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Medication without harm
WHO Global
Patient Safety Challenge

Discussion paper for public consultation

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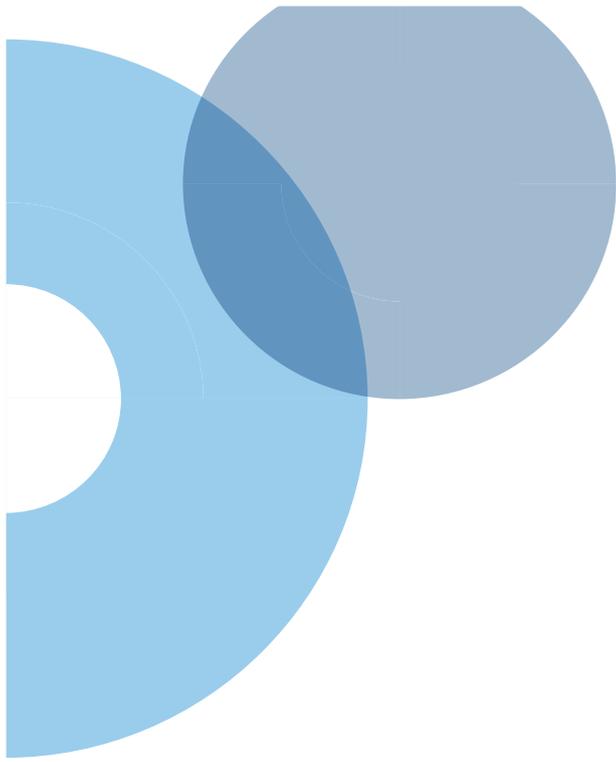
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Contents

Preface	1
Introduction	2
The third WHO Global Patient Safety Challenge – <i>Medication without harm</i>	2
The Australian response	3
The Challenge: the Australian response	4
The Australian context	6
Defining harm	6
The patient journey	7
WHO flagship area 1: Polypharmacy	8
Background and analysis	8
Programs and initiatives	9
Options for national action	11

WHO flagship area 2: High-risk medicines	12
Background and analysis	12
Programs and initiatives	18
Options for national action	22
WHO flagship area 3: Transitions of care	23
Background and analysis	23
Programs and initiatives	25
Options for national action	26
Conclusions	27
Acronyms and abbreviations	28
Glossary	29
Appendices	30
Appendix A – Summary of guidelines and tools to support safe use for: insulin, opioid analgesics, anticoagulants and antipsychotics	30
References	33

Preface

The third WHO Global Patient Safety Challenge – *Medication without harm* (the Challenge) aims to reduce severe, avoidable, medication-related harm by 50% over the next five years, globally. This document presents information on current medication safety initiatives in Australia and future considerations to inform a positive national response (the Response) to the Challenge.

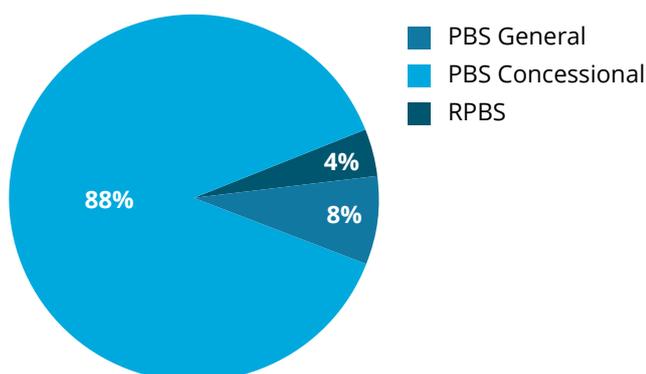
Harm from medications can be the result of an error, accident or communication problem, including:

- Healthcare professionals prescribing and administering medicine in ways that increase the risk of harm to consumers
- The complexity of medicine naming, dosing, indications, duration of therapy, monitoring, precautions, and interactions
- Consumers misunderstanding why and how to use their medicines.

The Challenge aims to make improvements at each stage of the medication process, including prescribing, dispensing, administering, monitoring and use.

In Australia it is estimated that there are 250,000 hospital admissions annually as a result of medication related problems.¹ Patients and clinicians report medication issues and adverse events in hospital, post discharge, in residential aged care facilities and in the community. Use of medications is the most common intervention made in healthcare. Total Pharmaceutical Benefits Scheme (PBS) government expenditure for financial year 2017–18 was **\$11,690 million with 204.1 million** subsidised prescriptions dispensed.²

Chart 1: Dispensed prescriptions 2017–18
– Total 204.1 million prescriptions



Source: Medicare Statistics – Department of Human Services.

In Australia, the goal is to reduce medication errors, adverse drug events and medication-related hospital admissions by 50% by 2025. The Response refines the three flagship areas of the Challenge for the Australian context:

- Monitoring polypharmacy and responding to inappropriate polypharmacy
- Reducing harm from high-risk medicines, with a focus on insulin, opioid analgesics, anticoagulants, and antipsychotics
- Improving medication safety at transitions of care, with a focus on a shared medicines list.

The Response examines existing evidence and programs that reduce medication-related harm in acute care, primary care and aged care settings. The Response also has a focus on transitions of care within and across these settings.

While the breadth of activities related to medication safety in Australia is large, there remain opportunities to improve the integration of these efforts. The unifying link between the flagship areas is the consumer journey through the healthcare system. Involving and engaging consumers to safely manage their own medicines and participate in decision-making about their medicines places the consumer at the centre of their care.

The Response asks that you consider initiatives and programs that will improve the monitoring of polypharmacy and responding to inappropriate polypharmacy, options to reduce harm from high-risk medicines, and options to improve implementation and application of medication reconciliation at transitions of care. A key theme of the Response must be to invest in positive patient outcomes. This can then lead to meaningful dialogue on how we shape the future of the Australian healthcare system to address this significant issue.

The Australian Commission on Safety and Quality in Health Care (the Commission), thanks all those that have collaborated towards the first phase in the development of this Response.

Introduction

The third WHO Global Patient Safety Challenge – Medication without harm

In 2017, the third World Health Organization (WHO) Global Patient Safety Challenge – *Medication without harm* (the Challenge) was launched at the Global Ministerial Patient Safety Summit in Bonn, Germany.

Medication errors vary in type, setting and impact. Many errors will be noticed before they reach a patient or have minimal impact to the patient. Others can have devastating consequences.³

The WHO goal for the Challenge is to reduce severe, avoidable medication-related harm by 50% in the next five years, globally, specifically by addressing

harm resulting from errors or unsafe practices due to weaknesses in health systems. The Challenge aims to improve each stage of the medication process, including prescribing, dispensing, administering, monitoring and use.⁴

The Challenge aims to improve medication safety by strengthening the systems for reducing medication errors and avoidable medication-related harm. The three flagship areas of the Challenge defined by WHO are:

- Polypharmacy
- High-risk situations
- Transitions of care.

Figure 1 outlines the relationships between the flagship areas and healthcare systems, including patients, clinicians, medicines, and medication practices.

Figure 1: Relationships among action areas and the health care system



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Source: Global Patient Safety Challenge – *Medication without harm*. Geneva: WHO 2017.

The Australian response

This document presents the draft Response to the Challenge. It is provided as a basis for the development of a national plan following consultation with state and territory health departments, peak clinical bodies, primary and acute health service providers and consumers.

The overall goal of the WHO in regard to the Challenge is to reduce medication errors and avoidable medication-related harm. In Australia the goal is to reduce avoidable medication errors, adverse drug events and medication-related hospital admissions by 50% by 2025.⁴ A collaborative approach that enhances consumer engagement with their medicines will seek to:

- Respond to inappropriate polypharmacy
- Reduce harm from high-risk medicines
- Improve medication safety at transitions of care.

The Challenge provides Australia with an opportunity to better align existing acute sector and primary care medication safety programs and initiatives, within the context of the National Medicines Policy. This policy aims to improve health outcomes for all Australians, focussing on consumers' access to, and wise use of medicines including selecting both medication and non-medication management options wisely; choosing suitable medicines if a medicine is considered necessary; and using medicines safely and effectively.

The Response examines existing programs that address the three WHO flagship areas, noting that the scope of the Challenge has been refined to align with the Australian context:

- Monitoring polypharmacy and responding to **inappropriate polypharmacy**
- Reducing harm from **high-risk medicines**, with focus on insulin, opioid analgesics, anticoagulants and antipsychotics
- Improving medication safety at **transitions of care** with focus on a shared medicines list.

The Response recognises that in the increasingly digital age, further technological developments to aid patient safety are key. The roll-out and optimisation of electronic-prescribing and medicines administration in secondary care is important as the benefits are now well documented. These systems demonstrate, amongst other things, a substantial reduction in medication-related error, particularly when they have been optimised after implementation.⁵

It is important for Australia to maintain its strong use of healthcare data to ensure we identify areas of risk or potential harm. Data should be used to develop, maintain and encourage proactive harm reduction interventions to reduce adverse events associated with medications in Australia.

Technology will also play an important role in better shared decision making, so that patients and carers are encouraged to ask questions about their medications. Improving the information available to patients promotes shared decision making and healthy challenge between patients and healthcare professionals. With patients and carers playing a more active role in their medication management, we will move towards an environment in which they are their own safety advocates. This can be further facilitated through patient friendly packaging and labelling, and work should be done to ensure that labelling contributes to safer use of medicines.

Cultural change within healthcare systems must also occur in order to deliver the best results for patients. Healthcare professionals should work closely together across all areas, in order to not only address the significant issue of over medication, which can lead to medication safety issues, but improve shared care with more comprehensive knowledge and support. Professional regulation in parallel to this will help ensure adequate training in safe and effective medicines use is embedded in undergraduate training, as well as continuing professional development.⁶

The Challenge: the Australian response



WHO provides leadership and guidance on Global Patient Safety Challenges in collaboration with Member States, stakeholders and experts, to develop and implement interventions and tools to reduce risk, improve safety and facilitate beneficial change. The theme of the third Global Patient Safety Challenge is medication safety.

Purpose

Establish the issues in the three WHO flagship areas

The scope of the Challenge refined to align with the Australian context:

- Monitoring polypharmacy (focusing on inappropriate polypharmacy)
- Reducing harm from high-risk medicines (focussing on insulin, opioid analgesics, anticoagulants and antipsychotics)
- Improving medication safety at transitions of care (focusing on a shared medicines list).

1 Polypharmacy

Australians are high consumers of medicines. In 2017–18 more than 200 million dispensed subsidised prescriptions were filled. Australians are also high consumers of complementary and over-the-counter medicines.² The polypharmacy definition used in the Response is five or more medicines at the same time, including prescription, over-the-counter and complementary medicines.

< 4 in 10

Over four in ten people aged 50 years and older take five or more medicines.¹¹

< 1 in 10

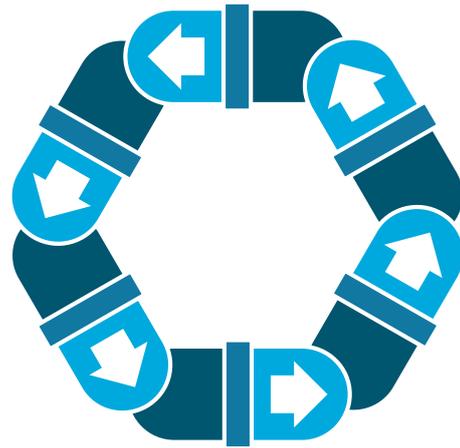
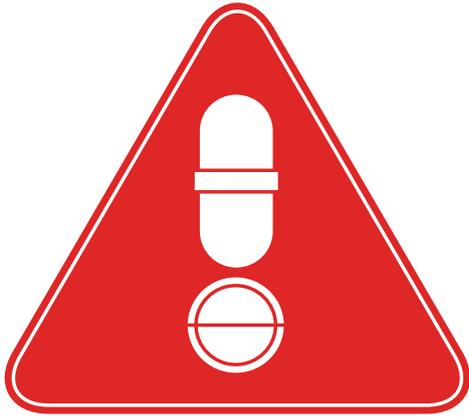
Over one in ten people aged 50 years and older take ten or more medicines.¹¹

Increased risks

Older people taking five or more medicines: Higher risk of delirium and falls, independent of medication indications.

Older people: At risk of inappropriate polypharmacy as they have increased frailty and are more likely to have multiple chronic co-morbidities, each often treated with multiple medicines.

Adverse drug events caused by polypharmacy: Have negative consequences above and beyond the risks of individual medicines.



2 High-risk medicines

High-risk medicines are associated with significant patient harm or death if they are misused or used in error.³⁴ The Response focuses on the prescribing, dispensing, administration and consumption of four high-risk medicines – insulin, opioid analgesics, anticoagulants and antipsychotics.

