00 – 2.40pm

Australian Eastern Daylight Time (AEDT)

9.00 – 12.00	Time to view posters and visit the sponsors' portal	**Poster sponsor:** Lonza
11.00 – 12.00	**The Annual General Meeting of APSA (via Zoom)**	
12.00	**Commencement of day two presentations**	
12.00 – 12.52	**Plenary session**	
12.00 – 12.52	**Debate: Is there a place in 2021 for a university education for clinical pharmacists? Are lectures and tutorials just for boomers?** **Debaters:** Dr Judith Coombes, University of Queensland Prof Amanda Henderson, Princess Alexandra Hospital Dr Adam La Caze, University of Queensland Prof Jeff Hughes, Curtin University **Chair:** Dr Nazanin Falconer, University of Queensland	
12.52 – 12.55	**Mini break**	
12.55 – 1.14	**Networking session topic 1:** Are there enough pharmaceutical sciences taught in pharmacy programs? **Facilitator:** A/Prof Amirali Popat, The University of Queensland **Networking session topic 2:** How should we be teaching dispensing in the pharmacy curriculum? **Facilitator:** Mr Jason Wang, The University of Queensland	**Networking sponsor:** vaxxas
1.15 – 2.20	**Concurrent oral presentations 3**	

Pharmacy Practice - Cardiovascular care	Pharmacy Practice - Supporting practice	Pharmaceutical Science 3
	Sponsored by: NAPE National Alliance for Pharmacy Education (The University Of Queensland, The University of Sydney, University of South Australia, Monash University)	
Chair: Dr Vivienne Mak, Monash University	**Chair:** Prof Parisa Aslani, The University of Sydney	**Chair:** Dr Betty Exintaris, Monash University
Switching of oral anticoagulants in atrial fibrillation: a cohort study using Australian general practice data 223 Mr Adane Kefale, University of Tasmania	**The impact of a pharmacy intern's early failures or successes on their preparedness for practice** 227 Ms Paeton Karakitsos, Monash University	**Could we 'clear' the way for Alzheimer's disease? Impact of copper complexes at the blood-brain barrier** 230 Mr Jae Pyun, Monash University
Developing new roles for Saudi community pharmacists in Cardiovascular health: multistakeholder engagement 224 Mr Hadi Almansour, The University of Sydney	**An exploration of resilience with early career hospital pharmacists: a qualitative study** 228 Ms Syafiqah Nadiah Halimi, The University of Queensland	**Toll like receptor transactivation dependent signalling: a new cell signalling frontier** 231 Dr Danielle Kamato, The University of Queensland
Re-hospitalisation caused by medication harm after an Acute Myocardial Infarction 225 Ms Chariclia Paradissis, University of Queensland	**The execution of evidence-based medicine with over-the-counter medicines in New Zealand: A Cross-Sectional Study of Community Pharmacists** 229 Mr Lik De Chun, University of Otago	**Toxic fat, 1-deoxysphinganine, compromises the functionality of skeletal myoblasts and underlies the development of Type 2 Diabetes Mellitus** 232 Ms Duyen Tran, University of Tasmania
A population pharmacokinetic model to inform tacrolimus therapy in heart transplant recipients 226 Ms Ranita Kirubakaran, University of NSW		**Usability and perceptions of two dry powder inhalers in inhaler-naïve individuals for a low-resource setting application** 233 Mr Andrew McArthur, Monash University

2.20 – 2.40	**Break**	**Conference supporter:** MTPConnect MedTech and Pharma Growth Centre

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Tuesday 7 December 2021 | continued 2.40 – 5.25pm

Australian Eastern Daylight Time (AEDT)

2.40 – 3.55	Concurrent 2 symposium session	
Symposium 3: Current challenges and successes in Pharmacy and Pharmaceutical Science Education 280	**Symposium 4: Drugs administered to cancer surgery patients in the perioperative period and long-term risk of recurrence or metastasis** 281	**Symposium 5: Emerging Leaders**
Sponsored by: MONASH University | MEDICINES MANUFACTURING INNOVATION CENTRE	**Sponsored by:** THE UNIVERSITY OF QUEENSLAND AUSTRALIA	
Chair: A/Prof Elizabeth Yuriev, Monash University	**Chair:** A/Prof Marie-Odile Parat, University of Queensland	**Chair:** A/Prof Joseph Nicolazzo, APSA
Evidence-based teaching and learning during times of change Dr Jacqueline McLaughlin, UNC Eshelman School of Pharmacy	**Local anesthetics: From analgesics to anticancer drugs** Asst/Prof Juan Cata, The University of Texas MD Anderson Cancer Center	**Understanding the experiences of informal caregivers in managing medicines for people receiving cancer treatment** 234 Dr Ramesh Walpola, UNSW Sydney
Developing work-integrated learning in formulation science and HPLC analysis for senior year pharmaceutical science students Dr Laurence Orlando, Monash University	**Opioids and tumour growth and metastasis** A/Prof Marie-Odile Parat, University of Queensland	**Opioid-related adverse drug events in surgical patients: Risk factors and association with clinical outcomes** 235 Dr Jonathan Penm, The University of Sydney
Design and implementation of an integrated, interdisciplinary, skills-based pharmaceutical science curriculum Dr Jennifer Short, Monash University	**Reducing perioperative stress using beta-blockers** A/Prof Erica Sloan, Monash University	**Population pharmacokinetics of orally administered cannabidiol in healthy adults: Implications for drug development** 236 Dr Hayley Schultz, University of South Australia
Has Global Citizenship survived the Covid19 Era? Miss Oksana Pyzik, UCL School of Pharmacy	**Aiming to improve long-term survival of cancer patients by perioperative combined inhibition of beta-adrenergic and COX2 signaling** Prof Shamgar Ben Eliyahu, Tel Aviv University	**Performance of a modification of the Adverse Inpatient Medication Event (AIME) Model** 237 Dr Nazanin Falconer, University of Queensland
		Progesterone after mifepristone - pilot for efficacy and reproducibility (PAMper): A clinical study 238 A/Prof Joy Spark, University of New England
3.55 – 4.10	Time to view poster presentations	
4.10 – 4.20	Mini break	
4.20 – 5.25	Concurrent oral presentations 4	
Pharmacy Practice - Adherence	**Pharmacy Practice - Reproductive health and Anti-infectives**	**Pharmaceutical Science 4**
Chair: Dr Lisa Kalisch Ellett, University of South Australia	**Chair:** Dr Meng-Wong Taing, Conference Chair	**Chair:** Dr Jennifer Short, Monash University
The use of gamification and incentives in mobile health apps to improve medication adherence: a systematic scoping review 239 Mr Steven Tran, University of Sydney	**The effectiveness of requiring an authorisation for a repeat prescription for four antibiotics as an antimicrobial stewardship intervention** 243 Miss Juliet Contreras, University of Canberra	**Restriction of sodium in people with chronic kidney disease treated with empagliflozin (RESPECT-EMPA): protocol of a randomised trial** 246 Ms Mansi Tiwary, University of New South Wales
Clinical interventions to improve adherence to urate-lowering therapy in patients with gout: a systematic review 240 Ms Klarissa Sinnappah, University of Otago	**Efficacy of estrogen replacement therapy on cognitive function in older women: a systematic review and meta-analysis** 244 A/Prof Joy Spark, University of New England	**Prevalence of frailty among older inpatients with dementia and association with medication use: a retrospective cohort study** 247 Ms Linda Koria, University of Sydney
Optimising adherence to allopurinol: gout patients' perspectives 241 Ms Jane Spragg, University of Sydney	**Evaluation of vancomycin dosing strategies in obese patients** 245 Ms Sherilyn Wong, University of South Australia	**Does one size fit all? Evaluation of piperacillin dosing regimens using a population pharmacokinetic approach** 248 Mr Aaron Kinnear, University of South Australia
Effect of self-monitoring urate on allopurinol adherence 242 Mr Jian Sheng Chan, St Vincent's Hospital		**Swallowing safety of oral liquid medications: assessment using the International Dysphagia Diet Standardization Initiative (IDDSI) framework** 249 A/Prof Kathryn Steadman, The University of Queensland

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Wednesday 8 December 2021 I 12.00 – 2.45pm

Australian Eastern Daylight Time (AEDT)

9.00 – 11.59	Time to view posters and visit the sponsors' portal	Poster sponsor: Lonza
12.00 – 12.35	**Plenary session**	
12.00 – 12.10	**APSA tribute to Prof Andy Gilbert AM** Dr Vivienne Mak, Monash University Dr Lisa Kalisch-Ellett, University of South Australia	
12.10 – 12:40	**APSA Lecture** There's no touching in pharmacy - the pharmacy vaccination evolution and revolution! Prof Lisa Nissen, Queensland University of Technology **Chair:** Dr Lisa Kalisch-Ellett, University of South Australia	
12.40 – 12.50	**Mini break**	
12.50 – 2.26	**Concurrent oral presentations 5**	

Pharmacy Practice - Aged care	Pharmacy Practice - Health service delivery	Pharmacy and Pharmaceutical Science Education 1
Chair: Mr Karl Winckel, The University of Queensland	**Chair:** Dr Lisa Kouladjian O'Donnell, The University of Sydney	**Chair:** A/Prof Elizabeth Yuriev, Monash University
Evaluation approaches, tools and aspects of implementation used in pharmacist interventions in residential aged care facilities: A scoping review 250 Ms Miranda Batten, University of Canberra	**National roll-out: the goal-directed medication review electronic decision support system (G-MEDSS) in practice** 256 Dr Lisa Kouladjian O'Donnell, The University of Sydney	**Enhancing knowledge and skills in urban, regional and remote community pharmacies for delivery of asthma care** 261 Ms Sarah Serhal, Woolcock Institute of Medical Research
Preventing adverse drug reactions after discharge: protocol for a randomised controlled trial in older people 251 Mr Justin Cousins, University of Tasmania	**How useful are drug-drug interaction alerts? An interview study with Australian hospital prescribers** 257 Theresa Lee, University of Sydney	**Development of a client-centered mental health medication information session: evaluation and pilot** 262 Ms Tien Bui, University of South Australia
Comparison of inappropriate polypharmacy in older adults with and without dementia in residential aged care facilities 252 Dr Mouna Sawan, University of Sydney	**Medication management during Ramadan: a cross-sectional study** 258 Mr Kerry Huang, Monash University	**A scoping review of global trends of assessment in pharmacy education** 263 Mr James Pan, University of Sydney
The FRAIL-NH scale: Systematic review of the use, validity and adaptations for frailty screening in nursing homes 253 Ms Shin Liau, Monash University	**Development and utilisation of clinician guides for deprescribing decisions and communication with older inpatients** 259 Ms Mai Duong, The University of Sydney	**Teaching associates' and students' perspectives of online learning in a pharmaceutical science degree** 264 Ms Sarah Yang, Monash University
Scoping review of studies evaluating frailty and its association with medication harm 254 Mr Jonathan Yong Jie Lam, The University of Queensland	**Development of a Patient Decision Aid for deprescribing cholinesterase inhibitors** 260 Dr Nagham Ailabouni, University of South Australia	**Guidance on the conduct of clinical research during the COVID-19 pandemic** 265 Miss Renu Bhutkar, The University of Sydney
Pharmacist's interventions to reduce the occurrence of drug-related harms in older residents: A systematic review 255 Mr Sheraz Ali, University of Tasmania		**A faculty approach for creating an inclusive and connected community campus environment for international students during the COVID-19 pandemic** 266 Dr Nilushi Karunaratne, Monash University and Dr Betty Exintaris, Monash University
2.26 – 2.45	**Break**	

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Wednesday 8 December 2021 | continued 2.45 – 4.50pm

Australian Eastern Daylight Time (AEDT)

2.45 – 3.50	Concurrent oral presentations 6	
Pharmacy Practice - Extended roles 2	**Pharmacy Practice - Practice resources**	**Pharmacy and Pharmaceutical Science Education 2**
		Sponsored by: MONASH University | MEDICINES MANUFACTURING INNOVATION CENTRE
Chair: Dr Petra Czarniak, Curtin University	**Chair:** Dr Peter Moyle, Conference Co-Chair	**Chair:** Dr Meng-Wong Taing, Conference Co-Chair
Exploring the knowledge, role and responsibilities of pharmacists in assisting prevention of the unintentional use of prohibited substances by athletes 267 Ms Deborah Greenbaum, University of Sydney	**Pharmacists, intern pharmacists and pharmacy students' use of professional practice resources: a cross sectional nationwide survey** 271 Ms Deanna Mill, University of Western Australia	**Content validation of simulated schizophrenia role-plays for pharmacy education** 274 Ms Tina Ung, University of Sydney
Pharmacists' and pharmacy technicians' scopes of practice in the management of minor ailments in Indonesian community pharmacies: a cross-sectional study 268 Ms Vinci Mizranita, Curtin University	**Analysing the range of drugs associated with xerostomia from the Australian Database of Adverse Event Notifications (ADAEN)** 272 Ms Pei Jin Choo, The University of Queensland	**An overview of available computer-based simulation tools in pharmacy practice education** 275 Mr Ahmed Gharib, University of Tasmania
Pharmacogenomic testing: perception of clinical utility, and enablers and barriers to adoption in Australian hospitals 269 Dr Sophie Stocker, The University of Sydney	**Barriers and facilitators to australian pharmacists use of professional practice resources: a focus group study** 273 Ms Deanna Mill, University of Western Australia	**Supporting the development of teaching associates: a virtual teaching associate training program** 276 Dr Betty Exintaris, Monash University and Dr Nilushi Karunaratne, Monash University
Impact of partnered pharmacist medication charting in the Royal Hobart Hospital emergency department on medication discrepancies and errors: preliminary results 270 Mr Tesfay Mehari Atey, University of Tasmania		**Can multiple choice questions examine application of knowledge in online tutorials?** 277 Dr Suong Ngo, University of Adelaide
3.50 – 4.00	Mini break	
4.00 – 4.50	Plenary session	
4.00 – 4.30	**APSA Medal presentation** Prof Timothy Chen, The University of Sydney **Chair:** A/Prof Joseph Nicolazzo, APSA President	
4.30 – 4.50	**Meeting close and awards** A/Prof Joseph Nicolazzo, APSA President Dr Peter Moyle, Conference Co-Chair Dr Meng-Wong Taing, Conference Co-Chair	

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Pharmacy and pharmaceutical science: rising to the global challenges before us

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Book of oral abstracts

200

A systematic review of the acceptability of community pharmacist-led screening

Sarira El-Den[1], Yee Lam Elim Lee[1], Duha N Gide[1], Claire L O'Reilly[1]. Sydney Pharmacy School, Faculty of Medicine and Health, The University of Sydney[1], Sydney, NSW, Australia.

Introduction: Pharmacists are in an ideal position to support the early detection and treatment of numerous medical conditions through the utilisation of screening tools. In order to gauge the acceptability of community pharmacist-led screening services, it is imperative to consider the perspectives of various key stakeholders, namely consumers, pharmacists, and other healthcare professionals.
Aim: To explore the acceptability of pharmacist-led screening within community pharmacy settings from the perspective of all key stakeholders.
Method: A systematic search was conducted through Embase, Medline, International Pharmaceutical Abstracts and Scopus. Studies were eligible for inclusion if they reported on screening for any illness or medical risk factor, were conducted by pharmacists in a community pharmacy setting and explicitly reported on the "acceptability" of community pharmacist-led screening.
Results: Systematic screening of 3930 potentially eligible publications identified through the database search resulted in the inclusion of 44 studies. Seventeen studies identified community pharmacies as appropriate locations to conduct screening services. Seven studies found that consumers were comfortable with participating in screening services. Four studies reported that screening tool results interpreted by pharmacists were rated as clinically acceptable by other healthcare professionals, including medical practitioners. The acceptability of pharmacist-led screening across a range of medical conditions and risk factors was investigated, including cardiovascular disease, excessive alcohol consumption and osteoporosis. However, comparisons across studies were made difficult by the lack of a uniform measure of acceptability.
Discussion: This systematic review demonstrated that community pharmacist-led screening is acceptable to all key stakeholders. However, standardisation of acceptability measures is recommended to allow for more accurate comparisons of acceptability across studies. The identification of barriers and facilitators to pharmacist-led screening may assist in the development and provision of pharmacist-led screening in community pharmacies in a manner acceptable to all stakeholders.

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Pharmacy student's attitude, knowledge and self-reported confidence about general nutrition counselling in practice

Clare Carter[1], Joanna Harnett[1], Ines Krass[1], Ingrid Gelissen[1]. School of Pharmacy, Faculty of Medicine and Health, The University of Sydney[1], Sydney, NSW, Australia.

Introduction. Pharmacists are one of the largest and most accessible healthcare professions in Australia who play a prominent role in counselling and education of patients complementary to the provision of medicines. The increase in non-communicable diseases and inadequate nutrition, associated with poor quality diets has placed a greater demand on pharmacists to play a role in the provision of nutritional education to patients. However, the attitude, confidence, and knowledge of pharmacy graduates in general nutrition counselling is unknown.
Aims. To investigate pharmacy students' and interns' knowledge, attitude, and self-reported confidence in general nutrition counselling of patients.
Methods. A study involving an online survey was designed using the theory of planned behaviour and has been distributed to final year pharmacy students and pharmacy interns enrolled at the University of Sydney. Data analysis will be conducted using SPSS to test for correlations between behavioural intentions, attitudes, subjective norms, and perceived behavioural control. Descriptive statistical analysis will be undertaken for demographic responses.
Results. At the time of completion of this abstract, a total of 41 completed surveys were collected, with data collection ending at the end of September 2021. Preliminary analysis indicates that a large proportion of pharmacy students were already providing nutritional advice to patients when working in pharmacies and on placements. They endorse the importance of providing nutrition counselling to patients and agree that nutritional counselling is an effective use of a pharmacist's professional time. Pharmacy students are only somewhat confident in having the knowledge and counselling skills to provide general dietary counselling. The inclusion of nutrition as a core subject in pharmacy education is supported by pharmacy students.
Discussion. Preliminary analysis suggests that while pharmacy students acknowledge their role in the provision of general nutrition counselling, the current deficit in coverage of nutrition in pharmacy education impacts on pharmacy student's confidence of general nutritional counselling in pharmacy practice.

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Australian pharmacist's knowledge and ability to assist athletes in avoiding the unintentional ingestion of prohibited substances.

Deborah Greenbaum[1], Andrew J McLachlan[1], Rebecca H Roubin[1], Rebekah Moles[1], Betty Chaar[1]. Sydney Pharmacy School, Faculty of Medicine and Health, The University of Sydney NSW, 2006, Australia.

Introduction. The World Antidoping Agency (WADA) prohibited list places strict limitations on which medicines (and substances) an athlete may consume in and out of competition. The International Pharmacy Federation in 2014 declared that pharmacists have an important role in assisting athletes. Surveys of pharmacists have indicated varying levels of knowledge and recognition of responsibility in advising athletes regarding doping.
Aim. To examine the knowledge of Australian pharmacists about counselling and advice-giving in relation to the use of prohibited medications in sport.
Method. Using a pseudo-patient study design the researcher, an elite athlete, contacted 100 pharmacies by telephone requesting advice about taking salbutamol inhaler (WADA prohibited, with conditional requirements) for exercise induced asthma, following a set interview protocol.
Results**.** Findings indicated majority of pharmacists had limited knowledge of whether a substance was prohibited for use by elite athletes. Less than 20% of pharmacist were able to correctly advise the athlete, with another 10% giving only partially correct advice. 22% identified a suitable resource to seek antidoping information. Close to 70% of pharmacists gave incorrect or inaccurate advice nor could pharmacist identify credible sources of antidoping information.

Discussion**.** Pharmacists, by training, can play a role in providing accurate medication-related information to athletes which can assist in avoiding unintentional ingestion of prohibited substances. The knowledge gap however is preventing pharmacists from taking on this new scope of practice. Specific inclusion of sport pharmacy in education and standards of professional practice will ensure ongoing competence. Formally expanding scope of practice to incorporate sport-based pharmacy advice will clarify willingness and ability to engage in this new and important area by pharmacists.

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Community pharmacist-led perinatal depression screening: a mixed methods study to explore acceptability among perinatal women and pharmacists

Lily Pham[1], Rebekah Moles[1], Stephen Carter[1], Claire O'Reilly[1], Camille Raynes-Greenow[1], Timothy Chen[1], Corina Raduescu[2], David Gardner[3], Andrea Murphy[3], Katharine Birkness[3], Sarira El-Den[1]. Faculty of Medicine and Health, University of Sydney[1], Sydney, NSW, Australia; Sydney Business School, University of Sydney[2], Sydney, NSW, Australia; College of Pharmacy, Dalhousie University[3], NS, Canada.

Introduction. Despite Australian clinical practice guidelines recommending routine perinatal depression (PND) screening, PND screening is still not universally accessible, with one in five women not receiving screening. Since pharmacists are accessible and trusted primary care providers who are increasingly recognised for their role in mental health care, pharmacist-led PND screening services may improve accessibility and address gaps in screening services.
Aims. The study aimed to explore perinatal women and pharmacists' attitudes and acceptability towards community pharmacist-led PND screening.
Methods. Perinatal women participated in semi-structured interviews that were conducted until data saturation was reached. Qualitative data from these interviews underwent inductive, thematic analysis based on the Consolidated Framework for Implementation Research. Pharmacists completed a 42-item survey, developed based on published literature and a theoretical framework of acceptability. Survey data was descriptively analysed.
Results. Perinatal women (n=41) expressed willingness and comfort with participating in pharmacist-led PND screening. However, concerns were raised regarding the lack of privacy in community pharmacies, inadequacy of mental health training in pharmacy education and limited public awareness of pharmacists' roles in mental healthcare. Although pharmacists (n=157) reported that PND screening is acceptable and were willing to screen for PND, their survey responses indicated limited knowledge, confidence and comfort in relation to administering screening tools, interpreting screening scores and providing referrals.
Discussion. The investigation into pharmacists' and perinatal women's attitudes and acceptability of community pharmacist-led PND screening will aid in the development of appropriate pharmacist training and service implementation. Support, remuneration and training of pharmacists as mental health providers is required to establish pharmacists' roles in perinatal mental health.

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Medicinal cannabis for patients with chronic non-cancer pain: Analysis of safety and concomitant medications.

Elise A. Schubert [1], Johannes C. Alffenaar[1,2], and Nial J. Wheate[1*]. School of Pharmacy, The University of Sydney[1], Sydney, NSW, Australia; Pharmacy Department, Westmead Hospital[2], Westmead, NSW, Australia.

Introduction. Medicinal cannabis is of increasing interest in the treatment of chronic non-cancer pain as an alternative and adjunct to conventional treatments; however, concerns have been raised regarding safety and drug-drug interactions.
Aims. This study aimed to explore the incidence of adverse events (AEs) reported by a cohort of chronic pain patients when initiating medicinal cannabis treatment, and they change according to the type of formulation prescribed, the dose, and concomitant medicines.
Methods. Patient demographics, medicinal cannabis formulations, and AE data were collected as part of the CA Clinics Observational Study, and concomitant medicines were obtained using patient health summaries provided by referring medical practitioners. Medicinal cannabis formulations were grouped as either cannabidiol (CBD) only or containing both CBD and Δ-9-tetrahydrocannabinol (THC). Chi-square and logistic regression analyses were performed to determine associations between AEs and concomitant medicines, and CBD and THC dose, respectively.
Results. From a total of 275 participants, those who were prescribed formulations containing both CBD and THC were 1.5-fold more likely (p = 0.004) to have experienced an AE when compared with those patients prescribed CBD only. Each participant had a median of six concomitant medicines, with opioids (n = 179; 65%), paracetamol (n = 110; 40%), and proton pump inhibitors (n = 102; 37.1%) being the three most common. Participants who were on concomitant gabapentinoids were 2.4-fold more likely to report dizziness (p = 0.036), and participants on tricyclic antidepressants were 1.8 times more likely to report somnolence (p = 0.034), and 3.4 times more likely to report anxiety (p = 0.04).
Discussion. These findings provide insight into some factors that may increase the likelihood of AEs when initiating medicinal cannabis treatment, and important consideration should be given particularly when commencing a product containing THC. Polypharmacy was observed in a majority of participants in our cohort, and our findings may suggest there may be potentiation of sedating and intoxicating AEs with certain concomitant medicines. Further research is needed to provide guidance on the pharmacokinetic and pharmacodynamic drug-drug interactions in medicinal cannabis patients.

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Effectiveness of organisational interventions on the appropriate use of opioids for non-cancer pain upon hospital discharge: A systematic review

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Introduction. Opioid analgesics are commonly prescribed on discharge for the management of moderate to severe pain. However, they are often excessively prescribed, with up to 71% of dispensed opioid tablets going unused. Having an excessive amount of discharge opioids contributes towards an opioid reservoir in the community, increasing the potential for diversion, misuse or overdose. Additionally, long-term opioid use is also more likely when a patient is discharged with an opioid prescription, and this increases the potential for harm including dependence, tolerance, and even death.
Aims. To summarise the effectiveness of organisational interventions on appropriate opioid use for non-cancer pain upon hospital discharge.
Methods. A systematic search was conducted on six electronic databases by two independent reviewers. We included original research articles reporting on quantitative outcomes of organisational interventions targeting appropriate opioid use on hospital discharge. Quality assessment was performed by two independent reviewers. The protocol for this review was prospectively registered on PROSPERO (ID: CRD42020156104).

Results. Out of 168 full texts assessed for eligibility, 38 were included in this review. The majority of studies had a moderate to serious risk of bias (27 out of 38). Most of the studies implemented a multifaceted approach (15 studies). Other interventions included guideline implementation, prescriber education and default quantity changes in electronic medical records. Dissemination of patient-specific and procedure-specific guidelines reduced the quantity of opioids prescribed by 44-57%. Prescriber education provided with feedback resulted in a 33-44% decrease in prescribing rates. Lowering the default quantities in the electronic medical records produced a 40% decrease in opioids prescribed.
Discussion. Guideline implementation, prescriber education and default quantity changes all appear effective in improving the appropriate use of opioids on hospital discharge.

