Quality Use of Medicines for Optometrists

2024

Optometry AUSTRALIA

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Acknowledgement of Country

Optometry Australia acknowledges the Traditional Custodians across the lands and waterways where we work, learn and live. We pay our respects to Elders past, present and emerging and express our gratitude for their continuing custodianship.

Optometry Australia also acknowledges Māori as tangata whenua and Treaty of Waitangi partners in Aotearoa New Zealand.

We honour the unique cultural and spiritual relationships that Aboriginal and Torres Strait Islander peoples, as well as Māori, have with knowledge, education and the land.

1. Development of this guide

Optometry Australia has created this Clinical Practice Guide series in consultation with an interdisciplinary expert working group comprised of academics from Australian university optometry schools, experienced endorsed optometrist prescribers, and pharmacists.

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All health professionals have a responsibility to be familiar with the principles of Quality Use of Medicines, as medicines are the most common clinical intervention. Australian optometrists must have the knowledge and skills to safely and effectively prescribe medicines for the practice of optometry. This requirement is within the current level of training and knowledge of therapeutically qualified Australian optometrists.[1] Even if an optometrist is not therapeutically endorsed, they must be able to apply the principles of quality use of medicines.

Optometrists' prescribing authority is currently limited to topical treatments, however, Optometry Australia believes the ability to prescribe oral medications is a key component of providing equitable, comprehensive care to all Australians, particularly for those in remote and vulnerable communities who face barriers to access. Including oral prescribing in the Clinical Practice Guide aligns with the *Trans-Tasman Mutual Recognition Act 1997*, which allows Australian optometrists to practice in New Zealand and vice versa. This ensures the Guide reflects the full scope of modern optometry practice and meets international standards for optimal patient care.

Optometry Australia created this guide in 2024 and supports the various modes of optometry practice. Optometry Australia advises adherence to the Australian Health Practitioner Registration Agency shared Code of Conduct.

This Clinical Practice Guide provides a detailed review of Quality Use of Medicines principles and outlines key resources that can be used by optometrists to integrate QUM into their practice. It can be used in conjunction with the Executive summary.

Please refer to the Clinical Practice Guides webpage on the Optometry Australia website for specific information on various eye conditions.

This Clinical Practice Guide will be reviewed and updated within 5-7 years or sooner if significant changes occur.

2. Introduction

Medicines use in Australia is increasing.[2] 'Medicines' refers to all therapeutic substances, including both prescribed and non-prescribed pharmaceuticals and complementary and alternative products.[3,4] As people age, there is an increase in medicine usage, regime complexity and the likelihood of polypharmacy, consequently increasing the potential for medicines-related harm.[5] Medicines related harm leads to emergency department and hospital admissions, costing the Australian health system over $1 billion annually.[6] Approximately 50% of these admissions are preventable.[6] Inappropriate medicine use encompasses no current therapeutic need for a medicine, prescribing omissions (the absence of an indicated medicine), inappropriate dosing (too high or too low) and inadequate medicine monitoring.[7-11]

Quality Use of Medicines (QUM), a national health priority of the Department of Health and Aged Care, is defined as the safe and effective use of medicines to achieve the best possible health outcomes.[3,4] It comprehensively covers all aspects of medicine management, including assessment, diagnoses, therapy, review and monitoring.[3,4]

The integration and review of Quality Use of Medicines (QUM) activities is essential[3,4] for all health professionals, including optometrists. QUM activities are designed to support health professionals and healthcare settings in decreasing inappropriate prescribing, promoting non-medicine strategies and lifestyle interventions, and heightening quality prescribing when a medicine is indicated.[4]

Quality Use of Medicines means patients receive the most appropriate, effective and safe medicines therapy to decrease medicines-related harm, treatment failure and preventable hospital admissions.[3,4] The National Strategy for Quality Use of Medicines defines core QUM concepts (**Table 1**).