Insulin

2016: More than 27,000 people began using insulin to treat their diabetes, adding to Australia's one million insulin users.⁴³

Opioid analgesics

Ten years to 2018: Opioid deaths and poisoning hospitalisations have increased, accompanied since 2009 by a general increase in S8 opioid analgesic prescriptions from 10 million to 14 million annually.⁴⁸

Anticoagulants

2015-16: AIHW reported that the original anticoagulant warfarin accounted for 1% of all medicines prescribed by general practitioners.⁵⁷ Along with direct-acting oral anticoagulants (DOACs), warfarin is used in the management of atrial fibrillation which occurs in about 2% of the general population and is particularly common in older people, affecting 5% of people 65 years and over.⁵⁶

Antipsychotics

Between 2013-14 and 2016-17: Rate of antipsychotic medicines dispensed per 100,000 people aged 18-64 years increased by 9%.³⁵ In the same period for people aged 65 years and over the rate of antipsychotic medicines dispensed per 100,000 decreased by 6%.³⁵

3 Transitions of care

Transitions of care are recognised as an area of high clinical risk for patients. Passing from one care setting to another, particularly for patients with complex and chronic care needs, opens the potential for mistakes, oversights, misunderstandings and, often, a marked absence of vital information that should flow from the hospital to the receiving carer.

Medication change

Up to 90% of people: May experience a change to their medicines while in hospital!

PIMs

Up to 42% of people: May be prescribed at least one potentially inappropriate medication (PIM) at discharge.¹⁰⁸

No separation summary

Only 12% of people: Had a separation summary that addressed the issues related to the PIM.¹⁰⁸

Adverse events

Poor quality documentation at transitions: Can lead to adverse events including medication errors and higher rates of admission and readmission to hospital – between 2% and 3% of all hospital admissions are medication-related.¹⁰⁹

The Australian context

The Australian approach to safety and quality has been to identify systemic risks to patients, to mitigate those risks and to improve patient outcomes through clinically appropriate risk management responses. Robust clinical governance, setting of standards, meaningful consumer partnerships, and measurement and reporting are central to this approach.

In Australia a key driver for safety and quality improvement in hospitals has been the development and implementation of the National Safety and Quality Health Service (NSQHS) Standards. There are eight NSQHS Standards which cover high-prevalence adverse events, healthcare-associated infections, medication safety, comprehensive care, clinical communication, the prevention and management of pressure injuries, the prevention of falls, responding to clinical deterioration, partnering with consumers and the implementation of robust clinical governance systems.

The Challenge aims to improve medication safety by strengthening the systems for reducing medication errors and avoidable medication-related harm and the relationships displayed in Figure 1.

Defining harm

As part of the Response to the Challenge it is important to reflect on the key message to reduce severe, avoidable medication-related harm.

In 2018, the WHO defined harm as the impairment of structure or function of the body and/or any deleterious effect arising from, or associated with, plans or actions taken during the provision of primary health care. It includes disease, injury, suffering, disability and death, and may be physical, psychological or social.⁷

In the absence of national data quantifying the extent of harm, Australia has used fragmented data and proxy indicators to gauge the extent of the problem. However, in the immediate term, measurement of direct outcomes of medication-related harm such as hospital-acquired complications, hospital re-admissions, and mortality are captured and able to be used.

In 2016, the WHO published a paper *Medication Errors: Technical Series on Safer Primary Care*,⁸ which made reference to The United States National Coordinating Council for Medication Error Reporting and Prevention definition of a medication error:

any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use.

As part of the Global Patient Safety Challenge, assessment tools are needed to enable safer medication practices, assess the systems and practices of medication, and monitor and evaluate the progress. The WHO is working in collaboration with the Institute for Safe Medication Practices (ISMP) to produce assessment tools that can assess medication safety at different settings or levels of care. The Australian health system is relatively rich in data, albeit in disparate places. Using a combination of wide and deep data, for example MBS, PBS, and other Commonwealth collections along with NPS MedicineInsight data will facilitate monitoring of inputs and outcomes to ensure that avoidable, medication-related harm is reduced over the duration of the Challenge.

The patient journey

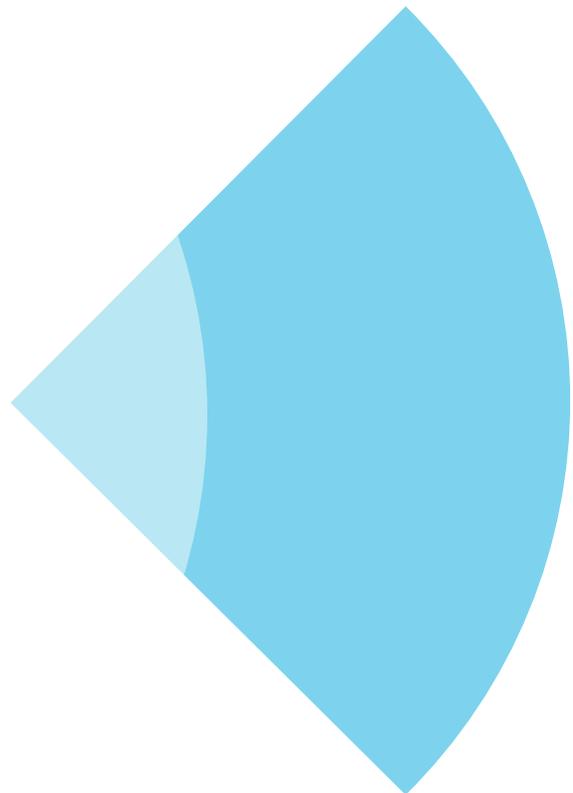
Important medication safety processes such as therapy initiation, monitoring, transitions of care and de-escalation are brought together across the three flagship areas (inappropriate polypharmacy, high risk medicines and transitions of care) of the national Response though focusing on the patient journey.

Shared and supported decision making is when health professionals and patients and their carers work together to integrate the patients values, goals and preferences with the best available evidence about the treatment options available and appropriate to the patient. This puts people at the centre of decisions about their own treatment and care. During shared and supported decision making, it is important that:

- Treatment options are fully explored, including discussion of the risks, benefits and uncertainties associated with different options
- Patient values, goals and preferences are discussed
- Decisions are agreed and there is a shared understanding between the patient (or substitute decision maker) and their healthcare provider.

Shared decision making can help support medication safety as it empowers consumers to take a more active role in managing their care including managing their medication. Supporting shared decision making and working with consumers as partners in their own care allows patients to better manage their own care, be their own safety advocate, and have more confidence to raise concerns and ask questions about their care.

Meaningful conversations between clinicians and patients before prescriptions are issued may also lead to fewer drugs being dispensed as opposed to unnecessary over prescribing of drugs, which are then not taken by a patient because they don't see the value of them.⁹ This could reduce both the risk to patients of unnecessary and avoidable admissions to hospital and avoidable costs to the patient and the Australian healthcare system.





WHO flagship area 1: Polypharmacy

Background and analysis

Australia's population is ageing. More than 938,000 people have moved into the 65–84 years age band in the last ten years. Chart 2 summarises the changes between 2008 and 2018.

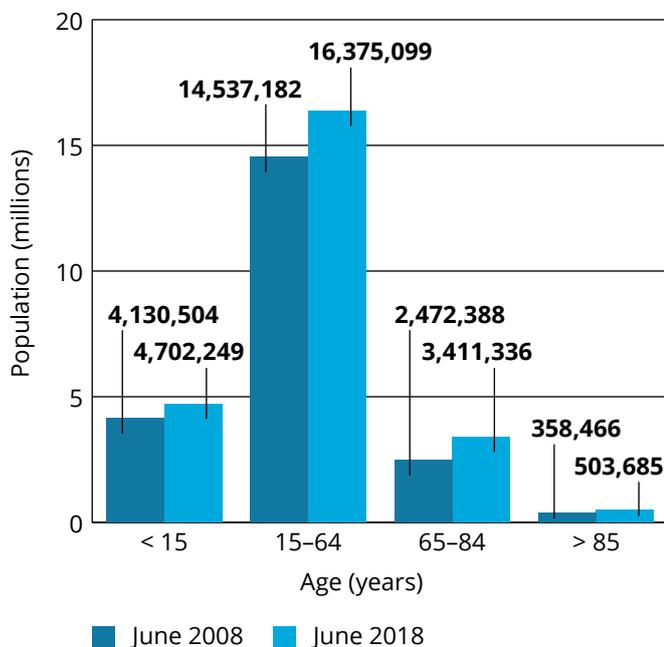
The Australian Institute of Health and Welfare (AIHW) reported that in 2016–17 hospitalisations for people aged 65 years and over accounted for 6.4 million (58%) of a total of 11 million hospitalisations. Chart 3 shows the split between same day and overnight hospitalisations.

AIHW further reported in 2016–17, there were 1.6 million emergency department (ED) presentations among people aged 65 years and over – around one-

fifth of the total 7.8 million presentations. There were 13.9 million specialist attendances claimed through Medicare in 2016–17 for people aged 65 years and over (representing 45% of all specialist attendance claims). Just under 38 million Medicare claims for unreferral GP attendances were made in 2016–17 for people aged 65 years and over (29% of the total 130 million claims for unreferral GP attendances).¹⁰

Many of these patients are on multiple medications to control chronic diseases. Morgan et al.¹¹ found that the prevalence of medicines use amongst Australians aged 50 years and older was 87.1%, with 43.3% of study participants reporting use of five medicines of any type in the previous 24 hours, and 10.7% reporting using ten or more medicines. Chart 4 summarise this data.

Chart 2: Australia's Ageing Population 2008–2018



Source: Australian Bureau of Statistics, Reports 3101.0 and 3201.1.

Chart 3: Hospitalisations by age demographic 2016–17 – Total 11 million hospitalisations

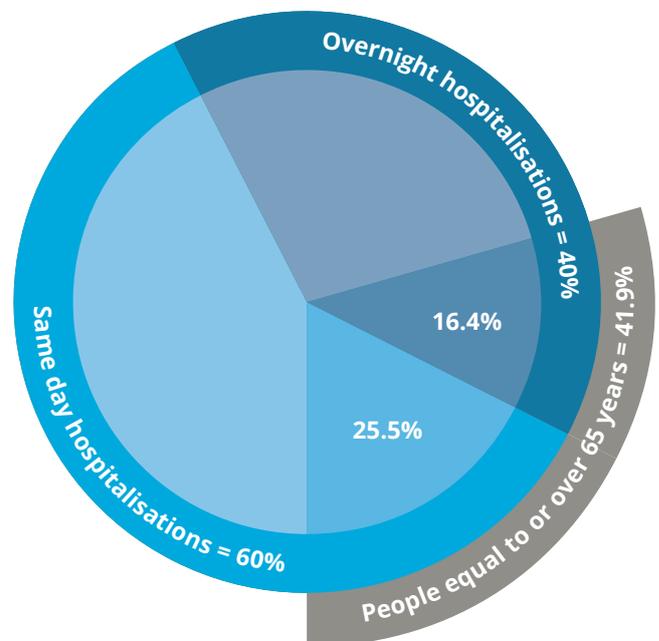
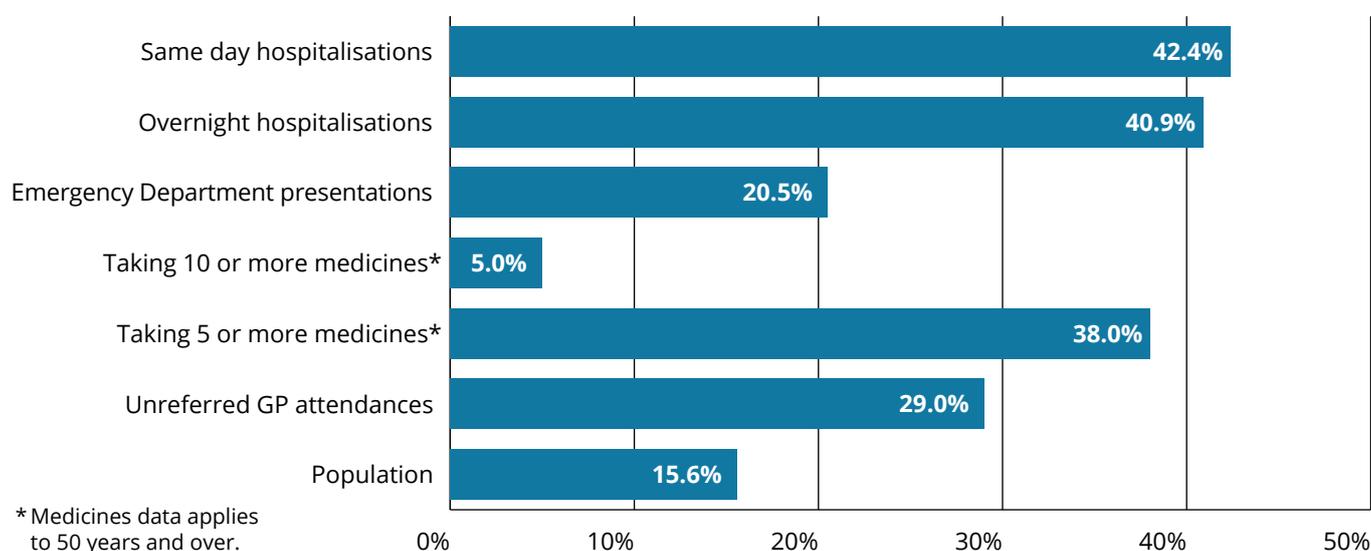


Chart 4: Use of Health Services by people aged 65 years and over,
Medicines Use by people aged 50 years and over



Older people taking five or more medicines are at higher risk of delirium and falls, independent of medication indications.¹² Older people are at risk of inappropriate polypharmacy as they have increased frailty and are more likely to have multiple chronic co-morbidities, each often treated with multiple medicines. Adverse drug events (ADEs) caused by polypharmacy have negative consequences above and beyond the risks of individual medicines.