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Prevalence and predictors of opioid use before orthopaedic surgery in an Australian setting

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Introduction. Opioid analgesics are commonly used by patients awaiting orthopaedic surgery and are associated with a greater burden of postoperative pain, suboptimal surgical outcomes and higher healthcare costs.
Aims. This study primarily aimed to examine the prevalence of any opioid use before elective orthopaedic surgery with a focus on regional and rural hospitals in New South Wales, Australia. The secondary aim of this study was to examine the association between setting (city, regional or rural) and any preoperative opioid use while controlling for known covariates.
Methods. This was a cross-sectional, observational study of patients undergoing elective orthopaedic surgery conducted between April 2017 and November 2019 across five hospitals that included a mix of capital city, regional, rural, private and public settings. Preoperative patient demographics, pain scores and analgesic use were collected during pre-admission clinic visit held on average two to six weeks before surgery.
Results. Of the 430 patients included (53.3% (229/430) women; mean age, 67.5 [standard deviation [SD] 10.1] years), the overall prevalence of any preoperative opioid use was 37.7% (162/430). Rates of preoperative opioid use ranged from 20.6% (13/63) at a capital city metropolitan hospital to 48.8% (21/43) at a regional metropolitan hospital. Multivariable logistic regression showed that the regional metropolitan setting was a significant predictor of opioid use before orthopaedic surgery (adjusted odds ratio [aOR], 2.6; 95% confidence interval [CI], 1.0 – 6.7) after adjusting for covariates.
Discussion. Opioid use prior to orthopaedic surgery is common and appears to vary by geographic location. Given its use is associated with worse postoperative outcomes, rigorous efficacy studies involving different geographic locations are required to determine whether opioid tapering prior to surgery can reduce harm.

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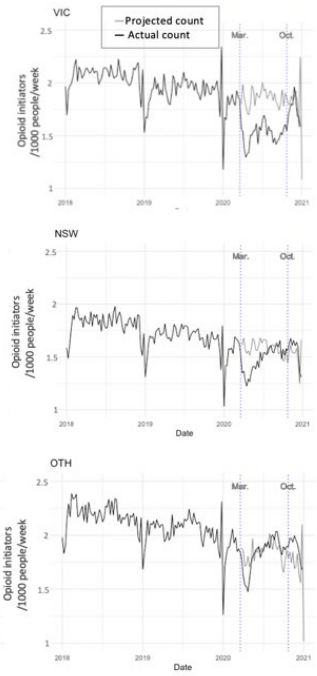
Trends in prescription opioid initiation and use in Australia during the COVID-19 pandemic



Monica Jung[1,2], Dickson Lukose[3], Suzanne Nielsen[1], J Simon Bell[1,2], Geoffrey I Webb[3], Jenni Ilomäki[2]. Monash Addiction Research Centre, Monash Univ[1], Melbourne, VIC, Australia; Centre for Medicine Use and Safety, Monash Univ[2], Melbourne, VIC, Australia; Monash Data Futures Institute, Monash Univ[3], Melbourne, VIC, Australia.

Introduction. The COVID-19 pandemic has changed the medication usage patterns, and COVID-19 restrictions may impact pain management.
Aims. To investigate the incidence and prevalence of opioid dispensing during COVID-19 restrictions in Victoria (VIC), New South Wales (NSW) and other Australian states (OTH).
Methods. We conducted time series analysis of people dispensed opioid analgesics for non-cancer pain between January 2018 and December 2020 using Australian Pharmaceutical Benefits Scheme data. Interrupted time series analyses were performed to examine changes in the trends for VIC, NSW and OTH at introduction of nationwide COVID-19 restrictions in March 2020, and at the end of lockdown in Victoria, the last state to ease restrictions, in October 2020.
Results. The sample comprised 626,163 people (54.0% female; mean [SD] age 51 [20] years) who were dispensed an opioid during the study period. Following COVID-19 restrictions, the incidence of prescription opioid use dropped by 0.38 (-0.49, -0.28), 0.33 (-0.46, -0.20) and 0.22 (-0.37, -0.07) /1000 people /week in VIC, NSW and OTH, respectively. Incidence increased by 0.39 (0.20, 0.57) /1000 people /week in VIC post lockdown; no changes were observed in NSW and OTH. A reduction in the prevalence was observed following COVID-19 restrictions by 0.54 (-1.03, -0.05), 0.62 (-0.97, -0.27) and 0.58 (-0.97, -0.18) /1000 people /week in VIC, NSW and OTH, respectively, but no changes were observed in any states at the end of VIC lockdown.
Discussion. COVID-19 restrictions corresponded with a reduction in prescription opioid initiation and use. Further research may determine if lower opioid supply could be due to lower rates of help seeking, fewer injuries and/or reduced elective surgeries and other procedures during lockdown.

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Ultra-Small Silica Nanoparticles for the Treatment of Brain Cancer

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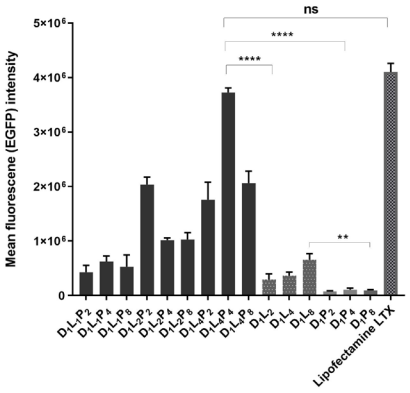

Introduction: The blood brain barrier (BBB) and blood tumour barrier (BTB) remains a major obstruction for delivering therapies to treat brain cancer such as glioblastoma (GBM). Herein, we propose a facile method to synthesize ultra-small silica nanoparticle with large pore (USLP) conjugated with lactoferrin a cascade targeting ligand for BBB and BTB.Aims: Development of facile synthesis protocol for ultra-small (30 nm) silica nanoparticles with large pore (7 nm). Conjugate with USLP lactoferrin for actively targeting both BBB and GBM. Evaluate ability of USLP to penetrate *in vitro* BBB and into GBM 2D and 3D models. Deliver doxorubicin using USLP to increase its efficacy against GBM *in vitro.*Methods: Nanoparticles were developed using sol-gel chemistry. Physiochemical properties such as particle size, surface charge and porosity were characterised. Efficacy of USLP delivery platform across BBB and GBM were analysed using 2D and 3D tumour models (Figure 1).Results: USLP can efficiently penetrate *in vitro* BBB and efficiently internalise into *in vitro* 2D and 3D GBM models. USLP based delivery systems can be used to deliver doxorubicin to GBM *in vitro* cultures in both 2D and 3D models. Discussion: With this platform we can significantly improve the utility of chemotherapeutic drugs such as doxorubicin which cannot otherwise penetrate BBB and into the tumour parenchyma. This delivery platform can be expected in future to improve survival and quality of life of patients with brain cancer and other CNS disorders.

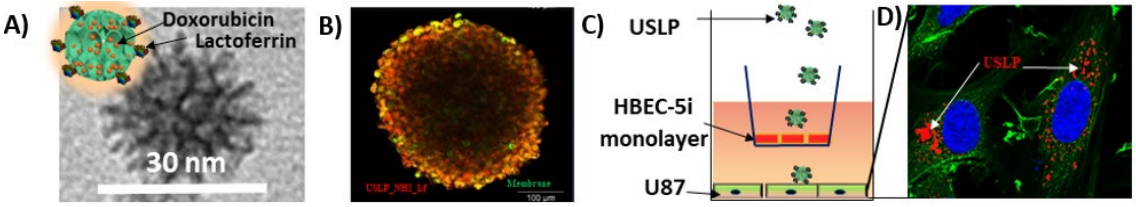

Figure 1. A) Transmission electron microscope image of USLP (inset graphical representation of USLP). B) 3D GBM tumour U87 spheroid penetration by USLP. C) *In vitro* BBB model showing USLP permeating BBB and into GBM U87 cells. D) Confocal image of U87 GBM cells showing the uptake of USLP after permeating *in vitro* BBB model.

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Multifunctional peptide/phospholipid hybrid system for target specific delivery of oligonucleotides

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Introduction. The development of non-viral gene delivery systems, with the capacity to overcome many of the biological barriers facing gene therapy, is challenging.

Aims. In this present work, a peptide/phospholipid hybrid system for delivery of oligonucleotide was developed with the aim of successful gastrin-releasing peptide receptor (GRPR) targeted delivery of pDNA/siRNA.
Methods. A multicomponent peptide system, R_9K(GALA)-BBN(6-14) has been synthesized successfully, using bombesin peptide (BBN(6-14)), a gastrin releasing peptide receptor ligand for receptor mediated gene delivery ; cationic nona-arginine (R9) to bind and condense oligonucleotides, endosomal disrupting peptide to assist endosomal release. A phospholipid oligonucleotide delivery system (1:1 1,2-dioleoylsn-glycero-3-phosphoethanolamine and 1,2-dioleoyl-3-trimethylammonium-propane) has been formulated and combined with the peptide system to investigate their effect on targeted delivery of pDNA and/or siRNA delivery in terms of complex size, toxicity, receptor-targeted delivery and gene expression or knockdown efficiency.
Discussion. This peptide/phospholipid hybrid system has demonstrated synergistic improvements in gene expression and knockdown when compared with either (peptide or phospholipid) system alone. The optimized formulation demonstrated high levels of EGFP expression and EGFP knockdown, target specificity of the system towards GRPR, enhanced endosomal release and minimal toxicity.

Begum A. et al (2019) Nanomedicine (Lond.) 14(9): 1153–1171

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Understanding the permeability-solubility interplay of γ-cyclodextrin-based formulations for poorly aqueous soluble benznidazole

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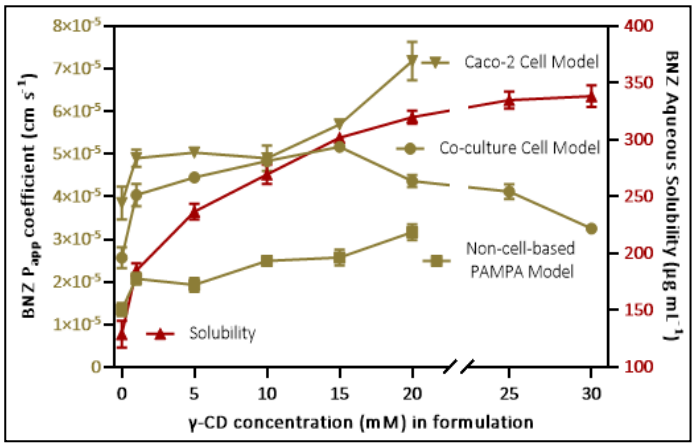
Introduction. Oral delivery has long been considered to be the "Holy Grail" of drug delivery due to its benefits compared to injections. Despite other factors, the solubility/dissolution of the drug in the GI milieu and its permeation through the GI epithelium are two key parameters governing the absorption following oral administration. Recently we showed that the aqueous dissolution of a lipophilic antiparasitic drug (benznidazole, BNZ) is enhanced by its complexation with γ-CD [1]. But at the same time, we don't know how this complexation would affect BNZ permeability.



Aims. This work was designed to investigate how γ-CD complexation impacts the overall BNZ permeability. In other words, what are we doing to the apparent permeability of BNZ when we complex it with γ-CD to increase its apparent aqueous solubility?
Methods. The influence of varying the concentration of γ-CD in the formulation on the aqueous solubility of BNZ was studied and its impact on overall permeability of BNZ was investigated in non-cell model and in cell models.
Results. The results for BNZ apparent solubility–permeability are presented in the Figure.
Discussion. The permeability of BNZ was increased following complexation with γ-CD in comparison to free BNZ in all models but the increase of solubility seems to impact the permeability differently in different models.

J Ndayishimiye (2021) IJP 596 (2021): 120240.

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Microfluidic assembly of pomegranate-like hierarchical microspheres for efflux regulation in oral drug delivery

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Introduction. Orally administered drugs face highly dynamic environmental changes throughout the gastrointestinal tract, including pH variations (acidic condition in the stomach and basic condition in parts of the small intestine and colon), enzymatic activities, and, ultimately, the presence of mucus and epithelial cell layers. Therefore, microparticles/spheres produced by microfluidics with sizes ranging from a few microns to hundreds of microns are most suitable to avert these challenges and ensure successful oral drug delivery.
Aims. To develop Meropenem (MER) loaded nano-in-micro hierarchical particles by an off-the-shelf co-flow type microfluidic device, consisted of mesoporous silica nanoparticles (MCM-48) packed in Eudragit® polymeric matrix to overcome challenges with MER oral delivery.
Methods. Drug release study and Caco-2 cell model for permeability study.
Results. *In vitro* release study showed that the Eudragit® polymers also protect MER from gastric pH and degradation. The bidirectional transport (absorptive and secretory) of MER across the Caco-2 monolayer was significantly improved for all of the prepared formulation, where the absorptive transport was significantly enhanced, and secretory transport was reduced significantly. This improvement of permeation (i.e. absorptive transport) of MER ranged between 2.6- to 13.9-folds in 6 h, whereas, the secretory transport was reduced by up to 2.1-folds in comparison to pure MER using our formulations.

Discussion. This study demonstrated that the Eudragit® polymers not only protect MER from gastric pH but also act as antagonist for p-glycoprotein protein (P-gp) efflux pumps to reduce the efflux of MER back into the gastrointestinal lumen.

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Validation of the Amharic version of ARMS and MGLS among Ethiopian people with cardiovascular diseases

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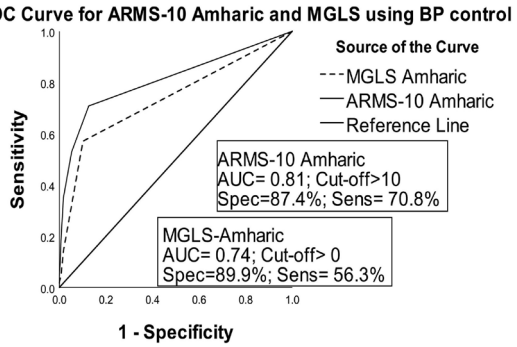

Introduction. There is no self-reported tool to measure medication adherenc Ethiopia.

Aims. To validate the Amharic version of Adherence to refills and medication s (MGLS).

Methods. People visiting the cardiovascular outpatient clinic at an Ethiopian gen using exploratory factor analysis (EFA), internal consistency (IC), convergent an Area under curve (AUC-ROC curve) was used to determine cut-off point, sens pressure control.

Results. 613 people with CVD participated in this study with a mean age of 57.6 and internal consistency, two items (Item 7 and 12) were dropped from the AR if item deleted. The final EFA using PCA with Promax rotation yielded a 10-item ARMS with 3-factors (55.6% variance explained) and ARMS-10 had good IC (α =0.74). For MGLS a single factor was extracted (44.2% variance) and there was poor IC (KR-20= 0.49). There was strong correlation between ARMS-10 and MGLS (ρ= 0.74). Pill count had moderate correlation with ARMS-10 (ρ =-0.43) and MGLS (ρ =-0.33), respectively.

The ability to discriminate between known groups based on blood pressure (BP) control, cholesterol control and congestive heart failure prognosis was confirmed by good KGV for both ARMS-10 and MGLS. ARMS-10 (AUC-ROC= 0.81) had better discriminatory power than MGLS (AUC-ROC= 0.74) on BP control.

Discussion. The Amharic version of ARMS-10 demonstrated robust psychometric properties indicating this tool can therefore be used to measure medication adherence for people with CVD in Ethiopia.

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The development and validation of the awareness and knowledge of diabetes distress questionnaire among doctors in Malaysia

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Introduction. Diabetes distress is the emotional burden that patients experience in managing their diabetes, which can negatively affect self-management and glycemic control. Unfortunately, diabetic distress remains largely undetected due to poor awareness among doctors in Malaysia. Presently there is no validated questionnaire to assess the awareness and knowledge regarding diabetes distress among doctors.

Aims. To develop and validate the Awareness and Knowledge of Diabetes Distress (AKODD) questionnaire among doctors in Malaysia.

Methods. Firstly, The AKODD was developed based on literature review and an expert panel, then piloted. It was then validated among doctors from the departments of Primary Care Medicine, Medicine, Psychological Medicine, Emergency Medicine and Staff Health Unit at a tertiary hospital in Kuala Lumpur, Malaysia, from June to July 2019, who could understand English. Doctors from these departments were selected as these doctors treat patients with diabetes or diabetes distress. The AKODD was administered at baseline and two weeks later. Discriminative validity was assessed by comparing participants who have/have not attended a diabetes course before.

Results. A total of 103/119 doctors agreed to participate (response rate=86.6%). The AKODD has 3 sections: socio-demographic information, awareness and knowledge. Flesch Reading Ease was 51.1. Thirty-three doctors (32.0%) have heard of diabetes distress before. Doctors had a good level of knowledge regarding diabetes distress with a median score of 77.8% (IQR:66.7–88.9). The AKODD had adequate discriminative validity between participants who have (83.3%)/have not attended a diabetes course before (72.2%; p<0.049). The AKODD had good internal consistency (Kuder-Richardson=0.931) and adequate reliability as 9/18 items were not statistically significant at test-retest.

Discussion. The AKODD was found to be a valid and reliable questionnaire to assess the awareness and knowledge of diabetes distress among doctors in Malaysia as it had adequate psychometric properties.

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Cross-cultural adaptation and psychometric properties of patient-reported outcome measures in Arabic speaking people: A scoping review

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Introduction: Patient-reported outcome measures (PROMs) provide valuable information on the impact of disease and treatment on quality of life from a patient perspective. The use of PROMs data in clinical practice and research is now recognized as a key indicator of health care quality and safety. Existing PROMs are largely intended for use in non-Arabic-speaking people and health care settings. For more than a decade, there has been a fundamental shift in focus on the development, cultural adaptation and the use of PROMs as an outcome measure in Arabic countries however, the quality of cross-cultural adaptation (CCA) and measurement properties of such PROMs have not been comprehensively evaluated.
Aims: To identify PROMs developed or utilized in Arabic-speaking people/countries and critically evaluate their CCA and measurement properties.
Methods: This review followed the PRISMA-ScR standards with six databases included in the search strategy. CCA was evaluated using Beaton guidelines, and the psychometric properties were assessed using COSMIN quality assessment.
Results: A total of 260 studies with 317 unique PROMs were included in this review. The studies were focused on psychometric testing (84.2%), CCA (75.8 %), using PROMs as an outcome measure (13.4%), and development of PROMs (2.3%). Of the total of 317 PROMs; 82.3% were disease-specific, 16.1% were generic and 1.6% were treatment-specific measures. Forward translation was being the strongest single criterion amongst studies. Internal consistency was the most frequently reported measurement property (91.1%) followed by test-re-test reliability (68.2%). Other measures such as cross-cultural validity, measurement errors, content validity and responsiveness were less reported.
Discussion: Measures available to assess patient-centered outcomes in Arabic people/countries vary in their quality of CCA processes and psychometric properties with the vast majority not adhering to the recommended standards. There is a need to improving methodological qualities, and providing emphasis on the transparency in reporting CCA process and measurement properties.

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Development of a tool to evaluate medication management guidance provided to carers of people living with dementia at hospital discharge

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Introduction. Medication management guidance for carers of people living with dementia at hospital discharge is important to prevent medication-related harm during transitions of care. Currently, there are no published validated tools that describe or quantify all aspects of medication management provided to carers of people living with dementia at discharge.
Aims. This study aimed to develop a tool to evaluate medication management guidance provided to carers of people living with dementia at hospital discharge.

Methods. The tool was developed using a multi-method two staged approach. Stage one involved item generation and content validation. Items were based on a previous qualitative study and systematic review. Content validation involved experts and consumers, with knowledge or experience of medication management guidance in the acute care setting, rating each item on importance and relevance. Stage two involved the conduct of cognitive interviews with carers of people living with dementia to pretest the tool. Results. The final tool contained 30 items capturing information across five domains: 1) provision of medication management information at hospital discharge; 2) carer engagement in discussing the safe use of medications at discharge; 3) carer understanding of medication management guidance provided at discharge; 4) carer preparedness to conduct medication management activities after discharge; and 5) co-ordination of medication management after discharge.
Discussion. A tool to assess medication management guidance provided for carers of people living with dementia at hospital discharge has been developed. The next step is to explore the construct validity and reliability of the tool. The tool has the potential to fill an important gap in optimising care for people living with dementia.

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Identifying Effective Interventions to Improve Metabolic Monitoring of Patients Taking Antipsychotics

Sarah Dinh, Margaret L Jordan, Alexandra A Bennett on behalf of the Project Steering Group, NSW Therapeutic Advisory Group, Sydney, NSW, Australia.

Introduction. Detailed reporting of interventions in quality improvement (QI) projects is recommended to improve effective and ineffective strategy identification and sustain improvement. A multisite study demonstrated suboptimal adherence to guideline recommendations for metabolic monitoring in hospital patients treated with antipsychotics. Improvement in adherence varied at individual sites following implementation of locally-derived QI interventions.
Aims. To identify effective and ineffective interventions and local and global barriers and enablers for improving metabolic monitoring in order to inform strategies and solutions.
Methods. Interview questions were developed using a recommended intervention reporting template. In-depth interviews were conducted with principal investigators of each participant site. Responses were thematically analysed, associations with success or failure identified and issues for local and global advocacy determined.
Results. Interviews between 30-60 minutes were completed with 6 principal investigators. Numerous interventions were identified. Education was commonly used but often of limited value. Simple work practice changes e.g. allocated monitoring days and improved availability of tape measures alone did not improve results. Pathology services to mental health areas increased but incorrect pathology continued to be reported. Sites with improvements detailed a multidisciplinary team approach of local champions, responsibility assignment, allied health utilisation and inclusion in clinical handover. Barriers and enablers were multidimensional and fell under the following themes: health service organisation culture, environment, and service delivery; human resources; and defining and standardising practices and prompts that influence metabolic monitoring. Many respondents noted that broad implementation of effective and sustained QI requires greater maturity of systems in the mental health care sector, the collective efforts of clinicians, managers, and health executives and changes to the culture and environment of service provision. Discussion. The interviews provided valuable front-line clinician perspectives to guide recommendations to stakeholders regarding effective and ineffective QI strategies and system gaps requiring attention. Collaborative multifaceted improvement strategy innovations are required as well as advocacy to those with jurisdictional and national responsibility to address global barriers and implement global solutions.

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Deprescribing anticholinergic and sedative medications in older New Zealanders living in the community: A Randomized Controlled Trial

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Introduction: Increasing Drug Burden Index (DBI) score, caused by the prescription of anticholinergic and sedative medications, is associated with poor outcomes in older people.
Aim: We aimed to reduce DBI in older people in the community, by implementing a pharmacist-led intervention to facilitate deprescribing of anticholinergic and sedative medications where appropriate. Our secondary aim was to investigate the effect size by frailty subgroup. Methods: This was a pragmatic two-arm randomised controlled trial comparing pharmacist-led recommendations to general practitioners (GPs) for deprescribing anticholinergic and sedative medication (the intervention) with usual care (control). Older people (≥65 years) were recruited from Canterbury and South Canterbury, New Zealand, if they were taking at least one anticholinergic or sedative medication. The primary outcome measure was the difference in DBI between medication assessment at baseline and follow-up. Frailty subgroups were defined using the Frailty Index. Summary data are presented as n (%) and means (standard deviation) or medians (inter-quartile range). Proportions were compared with Pearson's chi-squared test and presented with a confidence interval. Results: Interim findings suggest that of 363 participants who had a medication assessment, 21 (12.7%) in the control group and 21 (12.2%) in the intervention group had a reduction in DBI≥0.5. The mean difference in DBI was -0.4% (95%CI -7.9% to 7.0%, n.s.). Complete study findings will be presented. Discussion: Our pharmacist-led medication assessment of older people living in the community was not effective at reducing the anticholinergic and sedative load, measured with DBI, after three months of our deprescribing implementation strategy. There was a lack of evidence to suggest that this strategy was effective for any frailty subgroup. Further research into strategies to increase translation of deprescribing into practice is needed.

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Conversations about cannabis: the supply process

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Introduction. The supply process for medicinal cannabis (MC) in Australia is complex. Most products remain unregistered, requiring approval from the Therapeutic Goods Administration before supplying to the patient. The collective patient voice has been loud, with waiting times and cost of MC being reasons for diversion to black market cannabis use. However, little is known about those involved in the supply process of MC and the regulatory hurdles within it before the product reaches the patient.
Aims. To investigate the perspectives of key stakeholders in the supply of MC to patients.
Methods. After ethics review committee approval, in-depth semi-structured interviews were conducted individually with stakeholders who represent different parts of the MC supply chain (manufacturers, researchers, policy regulators, pharmacists, prescribers). All interviews were audio-recorded, transcribed and thematically analysed using NVivo software. An online focus group was held with some of the interviewees, as well as new stakeholders, to discuss important issues and consolidate themes gathered from the individual interviews.

Results. To-date, our study has comprised 12 interviews and a focus group consisting of eight people. Key themes emerging from the interviews include: the need for stringent production standards; length of time to grant licensure for activities relating to MC; lack of evidence of MC for certain indications; burden on pharmacists to source MC from suppliers. Additional key themes emerging from the focus group include: unwillingness to prescribe; MC as an appropriate treatment option; difficulty in recruitment for clinical trials; safety of MC; and the need for collaboration between all healthcare sectors.
Discussion. This study provides insights into previously undocumented perspectives from stakeholders involved in the provision of MC. Results can inform meaningful changes to policy to improve current practice, overcome anecdotal regulatory hurdles and ultimately streamline patient access to MC.