Table 1: Concepts of quality use of medicines	
Core concept	**Overview**
Selecting medicine management options wisely.	• Balancing the intended benefits (disease progression, risk reduction, symptom management) and risks, including adverse drug events. • Considering patient ability to appropriately administer the medicine and remain adherent. • Non-pharmacological interventions should always be considered (including observation only) before initiating or continuing a medicine.
Choosing medicines appropriately when pharmaceutical intervention is indicated.	• Comprehensive assessment of the individual. • Determination of diagnosis and differential diagnoses. • Determine appropriate drug, dosage, formulation and duration of treatment within the clinical context. • Determine appropriate monitoring required. • Economic implications of medicines use for both the individual and broader health system, including Pharmaceutical Benefits Scheme eligibility.
Using medicines safely and effectively.	• Assessment of the impact of treatment. • Detection of any adverse effects or inadequate responses that may require reconsideration of the initial diagnosis and treatment plan. • Preventing misuse, overuse, or underuse of medicines. • Empowering patients to actively engage in solving problems related to their medicines.
References: [3,4]	

3. Prescibing competencies

The way health professionals prescribe medicines influences patient outcomes and the efficacy of medicine therapy. Competent and responsible prescribing is essential to supporting the quality use of medicines.[12,13]

Prescribing is not an isolated task; it is a comprehensive process used by qualified health professionals to authorise a specific treatment customised to an individual's health needs.[14] The NPS MedicineWise Prescribing Competencies Framework conceptualises a four-stage model of prescribing (**Figure 1**),[12,13] which is underpinned by two key elements – enabling knowledge (e.g., clinical pharmacology) and global attributes (e.g., self-reflection on prescribing).[12] This model is summarised in **Table 2** and provides a structured approach to safe and effective medicine prescribing, consisting of four stages: information gathering; clinical decision-making; communication; and monitor and review.[12]