Definitions of inappropriate polypharmacy, appropriate polypharmacy and polypharmacy management have been outlined by the European Union-funded Stimulating Innovation Management of Polypharmacy and Adherence in the Elderly (SIMPATY) consortium.¹³ The SIMPATY consortium defines inappropriate polypharmacy as the prescribing of multiple medicines inappropriately, or where the intended benefit of the medicine is not realised.

In Australia the accepted definition on polypharmacy is the use of five or more medicines at the same time, including prescribed, over-the-counter and complementary medicines. This reflects the high consumption of complementary medicines by Australians.¹⁴

Programs and initiatives

Many programs are in place to help reduce inappropriate polypharmacy and promote safe use of medicines. These include pharmacist-led home medication review¹⁵ and residential medication management review,¹⁶ general practitioner-led multidisciplinary care plans,^{17,18} hospital outreach medication review services,¹⁹ and community pharmacy medication reconciliation services.²⁰ There is evidence that these programs improve medication safety.^{21,22} Caps apply to the number of services able to be delivered both by general practitioners and pharmacists.

Maintaining the theme of investing in positive patient outcomes and following the patient journey, a number of effective programs and resources have been identified by clinicians to help reduce inappropriate polypharmacy.

Prior to initiation of medication

Minimising medication-related harm starts with the development of a best possible medicines history (BPMH).

A BPMH is essential for:

- Ensuring continuity of medication management
- Identifying medicine-related problems
- Identifying potential medicine-related discrepancies
- Informing the decision-making process
- Optimising the use of medicines.

Development of good prescribing habits

The National Prescribing Curriculum for health professional students, developed by NPS MedicineWise in collaboration with the Australian Society of Clinical and Experimental Pharmacologists and Toxicologists (ASCEPT), provides online learning modules for future prescribers about judicious, safe and effective use of medicines.²³ The modules follow a stepwise approach as outlined in the WHO Guide to Good Prescribing.¹⁷⁷ The importance of continuing education, training and mentoring of healthcare professionals in the use of medicines is a career long requirement for maintaining healthcare professional registration in Australia.

The ASCEPT provide further guidance and tools for prescribers to manage the number of medicines required, notably, *5 Things Clinicians and Consumers Should Question*.²⁴ Other colleges and societies have also made similar recommendations which amplify the ASCEPT recommendations.

In addition to these programs there are resources from NPS MedicineWise highlighting the importance of judicious selection and use of medicines in older people^{25,26} and resources to support deprescribing in general practice are being delivered as part of a national primary care program *Starting, stepping down and stopping medicines*.²⁷

Monitoring of polypharmacy

In Victoria's public sector residential aged care facilities a quality indicator which reports on the proportion of residents using nine or more medicines is used. This polypharmacy indicator is a trigger to decide whether a review of the resident's medicines is needed.

In addition to the measure of polypharmacy, other measures, such as tools to identify people at risk of an in hospital adverse drug event, medication-related falls, and medication-related impairment of physical or cognitive function, may help to prioritise those consumers most likely to benefit from a medication review by a multidisciplinary team.

Transition of care arrangements

To avoid medication misadventure at transitions of care the sixth Community Pharmacy Agreement (6CPA) provides for Dose Administration Aids (DAAs) to assist consumers in the community to better manage their medicines, with the objectives of avoiding medication misadventure and improving medication compliance. In the twelve months to 31 May 2017, the average number of consumers receiving DAAs claimed through the 6CPA program increased by 1.9% over the previous twelve months.²⁸ In the same period the number of clinical interventions by pharmacist to identify, manage and document medication-related issues with a consumer's medicines increased by 25%.

Quality Use of Medicine indicators

Quality Use of Medicine indicators for reviewing inappropriate polypharmacy in older consumers in a hospital setting are being developed by the New South Wales Therapeutic Advisory Group (NSW TAG). In addition, point of care tools for clinicians and consumers are being developed and piloted to facilitate medication review in hospital.

Consumer fact sheets

Relevant consumer fact sheets, including Consumer Medicines Information fact sheets which inform consumers about prescription and pharmacist-only medicines do not typically include information on ceasing medicines. The NHMRC Cognitive Decline Partnership Centre 2018 report,²⁹ proposes that the Therapeutic Goods Administration (TGA) implement regulatory change, making it mandatory to include information on deprescribing or ceasing medicines in the Product Information (PI) and the Consumer Medicines Information (CMI) that form part of a medicine registration in Australia.

The practice of deprescribing

The practice of deprescribing medicines has gained support as a way to reduce inappropriate polypharmacy and to improve consumer safety. In 2015, Scott et al.³⁰ outlined the principles and processes of reducing inappropriate prescribing in the Australian health care setting. Randomised trials and observational studies have shown evidence of efficacy for deprescribing, including reductions in the number of medicines with questionable benefits, and improved consumer outcomes.³¹

Gillespie et al³² explored factors that influence the attitudes and practices of general practitioners (GPs) towards deprescribing in the context of care for older adults living independently in the community. The authors concluded that while GPs reported many supportive factors for deprescribing, the influence of unsupportive factors appears to remain strong, as deprescribing is not routinely considered in practice.

Rational prescribing is intended to effect quality use of medicines and eliminate unnecessary medication. The prescribing, dispensing and consumption of medicines that are no longer clinically appropriate, or are not indicated puts consumers at risk of unnecessary side effects and drug interactions, and places an unnecessary economic burden on the consumer and the healthcare system.

Partnering with consumers

Partnering with consumers involves working with consumers to understand their needs and preferences in the context of their immediate healthcare. It involves discussing options, sharing decisions and planning care collaboratively to improve self-management of their health, and personalised care planning. Barriers to deprescribing can be overcome by ensuring discussions with consumers or their carers about medications use a shared decision making approach.

To enable shared decision making, prescribers need to adapt their communication about polypharmacy based on their patients' knowledge of and attitudes to medicines and preferences for involvement in decisions,³³ including:

- Actively encouraging patients and carers to ask questions about their medication
- Talking about the risks, benefits and uncertainties of different medication and treatment options including when to stop medicines
- Encouraging and supporting patients and carers to raise any concerns about their medicines at any time.

Options for national action

To reduce by 50% avoidable medication errors, adverse drug events and medication-related hospital admissions caused by inappropriate polypharmacy, in Australia by 2025:

DISCUSSION POINT

What is considered best practice of what is being done now?

DISCUSSION POINT

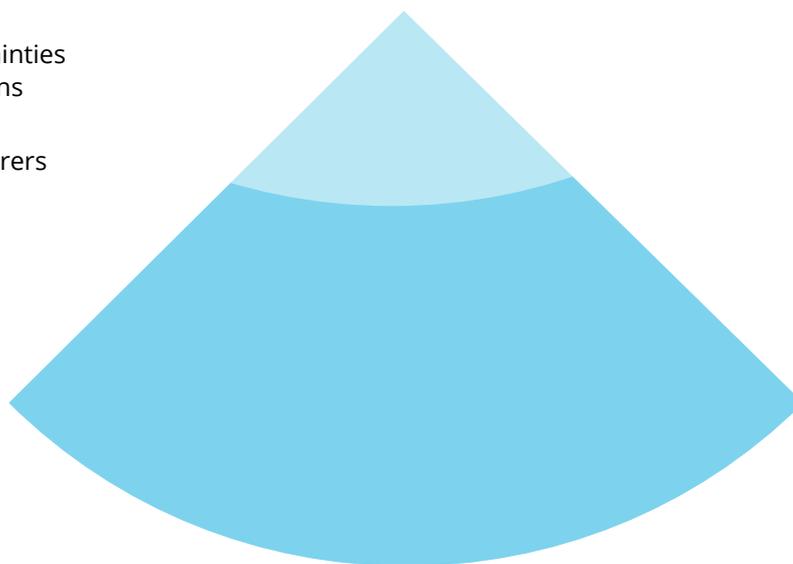
What, if anything, should be done more or less of?

DISCUSSION POINT

What are the current gaps in achieving positive patient outcomes to reduce adverse events from polypharmacy in the future?

DISCUSSION POINT

What indicators should be used to measure progress towards the 50% reduction targets?





WHO flagship area 2: High-risk medicines

Background and analysis

High-risk medicines are associated with significant patient harm or death if they are misused or used in error.³⁴ Typically high-risk medicines include those with a narrow therapeutic index, and those that present a high risk when administered via the wrong route or when other medication management system errors occur.

The high-risk medicines which are the focus of the Challenge in Australia are insulin, opioid analgesics, anticoagulants and antipsychotics. High-risk medicines are treatment options where fully informed decision-making by clinicians and consumers to optimise benefits and minimise harm is paramount.

*The Third Australian Atlas of Healthcare Variation (2018)*³⁵ defines appropriate care as optimising benefits and minimising harms, based on the best available evidence. The Atlas states that a key requirement for delivering appropriate care is accessible information about the benefits and risks of treatment options, so clinicians and consumers can make fully informed decisions.

Providing information that is easy to understand to consumers, simplifying treatment regimens, using prompts/behavioural methods to help medication concordance, and monitoring medication use are general principles that can be applied across high-risk medicines to optimise benefits and minimise harm. The *Australian Medicines Handbook*³⁶ and the *Therapeutic Guidelines*³⁷ are Australian, independent, evidence-based resources to guide quality use of medicines.

Throughout the health professionals prescribing pathway, health professionals are required to prescribe medicines within their scope of practice and to maintain and enhance their competence to prescribe.³⁸ Continuing education of health professionals facilitates improvements in prescribing, dispensing, administering and monitoring medicines to avoid medication-related harm. The importance of continuing education, training and mentoring of early career health professionals about high-risk medicines cannot be underestimated in the development of best practice. For later career health professionals staying up to date with current best practice is equally important.

Internationally, Improvement NHS UK (National Health Scheme United Kingdom), provides an example of further education in the report by the Royal College Physicians (RCP), in supporting junior doctors and prescribing.³⁹ The report has key recommendations for better education, collaborative working and shared learning. It aims to give guidance which will ultimately enhance support for junior doctors and create safer care for patients. A recommendation from the report is that multidisciplinary teams all have a degree of responsibility for supporting junior doctors in safer prescribing. This highlights the potential of schemes including using pharmacist 'buddies'; which creates a positive cultural and practical movement towards improving medication safety.⁴⁰

Connecting initiatives that improve prescriber competency with programs that capture and report medication errors, potentially maximises the impact of continuing education and training in prescribing competency.

The TGA's Database of Adverse Event Notifications (DAEN) is a repository of reported adverse drug events (ADE). Mandatory reporting of medication errors and adverse drug events associated with insulin, opioid analgesics, anticoagulants and antipsychotics to DAEN may provide improved information of the prevalence and incidence of adverse drug events from these medicines. Overlaying Pharmaceutical Benefits Scheme dispensing data for insulin, opioid analgesics, anticoagulants and antipsychotics, may aid in identifying geographic areas where use of high-risk medicines is associated with adverse events.

To further advance the reduction of adverse events from high-risk medicines, attention must be given to the deployment and optimisation of electronic medication management (EMM) systems. The benefits of EMM systems are now well documented and demonstrate, amongst other things, a significant reduction in medication related error, particularly when systems have been optimised after implementation. Even without optimisation, a recent National Institute for Health Research (NIHR) funded study in NHS UK has shown that high-risk medication errors can be reduced by up to 50%, as well as showing the systems to be cost effective. Optimisation however remains a challenge. It is clear from work undertaken by NIHR, that there are

significant challenges and delays with sites optimising systems once they have been implemented. This is leading to delays in benefits being realised, particularly around medication safety, and system generated errors being missed.⁴¹

The Medication Safety Standard⁴² within the National Safety and Quality Health Service (NSQHS) Standards (2nd ed.) sets out the processes and the elements that are needed in governance and communication strategies to ensure medication safety. The Commission and the health systems of the states and territories have high-risk medicine programs that provide resources and support hospitals to implement policies to manage high-risk medicines. A number of clinical colleges and societies also provide resources to guide the use of high-risk medicines.