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Impact of lipid functionalisation on polyethylene glycol polymer albumin binding, pharmacokinetics and lymph uptake

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Introduction. Conjugation with lipids has been used to extend the plasma half-life of several valuable therapeutic peptides by promoting binding to serum albumin. Recently, lipid conjugation has also been utilised to enhance the efficacy of peptide vaccines by enabling 'hitchhiking' on endogenous albumin trafficking pathway into lymph. Functionalisation of drug carriers with lipids thus has the potential to control and target the delivery of drugs to the lymphatics which play a critical role in immune response, acute disease and cancer.
Aims. To determine the impact of functionalisation with different lipids on albumin binding, pharmacokinetics and lymph uptake of polyethylene glycol (PEG) polymer based drug carriers.
Methods. Cyanine-5 labelled PEG polymers were attached with 4 different lipid tails - short alkyl (C2), long alkyl (C12), diacyl (2C12) or cholesterol (Ch). Albumin and lipoprotein binding were determined by FRET and ultracentrifugation based assays. Plasma pharmacokinetics (PK) and/or thoracic lymph uptake were compared after intravenous (IV) or subcutaneous (SC) injection in cannulated male Sprague-Dawley rats.
Results. Albumin binding was highest for the 2C12-PEG and Ch-PEG polymers. The plasma half-life of the 2C12-PEG and Ch-PEG polymers was also statistically longer than the other polymers following SC and IV dosing. All PEG-polymers had good bioavailability (>20%). The proportion of the bioavailable dose that was lymphatically transported was statistically higher for 2C12-PEG polymer (28.25% ± 5.28) than other polymers.

Discussion. Attaching PEG polymers with different lipids can control the polymers' plasma PK and lymph uptake. In general, plasma half-life and lymph uptake were increased via attachment to albumin binding lipids such as 2C12. This might have value for enhancing drug delivery to lymph to treat or diagnose diseases involving the lymphatics such as autoimmune diseases, acute diseases and cancers[1].

[1]Abdallah et al (2020) J Control Release 327:117-128

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Insights into Surfactant–Influenza Virus Interactions

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Vaccination is the best approach to prevent influenza. Inactivated virus vaccines are the most common influenza vaccines due to their proven safety profiles and relatively low production costs. Generally, a non-ionic surfactant such as Triton X-100 is used to split influenza virus when preparing inactivated vaccines. However, Triton X-100 was listed as "substance of very high concern" by the European Commission and hence it will be used only for exceptional circumstances from January 2021 onwards.

Herein, we are studying several surfactants including Tween-20, Tween-80, Brij-58 and Brij-56 to find an alternative to Triton X-100 that can be used in the manufacturing of inactivated vaccines.

A variety of different techniques were used comprising of fluorescence and light scattering spectroscopy, transmission electron microscope and dynamic light scattering to study surfactant–virus interactions and elucidate their ability to split the virus.

Our preliminary results showed that Tween-20, Tween-80 and Brij-58 were able to split the virus at high concentrations. However, Brij-56 showed a comparable effect to Triton X-100, and it was able to split the influenza virus within the same concentration range to Triton X-100.

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An analysis of the efficacy and adverse effects of cannabidiol and tetrahydrocannabinol used in the treatment of PTSD and other anxiety disorders.

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Introduction. Anxiety is a prevalent mental health condition for which current treatments are limited by low efficacy and adverse effects (AEs). Medicinal cannabinoids, cannabidiol (CBD) and tetrahydrocannabinol (THC), have been proposed as potential treatments for anxiety disorders, particularly post-traumatic stress disorder (PTSD).

Aims. To evaluate patient quality of life outcomes after treatment with various medicinal cannabis formulations to determine whether cannabis is effective for anxiety and understand the AEs experienced by patients.

Methods. A cross sectional analysis of data from the CA Clinics Observational Study (CACOS) compared PROMIS-29 survey scores for 198 patients at baseline and after treatment with medicinal cannabis to determine whether there was clinical improvement. The data of 571 anxiety patients was also analysed to examine the AEs they experienced by MedDRA organ system class.

Results. The median doses taken by patients included in the PROMIS-29 analysis were 50.0 mg/day CBD and 4.4 mg/day THC. There were significant improvements ($p<0.001$) to patient outcomes across PROMIS-29 domains of anxiety, depression, fatigue, and ability to participate in social activities. The most common AEs reported across the whole patient cohort were dry mouth (n= 185, 32.6%), somnolence (n=198, 31.3%), and fatigue (n=105, 18.5%) and incidence varied with different cannabis formulations.

Discussion. This data demonstrates that medicinal cannabis preparations with CBD and THC can significantly improve patient outcomes for specific symptoms of anxiety. The CBD only and balanced formulation groups improved four patient outcomes across all patients and the patients with unspecified anxiety, whereas the CBD only formulations were the only products to demonstrate efficacy in the PTSD patient subset. There was no association between CBD or THC concentrations and patient improvement. Patients in the CBD only group had the highest rates of never reporting an adverse effect (40.0%) whereas inclusion of THC in a formulation was significantly associated with experiencing gastrointestinal AEs (OR 1.011, p=0.003); specifically dry mouth (OR=1.010, p=0.005) and nausea (OR=1.008 p=0.008).

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Switching of oral anticoagulants in atrial fibrillation: a cohort study using Australian general practice data

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Introduction. Switching oral anticoagulants (OACs) may influence clinical outcomes, healthcare costs and patient satisfaction.
Aims. We aimed to assess patterns of switching in patients with atrial fibrillation (AF) in the period following widespread availability of the direct-acting oral anticoagulants (DOACs).

Methods. A retrospective cohort study was conducted using NPS MedicineWise's MedicineInsight dataset, collected from Australian general practices. Patients with AF who newly commenced an OAC between 1 January 2013 and 30 September 2017 were included. The switching rate was calculated within 12 months post-initiation. Switching rates between OACs were compared, and predictors of switching were identified using multiple regression.

Results. We included 15,020 patients (47.3% female) who were recorded as having been commenced on warfarin (29.1%) or a DOAC (70.9%). Overall, 5.7% (95% confidence interval [CI] 5.3-6.1%) of patients switched their OAC within 12 months. The switching rates from warfarin, apixaban, dabigatran and rivaroxaban were 9.4% (95% CI 8.6-10.4%), 2.6% (95% CI 2.2-3.2%), 8.9% (95% CI 7.5-10.4%) and 4.0% (95% CI 3.5-4.6%), respectively. Compared to apixaban, commencement on warfarin (adjusted hazard ratio [AHR] 4.60; 95% CI 3.45-6.12), dabigatran (AHR 3.73; 95% CI 2.71-5.14) or rivaroxaban (AHR 1.68; 95% CI 1.25-2.26) was associated with a higher risk of switching to another OAC. Patients with severe renal impairment (estimated glomerular filtration rate <30 mL/min) were more likely to switch from DOACs to warfarin and less likely to switch from warfarin.

Discussion. There was a relatively low switching rate between OACs in Australian general practice patients with AF. A key determinant of switching appeared to be kidney disease.

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Developing new roles for Saudi community pharmacists in Cardiovascular health: multistakeholder engagement

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Introduction. In Saudi Arabia, as elsewhere, the rising prevalence of cardiovascular disease (CVD) imposes a high level of morbidity and mortality. Early prevention of CVD and complications could be appropriately addressed in primary healthcare settings. As community pharmacists are an accessible and integral part of the primary healthcare system globally, they can enact key roles in identifying people with CVD risk, advising about risk reduction or treatment approaches, and/or referring to physicians.
Aim. To build the foundations for a pharmacist-led CVD risk screening and management service model in Saudi community pharmacies through stakeholder engagement.
Methods. Stakeholder engagement steps involved in this research were: 1) key stakeholder identification, and 2) engaging with identified stakeholders to glean an understanding of key factors that would influence the implementation of CVD risk services in Saudi pharmacies. The views, experiences, and recommendations of identified stakeholders were then explored using qualitative semi-structured interviews. Theoretical/implementation frameworks were used to map emergent themes and to standardise the reporting of factors influencing implementation of these novel services. The frameworks used included the Capability, Opportunity, Motivation and Behaviour (COM-B) model, the Socio-Ecological Model (SEM) and the Behaviour Change Wheel (BCW).
Results. Of the 124 participants recruited, 25 were health consumers, 50 pharmacists (24 community and 26 hospital pharmacists), 26 physicians, and 23 policymakers/opinion leaders. Findings were generally supportive of pharmacist provided CVD risk assessment and management services, with most participants believing such services in Saudi Arabia to be acceptable, feasible and beneficial. However, there were factors (such as systemic issues, public and physicians' acceptance, sociocultural issues, and pharmacy professional or organisational need for governmental support) that would likely influence the uptake of such services. The COM-B and SEM models allowed mapping of these factors at different levels from all stakeholders. The BCW framework was then used to construct matching strategies and interventions that could be applied to address stakeholder-identified issues to enable future implementation. In conclusion, this study provides a framework for the future development, implementation and evaluation of Saudi community pharmacist-provided CVD risk assessment and management services.

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Re-hospitalisation caused by medication harm after an Acute Myocardial Infarction

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Introduction. The contribution of medication harm to re-hospitalisation and adverse patient outcomes after an acute myocardial infarction (AMI) is not well understood. Patients post-AMI are at risk of medication harm as they are often older, have multiple co-morbidities and polypharmacy. This study investigated the incidence, type, timing, and severity of medication harm causing unplanned re-hospitalisation after an AMI.
Methods. This was a retrospective, cohort study of patients post-AMI. Those re-hospitalised within 18 months were identified from the electronic medical record. Medication harm re-hospitalisations were detected using clinician medical record review and clinical coding data. The events were appraised using a published severity scale and were classified based on the event type, the causal medication(s) and the timing (days) post-AMI discharge.
Results. A total of 1564 patients experienced an AMI and 418 (26.7%) were re-hospitalised within 18 months. Eighty-nine patients (5.7%) experienced a total of 101 medication harm events. Gastrointestinal bleeding (9.9%), acute kidney injury (9.9%) and hypotension (8.9%) were the most common medication harm events. The most commonly implicated medications included furosemide (15.8% of events), ticagrelor (15.8%), aspirin (14.9%) and perindopril (8.9%). Medication harm was caused by adverse events (87.1%), medication omission (8.9%) and medication errors (4%), resulting from the continuation of medications that were intended to be ceased/reduced and accidental patient-administration of incorrect medications. The median time to medication harm re-hospitalisation was 79 days (IQR: 16-200 days). The majority of events were classified as serious (81.2%) with eight (7.9%) life-threatening events and no fatalities caused by medication harm.
Discussion. This is the first study to investigate medication harm after an AMI. Approximately 6% of post-AMI patients are re-hospitalised due to medication harm causing serious and potentially preventable events. The first six months after discharge is a high-risk time for medication harm re-hospitalisation and should be the focus of pharmacy-led harm mitigation strategies. Potential strategies should include empowering patients to recognise medication harm and timely, multi-disciplinary monitoring following dosage adjustments.

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A population pharmacokinetic model to inform tacrolimus therapy in heart transplant recipients.

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Introduction. Existing tacrolimus population pharmacokinetic models are unsuitable for guiding tacrolimus dosing in heart transplant recipients. Aim. To develop and evaluate a population pharmacokinetic model for tacrolimus in heart transplant recipients, considering the tacrolimus-azole antifungal interaction.
Methods. Data from heart transplant recipients (n=87) administered the oral immediate-release formulation of tacrolimus (Prograf®) were collected. Routine drug monitoring data, principally trough concentrations, were used for model building (n=1100). A published tacrolimus model was used to inform the estimation of absorption rate constant [K_a], apparent central volume of distribution [V_2], apparent intercompartmental clearance [Q], and apparent peripheral volume of distribution [V_3]. Body weight was implemented as a covariate on apparent clearance [CL/F], V_2/F, V_3/F and Q/F on an allometry scale. The effect of concomitant azole antifungal use on tacrolimus CL/F was quantified. Subsequently, stepwise covariate modelling was performed. Significant covariates influencing tacrolimus CL/F were included in the final model. The robustness of the final model was confirmed using a prediction-corrected visual predictive check (pcVPC). The final model was externally evaluated for the prediction of tacrolimus concentrations of the fourth dosing occasion (n=87) from 1−3 prior dosing occasions.
Results. Concomitant azole antifungal therapy reduced tacrolimus CL/F by 80%. Haematocrit (changes in objective function value = -33, $p<0.001$) was included in the final model. The pcVPC of the final model displayed good model adequacy. One recent drug concentration is sufficient for the model to guide tacrolimus dosing.

Discussion. A population pharmacokinetic model that adequately describes tacrolimus pharmacokinetics in heart transplant recipients, considering the tacrolimus-azole antifungal interaction has been developed. Prospective evaluation is required to assess its clinical utility.

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The Impact of a Pharmacy Intern's Early Failures or Successes on their Preparedness for Practice

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Background
The early failures and successes in the first practicing year of a pharmacy intern can be an indicator of their degree of preparedness for practice. Literature within medical and allied health fields has established the significance of failure to new graduates, but evidence concerning the importance of early successes, and evidence specific only to pharmacy is lacking.
Method
This qualitative cohort study analysing longitudinal audio diaries (LADs) of nine current hospital and community pharmacy interns aims to answer the question: How do early successes and failures in the profession affect the pharmacy intern's feelings of preparedness for becoming a registered pharmacist? Entrance and exit interviews were conducted, and interns regularly returned voice recordings reflecting on their work experiences. Third party software Otter.ai ® transcribed interviews and recordings and this data was then analysed both independently and as a wider group, through deductive and inductive coding.
Results
Content analysis of audio diaries revealed failures often culminated from a lack of confidence, from a first attempt at a new task, or from time pressure. Successes mostly resulted from pleasant patient interactions where interns were able to make significant impact. Both successes and failures became motivators for improvement, and most interns sought the value in both types of experiences. Feelings of empowerment were linked to successes, whereas frustration, guilt or overwhelmedness often followed a failure. A commonality indicated interns were not well prepared for the negative emotional ramifications of independent practice.
Conclusions
The final findings of this study intend to expose missing elements of undergraduate pharmacy courses. In turn, improvements to coursework may generate cohorts of even more thoroughly prepared pharmacy interns. Results from this research may also aid preceptors in guiding and supporting their mentees through this challenging year.

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An exploration of resilience with early career hospital pharmacists: a qualitative study

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Introduction. Resilience assists healthcare professionals to overcome or bounce back from challenges, remain positive in the face of adversity, and allow them to deal with challenging work situations and environments. However, various definitions of resilience are described in the literature, and little is known how healthcare professionals, especially early career pharmacists, understand resilience.
Aims. To explore early career hospital pharmacists' understanding of resilience and strategies they use to enhance and maintain their resilience as healthcare professionals.

Methods. Three focus groups and five semi-structured interviews with a total of fifteen Australian early career hospital pharmacists (less than three years post-registration) were conducted. Audio recordings were transcribed verbatim and analysed using NVivo®. An inductive thematic analysis was performed to identify main themes.
Results. The main themes identified were 1) Early career pharmacists understood resilience as the 'capability to adapt to and learn from challenges and setbacks' 2) Their resilience in the workplace was challenged by 'the transition from intern to registered pharmacist', 'workload pressures' and 'working during the COVID-19 pandemic' 3) Professional resilience was supported by 'strong support from workplace management and senior pharmacists', 'social networks within workplaces and private lives' and 'keeping professional boundaries'.

Discussion. Pharmacists defined resilience constructively and identified many challenges testing but also strategies supporting their resilience in the workplace. Workplaces can support early career pharmacists by monitoring workload increases over extended time periods, creating opportunities for peer and mentor support and by allowing pharmacists to implement their personal, individualised resilience maintaining strategies. These strategies may support pharmacists coping with adversity in their professional life, especially under challenging circumstances like increased workload and uncertainties during the COVID-19 pandemic.

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The execution of evidence-based medicine with over-the-counter medicines in New Zealand: A Cross-Sectional Study of Community Pharmacists

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Introduction. Pharmacists are first-line health professionals and medicines experts, trained to deliver high quality evidence-based patient care to the community they serve. They have an important role in providing information to customers and patients on over-the-counter (OTC) medicines which may have limited evidence, yet are medicines that are most readily accessible to the public. However, the extent to which pharmacists make clinical recommendations based on evidence with regards to OTC medicines, is unmonitored and unknown in New Zealand (NZ).
Aims. To explore the extent at which community pharmacists in NZ execute evidence-based medicine (EBM) with regards to OTC medicines, as well as observing what factors influence their clinical decision-making.
Methods. A pre-piloted, self-administered online questionnaire was disseminated through email to 2788 registered NZ pharmacists. The questionnaire covered the aspects of EBM knowledge, attitude and barriers towards EBM, and factors influencing a pharmacist's product recommendation. Responses were collected over 4 weeks in January 2021. Data was analysed using SPSS® (version 26).
Results. A total of 326 responses were collected (11.7% response rate). Participants had an average EBM knowledge score of 15.6 (out of 33). More than 50% had a favourable attitude towards EBM. Insufficient time (20.2%) and a lack of EBM resources (16.4%) were reported as the major barriers to practicing EBM. The majority (72.8%) of the participants believed that guideline recommendations were important for OTC recommendations, however, 67.25% would often or always use their own judgement when conducting an OTC product consultation. Recent graduates (p=0.48) and pharmacists with higher level of education (p=0.00) scored significantly higher for EBM knowledge.
Discussion. The key findings of this study are consistent with prior studies. Guideline recommendations, the patient's situation and the user-friendliness of the OTC medicine were the most important factors influencing a pharmacist's OTC medicine recommendation. Pharmacists tend to often use their own judgement when recommending an OTC medicine, and recently graduated pharmacists and pharmacists with higher education displayed greater EBM knowledge. Overall, pharmacists had a favourable attitude towards the concept of EBM.

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Could we 'clear' the way for Alzheimer's disease? Impact of copper complexes at the blood-brain barrier

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Introduction. Efflux transporters expressed on the luminal surface of brain endothelial cells act as biochemical barriers to xenobiotic insult and regulate the transport of molecules across the blood-brain barrier (BBB). P-glycoprotein (P-gp) is one of the main efflux transporters involved in the hindrance to central nervous system (CNS) drug delivery. P-gp also plays a major role in the transport of endogenous molecules such as amyloid beta (Aβ) from the brain into the systemic circulation. The expression of P-gp is decreased in people with Alzheimer's disease (AD) which is suspected to decrease the clearance of neurotoxic Aβ from the brain. Biometals such as copper (Cu), have been shown to be important in the regulation of many signalling pathways in neurons and these pathways are linked to P-gp expression.
Aims. It was hypothesised that the bis(thiosemicarbazone) (BTSC) Cu-releasing complex, Cu(GTSM), would enhance P-gp expression and function at the BBB, while Cu(ATSM), which only releases Cu under hypoxic conditions, would not modulate P-gp expression. Methods. Expression of P-gp at the protein level and transcript level (MDR1) in immortalised human brain endothelial (hCMEC/D3) cells were quantified by Western blot and quantitative polymerase chain reaction respectively following treatment with 25-250 nM range of Cu(BTSC) for 24 and 48 h. P-gp function was assessed through the uptake of a fluorescent P-gp substrate, rhodamine 123. Intracellular Cu levels were quantified following treatment with the Cu(BTSC)s by inductively coupled plasma mass spectrometry.
Results. Interestingly, Cu(ATSM) significantly enhanced P-gp protein expression 2.0-fold, MDR1 expression 1.5-fold and P-gp function by 30% at the 100 nM concentration. In contrast, a 48 h treatment with Cu(GTSM) diminished P-gp expression at both protein (0.5-fold) and mRNA level (0.6-fold) leading to a reduction in P-gp function by 200%. However, both Cu(ATSM) and Cu(GTSM) were found to increase cytosolic Cu levels.
Discussion. Our findings suggest that these two compounds have opposing effects on P-gp regulation and have the potential to modulate the expression and function of a key efflux transporter expressed at the blood brain barrier with implications on enhanced brain drug delivery and clearance of Aβ in Alzheimer's disease.

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Toll like receptor transactivation dependent signalling: a new cell signalling frontier

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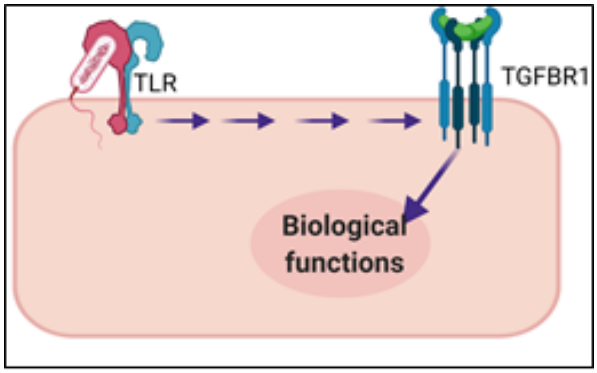

Introduction. Toll like receptors (TLR) are the first in line to respond to exogenous invading substances that trigger an immune response. Bacterial derived toxin lipopolysaccharide (LPS) activates TLR4 which leads to the phosphorylation of the Smad2 transcription factor. The phosphorylation of Smad2 is the result of the direct activation of the transforming growth factor-β receptor (TGFBR1).
Aims. To characterise the signalling mechanisms of LPS via TLR4 mediated Smad2 phosphorylation.
Methods. The invitro model used human aortic vascular smooth muscle cells (HA-VSMCs) to assess the implications of TLR4 (trans)activation of the TGFBR1 in vascular pathophysiology.
Results. LPS mediated Smad2 phosphorylation is inhibited in the presence of TGFBR1 inhibitor SB431542 in HA-VSMCs. Treatment with MyD88 and TRIF pathway antagonists does not affect LPS mediated phosphorylation of Smad2; however, LPS mediated Smad2 phosphorylation was inhibited in the presence of MMP inhibitor, GM6001 and unaffected in the presence of ROCK inhibitor Y27632. LPS via transactivation of the TGFBR1 stimulates PAI-1 mRNA expression.
Discussion. TLRs are first in line to respond to exogenous invading substances and endogenous molecules; our findings characterise a novel signalling pathway in the context of cell biology. Identifying TLR transactivation of the TGFBR1 may provide future insight into the detrimental implications of pathogens in pathophysiology.

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Toxic fat, 1-deoxysphinganine, compromises the functionality of skeletal myoblasts and underlies the development of Type 2 Diabetes Mellitus.

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Introduction. Metabolic dysfunction, dysregulated differentiation, and atrophy of skeletal muscle occur as part of a cluster of abnormalities associated with the development of Type 2 diabetes mellitus (T2DM). Recently, the role of 1-deoxysphinganine (1-DSA), atypical class of sphingolipids has gained interest because they are significantly elevated in patients diagnosed with T2DM but also in the asymptomatic population who later develop T2DM. It has been shown that 1-DSA have cytotoxic properties and compromise the secretion of insulin from pancreatic beta cells. The functionality of skeletal muscle cells is also compromised during the development of T2DM. However, whether 1-DSA impair the functionality of skeletal muscle cells remains unclear.

Aims. This study aimed to investigate whether 1-DSA are cytotoxic and disrupt the cellular processes of skeletal muscle precursors (myoblasts) and differentiated cells (myotubes).
Methods. In order to address the hypothesis, we performed cell viability assay, adenosine triphosphate production assay, immunocytochemistry, migration assay, myoblast fusion assay and glucose uptake assay.
Results. 1-DSA significantly reduced the viability of myoblasts in a dose- and time-dependent manner and induced apoptosis and cellular necrosis. Importantly, myoblasts were more sensitive to the cytotoxic effects induced by 1-DSA rather than by saturated fatty acids, such as palmitate, which are critical mediators of skeletal muscle dysfunction in T2DM. Additionally, 1-DSA significantly reduced the migration ability of myoblasts and the differentiation process of myoblasts into myotubes. 1-DSA also significantly reduced insulin-stimulated glucose uptake in myotubes.

Discussion. These findings demonstrate that 1-DSA directly compromise the functionality of skeletal muscle cells and suggest that increased levels of 1-DSA observed during the development of T2DM are likely to contribute to the pathophysiology of muscle dysfunction detected in this disease.

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Useability and perceptions of two dry powder inhalers in inhaler-naïve individuals for a low-resource setting application

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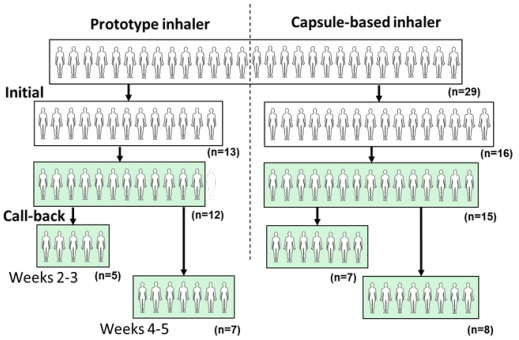

Introduction. Poor inhaler technique remains an obstacle to effective treatment. Inhaler mis-use presents an acute challenge for an inhaled oxytocin product due to the life-threatening nature of postpartum haemorrhage and the low-frequency of use predicted in rural low-income birthing centres.
Aim. To identify and quantify the inhaler technique of two DPIs in the hands of inhaler naive participants immediately after training and after a period of training decay.
Methods. A non-crossover inhaler technique study on inhaler-naïve participants (n=29) used mixed-methods approach to data collection and analysis. Inhaler technique errors were quantified using video recordings with all discussions transcribed and coded for thematic analysis.
Results. During self-administration 70% of participants made at least one critical error with the capsule-based inhaler and took significantly longer to do so ($p < 0.001$), when compared to the prototype inhaler (44%). Implementation of a training decay resulted in 100% of participants making a critical error using the capsule-based inhaler. Participants using the prototype inhaler performed less critical errors after 4-5 weeks (62%) than 2-3 weeks (43%). Discussion. A simple and affordable prototype inhaler was used most effectively without any training and after a two different periods of training decay. Participants often cited over-confidence and the complex instructions of the capsule-based inhaler as the primary causes for observed critical errors.

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Understanding the experiences of informal caregivers in managing medicines for people receiving cancer treatment

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Introduction. Informal caregivers are family members, relatives or friends who support the care and overall wellbeing of loved ones in need. In the context of cancer treatment, informal carers often assume this role instantaneously and may not necessarily have the capacity or capability to manage these responsibilities. Medicine management responsibilities have been linked to negative impacts on caregivers' mental and physical health. However, the nature of the activities that carers undertake, and their support needs to manage such responsibilities are poorly understood.
Aims. This study aimed to understand informal caregivers' experiences and support needs in their medicine management roles for people receiving cancer treatment.
Methods. Semi-structured and group interviews were conducted with 30 self-identified informal carers: 20 in group settings and 10 in one-to-one interviews. The interviews were audio recorded, transcribed verbatim, and analysed using a content analysis framework. The study findings were summarised thematically.
Results. Participants described a range of medicines management roles that they assume of varying complexity. Tasks they reported as especially challenging included: managing complex dosing regimens and adjusting to frequent changes to medicine regimens. They also reported mixed emotions towards their roles, from being overwhelmed and underprepared, to feeling that they are key member of their loved one's care team.
Discussion. This study has shed light on the key roles informal carers play in supporting their loved ones who are receiving treatment for cancer, and aspects of medication management that they found most challenging. A number of areas were identified as opportunities for pharmacists to play a greater role in addressing the unmet needs of cancer caregivers. Future research should explore the potential for provision of pharmacist-led interventions aimed at enhancing support of informal caregivers of people receiving cancer treatment.