A summary of the information and resources available in Australia to guide the use of the high-risk medicines in focus – insulin, opioid analgesics, anticoagulants and antipsychotics – is available in Appendix A.

Insulin

An Australian Institute of Health and Welfare (AIHW) report,⁴³ based on self-reported estimates from the Australian Bureau of Statistics 2014–15 National Health Survey, stated that 6.1% or 1.2 million Australian adults had diabetes, and that this was likely to be under-reported. In 2015–16, more than 11 million Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme prescriptions for diabetes medicines were dispensed. This included 1.04 million dispensed prescriptions for insulin. In 2016, 27,700 people began using insulin to treat their diabetes.

In July 2018, the AIHW Diabetes snapshot⁴⁴ showed 1 million hospitalisations associated with diabetes (principal or additional diagnosis) in 2015–16, and that there were 16,400 deaths in 2015 due to diabetes, with 55% due to type 2 diabetes.

Administration of insulin unmatched to carbohydrate load, illness or activity causes unwanted changes in blood glucose levels (BGLs). Too much insulin can cause hypoglycaemia; too little causes hyperglycaemia and can cause ketoacidosis in people with type 1 diabetes.

The Australian Government's National Diabetes Services Scheme (NDSS) aims to enhance the capacity of people with diabetes to understand and self-manage their diabetes. Fully subsidised continuous glucose monitoring (CGM) products for eligible children and young people aged under 21 years with type 1 diabetes are available through the Scheme. For adults with type 1 diabetes the Dose Adjustment for Normal Eating in Australia (OzDAFNE)⁴⁵ program helps them

calculate how much insulin is needed for the amount of carbohydrate eaten. The program also provides advice on how to manage hypoglycaemia, illness and exercise.

In hospitalised patients, factors such as fasting for surgery or investigations, appetite fluctuations due to nausea and vomiting, and other changes to daily routines while in hospital can affect BGLs. This can lead to potential complications with insulin use and dosing.

Many insulin-treated patients will have greater knowledge and experience of insulin adjustment than the medical and nursing staff responsible for their care. They will routinely monitor their capillary glucose and adjust the insulin dose depending on the result. Non-invasive glucose monitors and wearable devices provide alternative means of measuring blood glucose levels. Devices such as insulin pumps integrated with continuous glucose monitors in a closed loop system are able to automatically adjust the basal rate of insulin administered by the pump, thus reducing the risk of hypoglycaemia.

As the number of people with diabetes in Australia continues to rise, the corresponding increase in consumers using insulin will amplify the requirements for:

- Consumer information about managing insulin-dependent diabetes, including self-management
- Clinician knowledge of the risk of harm from insulin, especially in people with suboptimal glycaemic control
- Clinician communication skills and consumer engagement
- Diabetes educators to disseminate usage information for the expanding insulin delivery technologies, and newer formulations such as high concentration insulins.

Opioid analgesics

Opioid analgesics have established efficacy for managing acute pain, but carry potential for misuse. There has been 'indication creep' to use opioid analgesics to treat chronic non-cancer pain, despite the lack of evidence.⁴⁶ The United States has a widely publicised crisis in the widespread misuse of prescribed opioid analgesics, with more than 47,000 overdose deaths involving opioids (including prescription opioid analgesics, heroin and illicitly manufactured fentanyl) reported in 2017.⁴⁷ Since 2009 in Australia, there has been an increase in prescriptions for opioid analgesic medicines,⁴⁸ suggesting that Australia is trending along a similar path to the United States.

The increased availability and use of prescription opioid analgesics has been accompanied by a concomitant increase in adverse effects associated with long-term use,⁴⁹ hospitalisations and deaths.⁵⁰ A number of reports, such as the Penington Institute *Australia's Annual Overdose Report 2018*,⁵¹ the National Drug and Alcohol Research Centre (NDARC) 2018 report on *Opioid-, amphetamine-, and cocaine-induced deaths in Australia*,⁵² and the AIHW report *Australia's health 2018*⁵³ have highlighted the increase in reported opioid-induced deaths in Australia.

The Third Australian Atlas of Healthcare Variation (2018) found that between 2013–14 and 2016–17, the rate of opioid analgesic medicines dispensing per 100,000 people increased by 5% nationally. The magnitude of variation in dispensing rates also increased, from 4.8-fold to 5.1-fold. It is unclear whether these changes are due to more people requiring opioid analgesics for appropriate uses or an increase in inappropriate prescribing. Despite the number of regulatory efforts already in place to minimise harm from these medicines, continued focus on improving medicine use in this area is needed. Comparison of the risk presented by the different opioid analgesics would be facilitated by the adoption of a national uniform

measure of morphine equivalents, for example, oral morphine equivalent daily dose (oMEDD).

In 2018, the AIHW produced a comprehensive report⁵⁴ presenting current national data and trends on opioid use and harms in Australia. In 2016–17, 3.1 million people had one or more prescriptions dispensed for opioids (most commonly for oxycodone). About 40,000 people used heroin, and about 715,000 people used analgesics and pharmaceutical opioids for illicit or non-medical purposes. Findings included:

- Opioid deaths and poisoning hospitalisations have increased in the last ten years
- Legal or pharmaceutical opioids (including codeine and oxycodone) are responsible for far more deaths and poisoning hospitalisations than illegal opioids (such as heroin)
- More opioid prescriptions were dispensed but on average prescriptions were for lower doses and/or quantities
- Oxycodone and codeine were most commonly dispensed opioid analgesics
- One in ten Australians have ever used any type of opioid for illicit or non-medical purposes.

Table 1: Comparison of accidental deaths due to pharmaceutical opioid analgesics between 2002–2006 and 2012–2016

State or Territory	Deaths 2002–2006 (no.)	Deaths 2002–2006 per 100,000 people	Index vs Australia	Deaths 2012–2016 (no.)	Deaths 2012–2016 per 100,000 people	Index vs Australia	Ratio 2012–2016 vs 2002–2006
NSW	299	0.9	100	777	2.1	95	2.3
VIC	229	0.9	100	585	2.0	91	2.2
QLD	105	0.6	67	616	2.7	123	4.5
SA	73	1.0	111	136	1.7	77	1.7
WA	101	1.0	111	345	2.7	123	2.7
TAS	29	1.2	133	39	1.6	73	1.3
NT	10	np	np	15	np	np	np
ACT	10	np	np	31	1.6	73	np
Australia	856	0.9	100	2,544	2.2	100	2.4

Notes:

- np: Low absolute numbers suffer limitations of statistical robustness.
- Index vs Australia: Nominator = deaths per 100,000 people by state or territory; Denominator = deaths per 100,000 people for Australia.
- Ratio 2012–2016 vs 2002–2006: Nominator = deaths per 100,000 people in 2012–2016; Denominator = deaths per 100,000 people in 2002–2006.

Source: Adapted from Table 3, *Australia's Annual Overdose Report 2018* – Penington Institute.

Using opioid analgesics for the long-term management of chronic non-cancer pain is controversial. There are many resources available providing guidance on the treatment of chronic non-cancer pain. To avoid medication-related harm from opioid analgesics steps can be taken to:

- Modify prescriber behaviour to reduce dose, quantity and duration of opioid analgesics
- Encourage alternative therapies and combined strategies (for example, psychological therapies) for managing chronic non-cancer pain
- Partner with consumers to taper or de-escalate opioid analgesics for those consumers with chronic non-cancer pain already receiving high doses of opioid analgesics.

Anticoagulants

Cardiovascular disease (such as coronary artery disease and stroke) is one of the most common chronic conditions. *No Postcode Untouched – Stroke in Australia 2017*⁵⁵ states that every nine minutes someone in Australia will have a stroke. It estimated that 56,000 Australians would have a stroke in 2017, and that there are 470,000 people living who have had a stroke. The National Heart Foundation of Australia reports⁵⁶ that atrial fibrillation occurs in about 2% of the general population and is particularly common in older people, affecting 5% of people 65 years and over.

In *Medicines for Cardiovascular Disease 2017*⁵⁷ AIHW reported that in 2015–16 antithrombotic agents accounted for 2.3% of all medicines prescribed by general practitioners, with warfarin the most common.

Inappropriate dosing of anticoagulants can cause haemorrhagic disorder and can lead to excessive bruising or catastrophic bleeding. Their safe and effective use relies on balancing the benefits of blood clot prevention with the risks of bleeding. For consumers prescribed warfarin, regular international normalised ratio (INR) monitoring is essential to ensure the dose of warfarin continues to achieve the INR target. Integrated anticoagulation management systems are available that enable consumers to perform INR testing at home, and transmit results to their doctor, who can assess results and make any changes to warfarin dosing.

Along with warfarin, the newer direct-acting oral anticoagulants (DOACs) such as apixaban, dabigatran, and rivaroxaban, can all be considered for the prevention of stroke and systemic embolism in adults with non-valvular atrial fibrillation. Prescription data obtained for anticoagulant medicines from PBS Item Statistics Reports (Table 2) shows a 28% decline in

warfarin prescriptions between 2015–16 and 2017–18, but is more than offset by a 58% increase in direct oral anticoagulants (DOACs).

DOACs are as effective as warfarin in reducing stroke and systemic embolism, and bleeding rates are less than or similar to warfarin. Intracranial haemorrhage is significantly reduced with DOACs compared with warfarin.⁵⁸ DOACs do not need INR monitoring. This profile has contributed to the growing acceptance of DOACs. Whichever anticoagulant is selected, all people prescribed an oral anticoagulant medicine need individualised clinical monitoring.

To avoid medication-related harm from anticoagulants there are minimum actions required by clinicians to mitigate risks associated with anticoagulant use. These vary based on reason for anticoagulant use – stroke, stroke prevention, atrial fibrillation, and venous thromboembolism (VTE), including deep vein thrombosis and pulmonary embolism.

The National Quality Use of Medicines indicators in Australian hospitals 2014⁵⁹ lists six measures for judicious selection and safe and effective use of antithrombotic medicines, and a specific continuity of care indicator for consumers discharged on warfarin:

- 1.1 Antithrombotic therapy – Percentage of hospitalised adult patients that are assessed for risk of venous thromboembolism
- 1.2 Antithrombotic therapy – Percentage of hospitalised adult patients that receive venous thromboembolism prophylaxis appropriate to their level of risk
- 1.3 Antithrombotic therapy – Percentage of patients prescribed enoxaparin whose dosing schedule is appropriate
- 1.4 Antithrombotic therapy – Percentage of patients prescribed hospital initiated warfarin whose loading doses are consistent with a drug and therapeutics committee
- 1.5 Antithrombotic therapy – Percentage of patients with an INR above 4 whose dosage has been adjusted or reviewed prior to the next warfarin dose
- 1.6 Antithrombotic therapy – Percentage of patients with atrial fibrillation that are discharged on oral anticoagulants
- 5.4 Continuity of care – Percentage of patients on warfarin that receive written information regarding warfarin management prior to discharge.

Table 2: Pharmaceutical Benefits Scheme dispensed prescription summary – anticoagulants

Anticoagulant group	Anticoagulant	2015–16	2016–17	2017–18	Change from 2015–16 to 2017–18 (%)
Oral	Warfarin	2,075,514	1,694,048	1,489,857	-28
New direct-acting oral (DOACs)	Apixaban	721,201	1,125,024	1,547,286	115
	Dabigatran	327,744	370,798	445,728	36
	Rivaroxaban	1,289,051	1,502,294	1,694,596	31
	Total DOACs	2,337,996	2,998,116	3,687,610	58
Total		4,413,510	4,692,164	5,177,467	17

Source: Medicare Australia.

Antipsychotics

In *Australia's Health 2018 in Brief*⁶⁰ AIHW estimated that around 45% of Australians aged 16–85 years will experience mental illness in their life, and that 20% of adults and 14% of children and young people will experience mental illness in any year.

Of the four million consumers who received 25.7 million prescriptions for health related medicines (subsidised and under co-payment) in 2016–17,⁶¹ antipsychotic medicines were dispensed to 461,000 people. There was a 4% decrease in the number of dispensed PBS prescriptions for the top seven antipsychotics between 2015–16 and 2017–18 (Table 3).

Antipsychotic medicines are the mainstay of treatment for psychotic symptoms for people with mental illness. All antipsychotic medicines have potential side effects, which vary from person to person. Side effects can include those related to metabolism, weight gain, extrapyramidal motor function (restlessness, trembling in the limbs), muscle stiffness, dizziness, increased sweating, unusually dry or watery mouth, eyesight problems, nausea, constipation, pain or irregularity in menstruation and issues with sexual function. There are important interactions antipsychotic medicines have with other medicines. Guidelines on managing common adverse effects of antipsychotic drugs are available in Appendix 8.4 of the *Therapeutic Guidelines*.³⁷

Table 3: Pharmaceutical Benefits Scheme dispensed prescription summary – antipsychotics

Section	Antipsychotic	2015–16	2016–17	2017–18	Change from 2015–16 to 2017–18 (%)
100	Clozapine	294,697	294,849	287,709	-2
85	Aripiprazole	241,439	267,769	293,447	22
	Amisulpride	86,605	83,114	81,275	-6
	Olanzapine	963,222	923,385	898,701	-7
	Quetiapine	953,442	902,414	895,710	-6
	Risperidone	539,085	552,465	501,366	-7
	Ziprasidone	38,000	33,504	31,512	-17
	Total Section 85	2,821,793	2,762,651	2,701,011	-4
Total		3,116,490	3,057,500	2,989,720	-4

Source: Medicare Australia.

Medication safety in mental health is challenging where there is a lack of clarity over which health professional – the general practitioner, the psychiatrist or community mental health centre clinician, is responsible for care decisions. Involvement of all stakeholders in a systems approach is required to improve medication safety in mental health.

The 2017 Commission scoping study *Medication Safety in Mental Health*⁶² highlights the issues about medication safety in mental health settings. The findings suggest that existing medication safety practices and strategies may not be widely used in mental health services. The study suggested that strategies that have been successful in improving medication safety in general health may be successfully adapted to mental health settings. The study identified several areas for improvement:

- Multiple antipsychotic medicines
- Pro re nata (PRN or “when required”) medicines
- Monitoring the long-term side effects of taking medicines, including metabolic monitoring.

The study also suggested that the national data collection of medication complications be improved.

The National Quality Use of Medicines indicators in Australian hospitals 2014⁵⁹ lists five measures for safe and effective use of medicines in acute mental health care:

- 7.1 Acute mental health care – Percentage of as required (PRN) psychotropic medication orders with documented indication, dose (or dose range), frequency and maximum daily dose specified
- 7.2 Acute mental health care – Percentage of patients taking lithium who receive appropriate monitoring during their inpatient episode
- 7.3 Acute mental health care – Percentage of patients who receive written and verbal information on regular psychotropic medicines initiated during their admission
- 7.4 Acute mental health care – Percentage of patients taking antipsychotic medicines who receive appropriate monitoring for the development of metabolic side effects
- 7.5 Acute mental health care – Percentage of patients prescribed two or more regular antipsychotic medicines at hospital discharge.

The Commission provides a *National Adult Clozapine Titration Chart User Guide*.⁶³ In 2017, SA Health developed a guideline for the initial treatment (commencement), continued treatment (ongoing participant management) of clozapine, and management of recommencement or treatment interruption.⁶⁴

Psychiatrists usually initiate therapy with clozapine. However, on 1 July 2015, general practitioners became eligible to prescribe maintenance clozapine without needing to be affiliated with a hospital. At the same time, community pharmacies became eligible to dispense clozapine under the Pharmaceutical Benefits Scheme (PBS), with certain conditions. Clozapine is on the Section 100 Highly Specialised Drugs Program on the PBS. It is essential to monitor and manage the adverse effects of clozapine.

Murphy et al.⁶⁵ found that consumers participating in a share care model (psychiatrist, general practitioner, community pharmacist and consumer or carer) reported a positive experience with the shared care program and clozapine treatment, despite the potential for significant treatment burden. The benefits of regular contact with the general practitioner for treating physical comorbidities were noted. However the authors concluded improved communication between clinicians is essential.

The Royal Australian and New Zealand College of Psychiatrists (RANZCP) published a continuing professional development module on managing the adverse effects of clozapine, which is available to its members. The RANZCP publishes mental health information for everyone about medicines, including antipsychotics on the *Your Health in Mind*⁶⁶ website.

Antipsychotic medicines are also used for some people with behavioural and psychological symptoms of dementia (BPSD).

In an overview of dementia in Australia, National Centre for Social and Economic Modelling (NATSEM), forecast increases in the prevalence and incidence of dementia over the next 40 years.⁹⁹ Around 70% of the more than 436,000 Australians with dementia live in the community.¹⁰⁰ The symptoms of BPSD can include apathy, verbal outbursts, sleep disturbance, wandering, socially inappropriate behaviour, hallucinations and delusions. More serious symptoms of BPSD can include marked agitation and aggression, acute psychiatric disturbance and dangerous aggression. It is estimated that BPSD affects up to 90% of all people with dementia over the course of their illness. BPSD is independently associated with poor outcomes, including distress among patients and caregivers, long-term hospitalization, misuse of medication, and increased health care costs.¹⁰¹

Only one oral antipsychotic is approved for BPSD and listed on the PBS – risperidone – with conditions attached. Risperidone is to be used in people with dementia only of the Alzheimer type, who are unresponsive to non-pharmacological methods of treatment, and treatment duration is limited to twelve weeks.

Programs and initiatives

Insulin

In 2015, the Australian Government published the Australian National Diabetes Strategy 2016–2020.⁶⁷ The implementation plan for the strategy aims to produce targeted, tangible improvements in the prevention, early detection, management and care of all forms of diabetes. One of the goals is to reduce the occurrence of diabetes-related complications and improve the quality of life among people with diabetes. Improving access to structured self-management education programs for people with diabetes, including people recently diagnosed with diabetes and people starting insulin, is an identified area for action.

The Commission provides local and international resources related to the safe use of insulin.⁶⁸ The Commission's national subcutaneous insulin chart⁶⁹ supports the delivery of appropriate care and improves the management of BGLs in hospitalised patients.

The Commission identifies best practices and suggestions for clinicians to address hospital-acquired complications arising due to medication use in hospital, including tips for prevention and management of hypoglycaemia.

The Australian Diabetes Society provides position statements and guidelines for clinicians,⁷⁰ including peri-operative diabetes management guidelines⁷¹ and guidelines for type 1 diabetes in children, adolescents and adults.⁷²

The self-management of insulin dosing in hospital is expanding. In the UK, guidelines for the self-management of diabetes in hospital were developed in 2012 to provide people with diabetes who manage their condition out of hospital with the choice of continuing to self-manage during a hospital stay.⁷³ Similarly, in 2016 Queensland Health issued Insulin Infusion Pump Management Inpatient Guidelines so that individuals whose diabetes is being treated in the outpatient setting with a continuous subcutaneous insulin infusion delivered with an insulin pump can continue to be managed safely with their insulin pump during hospitalisation.⁷⁴

To build capability in inpatient diabetes management, the New South Wales Diabetes Task Force within the New South Wales Agency for Clinical Innovation has developed a program⁷⁵ to support junior clinicians and nursing staff care for people with diabetes who require insulin in hospital. The program includes a clinical decision support app *Thinksulin* to support point of care decision-making.

Opioid analgesics

Opioids are one of the priority substances in the *National Drug Strategy 2017–2026*,⁶⁶ a long-term framework for reducing and preventing harm. The Australian Government funds pharmacotherapy treatment for opioid dependence, which is implemented in the states and territories through publicly funded clinics, public hospitals and community pharmacies. National guidelines⁷⁷ were issued in 2014 as part of the National Drug Strategy. The Australian Government published a national needle and syringe programs strategic framework in 2010 as a harm minimisation initiative.⁷⁸ All states and territories have needle and syringe programs in place.

Since 2010 a number of regulatory changes have restricted access to and availability of codeine-containing analgesics available over-the-counter (S2 and S3 schedule, pack-sizes restricted to three and five days therapy). In 2018, all codeine-containing analgesics were moved to the prescription S4 schedule. This has reduced availability and restricted access in the primary care setting.

The Australian Government and other states and territories are working together to progress a National Real Time Prescription Monitoring (RTPM) system which will monitor S8 prescription opioid use. In 2018, Victoria commenced the roll out of a RTPM system (*SafeScript*) to help prescribers and pharmacists make more informed decisions when prescribing and dispensing certain medicines which may be subject to misuse, dependency and causing harm in the community. From April 2020, following an 18-month introductory period, it will be mandatory for doctors and pharmacists in Victoria to check *SafeScript* when writing or dispensing a prescription for a medicine monitored through the system. The strong opioid analgesics (buprenorphine, codeine, fentanyl, hydromorphone, methadone, morphine, oxycodone, pethidine and tapentadol) are one of the prescription medicine classes monitored through *SafeScript*.

Other primary care initiatives to enable consumers to manage their medicines safely are included in the 6th Community Pharmacy Agreement (6CPA). Staged Supply supports the provision of Pharmaceutical Benefits Scheme (PBS) medicines in instalments when requested by the prescriber, with consumer eligibility determined when one or more of opioid analgesics, antipsychotics, anxiolytics, hypnotics and sedatives, antidepressants, and psycho-stimulants are prescribed. Another is the *Chronic Pain MedsCheck Trial*⁷⁹ within 6CPA Pharmacy Trial Programs. In this trial, interventions from participating community pharmacies will focus on consumers who are dealing

with chronic pain for more than three months. Interventions will include an evaluation of the consumer's medicines, and provision of an action plan incorporating education, self-management and referral to other clinicians where more support is needed. The objective of the trial is to evaluate the efficacy of the Chronic Pain MedsCheck service in:

- Preventing incorrect use and/or overuse of pain medicine
- Increasing patients' pain medicine health literacy
- Improving their ability to self-manage their chronic pain
- Improving their overall quality of life.

To assist with tapering or de-escalating doses of opioid analgesics, Primary Health Tasmania produced a guide to deprescribing opioid analgesics.⁸⁰ In Victoria, the Department of Health and Human Services worked with NPS MedicineWise to develop a suite of resources for health professionals to safely prescribe, supply, and taper opioid analgesics.⁸¹ A number of consumer fact sheets have also been developed to assist health professionals provide advice to patients on the safer use of opioid medicines and the risks of harms from inappropriate use of opioids.

In 2018, the Therapeutic Goods Administration (TGA) proposed four options for a regulatory response to opioid analgesic use and misuse in Australia:

- Reviewing available product pack sizes for opioid analgesics commonly used to treat acute pain
- Reviewing the indications for the opioid products used to treat pain
- Reviewing the label warnings and content of consumer medicines information documents for opioid analgesics
- Working with stakeholders to raise clinician and consumer awareness about:
 - pain management guidelines, including the use of non-opioid alternatives for the management of chronic pain
 - safe disposal of opioid products.

The prescribing of opioid analgesics in a hospital setting has been identified as a key risk for ongoing use.⁸² Many consumers are prescribed opioid analgesics for the management of their postsurgical pain and continue using them for prolonged amounts of time following their surgeries.

For consumers undergoing surgery, medication reconciliation on admission and clinical review for risk factors may help determine the most appropriate therapy (choice, strength, duration, and cessation of therapy) for post-surgical pain relief.

The National Quality Use of Medicines indicators in Australian hospitals 2014⁵⁹ lists two measures for judicious selection and safe and effective use of analgesics to manage pain:

- 4.1 Pain management – Percentage of postoperative patients whose pain intensity is documented using an appropriate validated assessment tool
- 4.2 Pain management – Percentage of postoperative patients that are given a written pain management plan on discharge **and** a copy is communicated to the primary care clinician.

The 2018 report⁸³ by the Society of Hospital Pharmacists of Australia (SHPA) on reducing opioid-related harm identifies the sizeable gaps that exist in the hospital setting in the provision by pharmacists of medication reconciliation, clinical review of patients and risk factors, and review of post-surgery opioid analgesic use. The report cites evidence of the development of innovative strategies in Australian hospitals to effectively minimise the risk of opioid-analgesic misuse and dependence in post-surgical patients. The Analgesic Stewardship program across Alfred Health in Victoria promoting optimal use of analgesics is an example where regular pain assessment and opioid analgesics de-escalation plans are prioritised as part of the hospital discharge process.

In 2013, South Australia Health (SA Health) implemented state-wide guideline on prescribing opioid analgesics at discharge from hospital.⁸⁴ The prescriber must:

- Consider the appropriateness of prescribing an opioid analgesic on discharge
- Determine the quantity of opioid analgesic to be ordered
- Consider the legal requirements of an opioid analgesic prescription
- Consider required patient education
- Communicate the discharge summary to the primary care provider.

SA Health produces an information sheet for consumers who have been given opioid analgesics for short-term treatment of acute pain.⁸⁵ In addition South Australia's Child Health Community of Practice has a clinical practice guideline for pain management and opioid analgesic safety in children.⁸⁶ SA Health also produces an information sheet for paediatric consumers and their carers who have been prescribed opioid analgesics for short-term acute pain treatment.⁸⁷ Together these form a comprehensive and integrated package that seeks to limit access to and quantities of opioid analgesics, thereby reducing potential for avoidable medication-related harm.

The Penington report in 2018 revealed that the rate of accidental deaths due to opioid analgesics in South Australia over the 2012–2016 period was 1.7 per 100,000 people, about three quarters of the national rate of 2.2 per 100,000 people. The measures implemented in South Australia appear to have reduced the rate of accidental deaths due to opioid analgesics relative to the other large mainland states.