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Opioid-related adverse drug events in surgical patients: Risk factors and association with clinical outcomes

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Introduction. Opioid analgesics are commonly used to treat acute post-operative pain. Surgical patients are at high risk of developing opioid-related adverse drug events (ORADEs) due to the complexity of peri-operative care.

Aims. The primary objective of this study was to identify the risk factors for ORADEs in surgical patients. Secondary objective was to examine the association between ORADEs and clinical outcomes, length of stay (LOS) and 28-day readmission rate.
Methods. A retrospective cohort study was conducted using electronic medical records data during 1st July 2016 to 1st April 2020, from a 450-bed tertiary teaching hospital in Sydney, Australia. ORADEs were defined using International Classification of Diseases 10th Revision Australian Modification (ICD-10-AM) codes. Multivariable logistic regression was performed to identify risk factors for ORADEs. Propensity score matching was performed using 1:1 ratio to investigate the association between ORADEs and clinical outcomes. LOS was compared using negative binomial regression while 28-day readmission rate was compared using logistic regression.

Results. Among 17,886 surgical patients who received opioid analgesics during hospital stay, 1,814 patients (10.2%) experienced ORADEs. Risk factors for general ORADEs included advanced age, comorbidities (e.g. hypertension, sleep apnoea, chronic kidney disease, liver diseases), concurrent use of medications (benzodiazepines and gabapentinoids) and a higher Oral Morphine Equivalent Daily Dose (OMEDD). After propensity score matching, patients who experienced ORADEs were more likely to have a longer LOS compared to those who did not (Rate Ratio 3.00, 95% confidence interval [CI] 2.97-3.04). The 28-day readmission rate did not differ significantly between the two cohorts (Odds Ratio 0.89, 95% CI 0.71-1.11).
Discussion. Risk factors for general ORADEs in surgical patients were advanced age, comorbidities, concurrent use of medications and a higher opioid daily dose. ORADEs were associated with an increased LOS while no associations were found with 28-day readmission rate.

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Population pharmacokinetics of orally administered cannabidiol in healthy adults: Implications for drug development

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Introduction. Cannabidiol (CBD) is increasingly being studied as a therapeutic option for a range of health conditions including pain and epilepsy; however, the pharmacokinetics of CBD are not well understood.

Aims. This study was conducted to characterise the pharmacokinetics of CBD in healthy adults using a population pharmacokinetic approach, to inform the drug development of an oral dose form of CBD.
Methods. CBD concentration-time data was obtained from a phase I randomised, open-label, 4-way crossover clinical study (n=12, ACTRN12618000391279) (Hosseini, 2021) and modelled using Phoenix NLME. Monte Carlo simulations were conducted to provide an indication of expected CBD exposure with chronic oral dosing regimens.
Results. A three-compartment model with a chain of absorption transit compartments and first-order elimination most adequately described CBD pharmacokinetics. Substantial variability in population pharmacokinetic parameters was identified, which could not be accounted for by any covariates. Simulations indicated a 40-fold difference in daily drug exposure at steady-state with multiple dosing, and variability in the time to reach steady-state, which was predicted to be up to ~3 weeks in some patients.
Discussion. The observed variability in steady-state drug exposure and extended time to reach steady-state have important implications for drug development. The lack of a clear dose-response relationship, due to large pharmacokinetic variability, and the delay in the observation of response from a selected dose level means that determination of an efficacious dose is complex and requires careful consideration when designing clinical trials and using CBD in a clinical setting.

Hosseini A et al (2021) British Journal of Clinical Pharmacology, 87(4), 2070-2077.

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Performance of a modification of the Adverse Inpatient Medication Event (AIME) Model

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Introduction. Inpatient medication harm affects approximately 7% of patients. At least half are thought to be preventable. Timely clinician review can mitigate risk and optimise prescribing for high-risk individuals . The AIME Model(1) was developed to guide a systematic approach for patient prioritisation for medication review.

Aims. To evaluate the predictive performance of a modified AIME model in a cohort of patients separate to those used to develop and validate the original model.
Methods. A retrospective multisite cohort study was conducted of general medical and geriatric inpatients at two tertiary QLD hospitals, between 1st January – 31st April 2020. Medication harm was identified using ICD-10 Y-codes. The Hospital Frailty Risk Score(2) (HFRS) was also applied to calculate frailty for each patient. The variables from the original AIME model: length of stay (LOS), prior hospitalisation, ≥ 8 medications, serum sodium < 126 mmol/L, INR > 3, anticoagulants, anti-psychotics, antiarrhythmics, immunosuppressant use, and medication allergy were tested, along with other high-risk medication classes, renal function, and frailty. Multivariable logistic regression analysis was used to refit the AIME model to the new data.
Results. A total of 3948 patients were included, with a median (IQR) age of 67 (28) years. The mean (SD) HFRS was 6.2 (+/-5.9). A total of 187 (4.7%) patients experienced one or more medication harm events, including bleeding and severe hypoglycaemia. The modified AIME model incorporated 5 of the original variables, including LOS, anti-psychotics, antiarrhythmics, anticoagulants and immunosuppressants, and 4 new variables: frailty, antibiotics, insulin and opioid use. The area under the curve was 0.79 (95% CI: 0.76-0.83), with sensitivity of 69% and specificity of 81%.
Discussion. Screening patients using the AIME model could identify those at high-risk of medication harm for timely review, and facilitate optimisation and individualization of prescribing in frail older adults.

1. Falconer N, et al. Development and validation of the Adverse Inpatient Medication Event model. BJCP 2021 2. Gilbert T, et al. Development and validation of a Hospital Frailty Risk Score. Lancet 2018

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Progesterone after mifepristone - pilot for efficacy and reproducibility (PAMper): A clinical study

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Introduction. After initiating a medical termination of pregnancy (MTOP) by taking mifepristone some women decide they want to continue their pregnancy instead and reverse the effects of the MTOP medication. There are published case studies of successful “abortion reversal” but evidence from clinical trials is lacking.

Aims. To assess the efficacy of progesterone (P_4) after mifepristone.

Methods. A single arm clinical trial was conducted. Women contacted the trial via an online form that provided information about continuing their pregnancy after initiating MTOP. Women consenting to participate were prescribed oral P_4 (400 mg twice a day for 3 days then at bedtime only for a further 16 days). The presence of a viable pregnancy was confirmed by ultrasound within 3 days of initiating MTOP and ≥2 weeks after commencing P_4. Field notes were made at each point of contact between participants and the trial clinician or clinical trial office.
Results. To date, 9 women have contacted the trial office; of these 6 proceeded to treatment. Participants were aged 22 to 33 years (mean 26±4.3); all but 1 were from a metropolitan area. MTOP had been used previously by 1 participant and 3 had had at least one previous pregnancy. P_4 was commenced between 6 and 35 hours of taking mifepristone. On day 3, all had a viable pregnancy and 5 (83%) had a viable pregnancy 2 weeks after starting P_4.
Discussion. P_4 taken orally within 35 hours of taking mifepristone resulted in 83% of pregnancies continuing. Sample sizes for exact single-stage phase II clinical trials are small and a response of 5/6 is considered adequate proof of efficacy to move to follow-on phase III trials monitoring for adverse events (1). The PAMper Trial has provided preliminary evidence for a safe option of care for women presenting with an urgent and significant clinical need.

(1) A'Hern, RP (2001) Sample size tables for exact single-stage phase II designs. Stat Med 20:859-86

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The use of gamification and incentives in mobile health apps to improve medication adherence: a systematic scoping review

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Background. Emerging healthcare strategies to address medication adherence include the use of direct-to-patient incentives or elements adapted from computer games. However, there is currently no published evidence synthesis on the use of gamification and/or financial incentives in mobile applications (apps) to improve medication adherence.
Objective: To explore the use of gamification and/or financial incentives in mobile apps to improve medication adherence. Methods. The following databases were searched for relevant articles published in English up to 24th of September 2020: Embase, MEDLINE, PsycINFO, CINAHL and Web of Science. Arksey and O'Malley's framework and the PRISMA-ScR checklist guided this systematic scoping review. Risk of bias tools were then applied to evaluate the quality of evidence. Using a systematic screening process, studies were included if incentives and/or game features were used in mobile apps to address medication adherence. Results. An initial 691 potentially relevant articles were retrieved. Through the systematic process, 11 studies were included in this review. Across the studies, gamification alone (n=9) was used more than financial incentives (n=1) alone or a combination of the two (n=1). There was great variability in the development of the apps and underpinning theories. Patient involvement and contributions were not commonly seen in predevelopment but were evident in evaluations of feasibility, acceptance and effectiveness. The studies generally reported improved or sustained optimal medication adherence outcomes with gamification and financial incentives; however, there were significant heterogeneity in the patient population, methodology such as outcome measures and reporting of these studies. Conclusions. To address medication adherence via gamified and incentivised mobile apps, an evidence-based co-design approach and agile methodology should be used during development. Further research in a generalised cohort of patients living with chronic conditions would facilitate the identification of barriers and potential opportunities for the use of gamification and financial incentives in mobile apps for medication adherence.

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Clinical interventions to improve adherence to urate-lowering therapy in patients with gout: a systematic review

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Introduction. Adherence to urate-lowering therapy (ULT) in patients with gout is often poor and a major contributor to suboptimal treatment outcomes. Several clinical interventions have been implemented to improve adherence however, it is currently unknown which are most effective in improving quantitative adherence measures.
Aim. To determine the impact and compare the effect of different types of clinical interventions on ULT adherence.
Methods. Studies that described clinical interventions with quantitative adherence measures as an endpoint were included. MEDLINE, Embase, CINAHL, Scopus, and Web of Science were searched. Intervention details, quantitative adherence measures, and clinical outcomes were extracted. Risk of bias was assessed.
Results. From 4721 records, 11 studies met the inclusion criteria. Pharmacist-, and nurse-led services were described, involving a mix of patient education, phone call and text reminders, and free blister packing. Quantitative adherence measures included patient self-reporting using a variety of questionnaires, and pharmacy dispensing data. Most studies were found to have a moderate to high risk of bias. Two out of 3 randomised studies reported improvement in adherence measures (intervention vs control arms); including a 13% increase in proportion of days covered (PDC) $\geq$ 0.8 (50% vs 37%, $p<0.001$) (Mikuls et al, 2019) and an 88% increase in achieving a high Medicine Taking Behaviour-Thai questionnaire score (88.1% vs 0%, $p=0.002$) (Bunphong & Narongroeknawin, 2018). Half (4/8) of the observational studies reported improved adherence (by 33-91%) from baseline based on a range of adherence measures.
Discussion. Clinical interventions were found to improve ULT adherence in some studies. There were no discernible differences between interventions on quantitative adherence measures and large heterogeneity in study designs.

Bunphong K & Narongroeknawin P (2018) Ann Rheum Dis 77:155
Mikuls TR et al (2019) Am J Med 132: 354-61

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Optimising adherence to allopurinol: gout patients' perspectives

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Introduction. Gout is the most common form of arthritis in men. Despite effective urate-lowering treatments such as allopurinol, management of gout remains suboptimal. Poor adherence to allopurinol is a key reason for suboptimal gout management, with research suggesting adherence to allopurinol is one of the lowest of any chronic condition.
Aims. To understand the opinions of patients with gout on the factors contributing to poor adherence to allopurinol, and their perspective on strategies, including technological interventions, to support adherence to allopurinol.
Methods. Semi-structured interviews with gout patients currently or previously taking allopurinol were conducted. Questions focused on participants' experiences taking allopurinol, factors affecting their allopurinol adherence, and their opinions on strategies to support their allopurinol medication taking. Interviews were transcribed verbatim and inductive thematic analysis was independently conducted by two researchers to identify emerging themes.
Results. Preliminary findings demonstrated that participants reported both intentional and non-intentional non-adherence to allopurinol. Forgetfulness, negative attitudes towards medication and limited feedback regarding the effectiveness of allopurinol were barriers to adherence. Having a regular medication-taking routine, motivation through the frequency of gout flares, and understanding gout and its treatments were facilitators of adherence. Participants identified the ability to self-monitor urate concentrations, gout management apps and medication reminders as helpful strategies to support them to take their allopurinol regularly.
Discussion. Forgetfulness, negative attitude towards medicines and lack of mechanisms of monitoring treatment response are key barriers to optimising adherence to allopurinol. Ability to self-monitor urate concentrations and digital platforms are potential strategies to overcome these barriers.

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Effect of self-monitoring urate on allopurinol adherence

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Introduction. Gout is a prevalent and debilitating disease with safe and effective therapies. Yet, it is still sub optimally managed. A significant barrier to optimal gout management is poor adherence to urate lowering therapies.
Aims. To determine the effect of self-monitoring urate on allopurinol adherence.

Methods. Participants over 18 years, diagnosed with gout, prescribed allopurinol, and not using a weekly medication planner, have been recruited. Participants were asked to self-monitor their urate concentrations, at least once a month, using a point-of-care device (*Humasens2.0plus).* Adherence to allopurinol is being measured as a proportion of days with correct dosing using electronic monitoring (*MEMS)*. Participants will be observed for 12-months. Feedback on their urate concentrations is being provided at monthly follow-ups. Adherence information is unavailable to participants during data collection.
Results. Participants (n=31) are predominantly male (94%), with a mean (SD) age of 58.6 (12.5) years, and a median (interquartile range) baseline allopurinol dose of 300 (150-300) mg daily. Preliminary data from 11 participants indicates a mean adherence to allopurinol of 87.8% (95% CI 79.3-96.4%) with a mean (SD) follow-up period of 52.3 (16.0) days. The mean baseline urate was 0.34 mmol/L (95% CI 0.30-0.37 mmol/L). The majority (67%) of participants have reported optimal urate concentrations (<0.36 mmol/L). Two gout flares have been reported.

Discussion. Self-monitoring of gout offers a patient-led approach to gout management and is anticipated to promote allopurinol adherence. The observed allopurinol adherence rates, at this early stage, are promising. The majority of gout patients are achieving target urate concentrations. The full observation period will allow us to assess the long-term efficacy of this novel intervention.

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The effectiveness of requiring an authorisation for a repeat prescription for four antibiotics as an antimicrobial stewardship intervention.

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Introduction. Antibiotic resistance (AR) is a global-public health threat. Inappropriate use of antibiotics accelerates the rise in AR, so antimicrobial stewardship (AMS) is needed to minimise this while still making antibiotics available when needed. Government policy change can be an AMS intervention. In Australia, the government subsidises the cost of medicines via the Pharmaceutical Benefits Scheme (PBS). From April 1st, 2020, Australian non-paediatric amoxycillin, amoxicillin–clavulanic acid, cefalexin and roxithromycin prescriptions require an authority endorsement to be eligible for a repeat under the PBS and Repatriation Pharmaceutical Benefits Scheme (RPBS).

Aims. This study aims to investigate if introducing an authority process to prescribe a repeat prescription for the four antibiotics results in an increase in appropriate use of the antibiotics, and therefore if it is an effective AMS intervention.

Methods. The project consisted of a retrospective, unmatched case-control study. A 10% random de-identified sample (n=345,018) of prescriptions for Australian non-paediatric amoxycillin, amoxicillin–clavulanic acid, cefalexin and roxithromycin that were prescribed and supplied in May, June, and July of 2019 and 2020 were obtained.
Results. A total of 345,018 prescriptions were prescribed and supplied in the 6 months. 219,960 prescriptions supplied in 2019, vs 125,058 prescriptions supplied in 2020. It was more likely that original prescriptions were dispensed ≤7 days after prescribed in 2020 compared to 2019, OR=1.75 (95%CI: 1.68, 1.82). It was also more likely that repeat prescriptions were dispensed ≤10 days after the original in 2020 compared to 2019, OR=1.56 (95%CI: 1.25, 1.96).
Discussion. The results show the policy change requiring authority for a repeat antibiotic prescription was associated with an increase in the appropriate use of the four antibiotics, and a reduction in the number of antibiotics used. The intervention occurred during the Covid-19 pandemic and lockdown in Australia which may have contributed to this outcome.

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Efficacy of estrogen replacement therapy on cognitive function in older women: a systematic review and meta-analysis

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Introduction. Use of estrogen-based hormone therapy to prevent cognitive impairment is controversial. Most hormone replacement contains estrogens and/or progestogens, with estradiol being the most commonly used estrogen.
Aims. To systematically review the evidence on the effects of estrogen replacement therapy on cognitive function in older women.

Methods. PubMed, Embase, Cochrane and EBSCO were systematically searched, up to March 2021, for randomised controlled trials comparing the effects of estrogen-only therapy and placebo on cognition. A random-effects meta-analysis model was used with standardised mean differences (SMD) and 95% confidence intervals (CI). Study heterogeneity, risk of bias and study quality were determined using the I^2 index, Cochrane risk of bias tool and Jadad scale, respectively.

Results. Fifteen clinical trials studying the effect of estradiol, with either oral or transdermal administration, were identified; 10 trials (726 women) were included in the meta-analysis. Estradiol significantly improved the cognitive domain of attention with SMD -0.52 (95%CI -1.0 to -0.03; P=0.04) when using the Stroop-colour, Stroop-interference and Trail-making tests. No significant differences were observed regarding verbal-, visual-, and semantic memory and global cognition.

Discussion. Estradiol therapy was found to improve attention in older women. Comparisons were difficult given the range of tools used to investigate cognition and the relatively small sample sizes in trials. The findings provide reassurance to women and practitioners that estradiol does not adversely affect cognitive domains.

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Evaluation of vancomycin dosing strategies in obese patients

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Introduction. Obesity can affect the volume of distribution and clearance of drugs. As vancomycin dosing decisions are based upon body weight and renal function, there is uncertainty whether current dosing strategies result in attainment of therapeutic targets (AUC_{24}/MIC 400-650) in obese individuals.
Aims. To (i) review vancomycin dosing guidelines in obesity and (ii) evaluate the influence of using different indices for body weight and renal function on attainment of therapeutic target attainment in obese individuals.
Methods. A review of vancomycin dosing guidelines worldwide was conducted. Dosing regimens were simulated, based on indices of body weight (total body weight, ideal body weight, and adjusted body weight) and renal function (creatinine clearance and eGFR), in a representative patient population using a population pharmacokinetic approach. The proportion of patients attaining target AUC_{24} was assessed across different BMI categories (BMI 18-24.9, 25-29.9, 30-34.9, 35-39.9 and ≥40 kg/m^2). Results. Vancomycin dosing guidelines for obese individuals are inconsistent and use varied descriptors of body weight and renal function. Loading doses using total body weight resulted in higher (48-61%) target attainment after 24 hours than alternate weight descriptors across all BMI categories. Target attainment for individuals with BMI ≥30, following maintenance doses, was 47-54% (<25% supratherapeutic) using adjusted body weight, 27-50% (34-70% supratherapeutic) using total body weight and 25-36% (54-73% subtherapeutic) using ideal body weight. Use of eGFR increased target attainment with less risk of toxicity than creatinine clearance. For individuals with BMI 18-29.9, 40-52% attained target exposure, irrespective of the weight descriptor used for maintenance dosing.
Discussion. Adjusted body weight may be more appropriate than total and ideal body weight to determine vancomycin maintenance doses for BMI ≥30. This research prompts further examination of vancomycin dosing strategies in obese patients and the need for evidence-based guidelines for this subpopulation.

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Restriction of sodium in people with chronic kidney disease treated with empagliflozin (RESPECT-EMPA): protocol of a randomised trial

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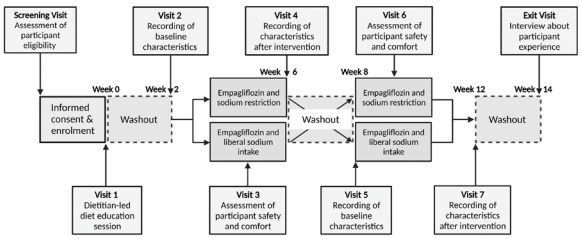

Introduction. Sodium-glucose cotransporter 2 (SGLT2) inhibitors and dietary sodium restriction are each known to have antihypertensive, renoprotective and cardioprotective effects in individuals with chronic kidney disease (CKD). However, the combined effect of the SGLT2 inhibitor, empagliflozin and dietary sodium restriction on 24-hour ambulatory blood pressure in people with CKD is not known.
Primary Aim. To examine the effect of empagliflozin and dietary sodium restriction, compared with empagliflozin alone during liberal sodium intake, on 24-hour ambulatory blood pressure in people with stage 1-4 CKD.
Methods. RESPECT-EMPA is an investigator-initiated prospective, single-centre, open-label, randomised crossover pilot study with a follow-up period of 14 weeks. A total of 30 participants will be recruited. Participants will be randomly assigned to either empagliflozin 10 mg daily with dietary sodium restriction (targeting 50 mmol of sodium per day) or empagliflozin 10 mg daily with liberal sodium intake for the first arm of the study. They will then cross over to the alternative sodium diet for the second arm, following a two-week washout period. Each treatment arm will last four weeks.

Discussion. It is hypothesised that in people with stage 1-4 CKD, the combination of empagliflozin and dietary sodium restriction will result in a greater reduction in mean 24-hour ambulatory systolic blood pressure than empagliflozin alone during liberal sodium intake. Results from RESPECT-EMPA will be used to inform larger randomised controlled trials.

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Prevalence of frailty among older inpatients with dementia and association with medication use: a retrospective cohort study

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Introduction. Frailty is an important geriatric syndrome that increases the risk of poor health outcomes in older adults such as those living with dementia. However, the prevalence of frailty and its relation to medication use in older inpatients with dementia remains unclear.
Aims. To describe the prevalence of frailty in older inpatient living with dementia and compare patterns of medication use accordingly. Method. We included patients with a documented diagnosis of dementia within the electronic medical record (eMR), aged ≥75 year and consecutively admitted to three hospitals in Sydney between 1 July 2016 to 1 February 2020. Frailty was measured using a 37-items Frailty Index (FI) and participants were considered frail if they scored >0.25 and non-frail for scores ≤ 0.25. Inappropriate medication use was defined as exposure to polypharmacy (≥ 5medications) and the use of at least one inappropriate medication according to the 2015 Beers Criteria. Statistical analysis for medication use was performed using the Chi Square test for categorical variables. Statistical significance was determined as $P<0.05$.
Results. On preliminary analysis, a total of 502 participants were included (mean age 85.9, SD 5.7) with 77.7% (n=390) classified as frail and 22.3% (n=112) non-frail. Polypharmacy was more prevalent in frail participants (83%) compared with non-frail (73.3%, $P<0.05$). The use of potentially inappropriate medications (PIMs) as defined by Beers criteria, was also more prevalent in frail participants (51.5%) compared to non-frail ones (37.5%, $P<0.05$). The most commonly prescribed PIMs in both groups were anti-depressant drugs (14.5% in frail, 8.9% in non-frail) and anti-psychotic drugs (14.5% in frail, 9.8% in non-frail). There was a statistically significant difference in the use of opioids between frail participants (9%) and non-frail ones (2.7%, $P<0.05$).
Discussion. Frailty is prevalent in older adults, especially hospitalised older adults living with dementia. Participants with concurrent dementia and frailty diagnoses, appear to experience higher exposure to polypharmacy and PIMs compared to their non-frail counterparts. Future studies should aim to establish the clinical impact of inappropriate medication use and polypharmacy in this population and subsequently design interventions to improve this aspect of patient's care.

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Does one size fit all? Evaluation of piperacillin dosing regimens using a population pharmacokinetic approach.

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Introduction. Piperacillin displays a high level of pharmacokinetic inter-individual variability; this variability can result in sub-therapeutic drug exposure and treatment failure when standard doses (4g, via 30min IV infusion, every 6-12h, depending on renal function) are given. Piperacillin's bactericidal action is time dependant, the optimal target is a free piperacillin concentration greater than the minimum inhibitory concentration (MIC) for 100% of the dosing interval (100% fT>MIC).
Aims. To characterise the pharmacokinetics of piperacillin in a diverse hospital cohort using a population pharmacokinetic approach and conduct simulations to assess the ability of standard and alternate dosing regimens to attain targets.
Methods. Demographic, biochemistry and piperacillin dosing and concentration patient data (n=342 patients) was extracted from hospital databases. Phoenix NLME® modelling software was used for population pharmacokinetic analysis. Monte Carlo simulations were conducted using R to determine probability of target attainment (free piperacillin above 16mg/L) for various dosing scenarios (e.g. standard doses, increased doses, extended infusions).
Results. Separate one compartment models were developed for general patients (Vd= 20.8L, CL= 8.9L/h) and critically ill patients (Vd= 32.7L, CL= 10.1L/h), with creatinine clearance and albumin identified as important covariates. Standard dosing commonly resulted in sub-therapeutic exposure (49% target attainment), particularly for patients with normal or augmented renal function. Whilst doubling the dose modestly improved attainment of efficacy targets (70% target attainment), this was associated with an increased risk of toxicity. Extended infusion regimens with doses calculated based on creatinine clearance provided good efficacy target attainment (99% target attainment) without compromising toxicity risk.

Discussion. This study indicates that standard dosing of piperacillin may be suboptimal. The use of a dosing strategy individualised for renal function, combined with extended infusions may improve target attainment.