The impact of the initiatives implemented in South Australia may inform the development of a national approach to managing the quantity of opioid analgesic prescribed at hospital discharge, and the duration of opioid analgesic therapy post-hospital. Components of The Alfred Analgesic Stewardship program provide an approach to making an opioid analgesic de-escalation and cessation plan part of the standard discharge summary communicated to the consumer and their primary care provider. Follow up of consumers for concordance with the de-escalation plan within seven days of discharge potentially contributes to minimising the risk of opioid harm.

Anticoagulants

In 2017, the Stroke Foundation updated the *Australian Clinical Guidelines for Stroke Management*⁸⁸ including updated recommendations and new practice points for use of anticoagulant therapy in the secondary prevention of stroke.

In 2018, the National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand released new clinical guidelines⁸⁹ for the management of heart failure and new clinical guidelines for diagnosing and managing atrial fibrillation. Treatment recommendations include the use of DOACs in preference to warfarin for stroke prevention.

The Commission has developed the *Venous Thromboembolism Prevention Clinical Care Standard*⁹⁰ which provides guidance to consumers, clinicians and health services on the care recommended to prevent VTE acquired in hospital and following hospital discharge.

NPS MedicineWise produces a number of resources for health care professionals – predicting risk with oral anticoagulants⁹¹ checklist for safe use of anticoagulants⁹² and safe use of oral anticoagulants⁹³ to help identify priorities for consumer counselling and promote a best practice encounter.

Medication stewardship programs have demonstrated best possible use of medicines across the health service and into the community by monitoring medicines use, coordinating interventions, and working with practitioners and consumers. In Victoria, Alfred Health has built on the success of its antimicrobial stewardship program, recently extending into anticoagulant stewardship. Monitoring and measuring the impact of this anticoagulant stewardship program will inform whether it can be applied in other health services.

Improving anticoagulant medication safety in primary care relies on effective transition of care from the hospital setting to the primary care and chronic care settings. Preparation and distribution of accurate medicines lists and informative, accurate handover summaries are important tools that facilitate continuity of anticoagulant management.

Antipsychotics

In 2015, the New South Wales Mental Health Commission released a paper that aimed to influence consumers, carers and clinicians to adopt safe, recovery-oriented use of medicine. There are supporting resources for use in education, advocacy, and consumer/carer discussion with health professionals. Together these promote shared decision making concerning medicine use in mental illness.⁹⁴

The same year, the South Australian Child and Adolescent Mental Health Services (Women's & Children's Health Network) released guidelines for monitoring adverse effects in children and adolescents prescribed an antipsychotic medicine.⁹⁵

The *Australian Clinical Guidelines for Early Psychosis*⁹⁶ recommends treating the acute phase of first-episode psychosis with second-generation antipsychotics in preference to first-generation antipsychotics. The side effect profile should guide the choice of second-generation antipsychotics such as risperidone, paliperidone, quetiapine, olanzapine, asenapine, lurasidone and ziprasidone. The guidelines state that there is limited evidence to suggest an increased treatment response when combining antipsychotics in schizophrenia. It is noted that combining antipsychotics also increases the risk of side-effects, non-adherence, and adverse drug interactions. It recommends that polypharmacy is to be avoided in first-episode psychosis, due to the propensity for side-effects in this population.

The *Royal Australian and New Zealand College of Psychiatrists Clinical Practice Guidelines for the Management of Schizophrenia and Related Disorders* were released in 2016.⁹⁷ It includes a pharmacological treatment algorithm for first-episode non-affective psychosis,⁹⁸ advocating a 'start low, go slow' approach to treating with antipsychotics.

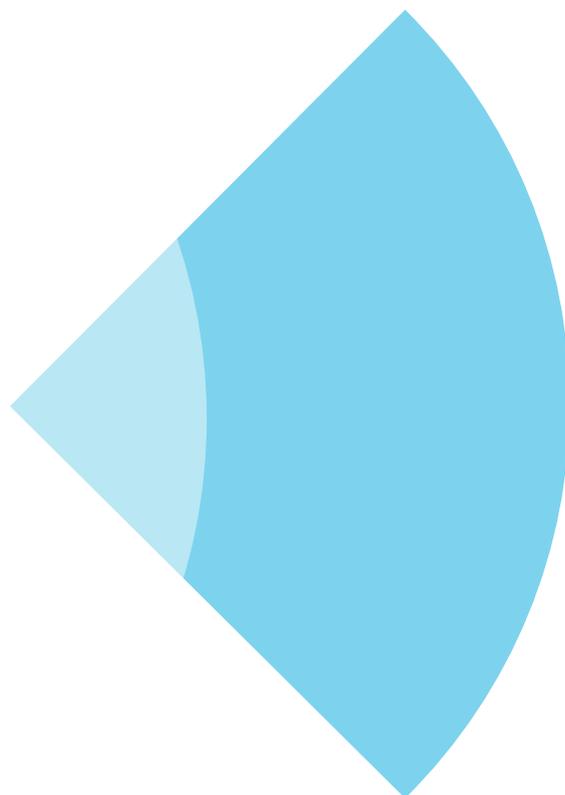
Antipsychotic medicines are also used in other mental health conditions, such as bipolar disorder, autism in children and for people with behavioural and psychological symptoms of dementia (BPSD). There are concerns that antipsychotic medicines are being prescribed inappropriately to people with BPSD to control behaviour.

Westbury et al.¹⁰² examined the use of antipsychotics, anxiolytics and hypnotics, and antidepressants in residents from 150 aged care homes across Australia in 2014–15. The authors concluded that effective interventions to reduce the continued reliance on psychotropic management, in conjunction with active promotion of nonpharmacological strategies, are urgently required. Westbury et al.¹⁰³ followed this work with the Reducing Use of Sedatives (RedUSE) intervention. It was designed to promote the appropriate use of antipsychotics and benzodiazepines in residential aged care facilities (RACFs). The RedUSE program achieved significant reductions in the proportions of RACF residents prescribed antipsychotics and benzodiazepines.

*The Australian Atlas of Healthcare Variation (2015)*¹⁰⁴ identified concerns about the prescribing of antipsychotic medicines outside guideline recommendations, such as for behavioural issues related to dementia or delirium, before secondary causes have been excluded and non-pharmacological measures have been tried. A 2016 national roundtable of experts convened by the Commission on reducing inappropriate use of antipsychotics in older people, acknowledged the complexity and concluded the need for multicomponent strategies to change practice, combined with regulatory and system levers.

In 2018, the Commission produced an infographic *Reducing Inappropriate Use of Antipsychotics*¹⁰⁵ to highlight the limited benefit of antipsychotics in people with BPSD and multicomponent strategies to reduce their inappropriate use.

Due to ongoing concerns that antipsychotic medicines are being prescribed inappropriately, the *Third Australian Atlas of Healthcare Variation (2018)* makes eight recommendations on this topic.¹⁰⁶ The key recommendation is that prescribers use antipsychotic medicines for people 65 years and over as a form of restrictive practice only as a last resort, and not until alternative strategies have been considered, and conditions of informed consent, dosage frequency and medicines review are met.



Options for national action

Insulin

To reduce avoidable medication errors, adverse drug events and medication-related hospital admissions caused by poor management of diabetes and insulin management, in Australia by 50% by 2025:

DISCUSSION POINT

What is considered best practice of what is being done now?

DISCUSSION POINT

What, if anything, should be done more or less of?

DISCUSSION POINT

What are the current gaps in achieving positive patient outcomes to reduce adverse events from poor diabetes and insulin management in the future?

DISCUSSION POINT

What indicators should be used to measure progress towards the 50% reduction targets?

Opioid analgesics

To reduce avoidable medication errors, adverse drug events and medication-related hospital admissions caused by opioid analgesics, in Australia by 50% by 2025:

DISCUSSION POINT

What is considered best practice of what is being done now?

DISCUSSION POINT

What, if anything, should be done more or less of?

DISCUSSION POINT

What are the current gaps in achieving positive patient outcomes to reduce adverse events from opioid analgesics in the future?

DISCUSSION POINT

What indicators should be used to measure progress towards the 50% reduction targets?

Anticoagulants

To reduce avoidable medication errors, adverse drug events and medication-related hospital admissions caused by anticoagulants, in Australia by 50% by 2025:

DISCUSSION POINT

What is considered best practice of what is being done now?

DISCUSSION POINT

What, if anything, should be done more or less of?

DISCUSSION POINT

What are the current gaps in achieving positive patient outcomes to reduce adverse events from anticoagulants in the future?

DISCUSSION POINT

What indicators should be used to measure progress towards the 50% reduction targets?

Antipsychotics

To reduce avoidable medication errors, adverse drug events and medication-related hospital admissions caused by antipsychotics, in Australia by 50% by 2025:

DISCUSSION POINT

What is considered best practice of what is being done now?

DISCUSSION POINT

What, if anything, should be done more or less of?

DISCUSSION POINT

What are the current gaps in achieving positive patient outcomes to reduce adverse events from antipsychotics in the future?

DISCUSSION POINT

What indicators should be used to measure progress towards the 50% reduction targets?



WHO flagship area 3: Transitions of care

Background and analysis

Transitions of care occur when all or part of a patient's care is transferred between healthcare locations, providers or levels of care within the same organisation or the patient's condition and care needs change. However, transitions of care are not always smooth. Negative patient outcomes associated with transitions across care boundaries can arise from transfer of care and discharge from hospital. From a patient perspective, these gaps in the transitions across the boundaries of care is experienced in several ways. Patients report them as 'falling through gaps', 'being forgotten about' or 'having to explain yourself to every professional or service you encounter'¹⁷⁸ Many transitions are affected by poor communication and information sharing between clinicians and organisations, which is a recurring theme in studies describing reasons for breaks in care across services.¹⁷⁹

A study published in 2014 retrospectively audited paper and electronic discharge summaries, finding that while electronic discharge summaries offer some improvements over paper discharge summaries in terms of the quality of medication information documented, less than 40% of medication changes were explained in the electronic discharge summaries.¹⁰⁷

A retrospective cohort study of medication regimens at discharge among patients aged 65 years and older who were admitted to the general medical units was conducted to examine medication regimen complexity and potentially inappropriate medications. Of the 100 patients included, 42% were prescribed at least one potentially inappropriate medication at discharge, as defined by Beers Criteria. Of 42 patients having at least one potentially inappropriate medication, only five (12%) had a separation summary that addressed the issues related to the potentially inappropriate medications.¹⁰⁸

In 2016–17 AIHW reported there were 11 million hospitalisations, 42% of which required an overnight stay. Of these overnight stays 40.9% or 1.8 million were people aged 65 years and over.

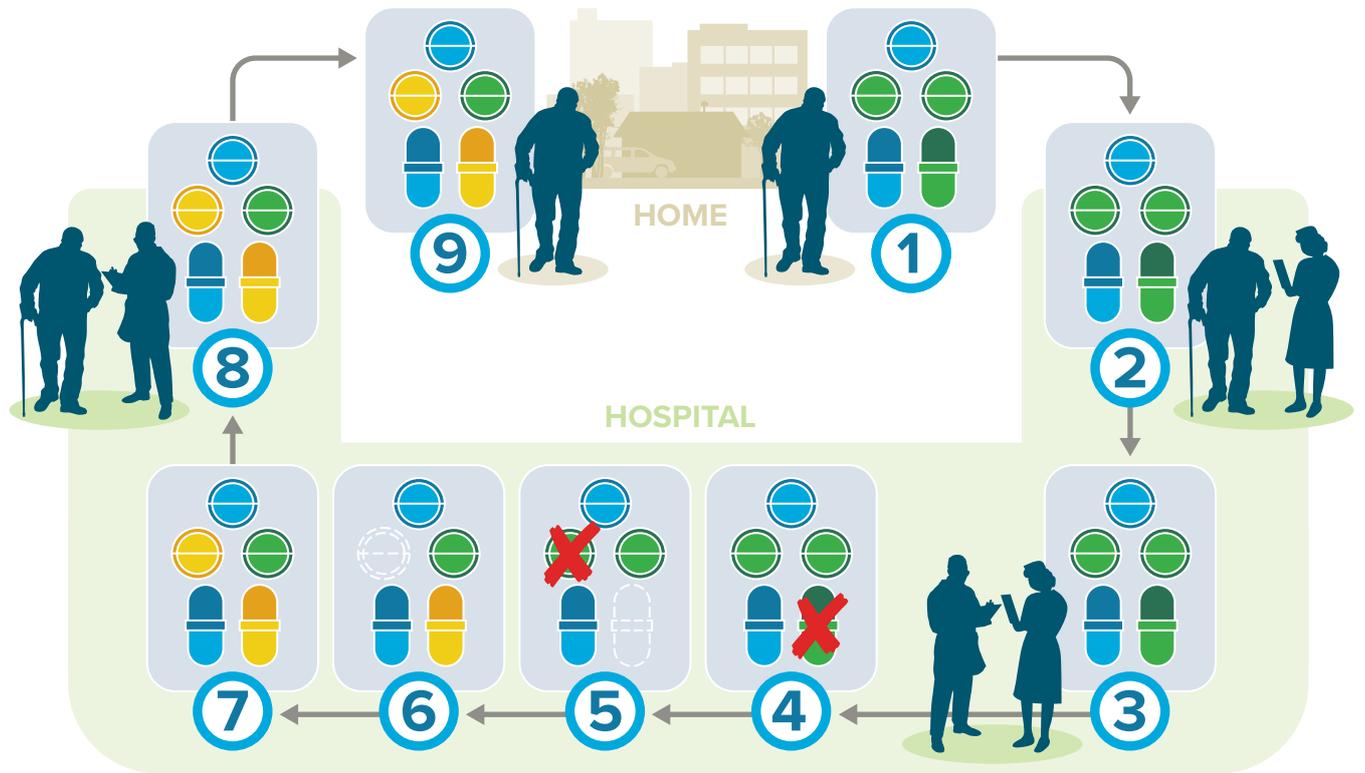
Roughead et al.¹⁰⁹ suggest that between 2% and 3% of all hospital admissions are medication related. Applying this rate to the AIHW data suggests that between 220,000 and 330,000 medication-related hospitalisations occurred in 2016–17. Roughead et al. further identify that problems with medication safety encountered by consumers as they move through the acute care setting in Australia are still a significant challenge. They summarise medication-related problems, including adverse drug events and medication errors during the hospital journey with the following medication safety:

- There may be an overall rate of two errors for every three patients at the time of admission to hospital
- Prescribing errors may be up to one per patient in major Australian teaching hospitals
- Administration errors may be approximately one per ten medication administrations in hospitals
- At hospital discharge, errors in medication documentation in discharge summaries may be up to two per patient.

The capture of accurate medicines information by healthcare providers, when a patient is admitted to or discharged from a healthcare facility or a primary care provider or service, is essential to good medication management. Transitions of care are recognised as an area of high clinical risk for patients.

The WHO High 5s Project identified the importance of medication list accuracy at transitions of care. Figure 2 shows where discrepancies in medicines can occur across the consumer journey through hospital.

Figure 2: Transitions of care can be associated with discrepancies in medication



- ① Admission to hospital from home
- ② Obtaining medication history
- ③ Verifying medication history using reliable source of medication information
- ④ Medication reconciliation at admission
- ⑤ Medication reconciliation at admission
- ⑥ Medication reconciliation at admission
- ⑦ Medication reconciliation at discharge
- ⑧ Pre-discharge communication and patient engagement
- ⑨ Discharge from hospital to home

Source: Adapted from *The WHO High 5s Project* implementation guide. Assuring medication accuracy at transitions in care: medication reconciliation. Geneva: WHO.

There are significant barriers to viewing and transferring accurate medicines information during the transfer of care to and from public and private hospital sectors, general practitioners, specialist doctors, community pharmacies and other primary care services, such as home nursing.

Wheeler et al.¹¹⁰ advocate that maintaining an accurate, comprehensive and up-to-date medicines list that follows the patient, reduces serious medication error when patients transition between healthcare providers. Pivotal to this record is a medicines reconciliation review at error-prone transition points.

Establishing and implementing medication documentation and communication standards applied across all transitions of care potentially leads to reductions in medication errors and adverse drug events. Improving consumer understanding of, and access to, their medicines information also aids medication safety pre and post transition of care.

Improving communication of health information between health professionals and consumers is important for improving health literacy. Tools and resources on health literacy for health services, along with information for consumers, are available on the Commission's website.¹¹¹ The Communicating for Safety Standard,¹¹² Comprehensive Care Standard, Partnering with Consumers Standard, Clinical Governance Standard and Medication Safety Standard within the NSQHS Standards recognise the importance of effective communication, including at transitions of care.

Programs and initiatives

Primary care

Continuity of care is essential for quality care and positive patient experience. In the majority of situations the general practitioner is the lead clinician who manages the consumer before and after hospital admission.

Good medical practice for effective handover of responsibility of the of a consumer to another health care professional is covered in the Code of Conduct for Doctors in Australia.¹¹³ There are a number of position statements, guidelines and resources covering transfer of care arrangements between general practice and hospitals,^{42,114,115} and for improving documentation at transitions of care for complex patients.¹¹⁶

Providing high-quality, patient centred care in the community may avoid costly hospital readmissions for consumers with complex health conditions, or multiple chronic co-morbidities, who have recently returned to the community. This group of consumers have an increased risk of medication-related hospitalisation.

The Hospital Admission Risk Program (HARP) in Victoria targets people with complex care needs that use the hospital system often, and aims to prevent avoidable hospital presentations. The Commonwealth Department of Veterans' Affairs Coordinated Veterans' Care (CVC) Program¹¹⁷ is a team-based program designed to increase support for veterans holding Gold Cards who have one or more targeted chronic conditions or complex care needs, and those who are at risk of unplanned hospitalisation.

Development of a tool to identify complex consumers who are at risk of hospital readmission for an early post-discharge hospital outreach pharmacy service is the subject of ongoing research in Western Australia (CoNeCT – Complex Needs Coordination Team, Sir Charles Gairdner Hospital¹¹⁸). In this model if a hospitalised consumer meets the high-risk criteria, then the CoNeCT clinical pharmacist coordinates a medication review once the patient returns home. Two of the criteria for eligibility are polypharmacy (five or more regular medicines daily) and/or taking a high-risk medicine (includes insulin, opioid analgesics, anticoagulants and antipsychotics).

Post-hospital medication reconciliation reduces the likelihood of medication errors and adverse drug events in the primary care setting, and can extend the period between hospitalisations.¹¹⁹

Acute care

The National Safety and Quality Health Service (NSQHS) Standards (2nd ed.)¹²⁰ provide a user guide for acute and community health service organisations that provide care.

The Medication Safety Standard actions 4.1 to 4.15 requires health service organisations to assess medication management and implement processes and practices that:

- Provide for sound governance for the safe and quality use of medicines
- Minimise the occurrence of medicine-related incidents and the potential for patient harm from medicines
- Ensure that competent clinicians safely prescribe, dispense and administer medicines, and monitor their effects
- Inform patients about their medicines and involve them in decision making.

This includes vulnerable populations such as children and older people.

Attention to medication safety at transitions of care for young and older consumers is especially important.

Children are more susceptible to harm from medicines due to a number of factors:

- The absorption, distribution, metabolism and excretion of medicines in children varies with age
- Children's weight varies with growth and changing activity levels
- The dosage of medications for children is often non-standardised and weight-dependent
- There may be difficulties associated with administering medications to children
- Children's capacity to communicate medication problems when they occur is variable.

For older consumers the risk of medication-related harm increases because of the effects of ageing (change to water, fat and muscle content of the body) and health conditions. Older consumers may become more sensitive to the effects of medicines, not be able to metabolise and excrete medicines as they once did, and become more prone to side effects and medicine interactions.

Prioritising consumers who have a higher risk of experiencing medication-related problems or adverse drug events for medication reconciliation ensures those most in need receive the review and reconciliation.

To identify consumers on hospital admission who are most 'at risk' from medication-related adverse drug events, Action 4.10 in the Medication Safety Standard within the National Safety and Quality Health Service (NSQHS) Standards (2nd ed.) recommends using eight criteria:

- Are admitted as a result of a medication-related problem
- Are taking multiple medicines or high-risk medicines
- Are taking medicines prescribed by multiple clinicians
- Have known or suspected adherence problems
- Have a chronic disease
- Have, or potentially have, a disability or impairment (for example, cognitive impairment)
- Are over 65 years old
- Have known allergies or adverse drug reactions.

To ensure continuity of care for discharged consumers the National Quality Use of Medicines indicators in Australian hospitals 2014⁵⁹ lists four measures:

- 5.3 Continuity of care – Percentage of discharge summaries that include medication therapy changes and explanations for changes
- 5.5 Continuity of care – Percentage of patients with a new adverse drug reaction (ADR) that are given written ADR information on discharge AND a copy is communicated to the primary care clinician
- 5.8 Continuity of care – Percentage of patients whose discharge summaries contain a current, accurate and comprehensive list of medicines
- 5.9 Continuity of care – Percentage of patients who receive a current, accurate and comprehensive medication list at the time of hospital discharge.

Aggregated reporting of these measures would:

- Inform progress toward wider implementation of medication reconciliation and review as part of the handover process at transitions of care
- Aid data collection to assess the benefits of medication reconciliation and review.

Through the Australian Digital Health Agency's Digital Health Test Beds program,¹²¹ a project will utilise consenting consumer's My Health Record to help consumers manage their medicines after they leave hospital. Another project in the program will research, measure and produce evidence of the benefits available through more effective medication management at the points of admission and discharge from hospital.

Options for national action

To reduce avoidable medication errors, adverse drug events and medication-related hospital admissions caused at transitions of care, in Australia by 50% by 2025:

DISCUSSION POINT

What is considered best practice of what is being done now?

DISCUSSION POINT

What, if anything, should be done more or less of?

DISCUSSION POINT

What are the current gaps in achieving positive patient outcomes to reduce adverse events from transitions of care in the future?

DISCUSSION POINT

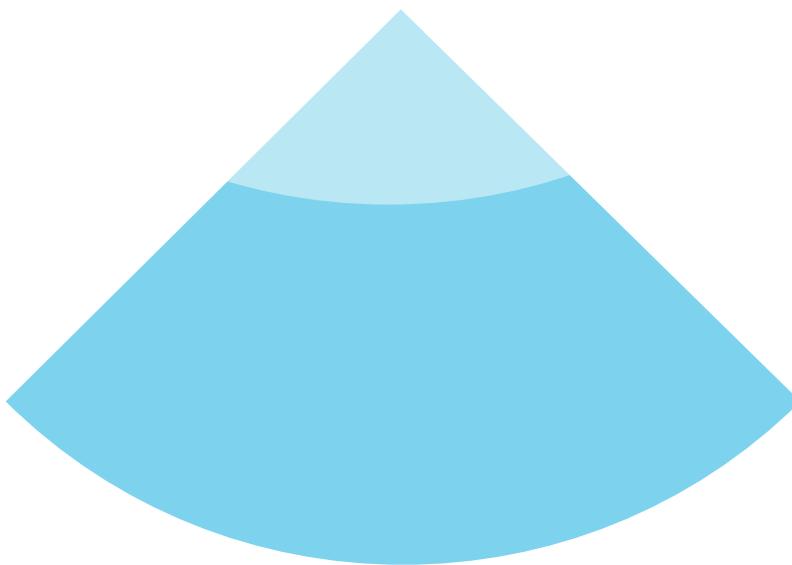
What indicators should be used to measure progress towards the 50% reduction targets?

Conclusions

This document demonstrates that the breadth of activities related to medication safety in Australia is large. As the Response to the Challenge is further developed following receipt of the feedback from this consultation, opportunities to improve the integration of the activities will emerge. Improved coordination will be necessary, not only between health systems and between technologies, but between health professionals.

Keeping the consumer at the centre of initiatives by raising awareness, increasing confidence and reducing confusion about medicines will help create the shifts necessary to reduce medication errors and adverse drug events and invest in positive patient outcomes.

Collectively these can lead to meaningful dialogue on how the future of the Australian health system is shaped to make medication safety a national health priority.



Acronyms and abbreviations

ABS: Australian Bureau of Statistics

ADE: adverse drug event

ADeN: Australian Deprescribing Network

ADR: adverse drug reaction

AIHW: Australian Institute of Health and Welfare

ARTG: Australian Register of Therapeutic Goods

BGL: blood glucose level

BPSD: behavioural and psychological symptoms of dementia

CGM: continuous glucose monitoring

DAA: Dose Administration Aid

DAEN: Database of Adverse Event Notifications

DOAC: Direct oral anticoagulants (formerly new direct-acting oral anticoagulants or NOACs)

ED: emergency department

EMM: Electronic Medication Management systems

HARP: Hospital Admission Risk Program

INR: international normalised ratio

MATE: Veterans' Medicines Advice and Therapeutics Education Services program

MBS: Medicare Benefits Scheme

NDSS: National Diabetes Services Scheme

NSQHS National Safety and Quality Health Service

oMEDD: oral morphine equivalent daily dose

PBS: Pharmaceutical Benefits Scheme

PGA: Pharmacy Guild of Australia

PHN: Primary Health Network

QUM: quality use of medicines

RANZCP: Royal Australian and New Zealand College of Psychiatrists

RPBS: Repatriation Pharmaceutical Benefits Scheme

RTPM: real time prescription monitoring

SA Health: South Australian Department of Health

SHPA: Society of Hospital Pharmacists of Australia

TGA: Therapeutic Goods Administration

VTE: venous thromboembolism

WHO: World Health Organization

6CPA: Sixth Community Pharmacy Agreement

Glossary

Acute care: a short and relatively severe course of a clinical service provided to a hospital-admitted patient during an episode of care.