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Swallowing safety of oral liquid medications: assessment using the International Dysphagia Diet Standardization Initiative (IDDSI) framework

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Introduction. Consuming fluids with the right thickness and texture properties is vital for patients with dysphagia. Fluids with an inappropriate thickness might expose patients to serious health consequences. A fluid that is too thin may cause aspiration, while over-thickened fluids increase the risk of post-deglutition oropharyngeal residue and choking. The International Dysphagia Diet Standardization Initiative (IDDSI) classifies nutritional products on a continuum of 8 levels (0–7) in which drinks are described by levels 0–4 and foods are levels 3–7.
Aims. This study aimed to assess commercially available oral liquid medications in terms of thickness and textural suitability according to the IDDSI framework.
Methods. 120 liquid medications designed for oral use were assessed using the IDDSI Flow test and Fork Drip test.
Results. There were oral liquid medications that classified as level 0 (thin, like water), level 1 (slightly thick) and level 2 (mildly thick). A small number of products, primarily suspensions containing xanthan gum, flowed too slowly to be level 2 according to the IDDSI Flow test but ran straight through the prongs of a fork so did not behave as required to be level 3; these were classified as '<3', an extra category that we have described previously (Malouh et al, 2020).

Discussion. Formulations described as solutions, elixirs, syrup, suspension on the packaging were found to occur in IDDSI levels 0, 1, 2 and <3, and so does not provide a clue as to the likely thickness. The IDDSI classifications determined in this project will be included within the 4th edition of Don't Rush to Crush by SHPA.

IDDSI (2019) Complete IDDSI Framework (Detailed Definitions). Available from: https://iddsi.org/Framework
Malouh et al (2020) Pharmaceutics 12, 924; https://doi.org/10.3390/pharmaceutics12100924
SHPA (2022) Don't Rush to Crush – 4th Edition. Will be available from: https://www.shpa.org.au/

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Evaluation approaches, tools and aspects of implementation used in pharmacist interventions in residential aged care facilities: A scoping review

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Introduction. The medication expertise of pharmacists is widely acknowledged and there is ongoing interest in their potential role to reduce medication-related harm amongst residents living in residential aged care facilities (RACFs). An increased understanding of how the implementation of these interventions is evaluated could support adoption of these interventions.
Aims. To systematically explore the application of evaluation approaches, evaluation tools and aspects of implementation (implementation factors i.e. barriers and facilitators, and assessing implementation fidelity) used in pharmacist interventions in the RACF peer-reviewed literature.
Methods. A search strategy was applied to MEDLINE, CINAHL, Cochrane Library and Web of Science databases for publications between 1 January 2000 and 27 August 2020 based on defined inclusion and exclusion criteria. Articles that reported on evaluated pharmacist interventions impacting residents in RACFs were included.
Results. 2003 published articles were identified, out of which 57 articles met the inclusion criteria. Fifty-three articles (93%) reported on outcome evaluations. Four articles (7%) used evaluation guidance with 1 article (2%) explicitly guided by an evaluation framework. Relationships, trust and respect between pharmacists and RACF health care team members were the most reported factor influencing intervention implementation. None of the 57 articles used a theory or model, assessed implementation fidelity or employed a logic model to evaluate the implementation of a pharmacist RACF intervention.

Discussion. To date there appears to be sparse utilisation of available evaluation approaches, evaluation tools and implementation aspects in pharmacist interventions in the RACF peer-reviewed literature. An opportunity exists for pharmacy practice researchers to leverage available evaluation approaches, evaluation tools and aspects of implementation to improve the evaluation quality of their interventions and thereby support adoption of pharmacist interventions in RACFs.

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Preventing adverse drug reactions after discharge: protocol for a randomised controlled trial in older people

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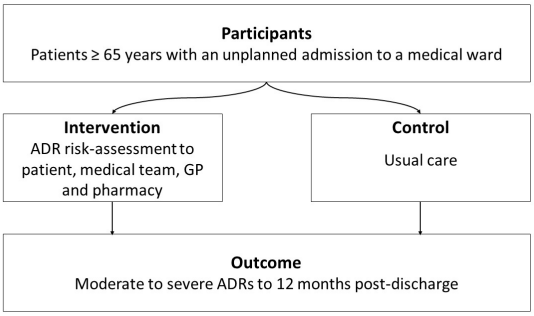
Introduction. Adverse drug reactions (ADRs) in older people are common following hospital discharge. Effective interventions are required to combat the burden of ADRs. The Prediction of Hospitalisation due to Adverse Drug Reactions in Elderly Community Dwelling Patients (PADR-EC) score is a validated risk score developed to assess the risk of ADRs in people aged 65 years and older and can be utilised as part of an intervention to reduce ADRs.



Aims. To investigate the effectiveness of an intervention to reduce ADR incidence in older people after hospitalisation.
Methods. An open-label randomised controlled trial is being conducted at the public 500-bed Royal Hobart Hospital, Tasmania, Australia. Following admission, the PADR-EC score for ADR risk will be calculated, communicated to hospital clinicians and discussed with patients. Following discharge, nominated general practitioners and community pharmacists will receive the risk score and bespoke pharmacist-developed interpretation of the score to guide ongoing patient care. ADRs will be identified through hospital readmissions along with patient and general practitioner contact to 12 months post-discharge. The primary outcome is the incidence rate of moderate-severe ADRs that requires hospital treatment, change in therapy or specific treatment at 12 months post-discharge.
Discussion. It is hypothesised that the trial will reduce ADRs in the intervention population.

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Comparison of inappropriate polypharmacy in older adults with and without dementia in residential aged care facilities

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Introduction. Older adults living in residential aged care facilities (RACFs) are at an increased risk of inappropriate polypharmacy. There is a lack of data as to whether a diagnosis of dementia may have an impact on the likelihood of inappropriate polypharmacy use in RACFs.
Aims. To compare in residents with and without dementia the: 1) prevalence of polypharmacy (5 or more medications); and 2) prevalence of potentially inappropriate medications (PIMs).
Methods. A retrospective analysis was performed using data of 16,261 residents living in 343 Australian RACFs, who had a medication review during 1st January and 1st December 2019. Dementia was confirmed with ICD-10. Data on medication use at the time of medication review was extracted from residents' medical records. Descriptive analyses were conducted to report resident demographics, and the prevalence of polypharmacy and PIMs (using the 2019 Beers Criteria). Paired t-test were used to compare differences in polypharmacy and PIMs in residents with or without dementia. Logistic regression tested associations with dementia diagnosis and medication use.
Results. Among 16,261 residents, 41.7% (n = 6781) had dementia and the median age was 86.0 (IQR 80.0 - 91.0). Residents with dementia were more likely to have polypharmacy compared to residents without dementia (96.1% prevalence, odds ratio [OR]: 3.64; Confidence interval [CI]: 3.16 - 4.18, ($p<0.001$). Exposure to one or more PIMs was more likely in residents with dementia compared to without dementia (83.1% prevalence, OR 1.84; CI 1.70 - 1.99), $p<0.001$). Most frequent PIMs used overall were anti-psychotics, anxiolytics, hypnotic/sedatives, and anti-depressants. Residents with dementia were more likely to be exposed to PIM use of anti-psychotics (OR:3.2; CI:2.9-3.4, $p<0.01$) and anxiolytics (OR:2.1; CI:2.0-2.3, $p<0.01$) than residents without dementia.
Conclusion. Residents with dementia frequently receive polypharmacy and PIMs, and those who do are more likely to receive PIM anti-psychotics and anxiolytics. These results highlight the need to optimise medications in older adults with dementia living in RACFs.

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The FRAIL-NH scale: Systematic review of the use, validity and adaptations for frailty screening in nursing homes

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Introduction. Currently, there is no international gold standard for frailty screening in nursing homes (NHs). Most existing tools were developed for community use. FRAIL-NH is a 7-item screening tool specifically designed for NHs.
Aims. To investigate frailty prevalence, cross-sectional associations, predictive validity, concurrent validity, and cross-cultural adaptations of the FRAIL-NH scale.
Methods. MEDLINE, EMBASE, CINAHL, and Cochrane Library were searched from January 2015 to June 2021 for primary studies that used the FRAIL-NH, irrespective of study designs and publication language. Results. Overall, 40 studies conducted across 20 countries utilized the FRAIL-NH scale; majority in Australia (n=14), followed by China (n=6), and Spain (n=3). The scale has been translated and back-translated into Brazilian Portuguese, Chinese, and Japanese. Various cut-offs have been used, with ≥2 and ≥6 being the most common cut-offs for frail and most frail, respectively. When defined using these cut-offs, frailty prevalence varied from 15.1-79.5% (frail) to 28.5-75.0% (most frail). FRAIL-NH predicted falls (n=2), hospitalization or length of stay (n=4), functional or cognitive decline (n=4), and mortality (n=9) over a median follow-up of 12 months. FRAIL-NH has been compared to 16 other scales, and was correlated with Fried's phenotype (FP), Frailty Index (FI), and FI-Lab. Four studies reported fair-to-moderate agreements between FRAIL-NH and FI, FP, and the Comprehensive Geriatric Assessment. Ten studies assessed the sensitivity and specificity of different FRAIL-NH cut-offs, with ≥8 having the highest sensitivity (94.1%) and specificity (82.8%) for classifying residents as frail based on FI, while two studies reported an optimal cut-off of ≥2 based on FI and FP, respectively. Discussion. In seven years, the FRAIL-NH scale has been applied in 20 countries and adapted into three languages. Despite being applied with a range of cut-offs, FRAIL-NH was associated with higher care needs and demonstrated good agreement with other well-established but more complex scales. FRAIL-NH was predictive of adverse outcomes across different settings, highlighting its value in guiding care for frail residents in NHs.

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Scoping Review of Studies Evaluating Frailty and Its Association with Medication Harm

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Background. Frailty and medication harm are major health challenges associated with poor health outcomes such as hospitalisation and death. Frail individuals are known to suffer from multiple comorbidities, and polypharmacy. Whilst a relationship between polypharmacy and frailty has been demonstrated, it is not clear if there is a relationship between frailty and medication harm. Aim. To identify and critically appraise studies evaluating medication harm in patients with frailty.
Methods. Databases (PubMed, EMBASE, CINAHL and Cochrane) searched using key terms synonymous with frailty and medication harm. To meet inclusion, studies must have identified medication harm as a primary or secondary outcome measure and used a frailty assessment tool to determine frailty. Data were narratively synthesised and presented in tables. The Quality Assessment Tool for Observational Cohort & Cross-Sectional Studies checklist was used to assess quality and bias.
Results. Of 2,685 retrieved abstracts, 24 underwent full text review and nine studies were included. Three studies were retrospective and six were prospective in design. Six studies comprised distinct groups of frail and non-frail individuals, and three studies evaluated medication harm in an entirely frail population. Three studies used validated frailty tools such as Clinical Frailty Scale, Fried Frailty Index, and Fried Frailty Phenotype, while six measured frailty though self-definition. Overall frail individuals were at risk of medication harm with rates ranging between 18.7% to 77% but whether frailty is a predictor of medication harm independent of polypharmacy remains unclear. The risk of bias assessment identified low methodological quality and reporting bias in all nine studies.

Discussion. There are very few high quality studies which describe a relationship between medication harm and frailty and none that identify frailty as an independent predictor.

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Pharmacist's interventions to reduce the occurrence of drug-related harms in older residents: A systematic review

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Introduction. In residential aged care facilities (RACFs), there is little evidence concerning pharmacist interventions to prevent adverse drug events (ADEs) .
Aims. This study aimed to investigate the effectiveness of pharmacist's interventions to reduce ADEs in older people permanently living in RACFs.
Methods. We performed a systematic search of MEDLINE via PubMed, Embase, Cochrane Central Register of Controlled Trials, and PsycINFO from the start to July 2020. We investigated pharmacist-led study designs that used a control group, or before and after studies conducted in RACFs.
Results. We found 23 studies from 3826 records. There were 7 single-component and 16 multicomponent pharmacist-led interventions aiming to reduce ADEs in older residents. The most frequent single-component pharmacist-led intervention was medication review. Medication review and the provision of education to healthcare professionals were the most common elements in many pharmacist-led multicomponent interventions. Ten studies (43%) reported substantial reductions in ADEs following pharmacist's interventions either as a single intervention or as a part of a multicomponent intervention. Many interventions were designed to reduce falls (39%).
Discussion. The review shows that pharmacist's interventions can reduce the occurrence of ADEs in RACFs. Medication review and educational programs, such as academic detailing, either as a single component or a part of multicomponent interventions, were the most common methods employed to reduce drug-related harm in older residents of RACFs. The lack of a positive association between interventions and ADEs in some studies suggests that targeted and customised pharmacist's interventions are required to reduce drug-related harm in older residents.

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National roll-out: The Goal-directed Medication review Electronic Decision Support System (G-MEDSS)© in practice

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Introduction. The Goal-directed Medication review Electronic Decision Support System (G-MEDSS)© provides guidance for healthcare practitioners conducting 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© and the revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire.
Aims. 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 implementation study.
Methods. Prospective cross-sectional evaluation (period: 1st May 2020 – 31st May 2021). The study was advertised to registered medical practitioners and pharmacists through relevant professional organisations. 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 129 participants (115 pharmacists and 14 medical practitioners) registered to use G-MEDSS, with most participants from NSW (n=35, 27%). These participants used G-MEDSS for 95 patients (mean age(SD) 76.8 (11.3)), predominately during medication reviews in the home (n=60,63%) and residential care (n=27,28%). Participants used the GCMT, DBI Calculator and rPATD for n=28 (29%), n=90 (95%), and n=23 (24%) of patients, respectively. The most common goal reported by patients was "optimising quality of life" (n=23, 36.5%). The mean(SD) DBI score for patients was 1.41(1.1) and the mean(SD) number of medications per patient was 10.0(4.1). The 793 medication recommendations made by clinicians who used G-MEDSS consisted of 413 (52%) for no change, 190 (24%) to continue the medication as clinically indicated, 181 (23%) to deprescribe the medication and 9 (1%) to increase the dose. The proportion of patients who said that they would be willing to have a medication deprescribed if their doctor recommended it was 82.6% (n=19).

Discussion. G-MEDSS is being used within clinical practice primarily by pharmacists to support medication review in the home. Further qualitative studies will determine the barriers and enablers to wider use.

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How useful are drug-drug interaction alerts? An interview study with Australian hospital prescribers

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Introduction. Drug-drug interaction (DDI) alerts have been integrated into Australian hospital electronic medication management systems as a strategy to prevent medication errors and reduce patient harm. Although these alerts are believed to facilitate and improve prescriber behaviour, research suggests that up to 90% of DDI alerts are overridden by prescribers in practice (Weingart et al, 2003).
Aims. This study aims to identify the barriers and facilitators to the optimal use of DDI alerts and explore the experiences and perceptions of Australian hospital prescribers towards these alerts.
Methods. Semi-structured interviews were conducted at two hospital sites and participants were recruited using a snowball sampling approach. Prescribers were asked if DDI alerts were useful, how DDI alerts impacted prescriber workflow or decision-making and suggestions to improve DDI alerts. Interviews are audio-recorded and transcribed, and interview data analysed using qualitative content analysis and coded independently by three researchers to reach a consensus on the main themes identified.
Results. Although alerts were perceived to be useful in theory, prescribers identified several areas where DDI alerts could be improved, particularly in alert design. DDI alerts were reported to have a mixed impact on patient safety and prescriber workflow, with users identifying particular contexts where DDI alerts might be useful (e.g. complex polypharmacy patients and high risk interactions) and other contexts where alerts were not (e.g. prescribers receiving alerts for drug combinations commonly used in practice).
Discussion. The implementation of DDI alerts in hospital electronic medication management systems is important to help prescribers prevent medication errors. However, these alerts are also associated with many risks, such as alert fatigue. Significant work is needed to tailor DDI alerts to the needs and preferences of prescribers. This way, we can optimise alert usability and effectiveness, as well as improve medication safety and patient outcomes overall.

Weingart, S. N. et al (2003). Arch Int Med, 163(21), 2625–2631.

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Medication management during Ramadan: a cross-sectional study

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Introduction. Many Muslims fast during the Islamic month of Ramadan which may impact their medication taking routines. There is a paucity of Australian literature investigating medication taking practices of Muslim patients during Ramadan.
Aims. To describe the medication-related experiences of Muslim patients and whether they alter their medication regimen due to fasting during Ramadan.

Methods. A mixed-methods, cross-sectional observational study was undertaken of Muslim patients admitted to a tertiary-referral Melbourne hospital in the 10 weeks prior to or during Ramadan 2021. Adult patients admitted for ≥24 hours and taking ≥1 medications were interviewed via telephone or face-to-face.
Results. Overall, 103 patients were included; mean age 53.3±18.3 years, 54 (52.4%) were male and the median number of regular medications taken was six. Eighty-one (78.6%) patients were born overseas and 32 (31.1%) interviews were conducted in a language other than English. Forty-nine (47.6%) patients reported fasting during Ramadan 2021. Of these patients, 41 (83.7%) altered how they took at least one of their regular medications due to fasting and of these, 28 (68.3%) did so without input from healthcare professionals. Ten (9.7%) patients reported medication-related adverse events associated with fasting. Themes identified from qualitative data included interpretation of Ramadan practices and what constitutes breaking the fast, perceptions of healthcare professionals as advocating or hindering fasting and self-adjusting medications/lifestyle to facilitate fasting.
Discussion. Altering medications to facilitate fasting during Ramadan is common practice and some patients experience medication-related adverse events. It is imperative that healthcare professionals partner with their Muslim patients to optimise health outcomes.

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Development and utilisation of clinician guides for deprescribing decisions and communication for older inpatients

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Introduction. Implementing deprescribing (supervised withdrawal of inappropriate medicines) guidelines in hospital requires evidence on the efficacy and safety of deprescribing, advice for complex decisions, communicating decisions between clinicians and patients, increased clinicians' skills and prioritised time for deprescribing in routine care.
Aims. To iteratively develop and evaluate the usability and utilisation of deprescribing guides to support multidisciplinary clinicians to reduce inappropriate polypharmacy in older hospitalised patients. Methods. A novel mixed-methods, iterative process was applied to develop nine deprescribing guides for medication classes with high risk of harm in hospitalised older people (Duong et al, 2021). This included content development through review of relevant literature; a modified Delphi approach; and usability testing with 16 multi-disciplinary hospital clinicians by observations, semi-structured interviews, and the system usability scale (SUS). Utilisation was evaluated with Google analytics between July 2020 to September 2021. From March 2021, deprescribing guides were integrated in a multi-component electronic intervention in two services in one urban Sydney hospital. Results. Deprescribing information aligned with hospital clinician workflows in multidisciplinary teams. Guides supported application of the evidence to the individual patient and decision-making communication between health providers or with patients/carers using "preferred language". The total SUS score was 80.6 ± 2.0, indicating excellent usability. The website had 1131 views from 960 unique users. The guides were downloaded 343 times (36%) by 316 unique users (39%). The benzodiazepine deprescribing guide was most frequently accessed (n=71, 20.7%). Discussion. Utilisation was low for user tested deprescribing guides implemented in an integrated multi-component electronic intervention. Further dissemination and integration with existing eMR resources will likely increase uptake.
Duong M et al (2021) Drugs and Aging 38:75-87

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Development of a Patient Decision Aid for deprescribing cholinesterase inhibitors

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Introduction: Engaging consumers (people living with dementia and their carers) in the shared decision-making process with their healthcare professional is an essential element of providing patient-centred care. Decision aids are tools that can facilitate shared decision-making and produce treatment decisions that align with the consumer's goals and preferences. Aim: To develop a Decision Aid for deprescribing or continuing cholinesterase inhibitors (ChEIs). This is designed to complement an evidence-based deprescribing guideline for ChEIs and memantine, which includes an algorithm to help clinicians deprescribe these medications appropriately. Methods: We employed a systematic, iterative process and the International Patient Decision Aids Standards to develop Patient Decision Aids. Development involved defining the purpose, scope and target audience, and assembling a steering group to review the prototype draft's content and format. It also involved conducting one-on-one interviews with healthcare professionals and consumers. Discussion: A steering group composed of clinicians and consumer representatives was assembled. The group reviewed the prototype and changes were made for further testing. One-on-one interviews were conducted with 3 healthcare professionals (General Practitioners) and 7 consumers (one person living with dementia and 6 carers). The research team synthesised the findings to complete two rounds of modification. Iterative changes to improve the content, format and structure of the decision aid were made. The main changes included rewording of the purpose of the decision aid and simplifying the layout and format. Overall, participants reported that the decision aid is comprehensible and may be useful in clinical practice. Further research will evaluate this tool in clinical practice. The use of such a tool may encourage shared decision-making to continue or stop ChEIs.

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Enhancing knowledge and skills in urban, regional and remote community pharmacies for delivery of asthma care.

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Introduction. Upskilling the pharmacist workforce regarding asthma has been shown to have a significant impact on the clinical trajectory of patients with asthma. Historically, specialized asthma education was delivered in face-to-face seminars, which were logistically challenging and costly, particularly for participants in rural or remote areas. Online alternatives were unable to address the need for physical skills assessments required for asthma device competency. Aim. This study describes the development and evaluation of a multi-mode education program aiming to enhance both pharmacists' clinical knowledge and practical skills. Methods. The education program comprised five evidence-based education modules delivered online and a skills review conducted either in-person with real-time feedback (metropolitan pharmacists) or via video upload and scheduled video-conference feedback (regional and remote pharmacists). A mixed methods approach was used to obtain feedback from pharmacists and evaluate the content, efficacy, and applicability of the education. Results. Ninety-seven pharmacists opted into the program and successfully completed all education requirements. Quantitative feedback was collected from 26 pharmacists upon completion of their online education modules. Qualitative feedback was obtained from 48 pharmacists upon completion of the trial. The evaluation demonstrated that the education program was well received by pharmacists, offered flexibility in learning and assessment, enhanced knowledge and supported practical skill development. Discussion. This innovative model of education can cost effectively upskill pharmacists in rural and remote regions and may be more broadly implemented in international collaborative trials. Serhal S, et al. A Novel Multi-Mode Education Program to Enhance Asthma Care By Pharmacists. Am J Pharm Educ. 2021 Aug 16:8633. doi: 10.5688/ajpe8633. Epub ahead of print. PMID: 34400397.

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Development of a client-centered mental health medication information session: evaluation and pilot.

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Introduction. Recent findings suggest that many mental health consumers do not have sufficient medication knowledge. In Australia, doctors and pharmacists play a central role in providing medication counselling. However, the often-busy work environment in medical practices and pharmacies can hinder the provision of regular comprehensive medication counselling, with the issue being further compounded by the coronavirus pandemic. Future initiatives should consider the delivery of additional medication education by health professionals such as pharmacists in an alternative community setting, for example in a not-for-profit (NPO) community-managed specialist mental health organization. Aim. To evaluate a client centered medication information session for mental health consumers and pilot the information session at a NPO. Methods. Identified gaps in knowledge from our previous findings were reviewed and a medication counselling session was designed. The proposed session content was reviewed by three groups of pharmacists: hospital pharmacists specialising in mental health (n=5), community pharmacists (n=5) and hospital pharmacists with a generalist health focus (n=3). The final information session titled *'My Mind, My Health'* was piloted at a NPO with mental health consumers (n = 9) and delivered by the pharmacist researcher (TB). Results. The *'My Mind, My Health'* information session focuses on common psychotropic agents and their modes of action, common medication-related adverse effects and their management, where to source reliable information and the role of community pharmacists in supporting mental health consumers. The information session was well received by consumers. In particular, participants reported having an improved understanding of pharmacists' roles and as a result expressed their desire to establish a therapeutic relationship with their local community pharmacists. Discussion. This translational study was able to evaluate and pilot a client-centered mental health information. Additionally, the study demonstrated the feasibility of conducting additional medication counselling in an alternative community setting. This may be a viable solution in addressing the current gap in medication knowledge reported by mental health consumers.

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A Scoping Review of Global Trends of Assessment in Pharmacy Education

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Introduction. Pharmacy curricula employ competency-based education derived from the professional role of the pharmacist in society, which is ever-evolving. Thus, as the role of the pharmacist expands, methods for assessing pharmacy students' competence become inadequate for the new skills expected of them and new assessment methods need to be developed.
Aims. To investigate assessment methods in pharmacy education used globally in the past decade, as well as changes and trends of assessments, and their outcomes, to inform future development of pharmacy curricula assessment.
Methods. Following the PRISMA-ScR guidelines, Medline, Embase, IPA, ERIC, and Scopus were systematically searched for English language articles focused on assessment in pharmacy education, published between January 2011 and March 2021. Results were grouped thematically as either traditional, performance, or workplace-based assessments and mapped to Miller's Prism of Clinical Competence framework for further analysis.

Results. The search yielded 36 articles, with 9 manuscript describing traditional assessments, 23 performance-based assessments, and 4 describing workplace assessments. Assessment methods have become increasingly reflective of real-world pharmacy practice. Changes in assessment methodology reflected the shift towards patient-centred care. Case-based and more complex traditional assessments, such as written and oral examinations, required students to apply knowledge and exhibit higher order thinking. An abundance of literature exploring performance assessments such as simulations and OSCEs indicated their efficacy in assessment of pharmacy competencies. Workplace assessment was made more robust through objective entrustable professional activity (EPA) scales, and self-reflection, allowing students to gain deeper understandings of their capabilities in the workplace. Digitisation was observed throughout all assessment types, increasing utility of assessments for both students and faculty.

Discussion. Overall, innovations in assessment have led to greater authenticity of assessment allowing for more meaningful evaluation of students performance of relevant tasks in realistic environments. Digitisation of assessment has generated useful assessment data for educators and feedback for students as well as increased authenticity, overall improving the utility of assessments in pharmacy education.

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Teaching associates' and students' perspectives of online learning in a pharmaceutical science degree

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Introduction. COVID-19 restrictions have forced instructors to quickly adapt to the online environment by familiarising themselves with various strategies for teaching online.

Aims. To identify approaches that led to successful and supportive learning experiences by analysing teaching associates' (TA) and students' perspectives of online learning.

Methods. Seven semi-structured interviews with TAs and surveys of 118 students from the Bachelor of Pharmaceutical Science (Monash University) degree were analysed quantitatively and qualitatively using the thematic analysis abductive approach.

Results. The results show that a well-outlined course structure, regular interaction with their instructors, and small synchronous Zoom workshops were effective approaches that contributed to students' learning. However, discussion forums and non-timetabled recorded lectures were perceived as less effective. Areas for improvement were also revealed, such as promoting camera use during class and expanding training for online facilitators.

Conclusion. After implementing strategies to address the less effective online teaching approaches, future studies to again examine TA's and students' perspectives of online learning would be necessary as part of an iterative improvement cycle, and could be expanded to determine whether the improvements in online teaching approaches have enhanced student learning.

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Guidance on the conduct of clinical research during the COVID-19 pandemic

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Introduction. The World Health Organisation declared the Coronavirus Disease 2019 (COVID-19) pandemic in March 2020 and since then the introduction of safety measures, including physical distancing and isolation, have disrupted the conduct of clinical research. As a result, member countries of the Organisation for Economic Co-operation and Development (OECD) have released guidance on how to conduct clinical research during the pandemic.
Aim. To identify, synthesise and analyse guidance issued by OECD member countries relating to the conduct of clinical research during the COVID-19 pandemic. Methods. A systematic search of four databases PubMed, Embase, MEDLINE, and Trip, the Guidelines International Network registry (G-I-N), as well as Google was conducted in April 2021 to identify guidance available in English from each member country of the OECD since January 1st 2020. A search strategy consisting of the keywords and MeSH terms relating to *'COVID-19'*, *'clinical research'* and *'guidance'* was adjusted for each of the 37 OECD member countries. Data extraction focused on nine aspects of research conduct during the COVID-19 pandemic, including monitoring, risk-benefit assessments, symptom screening, continuity of trials, recruitment, remote source data verification, delivery of investigational medicinal product (IMP), use of information technology and informed consent.
Results. Following citation searching, deduplication, title and full-text screening of the 9419 potentially relevant publications retrieved through the systematic search, 46 publications from 27 OECD countries were included in this systematic review. Guidance differed by the date it was published and the breadth of topics endorsed and discouraged in regards to the nine extracted data categories. Guidance relied on two principal resources and no included guidance advised on the use of personal protective equipment (PPE). Discussion. Early guidance was not as comprehensive and could be attributed to the uncertain nature of the pandemic and the lack of resources available to provide recommendations of great scope. As publications relied on two main resources, the accuracy of each country's guidance is challenged since each country has been affected to disparate extents by the pandemic. More efficient research methods such as delivering IMP's and telehealth technology can be used prospectively and future research exploring guidance from countries not a part of the OECD is warranted.

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A faculty approach for creating an inclusive and connected community campus environment for international students during the COVID-19 pandemic

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Introduction. The ongoing nature of the COVID-19 pandemic and remote online learning has created challenges that significantly affect the well-being, social support, and self-esteem of all university students. It is particularly challenging for international students who experience language and cultural differences, loneliness due to being separated from peers, friends and family, financial hardships and education system differences [1]. Academic staff, given their educational perspective, present a unique way to foster connection with international students. Aims. To develop and implement an inclusive faculty community environment for international students at Monash's Faculty of Pharmacy and Pharmaceutical Sciences (FPPS) through an academic-led student engagement program. Methods. The program was designed to include a series of international student engagement activities, a quarterly newsletter and a central email as a unique port of call for academic support. The program focused on providing support through three key areas: 1) communication; 2) social and networking and; 3) wellbeing activities. Results. A series of engagement and networking activities focused on skill development, social interaction and support were designed and implemented. These included 'Studying virtually' and several 'Communication-focused' events that were driven by student interest. A 'Speed Networking' event where a personality test as a conversation starter was used to facilitate social interaction and networking. Regular informal check-in sessions were held in the form of 'Pop-in Cuppa' sessions. A sense of community was further established by the launch of a quarterly newsletter featuring international students from the campus, upcoming events and Australian-themed competitions. Discussion. Our program was designed to foster a sense of inclusive campus community with an impact on the well-being of international students. This program was also timely given the challenges and isolation brought on by the COVID-19 pandemic. While engagement in activities varied, feedback was overwhelmingly positive thereby validating that an academic-led student engagement program can create a welcoming environment in which international students feel connected, safe, and experience a sense of belonging.
1. Barker, M., et al., Difficulties of overseas students in social and academic situations. AJP, 1991. 43(2): p. 79-84.

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Can pharmacists support athletes? Exploring the knowledge, role and responsibilities of pharmacists in assisting prevention of the unintentional use of prohibited substances by athletes

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Introduction. Following establishment of the World Anti-Doping Agency in 1999, the International Pharmacy Federation (FIP) published guidelines – The Role of the Pharmacist in the Fight against Doping in Sport (2014) – intended for implementation into national standards of practice, to clarify pharmacists' roles and responsibilities in supporting athletes. Despite seven years since publication of these guidelines, the extent of practice into and knowledge regarding sport pharmacy is little known.
Aim. To investigate the literature to ascertain knowledge held by pharmacists and pharmacy students regarding antidoping, and current/potential roles and responsibilities for pharmacists in assisting athletes.
Method. A scoping review of the literature was undertaken. We searched five databases utilising terms such as '*athlete*', '*performance-enhancing*' and '*pharmacist*'. Relevant articles published since the 1999 establishment of WADA were searched for findings such as knowledge held, roles described, and responsibilities of pharmacists.
Results**.** The search identified 16 research studies from Australia, Europe and the middle east, North America and Asia outlining knowledge, as well as roles and responsibilities of pharmacists in assisting athletes. Pharmacists reportedly had limited knowledge of antidoping organisations and whether a substance was prohibited for use by athletes. Roles identified included counselling, education, advice about prohibited substances and dispensing. Responsibilities included medication review and assisting athletes to avoid unintentional ingestion of prohibited substances.

Discussion**.** Pharmacists, by training, can play a role in providing accurate medication-related information to athletes to avoid unintentional ingestion of prohibited substances. Key barriers identified were pharmacists' lack of knowledge and the absence of guidelines articulating specific roles and responsibilities for pharmacists, highlighting the need for professional educational programs and inclusion of specific responsibilities in national guidelines.

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Pharmacists' and pharmacy technicians' scopes of practice in the management of minor ailments in Indonesian community pharmacies: a cross-sectional study

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Introduction. There has been limited research in Indonesia regarding pharmacists' and pharmacy technicians' scopes of practice to deliver minor ailments management services in community pharmacies.
Aims. To evaluate pharmacists' and pharmacy technicians' understanding of their scopes of practice, perceived competency and factors influencing the delivery of minor ailments services in Indonesian community pharmacies.
Methods. Cross-sectional paper-based surveys were conducted during January-February 2020 of pharmacists and pharmacy technicians attending seminars conducted separately by the Indonesian Pharmacists Associations (IAI) and Indonesian Pharmacy Technicians Associations (PAFI) in Central Java, Indonesia. Percentage of common responses (PCR) described similarity levels of perceived scopes of practice for pharmacists and pharmacy technicians. Univariate and multivariate analyses evaluated factors influencing perceived scopes of practice.
Results. 185 pharmacists (response rate of 81.5%) and 142 pharmacy technicians (response rate of 67.3%) participated. Of 34 minor ailments, 11 showed concordance based on overlapping PCRs of 40-60% for pharmacists and pharmacy technicians' perceived scopes of practice. These minor ailments were: allergy/rash, back pain, cold sore, dermatitis, diarrhoea, eczema, hayfever, haemorrhoids, rheumatism, sore throat, and superficial wounds. Of these, back pain, cold sore, dermatitis and sore throat were independently associated with pharmacists' scope of practice based on their years of practice experience (p-value<0.05).
Discussion. Discordance between pharmacists' and pharmacy technicians' perceptions of their scopes of practice was evident. This needs to be addressed to ensure professional and safety standards are upheld. Health authorities must support the development of pharmacy practice regulation without restricting pharmacies in the provision of minor ailments where they have the expertise. The training and education received by Indonesian pharmacists and pharmacy technicians may contribute to their different views of professional competency to manage minor ailments.

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Pharmacogenomic testing: perception of clinical utility, and enablers and barriers to adoption in Australian hospitals.

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Introduction. Pharmacogenomic (PGx) tests can help predict a patients' responses to select medications. Despite anticipated benefits to patient care, implementation of PGx testing in Australia is limited. Aims. Assess healthcare professionals' (HCPs) perceptions of PGx testing and identify barriers to implementation. Methods. An online survey (10-12 mins duration, 31 multiple choice and short answer questions) was used at 3 NSW hospitals (July 2020 and May 2021) to assess HCPs knowledge, usage, confidence and experience with PGx testing, and their perceptions of clinical utility, risks and barriers to its implementation. Results. HCPs (n=107) were predominantly medical practitioners (70%) and pharmacists (23%). PGx testing was considered beneficial, particularly to identify risk of drug intolerance and side effects. Despite this, few HCPs reported past (23%) or intended future (26%) use of PGx testing. Few HCPs reported confidence in their ability to identify indications for PGx testing (13%), order tests (18%) and communicate results to patients (15%). Lack of clinical practice guidelines and knowledge were considered barriers to implementation of PGx. Reimbursement for testing, availability of guidelines and electronic clinical decision support, alongside models-of-care involving multidisciplinary teams and local clinical champions were suggested strategies to facilitate implementation of PGx testing into practice.
Discussion. Pharmacogenomic testing whilst important to guide drug selection and dosing decisions is infrequently used. Further education, development of guidelines, and onsite expert advice could help improve the implementation and adoption of pharmacogenomic testing into routine clinical care to inform prescribing decisions.

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Impact of partnered pharmacist medication charting in the Royal Hobart Hospital emergency department on medication discrepancies and errors: preliminary results

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Introduction. Medication errors are relatively common in settings with acutely ill patients and heavy workloads, such as the hospital emergency department (ED).
Aims. To compare the impact of partnered pharmacist medication charting (PPMC) in the ED on the prevalence of medication discrepancies and errors, and their clinical significance.
Methods. Adult patients aged ≥ 18 years who were admitted to the Royal Hobart Hospital's acute medical units via the ED between 01/06/20 and 22/09/20 were included. The study compared the PPMC model (fast-tracked best-possible medication history [BPMH] early after ED presentation, mostly within two hours, followed by the PPMC approach) with early BPMH alone (fast-tracked BPMH early in the ED followed by the traditional medical officer medication charting approach) and usual care (BPMH in the ward by a pharmacist after the traditional medication charting approach in ED). A blinded independent expert panel, consisting of three multi-disciplinary clinicians, individually assessed intentionality of discrepancies and clinical significance of errors in randomly selected cases. Discrepancies likely to have been inadvertent were classified as errors by the panel. A blinded independent fourth senior clinician assessed any remaining panel differences. Kruskal–Wallis test with Dunn's post hoc test was used for comparisons. Results. The analysis included 366 participants with 122 per study group. The proportion (95% confidence interval [CI]) of participants having at least one unintentional medication error was 5.7% (1.6% – 9.9%), 56.2% (46.4% – 66.0%) and 62.7% (51.9% – 73.4%) in the PPMC, early BPMH and usual care groups, respectively. The number of patients needed to be treated with the PPMC to prevent at least one additional error was 2.0 (95% CI: 1.8 – 2.2) and 1.8 (95% CI: 1.6 – 2.0) compared to the early BPMH and usual care groups, respectively. For every 100 prescribed medications, there were 0.9 (95% CI: 0.4 – 1.5), 14.1 (95% CI: 12.1 – 16.1) and 18.0 (95% CI: 15.8 – 20.2) errors in the PPMC, early BPMH and usual care groups, respectively. Discussion. The PPMC model demonstrated a significant reduction in undocumented medication discrepancies and clinically significant medication errors compared to early BPMH or usual care.

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Pharmacists, Intern Pharmacists and Pharmacy Students' Use of Professional Practice Resources: A Cross Sectional Nationwide Survey

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Introduction. Pharmacy practice is guided by a myriad of practice resources including professional practice guidelines, codes and practice standards produced by professional organisations and bodies. These resources provide a framework for pharmacy practice and endeavour to facilitate consistency in the provision of pharmacy-based services to consumers across the country. Despite their role in specifying essential pharmacist behaviours, there is limited research exploring the use of these resources in practice. Aims. To characterise Australian pharmacists' use of the Pharmaceutical Society of Australia's Code of Ethics, Professional Practice Guidelines and Professional Practice Standards. Methods. A cross-sectional, self-administered, electronic survey of registered pharmacists, intern pharmacists and pharmacy students living in Australia was conducted. Questions focussed on participants' use of professional practice resources in the preceding 12 months. Quantitative data were analysed with descriptive statistics. Results. Of the 601 responses included in the analysis 462 (76.9%) were registered pharmacists, 88 (14.6%) pharmacy students and 51 (8.5%) intern pharmacists. Interns and students accessed the general professional practice resources more frequently than practising pharmacists. This was driven by their use of the resources for study and to check their current knowledge/practice. Pharmacists accessed professional practice guidelines when they needed help; to inform implementing a new service; or to resolve practice and patient care issues. All resources except the Professional Practice Standards for Pharmacists (67.4%) were accessed by less than 50% of respondents in the preceding 12-month period. Reasons for not accessing resources varied between cohorts and resource groups, but generally were due to not knowing the resources existed or they weren't considered necessary for the individual's practice.
Discussion. Access and use patterns for professional practice resources appear to change with experience. Professional organisations responsible for developing these resources should consider these patterns and involve students, interns and pharmacists when designing and reviewing these resources and related policies.

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Analysing the range of drugs associated with xerostomia from the Australian Database of Adverse Event Notifications (ADAEN)

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Introduction. Xerostomia is a subjective sensation of dry mouth that is a common adverse effect of medications and is associated with tooth decay, increased susceptibility to oral infections and a reduced oral-health related quality of life. Many medications have the potential to cause dry mouth but most of their mechanisms are unknown. This may partly explain why dry mouth medications lists, reports and databases are potentially incomplete. Aims. To summarise all case reports associated with xerostomia submitted to the publicly available Database of Adverse Event Notification (ADAEN) from the Therapeutic Goods Administration in Australia. Methods. A request was made to the Therapeutic Goods Administration to provide all reports associated with dry mouth. This was provided in a spreadsheet of de-identified reports from the commencement of the database in 1971 until June 2020. Drugs were divided into lists of established drugs associated with xerostomia and secondary drugs that can contribute to dry mouth. Results. There were 1927 individuals reported dry mouth with their medications. Of these, there were 1379 reported cases of established drugs, and 1481 reports of secondary drugs associated with xerostomia from the ADAEN. Some cases (12.87%) had more than one associated medicine. Dry mouth was found to be associated with many medication classes; analgesics, cardiovascular and gastrointestinal drugs had the greatest number of secondary drugs reported to the ADAEN. Some commonly reported secondary drugs associated with dry mouth identified were captopril, simvastatin, omeprazole, varenicline and hyoscine. Discussion. A comprehensive list of suspected medications associated with xerostomia reported in the ADAEN has been established. This adds to the growing list of medications associated with dry mouth, where several medications have not previously been identified in the literature. Some of these suspected medications are even available to patients over the counter so are readily available. The list of medications identified may be used by all healthcare professionals to inform patients of the possible adverse effect of dry mouth and provide appropriate advice.

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Barriers and Facilitators to Australian Pharmacists Use of Professional Practice Resources: A Focus Group Study

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Introduction. Pharmacy practice in Australia is governed by a hierarchy of codes, standards and professional practice guidelines. These professional practice resources provide a framework for pharmacy practice and endeavour to facilitate consistency in the provision of pharmacy-based services to consumers across Australia. Despite their role in specifying essential pharmacist behaviours, there is limited research exploring the use of these resources in practice.
Aims. To determine Australian pharmacists' (including intern pharmacists') perspectives regarding barriers and facilitators to the use of professional practice resources.
Methods. Focus group discussions were undertaken with pharmacists and interns from various practice settings, locations, and with varying years of experience. Audio-recordings from each focus group were de-identified and transcribed verbatim. Transcripts were analysed using the COM-B ('capability', 'opportunity', 'motivation' and 'behaviour') model.
Results. Nine focus groups with 45 participants were conducted. Limited awareness of the practice resources hindered pharmacists' 'capability' to use them. Pharmacists indicated that access challenges and suboptimal content design limited their 'opportunity' to use the resources. Pharmacists' professional role and identity ('motivation') appeared to inhibit use of the resources if they were perceived to not apply to their current role (e.g. hospital pharmacists) or facilitated use as an educator (e.g. mentoring an intern). Motivation to use the resources was associated with a need to 'do the right thing' by patients and meet professional obligations.
Discussion. Understanding influences on the use of professional practice resources, will allow design of behavioural interventions to increase their use. The Behaviour Change Wheel offers clear next steps for this process. Awareness, access and content will likely need to be improved in the first instance. Improving these may also work to improve motivation. Leveraging influences on motivation however, may serve to ensure that use of professional resources is embedded in future practice, albeit motivation can be more difficult to target.

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Content validation of simulated schizophrenia role-plays for pharmacy education

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Introduction. Simulated patient role-plays are an effective tool to educate and assess pharmacy students in providing care for people living with mental illnesses (El-Den et al, 2021). Little research explores the development of educational material relating specifically to supporting people living with schizophrenia and their carers.
Aims. This project aimed to co-design and content validate educational material relating to caring for people living with schizophrenia and their carers.
Methods. Stakeholders, including people with lived experience of mental illness and health professionals, were invited to co-design and content validate three case studies and associated marking rubrics. Firstly, three simulated schizophrenia case studies were co-designed by consumers with lived experience of schizophrenia and the research team. Then, the first round of content validation required participants to complete a questionnaire enabling calculation of the item content validity index (I-CVI) scores for relevance and clarity, content validity ratio (CVR) scores for item essentiality and overall scale content validity index (S-CVI/Ave and S-CVI/UA) scores for each role-play case study. Analyses of I-CVI, CVR, S-CVI/Ave and S-CVI/UA scores, as well as free-text feedback comments, informed item revisions, the second-round panel meeting discussion and finalisation of content.
Results. Two mental health consumer educators participated in the co-design phase. Next, a panel of nine mental health stakeholders participated in the first round of content validation. Each item in all three case studies generated an I-CVI score of 1.00 or 0.89. CVR scores ranged from 0.11 to 1.00. Overall S-CVI/Ave scores for each case study were 0.96 or higher. S-CVI/UA scores for each case study ranged from 0.63 to 0.89. Feedback comments and item revisions were discussed at the panel meeting until consensus was achieved to finalise the educational material. Discussion. Partnering with stakeholders, including mental health consumers and professionals, has enabled the co-development of educational material that is authentic, content valid and meets the educational needs of pharmacy students, as well as people living with schizophrenia and their carers.
El-Den S et al (2021) Pharmacy 9:28-44

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An overview of available computer-based simulation tools in pharmacy practice education

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Introduction. Pharmacy education is changing rapidly, with increasing pressure on clinical placement opportunities and interest in innovating pharmacy curricula. Moreover, sudden changes due to Covid-19 are encouraging pharmacy schools to incorporate computer-based simulations as a flexible, rapid, and cost-efficient solution to supporting the training of pharmacy students.

Aims. This literature review provides an overview of different computer-based simulation tools relevant to patient encounters in pharmacy practice education and highlights their different features.

Methods. A systematic narrative review was conducted to identify and collect data on relevant simulation tools within pharmacy practice education. The search included five major databases: Medline, CINAHL, ERIC, Education Source and EMBASE; followed by similar searches in key dedicated journals for pharmacy education.

Results. We identified 50 studies for full text analysis. They covered 29 unique simulation tools. Seven main criteria were discussed, such as the way they provide feedback and represent avatars, which environments they include, whether they were developed by an educational institute, privately or in collaboration, whether they can be localised, and the methods of user interaction used. It was found that the educational focus of these tools ranged between enhancing students' skills in dispensing, communication, and clinical assessment, and promoting active learning and independent studying. The selection of an appropriate simulation tool in any course depends on the course's aims, expected educational outcomes and requirements.
Discussion. This review provides educators with an up to date and comprehensive overview of the various available computer-based simulations in pharmacy practice education, and their capabilities. This review can also guide educators in selecting and determining the most suitable simulation tool for their course needs and aims.

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Supporting the development of teaching associates: a virtual teaching associate training program

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Introduction. Teaching Associates (TAs) play a critical central role in student learning, student engagement and therefore, the overall student experience, yet university faculties have limited time and resources to adequately mentor TAs, many of whom have little to no teaching experience [1]. At the Faculty of Pharmacy and Pharmaceutical Sciences (FPPS) at Monash University, a need for goal-oriented training focusing on orientation, induction, TA teaching responsibilities and fostering the development of the individual TA was recognised.
Aims. To design, develop and implement a flexible, evidence-based, self-regulated Virtual Teaching Associate Training Program with a focus on learner engagement to train and support the development of TAs at the FPPS.
Methods. The program was designed with learner engagement and preparedness in mind, whilst incorporating a variety of content formats, knowledge checks, reflective practice and peer-to-peer feedback. The resource developed contained 5 distinct training modules each focusing on a specific aspect of TA: 1) General training; 2) Understanding Students and the Learning Environment; 3) Degree-specific Learning and Teaching; 4) Facilitating Learning; 5) e-Portfolio (fostering the development of the individual TA).
Results. The program, across 6 semesters over 3 years, has directly influenced student learning and engagement by helping TAs to be more prepared to teach better. Anonymous feedback from TA participants (response rate: >80%) show that the majority of TAs felt better prepared for teaching and learnt new skills to teach better. TAs' ability to apply strategies to ask questions and respond to student questions was clearly demonstrated from student feedback in SETU and faculty-based student feedback surveys. Feedback from Unit Coordinators has shown the positive influence of TAs on student engagement. This program has been used to train nearly 200 individual TAs.
Discussion. This training program has provided TAs an opportunity to gain the confidence and skills to give them a successful start into teaching practice, regardless of their background and prior experience. Furthermore, improving training for TAs not only benefits the TAs, who are largely PhD students, but also results in benefits to various stakeholders impacted by the quality training of TAs.
1. Komarraju.2008. A Social-Cognitive Approach to Training TAs. Teaching of Psychology; 35(4): p.327-334.

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Can multiple choice questions examine application of knowledge in online tutorials?

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Introduction. Application of knowledge is one of the core attributes of graduates from pharmacy schools and related disciplines in Australia and worldwide.
Aims. The aim of this study is to examine the use of multiple choice questions (MCQs) to assess the application of knowledge in online tutorials introduced during the COVID-19 pandemic.
Methods. MCQs were developed and ranked into one of two cognitive levels, based on a modified Bloom's taxonomy, as knowledge recall 'KQ' or application of knowledge 'AQ'. Ranked MCQs were included in online tutorials of a Pharmacology course. Student performance on MCQs was compared between and within each Bloom's level, and the differences in the percentage of students who obtained a correct answer for each level were then analysed using Student's *t* Test.

Results and Discussion. A total of 57 students were enrolled in the Pharmacology course. MCQs (comprised of roughly 40% KQ vs 60 % AQ, with the total number of MCQs varies per each tutorial session) were included in the course weekly tutorials and administered online via MyUni Quizzes. Mean average score overall for online AQ was 85.1% (+/- 3.0) compared to 94.1% (+/- 1.8) for KQ, calculated based on a total 6 tutorial sessions ($p= 0.29$). Overall, student performance for AQ was consistently reduced by a minimum of 7% to a maximum of 14% score, as compared to student performance for KQ, observed in all tutorial sessions administered throughout the semester. However, the findings did not reach statistical significance at $p < 0.05$ for any of the analyses, which was possibly due to the great standard deviation SD observed. The results suggested great differences in the students' ability to study within the cohort. In addition, it was interesting to see that student performance on all MCQs varied greatly across sessions depending on the topics, with an average score of 93% +/- 5%, 86% +/- 12%, 90% +/- 10%, 90 %+/- 7%, 86% +/- 11% and 87% +/- 18% for sessions 1 to 6, respectively.

Conclusion. In conclusion, the results overall suggested well-designed MCQs which target various cognitive levels can be used in pharmacology online tutorials to facilitate assessment of student performance and application of knowledge.

Symposia abstracts… page over.

Symposia abstracts

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Symposium 1

Scientists march to combat COVID-19

Moderator: Shyamal C Das. School of Pharmacy, University of Otago, Dunedin, OTAGO, New Zealand

Scientists have been played a vital role in combating COVID-19 by introducing an effective elimination strategy, quickly diagnosing this ever-changing virus SARS-CoV-2, developing vaccines and treatment. This workshop aims to discuss those effective elimination strategies, diagnoses, vaccines, and treatments (Figure 1).

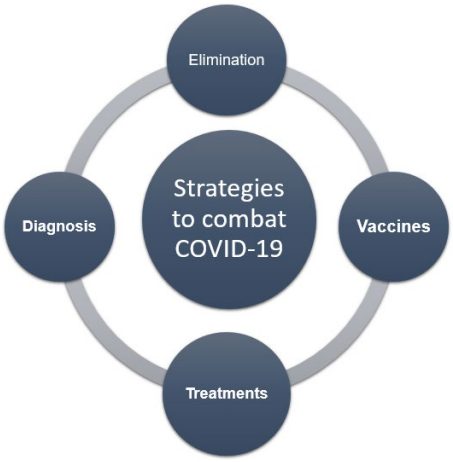

Figure 1. Strategies to combat COVID-19

New Zealand is one of the first countries to successfully eliminate SARS-CoV-2 in 2020, although the new delta strain hit the country later. For a successful COVID-19 elimination, a science-based policy was necessary, among other actions. SARS-CoV-2, the causative virus for COVID-19, rapidly mutates, and new variants such as alpha (B.1.1.7), beta (B.1.351), gamma (P.1), delta (B.1.617.2), etc., have already been identified. The development of diagnostic capabilities of this virus quickly can contribute to elimination. While several vaccines are available, the immunity against new variants may be uncertain. The persistence of this virus stresses the local manufacture of vaccines both in New Zealand and Australia is essential.

Significantly, new mRNA vaccines should be designed keeping in mind new SAS-CoV-2 variants. It is now clear that this virus will prevail around. Therefore, treatment besides vaccines is also important. However, the treatment success of a drug candidate is also influenced by the route of delivery. Since this virus mainly affect the lungs, pulmonary route of drug delivery is regarded as the most logical route of drug delivery for efficient treatment of COVID-19.