Appropriate polypharmacy: prescribing multiple medicines for an individual for complex conditions or for multiple conditions in circumstances where medicines use has been optimised and where the medicines are prescribed according to best evidence.

Clinical handover: the transfer of professional responsibility and accountability for some or all aspects of care for a consumer, or group of consumers, to another person or professional group on a temporary or permanent basis.

Deprescribing: the process of tapering or stopping medicines, which aims to discontinue potentially inappropriate medicines, minimise inappropriate polypharmacy and improve consumer outcomes.

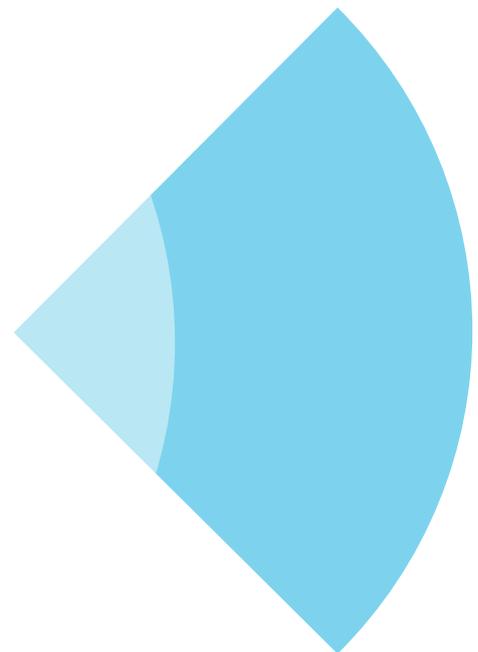
Inappropriate polypharmacy: prescribing of multiple medicines inappropriately, or where the intended benefit of the medicine is not realised.

Inappropriate prescribing: the use of a medicine where there is an equal or more effective and lower risk alternative available, including prescribing non-pharmacological strategies.

Polypharmacy: the use of five or more medicines at the same time, including prescribed, over-the-counter and complementary medicines.

Primary care: clinical service provided at the entry level to the health system, and as such is usually a consumer's first encounter with the health system.

Transitions of care: Transitions of care occur when all or part of a patient's care is transferred between healthcare locations, providers or levels of care within the same organisation or the patient's condition and care needs change.



Appendices

Appendix A – Summary of guidelines and tools to support safe use for: insulin, opioid analgesics, anticoagulants and antipsychotics

Caution: New drugs in high risk medicine classes may not be addressed.

Get It Right! Taking a Best Possible Medication History is an online learning module centred around a video that guides clinicians on how to obtain and record a Best Possible Medication History (NPS MedicineWise).¹²²

The Commission makes available a range of medication safety alerts, notices and guidance issued by the Australian states and territories and by international organisations.¹²³

Initiation

Insulin

- National subcutaneous insulin charts for acute hospitals (ACSQHC 2017)¹²⁴
- National subcutaneous insulin charts for sub-acute hospitals and mental health facilities (ACSQHC 2017)¹²⁵
- General practice management of type 2 diabetes (RACGP 2016–2018)¹²⁶
- National Evidence-based Clinical Care Guidelines for Type 1 Diabetes in Children Adolescents and Adults (Australian Diabetes Society 2011)¹²⁷
- Insulin Safety Tips (SA Health)¹²⁸

Opioid analgesics

- Prescribing drugs of dependence in general practice – Part A: Clinical governance framework; Part C: Summary; Part C1: Opioids; Part C2: The role of opioids in pain management (RACGP – Oct 2017); Reducing Opioid Prescribing in General Practice – 12 point challenge to GPs¹²⁹
- Recommendations regarding the use of Opioid Analgesics in patients with chronic Non-Cancer Pain (Faculty of Pain medicine – Australian & New Zealand College of Anaesthetists PM01 2015)¹³⁰
- Opioid recommendations in General Practice – Pain Management Network (NSW Agency for Clinical Innovation – 2014)¹³¹
- Reconsidering opioid therapy – Hunter Integrated Pain Service (NSW Health Hunter New England LHD May 2014)¹³²

- Opioid recommendations for hospital settings – Hunter Integrated Pain Service (NSW Health Hunter New England LHD Feb 2016).¹³³

Anticoagulants

- Guidelines for the diagnosis and management of atrial fibrillation – 6.3. Stroke Prevention with Anticoagulation (Nat Heart Foundation + Cardiac Soc of ANZ 2018)¹³⁴
- NOAC Guidelines Non-Vitamin K Antagonist Oral Anticoagulant (Clinical Excellence Commission NSW 2017)¹³⁵
- Clinical Guideline – Safe prescribing of new oral anticoagulants: apixaban, rivaroxaban, and dabigatran (SA Health 2015)¹³⁶
- Clinical Practice Guidelines for Anticoagulation therapy – The Royal Children’s Hospital Melbourne¹³⁷
- Warfarin Administration and Dosage Adjustment (The Royal Hospital for Women, Randwick New South Wales).¹³⁸

Antipsychotics

- Clinical practice guidelines for the management of schizophrenia and related disorders (RANZC Psychiatrists 2016)¹³⁹
- Safe and quality use of clozapine therapy in mental health services (Developed by the Queensland Psychotropic Medication Advisory Committee, Queensland Health 2016)¹⁴⁰
- Clozapine Management Clinical Guideline (SA Health 2017)¹⁴¹
- Guidelines for the safe and quality use of clozapine therapy in the WA health system (WA Health 2017)¹⁴²
- Clozapine Initiation and Titration Chart (WA Health 2017)¹⁴³
- Australian Clinical Guidelines for Early Psychosis – a brief summary for practitioners 2nd edition (Orygen Youth Health – The National Centre of Excellence in Youth Mental Health Melbourne. 2010)¹⁴⁴
- Professional Practice Guideline 7: Guidance for psychotropic medication use in children and adolescents (The Royal Australian and New Zealand College of Psychiatrists 2015)¹⁴⁵
- Professional Practice Guideline 10: Antipsychotic medications as a treatment of behavioural and psychological symptoms of dementia (The Royal Australian and New Zealand College of Psychiatrists 2016)¹⁴⁶
- Guideline Adaption Committee. Clinical Practice Guidelines and Principles of Care for People with Dementia. Sydney. 2016. NHMRC Partnership Centre for Dealing with Cognitive and Related Functional Decline in Older People.¹⁸⁰

Monitoring

Insulin

- Tips for prevention and management of hypoglycaemia – Hospital-Acquired Complication: Medication complications (ACSQHC)¹⁴⁷
- Inpatient management of diabetes mellitus, including the Thinksulin app (New South Wales Agency for Clinical Innovation 2018)¹⁴⁸
- Guidelines for routine glucose control in hospital (Australian Diabetes Society 2012).¹⁴⁹

Opioid analgesics

- Opioid Dose Equivalence (Faculty of Pain Medicine – Australian & New Zealand College of Anaesthetists)¹⁵⁰
- Preventing and managing problems with opioid prescribing for chronic non-cancer pain (New South Wales Therapeutic Advisory Group – July 2015)¹⁵¹
- Clinical Guideline: Paediatric Practice Guidelines – Pain management and opioid safety (SA Health Aug 2018).¹⁵²

Anticoagulants

- Oral anticoagulants: Safety checks (NPS MedicineWise)¹⁵³
- Guidelines for warfarin management in the community (QLD Health & Royal Flying Doctor Service 2016)¹⁵⁴
- Tips for prevention and management of haemorrhagic disorder due to circulating anticoagulants – Hospital-Acquired Complication: Medication complications (ACSQHC).¹⁵⁵

Antipsychotics

- Using the National Quality Use of medicines Indicators for Australian Hospitals 7.4 In hospital patients taking antipsychotic medicines who receive appropriate monitoring for the development of metabolic side effects (Nat QUM Indicators for Aust Hosp 2014)⁵⁹
- Guidelines for monitoring adverse effects in children and adolescents prescribed antipsychotic medication (Children and Adolescent mental Health Services Procedure – Women’s & Children’s Health Network / SA Health 2015)¹⁵⁶
- Clozapine Monitoring Form and Guidelines for Completion of Clozapine Monitoring Form (WA Health 2017)¹⁵⁷
- Clinician prompt checklist to assess clozapine side effects (WA Health 2013).¹⁵⁸

Transition of care

Insulin

- National Evidence-based Clinical Care Guidelines for Type 1 Diabetes in Children Adolescents and Adults (Australian Diabetes Society 2011)¹⁵⁹
- Safety Brief: U-500 insulin (QLD Health Medicines regulation and Quality Fact Sheet Oct 2013)¹⁶⁰
- Medication Management Plan (ACSQHC 2010)¹⁶¹
- Insulin infusion pump management Inpatient guidelines (Queensland health Statewide Diabetes Clinical Network 2016)¹⁶²
- Guidelines for insulin management for adult diabetics with unrelated ED presentations (Emergency Care Institute 2014)¹⁶³
- Key principles preoperative fasting in NSW public hospitals (NSW Agency for Clinical Innovation 2016).¹⁶⁴

Opioid analgesics

- Using the National Quality Use of Medicines Indicators for Australian Hospitals 4.2 Postoperative patients given written pain management plan at discharge and a copy is communicated to the primary care clinician (Nat QUM Indicators for Aust Hosp 2014)⁵⁹
- Clinical Guideline Opioids: Guidelines for Prescribing on Discharge (SA Health Oct 2015)¹⁶⁵
- Recommendations for prescribing analgesia on discharge following surgery or acute injury – Information for health practitioners preparing the patient for discharge (WA Health 2017).¹⁶⁶

Anticoagulants

- NOAC Guidelines Non-Vitamin K Antagonist Oral Anticoagulant (Clinical Excellence Commission NSW 2017)¹³⁵
- Clinical Guideline – Safe prescribing of new oral anticoagulants: apixaban, rivaroxaban, and dabigatran (SA Health 2015).¹⁶⁷

Antipsychotics

- Tips for prevention and management of delirium – Hospital-Acquired Complication: Medication complications (Clinician Fact Sheet. ACSQHC 2018)¹⁶⁸
- Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards User guide for health service organisations providing care for patients with cognitive impairment or at risk of delirium. Sydney: ACSQHC; 2019.¹⁸¹

De-escalation

Insulin

- General principles and peri-operative management of patients who require insulin therapy (Australian Diabetes Society 2012).¹⁶⁹

Opioid analgesics

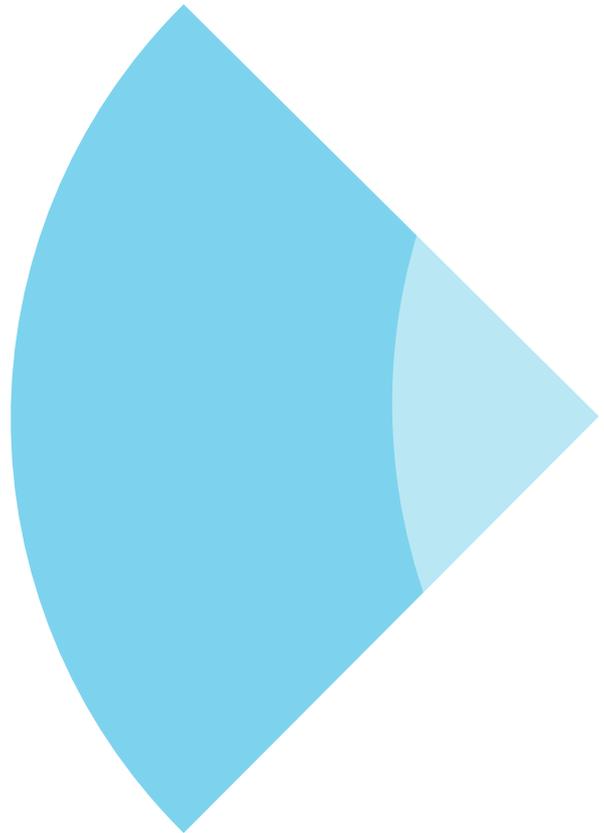
- A guide to deprescribing – Opioids (PHN Tasmania)¹⁷⁰
- Recommendations for deprescribing or tapering opioids (NPS MedicineWise May 2016)¹⁷¹
- National Guidelines for Medication-Assisted Treatment of Opioid Dependence (C'wealth of Australia 2014).¹⁷²

Anticoagulants

- Bridging in patients with atrial fibrillation undergoing surgical procedures (Australian Clinical Guidelines for the Diagnosis and Management of Atrial Fibrillation 2018)¹⁷³
- For patients on anticoagulants to prevent Venous thromboembolism: Venous Thromboembolism Prevention Clinical Care Standard (Australian Commission on Safety and Quality in Health Care October 2018)¹⁷⁴
- Guidelines on perioperative management of anticoagulant and antiplatelet agents (New South Wales Clinical Excellence Commission December 2018).¹⁷⁵

Antipsychotics

- A guide to deprescribing Antipsychotics (PHN Tasmania).¹⁷⁶



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