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Symposium 3

Current challenges and successes in Pharmacy and Pharmaceutical Science Education

Moderator: A/Prof Elizabeth Yuriev, Pharmacy and Pharmaceutical Science Education, Monash University, Melbourne, VIC, Australia

Pharmacy and Pharmaceutical Science (PPS) Education is an emerging and innovative field catering to the needs of student cohorts with unique foundational and professional profiles. The challenges faced by the PPS Education reflect the expectations of the pharmaceutical workforce to have not only the technical expertise and professional experiences but also the appropriate attitudes, high-level inter-disciplinary training, collaborative approach to healthcare teamwork, commitment to life-long learning, cultural tolerance, optimism, and self-motivation. Recently, these challenges have been made even more acute due to the COVID-19 pandemic and its impact on pharmacy and pharmaceutical science education, professional pharmacy practice, and outcomes-focussed pharmaceutical research and development.

This symposium will address current challenges and successes in this field by drawing on the expertise of speakers from diverse areas: national and international; pharmacy and pharmaceutical science; enabling sciences, practice and education research. It will demonstrate the curriculum development, teaching approaches, and global engagement driven by the leaders in the field.

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Symposium 4

Drugs administered to cancer surgery patients in the perioperative period and long term risk of recurrence or metastasis

Moderator: Marie-Odile Parat. School of Pharmacy, University of Queensland, Brisbane, QLD, Australia

Evidence suggests that a number of factors can be optimised in the period surrounding solid tumour excision in order to reduce the risk of long-term recurrence or metastasis. These factors include anxiety and stress, nutritional status, hypothermia, blood transfusion, tissue damage, as well as the drugs administered perioperatively. This symposium combines presentations from speakers who have researched how to optimise perioperative pharmacotherapy to improve the cancer outcome of the surgery, including beta blockade, COX-2 inhibition, local anaesthetics, and opioids. Dr Cata will introduce the current knowledge about systemic use of local anaesthetics to promote recurrence-free survival. A/Prof Parat will summarize conflicting literature and recent laboratory-based findings supporting the influence of opioids on tumour growth and metastasis. A/Prof. Sloan will present evidence that beta adrenergic signalling enhances tumour growth and metastasis and Prof Ben-Eliyahu will share the latest updates on clinical evidence of protection afforded by combined beta blockade and COX2 inhibition administered perioperatively to cancer surgery patients.

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Silica nanoparticles for oral insulin delivery

Yuxue Cao[1], Tushar Kumeria[2] *, and Amirali Popat[1] * [1] School of Pharmacy, The University of Queensland, Brisbane, QLD 4102, Australia, [2] School of Materials Science and Engineering, The University of New South Wales, Sydney NSW 2052, Australia.

Introduction. Diabetes is a chronic disease which impact over 400 million people. One of the most effective way to manage diabetes is human recombinant insulin injection. However, injection pain and injection site infection are responsible for dose skipping in patients. Oral delivery of insulin holds the most potential in overcoming these challenges as it is the most desired drug administration route with the highest patient compliance. However, insulin cannot be administrated orally due to highly acidic condition in the stomach, active hydrolytic enzyme in the intestine and intestinal epithelial. Silica nanoparticles (SNP) have been widely investigated as a drug carrier for delivering peptides and proteins orally because of its excellent biocompatibility, high stability, ease of functionalization ultra-high loading capacity, and ability to enhance permeation of biologics such as insulin. Interestingly, the size of solid SNP could impact its ability to cross the intestinal barrier, but the influence of pore size has not been investigated.
Aims. Synthesis of SNP with different pore size to compare their ability of insulin permeation across the intestinal epithelial barrier. Results. SNP around 100 nm with different pore size were synthesized and characterized. *In vitro* studies proved that silica nanoparticles could successfully open the tight junction of Caco-2 monolayer and Caco-2/ MTX-HT29 co-culture model. The TEER value indicated different pore size SNP had different cellular transportation ability (Figure 1).
Conclusions. Pore size control can play a significant role in opening the intestinal epithelial tight junction and may improve the bioavailability of oral insulin.

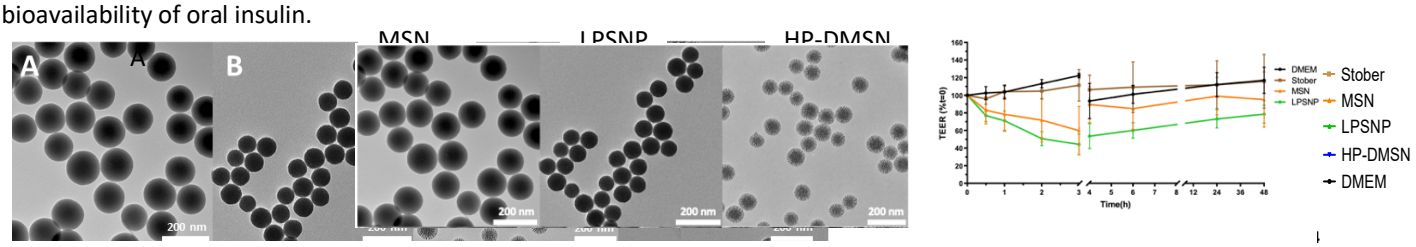

Figure 1. (A) TEM images of three types of SNP. (B) TEER value variation of Caco-2 monolayer with SNP treatment.

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Molecular dynamic simulations of the human P2X7 Receptor

Justin Cheah[1,2], Ali Kusay[1,2], Thomas Balle[1,2]. Sydney Pharmacy School, Faculty of Medicine and Health, The University of Sydney[1], Sydney, NSW 2006, Australia; Brain and Mind Centre, The University of Sydney[2], Camperdown, NSW 2050, Australia

Introduction. The P2X7 receptor (P2X7R) is a ligand gated cation channel with suggested roles in inflammation and neurological conditions. This has inspired rigorous studies on the receptor, however, many aspects of the receptor are yet to be explained, such as the assembly of isoforms into heterotrimers . Recently, the structure of the rat P2X7R in both the open and closed state were determined by cryo-electron microscopy (McCarthy et al, 2019), creating new opportunities to uncover the properties of the enigmatic receptor.
Aims. To construct homology models of the human P2X7Rs using the newly determined structures and get insight into its dynamic properties using extensive molecular dynamics simulations.
Methods. Homology models of the human P2X7R were constructed in the open and closed state based on the recent P2X7 structures (PDB codes: 6U9W and 6U9V respectively). Model preparation included assigning protonation states to titratable residues at a pH of 7, each assignment was carefully inspected to arrive at a consensus set of residue states. Models were placed in a solvent box and embedded in a lipid bilayer. Molecular dynamics simulations were conducted with OPLS_2005 force field parameters.
Results. Visual inspection and RMSD plots reveal that the models were stable throughout the simulation. RMSF plots reveal that loops at the extracellular and intracellular tips exhibited the greatest degree of motion. We observe the progressive hydration of the transmembrane pore which was more prominent in the open state model.
Discussion. RMSF plots follows the expected trend whereby buried transmembrane components exhibited little fluctuations while solvent exposed loops exhibited most fluctuations. Taken together with RMSD stability, this supports the validity of the final P2X7R models. The formation of a water channel throughout the transmembrane pore is an essential step for ion conductance, we aim to investigate this through further simulations. All in all, our simulation findings will help better understand the properties and function of the P2X7R.
McCarthy et al (2019) Cell 179:659–670

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Engineering nanoexosomes for targeted drug delivery for ovarian cancer

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Introduction. Ovarian cancer is the 8th most common cause of cancer mortality in women globally, the high mortality rate owing to unfavourable biodistribution, low penetration and rapid clearance of therapeutics. Biomimetic extracellular vesicle (EV)-encapsulated mesoporous silica nanoparticles (MSNs) can be ideal therapeutics by combining target-homing capacity of EVs with high drug loading capacity of MSNs. Here, we propose construction of EV-coated MSNs as drug carriers for ovarian cancer therapy.
Aims. Fabrication and optimisation of EV-coated MSNs through extrusion, extrusion combined with incubation and sonication.
Methods. Amino-functionalized MSNs were loaded into SKOV-3 derived EVs using extrusion, extrusion combined with incubation, and sonication. Physicochemical properties of resultant particles were analyzed via TEM and DLS.

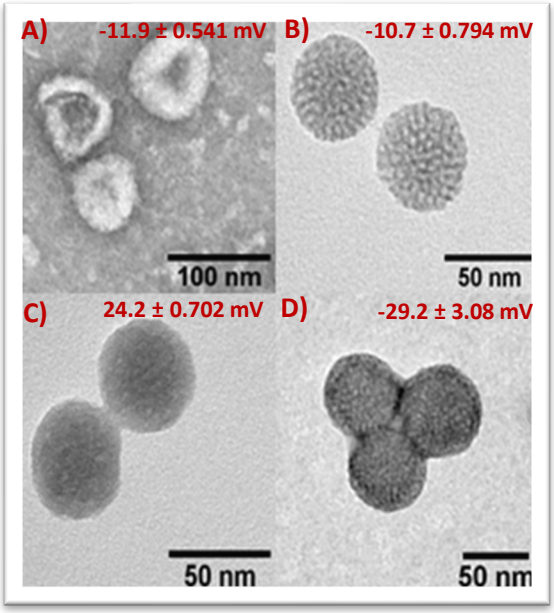

Figure: Transmission electron microscope images and Z-potential values of A) EVs; B) MSNs; C) Amino-functionalized MSNs; D) EV-coated amino functionalized MSNs.

Results. EV-coated MSNs were successfully synthesized. Extrusion was the most effective method for a complete coating.
Discussion. These biomimetic particles could significantly enhance the delivery of therapeutics for ovarian cancer owing to their low immunogenicity, biocompatibility, and target homing capacity. Future studies will assess their gene delivery potential and efficacy of the particles in vitro.

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Incomplete apoptosis in MDA-MB-468 breast cancer cells: Implications for cancer therapy

Trinh N Hua[1], Francisco Sadras[1], Mélanie Robitaille[1], Sarah J Roberts-Thomson[1], Gregory R Monteith[1,2]. School of Pharmacy, The University of Queensland[1], Brisbane, QLD, Australia; Mater Research, The University of Queensland[2], Brisbane, QLD, Australia

Introduction. Measuring executioner caspase (caspase-3/7) activity is a common screening and evaluation method for anticancer drugs. However, recent studies show that cancer cells can survive executioner caspase activation, induced by a range of apoptotic stimuli (Berthenet et al, 2020, Seervi et al, 2019). This process of incomplete apoptosis also enhances cancer cell aggressiveness. However, the occurrence of incomplete apoptosis has not been assessed in cancer cells under non-stimulated (basal) conditions.
Aims. To assess the propensity of triple-negative MDA-MB-468 breast cancer cells to undergo incomplete apoptosis, under non-stimulated condition.
Methods. Lentiviral transduction was used to construct an MDA-MB-468 cell line that stably expressed a fluorescent reporter of caspase-3/7 activity (MDA-MB-468-VC3AI). Cells with activated caspase-3/7 were identified and isolated by fluorescence activated cell sorting (FACS). Caspase-3/7 positive cells were promptly reseeded onto a 96 well plates coated with poly-D-lysine. Live cells were labelled with the CellTracker™ Red CMTPX dye and cell survival was assessed using automated epifluorescence microscopy (ImageXpress Micro).
Results. MDA-MB-468-VC3AI cells with activated caspase-3/7 (~ 0.5%) were detected under non-stimulated conditions. Most reseeded cells with activated caspase-3/7 underwent cell death by day 5. However, a small number of cells remained viable following executioner caspase activation. Surviving cells were also capable of proliferation, with colony formation and expansion observed at day 5, 7 and 10.
Discussion. This study highlights that death is not always a final consequence of executioner caspase activation. Triple negative MDA-MB-468 breast cancer cells can survive executioner caspase activation, in the absence of apoptotic stimuli. Executioner caspase activity may be hijacked to drive oncogenic functions rather than death, highlighting a potential target for therapeutic intervention.
Berthenet et al (2020) Cell Rep 31:1-14
Seervi et al (2019) Cell Oncol 42:645-61

104

Nociceptin/orphanin FQ (N/OFQ) modulation of cell signalling and biotransformation profile

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Introduction. Nociceptin/Orphanin FQ (N/OFQ (1-17)) is the endogenous opioid ligand of Nociceptin/Orphanin FQ Opioid Receptor (NOPr), which is involved in the modulation of pain. The biological stability of N/OFQ may provide unique insights into NOPr activity. Biotransformed fragments such as N/OFQ (1-13), (1-11), (1-9) and (1-7) were synthesised and selected to determine their biotransformation profiles in rat plasma, trypsin and assay media, and investigate their ability to modulate cellular signalling.

Methods. Candidate peptides were synthesised by solid-phase peptide chemistry was utilised to synthesise the candidate peptides. Human NOPr CHO-K1 cell lines were employed for *in vitro* studies. A commercially available cAMP assay was utilised to assess NOPr modulation. Peptide stability was assessed in rat plasma, bovine trypsin and cAMP assay media at 37 °C for up to 2 hrs. Graphpad Prism software was used to determine potency (EC_{50}) and half-lives ($T_{1/2}$) of peptides.
Results. Peptide potency EC_{50} of the parent peptide (N/OFQ (1-17)) and (1-13) were 0.9 ± 0.3 nM and 28.2 ± 16.3 nM respectively, while that of the smaller fragments N/OFQ (1-11), (1-9) and (1-7), had an EC_{50} in excess of 10 µM. Peptide stability in rat plasma revealed N/OFQ (1-17) had a $T_{1/2}$ of 21.7 min, N/OFQ (1-13) was 9.8 min. N/OFQ (1-7) and (1-8) were the major products of the longer parent peptides N/OFQ (1-17), (1-13) and (1-11), and both displayed a $T_{1/2} \geq 2$ hr. All peptides were substantially preserved in HBSS media.
Conclusion. Pharmacological potency examination revealed that only N/OFQ (1-17) and (1-13) activate NOPr at nanomolar concentrations. Biotransformation profiles of N/OFQ (1-17) and its native fragments indicate the enzymatic cleavage points of the N/OFQ (1-17) sequence are primarily the Ala^{7}-Arg^{8}, Arg^{8}-Lys^{9}, Lys^{9}-Ser^{10} and Arg^{12}-Lys^{13} bonds in the presence of trypsin and rat plasma.

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Linking cellular cholesterol transport and distribution with anticancer drug resistance: a narrative review

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Introduction. It is now well believed that cancer cells undergo drastic metabolic adaptions to cover increased bioenergetic needs required for tumour growth and progression. This includes an increased demand for cholesterol and other lipids, which coincides with increasing evidence linking anticancer drug resistance with elevated cholesterol uptake or synthesis. However, little is yet known if expression levels of intracellular cholesterol transporters, which are vital for the proper distribution of cholesterol inside cells to support oncogenic growth and metastatic behaviour, influence cancer incidence, progression and anticancer therapy.

Aims. The aim was to identify, describe and evaluate current literature on the contribution of intracellular cholesterol transport and distribution on cancer growth, progression and anticancer drug resistance.

Methods. A comprehensive systematic search with keywords such as cholesterol, drug resistance and cancer in PubMed, MEDLINE and Embase was performed. Several cholesterol transporters/receptors with roles in worsening chemotherapy performance in cancer were identified. Further literature searches were conducted to retrieve additional information warranting their function in the development of anticancer drug resistance.
Results. At the cell surface, elevated low-density lipoprotein (LDL) receptor, scavenger receptor class B type 1 (SR-BI), adenosine triphosphate (ATP)-binding cassette subfamily A member 1 (ABCA1) and ATP-binding cassette subfamily G member 1 (ABCG1) can increase cholesterol uptake or efflux in cancer settings, with potential to influence anticancer drug performance. In late endosomes/lysosomes, up- or downregulation of Niemann-Pick Type C1/2 (NPC1/2), oxysterol-binding protein-related protein 1L (ORP1L), steroidogenic acute regulatory protein-related lipid transfer domain containing 3 (StARD3), as well as scaffold proteins, such as annexin A6 (AnxA6), can modulate cholesterol distribution in tumour cells, with potentially diverse outcomes for cancer growth, progression and the development of anticancer drug resistance.

Discussion. This review provides an overview on the current understanding of cholesterol transporters that connect cellular cholesterol distribution with cancer growth, progression and anticancer drug resistance. This will assist in the development of strategies to reduce cancer progression and overcome resistance against current chemotherapies.

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Antibiotic use and the development of depression: A systematic review

Mahsa Pouranayatihosseinabad[1], Yihienew Bezabih[2], Jason Hawrelak[1], Gregory M. Peterson[1], Mackenzie Williams[1], Felicity Veal[1], Corinne Mirkazemi[1]. School of Pharmacy and Pharmacology, University of Tasmania[1], Hobart, TAS, Australia; WellStar Atlanta Medical Center[2], Atlanta, Georgia, USA.

Introduction. Disruption of the gastrointestinal (GI) ecosystem is thought to be involved in the pathogenesis of several medical conditions, including depression. Antibiotics can induce substantial changes in the GI microbiota and several lines of evidence suggest that exposure to antibiotics may increase the risk of developing depression.
Aim. This systematic review examined the potential association between antibiotic exposure and the development of depression in humans.
Methods. PubMed, Ovid EMBASE, CINAHL, and PsychINFO databases, as well as unpublished resources, were searched for studies published from 2000 onwards, in humans without any prior history of depression. The studies needed to consider the connection between antibiotic exposure (either alone or in combination with other antibiotics and medications) and the development of depressive disorders (in isolation to other psychological conditions).
Results. The literature search retrieved 2,979 publications with no additional publications found from unpublished sources. After removing duplicates, 2,309 publications remained. In the initial screening of title and abstract by two researchers, 24 articles were selected for full-text review, from which four met the eligibility criteria to be included in this systematic review. These were retrospective and observational studies, conducted in different age groups with various indications for receiving different antibiotics. The findings indicate a potentially increased risk of developing depression symptoms following antibiotic use, which increases based on the number of courses and agents used, and which persists with a slow decline over the ten years following exposure. These findings, however, must be reviewed considering several limitations including the retrospective nature of the data collected, and lack of consideration of other potentially confounding factors such as probiotic use. Conclusions. The lack of studies in this area, and the inherent limitations associated with their methodologies, make it difficult to draw a definitive conclusion about antibiotic exposure and subsequent development of depression. Consequently, large prospective studies are still required.

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Development of DNA vaccine against malaria

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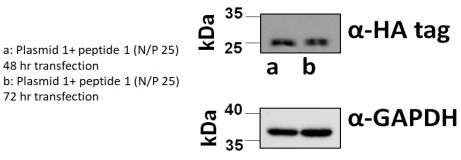
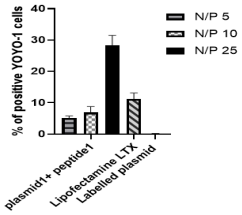
Introduction. Malaria is an important infectious disease globally, especially in developing countries [1]. The strategy for controlling the disease is dependent on anti-malarial drugs, but the parasite has developed resistance against currently available drugs, increasing the urgency to develop vaccines against it [4]. The only vaccine available in the market provides 32-50% protection [5], so our aim is to develop a DNA vaccine that can stimulate the required immune response for protection against malaria.
Aims. 1-Construction different plasmids encoding gene sequence of one of malarial antigens along with different molecular adjuvants. 2-synthesis different delivery systems with different dendritic targeting peptides. 3- testing these constructs *in vitro* and *in vivo*.
Methods. Gibson assembly was used to synthesis both plasmids. As for the delivery system, they were synthesized using Biotage® Initiator+ Alstra peptide synthesizer. Dendritic cellular uptake and gene expression were determined using flow cytometry and western blotting respectively.





Discussion. One of the tested peptide based delivery systems provided significant increase in the dendritic cellular uptake compared to the positive control (lipofectamine LTX), in addition to maintaining the ability to achieve decent level of gene expression.

1. Laishram D D et al (2012) Malar J 11: 29.
2. Cui L et al (2015) Am J Trop Med Hyg 93:57-68.
3. Kester K E et al. (2009) J Infect Dis, 200:337-46.

108

Communication and social interaction are key to student engagement and satisfaction in online learning

Kameleia Abu Saffian[1], Canley Chau[1], Monique Nguyen[1], Ren Shang Chan[1], Shaun Kokkat[1], Suzanne Caliph[1]
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Introduction. Online learning is being rapidly integrated into educational curricula, particularly in light of the COVID-19 pandemic and learners from traditional in-person classrooms are swiftly shifted onto video conferencing platforms such as Zoom, Microsoft Teams etc. There has been limited studies that investigate pharmacy students' experiences and perspectives on enablers and barriers of online learning.
Aims. To explore the factors that affect pharmacy student's engagement and satisfaction in online learning
Methods. A self-administered survey questionnaire with 5 point Likert scale was designed to rate student online experience including asynchronous and synchronous learning and assessment. Qualitative free text responses about enablers and barriers of online learning were also collected and grouped into common themes.
Results. 111 Undergraduate pharmacy students from all year levels (Y1 23%, Y2 22%, Y3 13% , Y4 37%, Graduate entry 5%) participated in this study. Overall, 56 % of students were satisfied with livestream lectures and self-directed learning resources including online modules and video recordings whereas 41 % were satisfied with small group applied workshops online. 62 % felt prepared and confident to take an assessment online with 15% believed they could achieve better grades. <10% perceived online learning enabled high quality group tasks. Ability to learn at own pace and flexibility were the top two enablers of online learning cited by >80% of students. Difficulties to connect and communicate (78%) and distractions (76%) were perceived as the top two limiting factors in online learning.
Discussion. Live stream lectures and independent learning resources that allowed self-paced learning and flexibility were popular with students. Collaborative learning activities that facilitate effective communication and social interaction may enhance student engagement and learning in team-based applied workshops in pharmacy.

Regmi K & Jones L. (2020) BMC Med Educ 20, 91. https://doi.org/10.1186/s12909-020-02007-6
Shawaqfeh M et al (2020) J Med Educ Curric Dev. 7, 2382120520963039. https://doi.org/10.1177/2382120520963039

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Grit and Academic Performance in Healthcare Students

Betty Exintaris, Charlie Wang, Ethan Loo, Sara Lee, Yunyi Chen, Kho Hyee Lau, Kirsten Galbraith and Nilushi Karunaratne. Monash Institute of Pharmaceutical Sciences, Melbourne, VIC, Australia.

Introduction. Grit is a factor that consists of perseverance of effort (PE) and consistency of interest (CI) and has been a point of interest in educational research as a non-cognitive skill that could contribute to academic performance. Grit has been explored in other areas of education, however there is limited literature specifically in healthcare education.
Aims. To conduct a scoping review to assess the significance of grit in relation to academic performance within the realm of healthcare students.

Methods. Ovid Medline and PubMed medical databases were used to scope the literature to explore the question 'what is the relationship between grit and academic performance in the context of healthcare students?' Following appraisal based on inclusion and exclusion criterion, 13 articles were selected for analysis between 2007 and 2021. The articles contents were analysed using a qualitative synthesis approach, to extract the most important information regarding grit and its impact on academic outcomes.

Results. The scoping review revealed varied correlation between grit and academic performance. The review also revealed that Grit-S, the current primary measure of grit, has limitations which may contribute to the variance seen in any correlation between grit and academic performance. For example, PE appears to drive most of the predictive effects of grit, with PE being a better predictor of academic performance than CI. In addition, although resilience appears to be included in the definition of grit, as well as being positively correlated with Grit, Grit-S does not contain a dedicated resilience scale.

Discussion. The scoping review regarding whether there is a relationship between grit and academic performance in healthcare students was inconclusive with several limitations outlined. As PE can be considered to be part of grit, incorporating a conscientiousness scale could be a more robust measure of academic performance. In addition, the inclusion of a dedicated resilience scale could also better ascertain an individual's resilience.

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A scoping review of resilience strategies to promote academic resilience in international pharmacy students

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Introduction. The international student cohort has been especially impacted due to COVID-19 restrictions - travel bans, transition to online classes, self-isolation and job losses have caused disruptions to academic progress, social lives and economic stability [1]. Moreover, international students under high stress and with low resilience are at higher risk of binge drinking and mental health issues [2]. Alongside alleviating stress and preventing burnout, academic resilience may prevent health risk behaviours.
Aims. To identify strategies to promote academic resilience in an international pharmacy student cohort.
Methods. Three medical databases were used to scope literature to identify resilience strategies in international students, published between 2011 and 2021. Results were screened and relevant studies were identified.
Results. The search resulted in 20 articles, with 13 articles included in the scoping review after the inclusion criteria were applied. Several evidence-based strategies were identified to promote academic resilience including the Stress Management and Resiliency Training (SMART) program [3] which focuses on supporting wellbeing, and practising mindfulness [4]. In addition, the scoping review revealed that a holistic approach to promote academic resilience is necessary, where personal and faculty-based activities are implemented [5]. Discussion. Recognising the need for a holistic approach to develop academic resilience, programs identified from the scoping review will be piloted alongside current offerings from academic and student support groups in 2022.

1. Van de Velde, S. et al (2021). The COVID-19 International Student Well-being Study. SJPH, 49(1), 114-122.
2. Kim, Y. K., & Cronley, C. (2020). Acculturative stress and binge drinking among international students in the United States: Resilience and vulnerability approaches. JACH, 68(2), 207-218.
3. Sood, A. et al (2014). Stress Management and Resiliency Training (SMART) Program among Department of Radiology Faculty: A Pilot Randomized Clinical Trial. EXPLORE, 10(6), 358-363.
4. Heath, J. et al (2020). CPR to the Rescue! Clinical Nurse Specialist, 34(2), 63-69.
5. Kang, K. et al (2019). Tactics to improve resilience and well-being among pharmacy students. AJSHP, 76(18).

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A Global Conversation about Demographic Items for Pharmacy Educational Research

Kyle T Fassett[1], Jacqueline E McLaughlin[1]. Center for Innovative Pharmacy Education & Research, UNC Eshelman School of Pharmacy[1], Chapel Hill, NC, USA

Introduction. Pharmacy educators rely on demographic data to better understand students and faculty.[1,2] Yet, debate exists about how to classify or categorize individuals by identities that contain complex and deep sociocultural roots.[3,4] National and international data collection instruments use a variety of terminology to capture information about race/ethnicity, gender, sexual orientation, and disability.[1,5] In example, some scholars and federal guidelines define “race/ethnicity” as an individual’s ancestry information, country of origin, or physical color.[2,4,5]
Aims. The purpose of this study was to characterize common terminology that pharmacy educators use to collect demographic data.
Methods. Using thematic analysis, we synthesized common measures from the United States, Australia, and beyond to understand historical contexts and current trends.
Results. Themes included varied structures and orders of demographic items, (e.g., race, disability, gender) and various types and number of response options (e.g., other, prefer not to answer).
Discussion. We provide recommendations for crafting demographic questions, conducting analyses with numerically small populations, and increasing reflexivity for pharmacy educators and scholars.

1. American Association of Colleges of Pharmacy. Curriculum quality survey reports. 2021. Accessed September 9, 2021. https://www.aacp.org/research/institutional-research/curriculum-quality-surveys
2. Amaral CM, Carvalho RC, Vieira ME, Aguiar PM. Factors associated with use of medications for anxiety and depression in pharmacy students in Brazil. American Journal of Pharmaceutical Education. 2021 Jun 1;85(6).
3. Pryzgoda J, Chrisler JC. Definitions of gender and sex: The subtleties of meaning. Sex roles. 2000 Oct;43(7):553-69.
4. Hughes JL, Camden AA, Yangchen T. Rethinking and updating demographic questions: Guidance to improve descriptions of research samples. Psi Chi Journal of Psychological Research. 2016;21(3):138-51.
5. Australian Government: Department of Education, Skills and Employment. Higher education statistics: Student data. 2020 Oct 18. Accessed September 9, 2021. https://www.dese.gov.au/higher-education-statistics/student-data

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Impact of promotional videos on public perception of pharmacy services in New Zealand

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Introduction. Promotional videos are an effective tool for marketing products or services in this era of social media. The recent years have seen tremendous growth in the clinical services provided by pharmacists. Considering the changing face of the pharmacy profession and the importance of promotional videos the Pharmaceutical Society of New Zealand (PSNZ) produced a series of videos to help increase awareness of pharmacy services in New Zealand (NZ).

Aims. To assess the impact of PSNZ promotional videos on public awareness of the health services provided by the NZ pharmacists.
Methods. This experimental study used an online questionnaire and PSNZ promotional videos as an intervention to assess the public's perspectives about pharmacy services before and after the intervention. The survey was sent out with the help of a company 'SurveyEngine®'to 1127 randomly selected members of the public aged 18 and above from all over New Zealand. Data were analysed using descriptive statistics.
Results. A total of 329 participants completed the survey. The majority (93.6%) had not heard of the PSNZ promotional videos before. However, 84.4% of the respondents found the videos informative and more than three-quarters (76.5%) reported a change in their perception of pharmacy services after watching the video. Similarly, 65.3% reported that they or a family member would be more likely to visit a pharmacy in the future after watching the promotional video.
Discussion. Previously, very few studies about public perception of pharmacists and pharmacies in New Zealand have been conducted. The findings of this study suggest that the PSNZ videos were an effective tool for educating New Zealanders on different pharmacy services and the pharmacy profession, however, there is a need to choose the advertising platform carefully so as to enhance the coverage.

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Changes in sedative burden in hospitalised patients taking antipsychotic medications

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Introduction. Prescribing of antipsychotics and other psychotropic medications is common in severe mental illnesses, such as schizophrenia and bipolar disorder. Co-administration of several psychotropic medications can result in increased adverse effect burden, including sedation.

Aims. To quantify the changes in the sedative burden between admission and discharge in patients using at least one antipsychotic medication at admission.
Methods. This retrospective study included patients taking at least one antipsychotic medication at admission from three South Australian public hospitals between 1st Jan and 31st Dec 2019. All medications were classified according to the ATC system and difference in the sedative burden prior to admission and on discharge were then compared using the Sedative Load Model (SLM)[1], the Drug Burden Index (DBI)[2] and the modified DBI (DBI-WHO)[3].
Results. The study cohort consisted of 716 patients with a mean age of 54.69 (SD 20.99), and a mean length of stay of 16.84 days (SD 25.83). 405 patients (56.6%) were admitted to acute mental health wards. The sedative burden calculated by the SLM, DBI and DBI-WHO models revealed the mean sedative burden was greater upon discharge for their regular medications. This difference was statistically significant for the drug burden measured by the DBI-WHO model ($t(715) = -2.19$, $p = 0.029$). However, the trend for decreased burden from PRN medications was not statistically significant.
Discussion. Sedative burden determined by the DBI-WHO model statistically significantly increased on discharge, and the mean sedative load score and sedative drug burden were also higher in comparison to previous studies. However, all participants of this study were taking at least one antipsychotic, hence explained the higher burden. It is important to determine the factors that contributed to the increased burden upon discharge.

1. Linjakumpu, T.A., et al., Int J Geriatr Psychiatry 2003; 18: 542-544.
2. Hilmer, S.N., et al., Arch Intern Med 2007; 167: 781-787.
3. Faure, R., et al., J Am Geriatr Soc 2013; 61: 1227-1228.

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Assessment of potentially inappropriate prescribing for adults with type 2 diabetes mellitus in Ethiopia using IMPACT2DM, a new explicit tool

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Introduction. People with T2DM are at greater risk of potentially inappropriate prescribing (PIP) due to multiple comorbidities and polypharmacy. IMPACT2DM (Inappropriate Medication Prescribing Assessment Criteria for Type 2 Diabetes Mellitus) is a 70-item tool designed to identify PIP for adults with T2DM.

Aims. To assess PIP for adults with T2DM in Ethiopia using IMPACT2DM and test the feasibility of the tool.

Methods. Randomly selected medical charts of 418 adults with T2DM who had follow up care at Debretabore Hospital were reviewed retrospectively. Bivariate and multivariate binary logistic regression analyses were done to check for association between PIP and sociodemographic or clinical characteristics. Some items/item components of IMPACT2DM were modified to increase the tool's feasibility for the outpatient setting, to clarify content or to use the terms common in this particular setting.
Results. More than 90% of participants had at least one PIP. The average number of PIP per patient was 1.87 $\pm$ 1.1. Prescribing omission (80.9%) was the most commonly identified type of PIP followed by dosing problems (28.5%) and inappropriate drug selection (27.3%). Multivariate binary logistic regression found that adults with prescribing omissions are more likely to be older than 40 years or to be prescribed with less than 5 medications. Adults with dosing problems were more likely to be older (≥65 years old), or have had a fasting blood sugar (FBS) out of the target range (80-130) recorded at their last visit or receiving polypharmacy. During data analysis minor modifications were made to the text for thirteen of the items, while major modifications were made to three items. Two items were deleted from the tool and one item was added.
Discussion. IMPACT2DM is an easy to use tool that can capture a large number of PIP events. Physicians should make sure that all necessary medications are prescribed to adults with T2DM especially for those older than 40 years. Medication doses should be checked for adults particularly when they have a FBS recorded out of the target range, are 65 years of age or older or receive 5 or more medications.

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What are the research priorities for optimising the safe and effective use of opioids in general practice?

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Introduction: Pharmaceutical opioid related harms are a major public health concern globally. With high numbers of opioids prescribed in general practice setting, and the associated issues such as opioid overdose and dependence, there is an urgent need to gain a better understanding of opioid use in these clinical setting. Identifying research priority areas can inform the direction and focus of future research in optimising the safe and effective use of prescription opioids in general practice.

Methods: A group of professional and consumer stakeholders were invited to attend a workshop held in May 2021. A nominal group technique was used to explore the research priorities for the safe and effective use of opioids in general practice. Research priorities were identified and consolidated through a structured workshop and ranked in priority order using an online survey.

Results: Seventeen participants representing medical, pharmacy, nursing, allied health, policy and consumer disciplines identified a total of 26 priorities in three domains: (1) consumer, (2) clinician and practice, and (3) system and policy. The top priorities identified in each domain were: "How do consumer characteristics influence opioid prescribing and outcomes?", "What are the outcomes of different opioid deprescribing strategies in primary care?", and "What is the impact of regulatory strategies that aim to restrict opioid supply on opioid prescribing and outcomes?" in consumer, clinician and practice, and system and policy focused domains, respectively.

Discussion: Communication and health literacy, the outcomes of different prescribing strategies, and the impact of major policy changes were important themes identified across the research questions. With a growing focus on using primary care 'big data' for research, the research questions and major themes identified in this study can guide future research utilising large general practice and primary care datasets to inform opioid policy and practice.

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Healthcare professionals' perspectives on the use of medicinal cannabis to manage chronic pain: a systematic search and narrative review.

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Introduction. Chronic pain is a global public health problem that negatively impacts individuals' quality of life and imposes a substantial economic burden on societies. The use of medicinal cannabis is often considered by patients to help manage chronic pain given its resistance to conventional treatments and legalisation in a number of countries. However, healthcare professionals involved in providing guidance for patients related to medicinal cannabis are often doing so in the absence of strong evidence and clinical guidelines. Little is known about their perspectives regarding the clinical use and relevance of medicinal cannabis for chronic pain.

Aims. The aim of this review was to identify and synthesise the published evidence on this topic.

Methods. A systematic search was conducted across six databases: MEDLINE, EMBASE, CINAHL, Scopus, Web of Science and PubMed from 2001 to 26th March 2021. Three authors independently performed the study selection and data extraction.
Results. A total of 26 studies were included, involving the USA, Israel, Canada, Australia, Ireland and Norway, and the perspectives of physicians, specialists, nurses and pharmacists. Nine key themes were identified: medicinal cannabis as a treatment option; legal issues; low perceived knowledge and the need for education; willingness to prescribe medicinal cannabis; comparative safety of medicinal cannabis versus opioids; perceived indicated uses; end-of-life care; addiction/abuse; and perceived adverse effects.

Discussion. Healthcare professionals require education and training, as well as clinical guidelines that provide evidence-based information about efficacy, safety and appropriate dosage of medicinal cannabis products for chronic pain.

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How do pharmacists assess evidence of drug harms?

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Introduction. Clinicians must assess drug benefits and harms through critical appraisal of literature by appropriately interpreting the statistical findings. Current research suggests that key statistical concepts are often misinterpreted by researchers and practitioners.

Aims. To determine how pharmacists, pharmacy students and pharmacy educators evaluate the statistical evidence regarding drug harms.
Methods. An online was conducted with pharmacists, pharmacy students and pharmacy educators. The survey aimed to gain insight into how participants interpret statistical findings reported in the literature related to drug harms. The survey consisted of 7 demographic questions and 16 statements related to the statistical interpretation of evidence relating to drug harm from two influential clinical trials. Participants were asked to identify whether the statements were true or false. Each of the statements presented common misinterpretations of statistical inference (i.e. all of the statements were false). The mean number of incorrect statements was calculated. An ANOVA test was conducted comparing differences in responses between the three groups (pharmacists, educators and students).

Results. A total of 35 pharmacists, 9 educators, and 30 pharmacy students completed the survey. On average participants misidentified half of the false statements as true (mean 8.12, 95% CI 7.14-9.1). Participants most frequently misidentified statements regarding confidence intervals. We did not observe a statistically significant difference in correct responses between the three groups ($P = 0.33$).

Discussion. The findings of our survey suggest that pharmacists, educators and students frequently misinterpret statistical findings relating to drug harms. An improved understanding of statistical concepts such as *p*-values and confidence intervals is an important gap that needs to be addressed to ensure that evidence relating to drug harms is correctly interpreted and applied.

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Optimising stakeholder engagement in development and clinical use of health apps: evidence-based concept map

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Introduction. Accessible and secure digital health services for all Australians requires collaboration between medical practitioners, pharmacists, researchers, information technology infrastructure providers and developers, and health consumers. Coupled with this, the national My Health Record (a consumer-controlled digital health record) and burgeoning digital media accessible to consumers presents a challenge for stakeholders to understand their place in this ecosystem, ensure they engage appropriately to optimise outcomes for health consumers.
Aims. To conceptualise an evidence-based Health App Ecosystem Map to identify interactions by stakeholders and illustrate consumer-centric health relevant to the current and near-future digital environment in Australia. Methods. The concept map was derived using "organised knowledge" principles adapted to the digital environment. Elements of the concept map were identified from literature relating to use of digital health media, the contemporary digital environment in Australia, and digital health strategy/vision documents, including Blockchain technology developments for secure eHealth messaging. The map identified stakeholders within the ecosystem, subsequently focussing on health apps to illustrate the interactions and data flow relating to consumers' digital self-monitoring of chronic conditions. An iterative process with input from all authors was used to maximise construct and face validity. Results. The map comprises two operational processes: 'front-end' Consumer Engagement and Academic Evaluation of Apps (Part 1), and 'back-end' Data Utilisation, Transfer and Management (Part 2). Collectively, the map presents a use case for three stakeholder groups: consumers, to appreciate how their proactive involvement in self-care and personal ownership of their health can influence clinical outcomes; clinicians, to understand their role in the self-care paradigm and to engage with consumers' self-documented data in electronic platforms; and app developers, to understand patient-clinician interaction in the design of user-friendly, functional interfaces. The secure messaging component provides 'proof of work' mechanisms to validate transactions within the ecosystem. Discussion. The map illustrates how connectivity between stakeholders should enhance inter-professional engagement and security relating to consumers' self-monitored data, and ultimately, care for those consumers. With the increasing reliance on electronic health data, understanding of the complexities of the digital ecosystem should help ensure all parties are appropriately engaged for the benefit of consumers' sustained interaction with their health.

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Form versus function: evaluation frameworks for health information communication in pharmacist prescribing

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Introduction. Information communication technology (ICT) is instrumental in current practice and emerging roles of pharmacists. Development and refinement of ICT is assisted by evaluation frameworks that describe or measure features of ICT and its implementation. Evaluation frameworks are applicable throughout the lifecycle of an ICT, and ideally consider the stakeholders involved at each stage. In the context of pharmacists' prescribing roles, evaluation frameworks can guide the utility of ICT systems and identify pharmacists' ICT requirements for effective prescribing.
Aims. To review existing ICT evaluation frameworks in health-related literature and identify frameworks relevant to the development, implementation and evaluation of pharmacist prescribing. Methods. A database search of CINAHL, Cochrane Library, EMBASE, Medline (Ovid), ProQuest, Scopus, Web of Science and grey literature was conducted, using combinations of keywords relating to 'ICT', 'utilisation', 'usability', and 'evaluation framework'. Abstracts and titles were screened according to inclusion criteria. Identified evaluation frameworks were critiqued for relevance to pharmacy practice. Results. Nineteen articles were identified, describing the development or application of evaluation frameworks. However, none of the frameworks was developed specifically for pharmacy practice. The Technology Acceptance Model (TAM), comprising use behaviour, behaviour intention, perceived use, and perceived ease of use factors, was the most widely utilised or adapted framework, validated in studies of health informatics and e-commerce. The key limitation of this model is its inability to evaluate the user experience as part of ICT development and design. DeLone and Mclean's Information System Success Model, and Human-Organisation and Technology Fit (HOT-fit) are notable evaluation frameworks that address user and organisational influences in ICT utility. Discussion. The paucity of reference to ICT evaluation frameworks in pharmacy practice research may be due to the complex nature of the pharmacy settings, especially hospitals, the heterogenicity of technology terms and systems, and the complex nature of existing ICT systems. While the TAM appears useful to evaluate user attitudes and intentions towards the use of ICT, its relevance to ICT in contemporary community pharmacy practice has not been explored. Therefore, we propose to adapt this model in the context of ICT to enable emerging community pharmacists' roles in Australia, specifically prescribing, whilst also drawing on principles of experience design.

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Antidepressant use in Australian residential aged care facilities: are we achieving quality use of medicines?

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Introduction. The National Medicines Policy, supported by the National Strategy for Quality Use of Medicines, guides safe, judicious, and appropriate use of medicines to optimise health outcomes for Australians. The Royal Commission into Aged Care Quality and Safety highlighted concerns about psychotropic medicines use in residential aged care facilities (RACFs). Antipsychotics were the focus; whereas antidepressant use in RACFs remains largely unexplored.
Aims. To explore the prevalence of antidepressant use among residents of Australian RACFs.
Methods. Information from observational studies reporting prevalence of antidepressant use in Australian RACFs was synthesized. Eligible studies published in English between January 2000 and August 2021 were identified through MEDLINE, Embase and hand searches. Cohorts defined by specific characteristics such as antidepressant type or health condition were excluded, with dementia diagnosis an exception as half of all residents are living with dementia.
Results. We found 24 studies reporting prevalence of use between 18.0% and 68.3%, with measurement periods ranging from one day to 12 months. In more recent analyses, residents were older, with multimorbidity and polypharmacy. Tricyclic antidepressants contributed to 44.6% of antidepressant use in 1996–7 and 9.4–18.2% from 2003 onwards. Selective Serotonin Reuptake Inhibitors (SSRIs) were prescribed to 40–63% of antidepressant users, while mirtazapine use ranged from 1.6% in 2003 to 38.9% in 2016. Small audits of less than 1,000 participants accounted for 54% of studies, with only two studies including all residents nationally. Indication, duration of use, switching between therapies, initiation during care transitions and utilisation at end-of-life remain largely unexplored.
Discussion. At a similar time to the establishment of the National Medicines Policy and supporting quality use of medicines frameworks in 1999-2002, SSRIs and mirtazapine were introduced and improved access to safer antidepressants. However, the high prevalence of use observed in this review raises concerns around their judicious use among residents of RACFs, particularly as efficacy remains indeterminate and non-pharmacological therapies underutilised. My thesis will reflect on changing policies and practices for achieving quality use of medicines in RACFs, to explore gaps in understanding around antidepressant use and optimise resident outcomes.

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Evaluating the dissemination and implementation of deprescribing guidelines

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Introduction. Deprescribing guidelines are an invaluable approach to support evidence-based clinical practice, and professional organisations play a critical role in ensuring guidelines reach and are adopted by intended end-users. At present, there is limited knowledge about deprescribing guideline dissemination and implementation strategies used by stakeholders, and the impact of such strategies.
Aims. To describe the dissemination and implementation efforts for existing deprescribing guidelines.
Methods. The RE-AIM framework was used to assess the translation of scientific advances into practice with reach, effectiveness, adoption, implementation, and maintenance components guiding survey development. A systematic search with the key themes ‘deprescribing’, ‘dissemination’, and ‘guidelines’ over the last 5 years was performed in five electronic databases (Medline, EMBASE, CINAHL, Scopus, Web of Science) to inform item generation. The search ascertained 3 results after screening, warranting further investigation into strategies used for dissemination and implementation of deprescribing guidelines. Results. An international survey targeting organisations involved in deprescribing guideline endorsement, dissemination, modification, or translation was developed. The survey questions, a mixture of multiple-choice and open-ended questions was developed in alignment with the RE-AIM framework. Fifty-four items were formulated for the survey, reviewed for appropriateness and wording by the research team via teleconferences and revisions were made by all investigators. Pilot testing will be done mid-September 2021. Following pilot testing, the survey will be distributed to eligible stakeholders internationally. Further recruitment will occur via passive snowballing.
Discussion. Anticipated output from the international survey will attempt to uncover the current dissemination strategies and adoption of deprescribing guidelines and accompanying knowledge mobilisation tools. Findings will be used to assess initial guideline use and impact.

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3D printed coenzyme Q10 tablets as a proof of concept for personalised dosing

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Introduction. The medication of today is restricted to the strengths and combinations that area available commercially. This makes it impossible to tailor a medication regimen to an individual patient. By 3D printing medications on site, drugs can be loaded into biodegradable, biocompatible, and non-toxic polymers that can be printed with custom strengths and even custom combinations of several medicines, greatly benefiting those with multiple comorbidities or that otherwise struggle to manage their medications.
Aims. Combining polycaprolactone with the model drug coenzyme Q10 to make a filament that can subsequently be printed into a tablet on a conventional desktop 3D printer.

Figure 1: Successfully printed polycaprolactone tablets loaded with coenzyme Q10

Methods. Filaments were prepared using hot melt extrusion, heating and mixing the polymer, drug, and excipients into a molten state and pushing it through a nozzle, where it is then cooled as a uniformly mixed filament. Tablets were created by feeding this filament into a conventional fused deposition modelling 3D printer.
Results. The model drug coenzyme Q10 can successfully be loaded into the polycaprolactone filament at different percentages. The filament had satisfactory mechanical properties to be 3D printed. The printer was instructed using computer aided design to build a tablet shape layer by layer.

Discussion. This proof of concept study showed that a drug-loaded filament can be made and subsequently 3D printed. By instructing the printer to create different sizes or shapes of tablets, different doses can be made. This could have a huge impact in the community, namely for those with multiple comorbidities who have a large tablet burden, or those who otherwise struggle with their medication regimens such as the elderly, or those with dementia or similar conditions.

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Interprofessional collaboration and team effectiveness of general practice pharmacists: A cross-national survey

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Introduction. As their role continues to evolve worldwide, pharmacists have been included in general practice teams in many countries to improve medication use and patient safety. However, Australia lags in expanding the role of general practice pharmacists, compared to Canada and the United Kingdom (UK), where models of pharmacists working in general practice are more established. Furthermore, evidence on interprofessional collaboration and team effectiveness of general practice pharmacists is sparse.
Aims. To compare the level of interprofessional collaboration and team effectiveness of general practice pharmacists in Australia with international sites (Canada and the UK).
Methods. General practice pharmacists from Australia, Canada, and the UK were identified through professional organisations and networks, and were invited to participate in an online survey, adapted from existing validated tools. The survey explored (i) professional interactions, (ii) relationship initiation, (iii) exchange characteristics (role specification and trustworthiness), (iv) collaborative care domains and (v) team effectiveness.
Results. Of the 112 respondents, 78% were females, and 52% were aged below 40 years. Total survey scores for collaboration of pharmacists were 86.1±7.4 in Australia, 88.5±7.5 in the UK, and 89.1±7.3 in Canada (mean±SD, where higher scores represent more advanced collaboration). Pharmacists in Canada rated higher scores for professional interactions with general practitioners (15.5±3.7) compared to pharmacists in Australia (12.9±2.3) and the UK (13.3±1.5) ($P < 0.05$). Having prescribing rights, and full-time and longer length of employment positively influenced interprofessional collaboration, while older age, greater experience, full-time and longer length of employment were positively associated with team effectiveness.
Discussion. Overall, general practice pharmacists in the three countries were highly collaborative with general practitioners. This study has identified individual and contextual factors that can influence collaboration and team effectiveness of pharmacists in general practice settings. Understanding these factors may guide future interventions to strengthen collaboration and team effectiveness of pharmacists in general practice teams.

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Attitude of Australian doctors, nurses and pharmacists towards deprescribing in older adults with limited life expectancy

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Introduction. Older adults with limited life expectancy are receiving potentially inappropriate medications, which necessitates deprescribing. Understanding the perspective of key health care professionals towards deprescribing is crucial towards the implementation of deprescribing.
Aims. To assess the attitudes and beliefs of Australian doctors, nurses and pharmacists towards deprescribing in older adults with limited life expectancy
Methods. Data (n=108) from study used for the validation of 23-itemed health care professionals' attitude towards deprescribing (HATD) tool was used. HATD tool utilises 5-point Likert scale score to assess five factors - concern about deprescribing, burden of medications on patients, organisational support for deprescribing, assurance for deprescribing and patient-involvement in medication management. Descriptive statistics of the participant characteristics and the 23-items were populated. The differences in the factor scores between the three health care professionals was determined using one way ANOVA or Kruskal-Wallis test where appropriate.
Results. Participants were doctors (n=46), nurses (n=32) and pharmacists (n=30). Most of them were females (68.9%) with median age 45.5 years. The overall factor scores were above average (>2.5 or high) in all factors except patient-involvement factor (2.3). There was a statistically significant difference between the three HCPs in terms of the scores of concerns factor (p=0.005), organisational factor (p=0.002) and assurance factor (p<0.001).
Discussion. In terms of deprescribing in older adults with limited life expectancy; Australian doctors, nurses and pharmacists had greater concerns about deprescribing, perceived burden of medications on patients, organisational support to deprescribing and assurance for deprescribing while lower perceived patient-involvement in medication management. The attitude among the three HCPs varied significantly in terms of concerns, organisational and assurance factors.

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An online survey on the trend of online purchasing of pharmacy items in Malaysia

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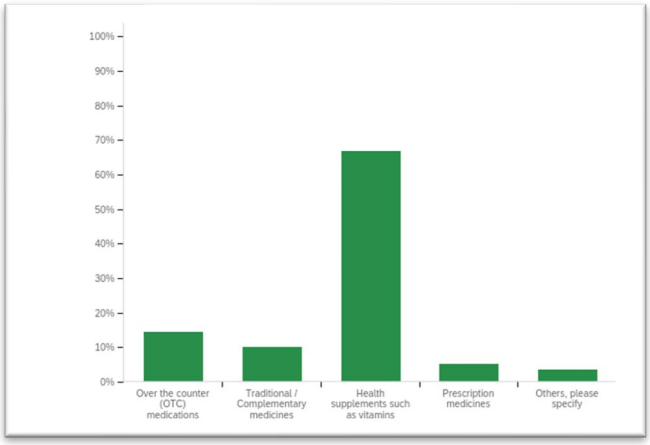

Introduction. The advancement of internet technologies has helped encourage the growth of online purchases and home delivery. As online purchases could be completed alone by the buyer, it is crucial to determine how they obtain pharmacy product information to use them safely.
Aims. This prospective study aims to investigate the general online purchase pattern of pharmacy items in Malaysia.
Methods. An electronic questionnaire in English and Malay developed on Qualtrics was shared via snowballing to collect responses from March to May 2021.

Results. A total of 298 complete responses were obtained. Only 7 per cent of the respondents do not have online purchase experience. 37 per cent of the respondents have experience purchased pharmacy items online. The main reasons for not buying pharmacy items online are the preference for face-to-face consultations at pharmacies and the concern for the authenticity of product purchased online. 72 per cent of the online pharmacy items buyers already knew the products, whereas 19 per cent of the buyers consulted pharmacists for product information.

Discussion. With the number of people buying medicines on the internet (whether through pharmacies or other sources) expected to increase in the future, there are steps that pharmacists of today can take to complement the face-to-face services in addition to online services to create awareness and educate consumers on how to do this safely.