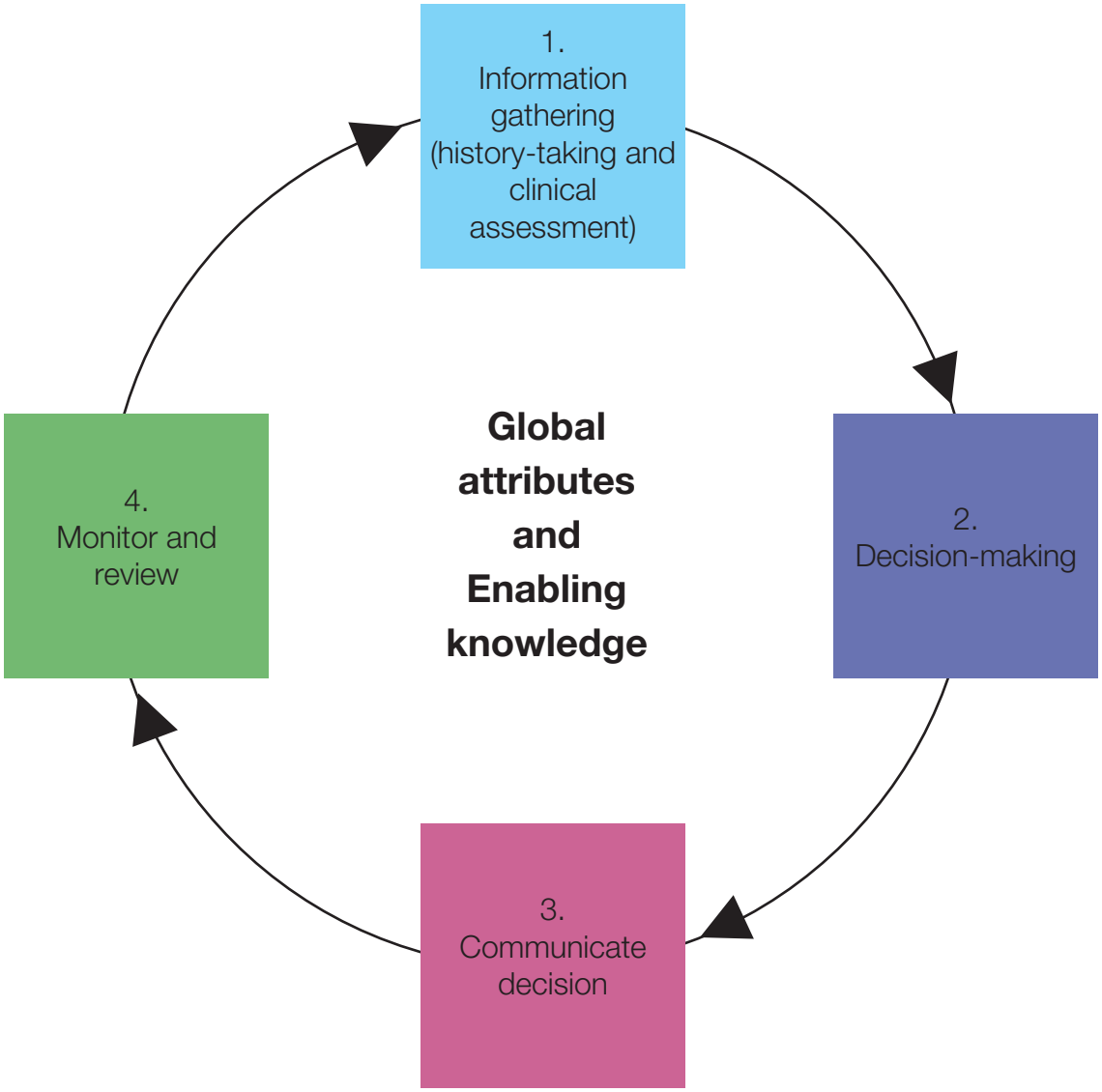

Figure 1: Prescribing Competencies Framework (adapted from Lum, Mitchell and Coombes[12])

Table 2: Prescribing skills and competencies (adapted from Teoh et al, adapted from Lum, Mitchell and Coombes)		
Stage of prescribing		**Skills and competencies**
1	**Information gathering (history-taking and clinical assessment)**	**The prescriber needs to consider the role of medicines in the management of eye conditions, both for treatment and considering the possibility that the presenting symptom is a medicines-related effect.** • The prescriber should gather all relevant information about the patient (e.g. age, gender, diagnoses, allergies, previous adverse drug reactions) and their medical treatment. This includes completing a Best Possible Medication History, remembering to consider potential medicines that were previously used that may be relevant (e.g. historical amiodarone) and undertake further examinations or investigations where appropriate. • The prescriber should assess adherence to medicines, including the patient's ability to administer and store them appropriately, manage devices, and consider risk factors for non-adherence.
2	**Decision-making**	**After forming a diagnosis, the prescriber should consider the most appropriate treatment option(s) in collaboration with the patient/carer (shared decision-making).** • Consider treatment options (including non-pharmacological options such as cold/warm compresses or lifestyle behaviour modification), including actual and potential precautions and contraindications to use and the potential for interactions with other medicines. The anticipated benefits of the treatment need to be weighed with the potential risks of treatment and the treatment burden. • Consider the appropriate medicine and the required formulation (e.g. oral, injection, eye gel, eye drop), administration frequency and the anticipated treatment duration.

Table 2: Prescribing skills and competencies (adapted from Teoh et al, adapted from Lum, Mitchell and Coombes)		
Stage of prescribing		**Skills and competencies**
3	**Communicate decision**	**Agree on and develop a management plan with the patient and communicate prescribing decision.** • **Communication with patient and caregivers:** Once the shared decision is made, it is important to provide patient education about the medication, possible adverse effects, what to do if they occur, and the importance of adherence to the regimen. • **Communication with other health professionals:** Safely and effectively communicate treatment decisions (with patient consent) to other health professionals. This communication includes the written (or electronic) prescription, which must be a legally compliant, legible and accurate prescription for a pharmacist to dispense.
4	**Monitor and review**	**A clinically appropriate timeframe should be identified for follow up to monitor and review.** • Check that the patient has stored and taken the medication as agreed upon, and that the desired clinical outcome is being achieved and whether any actual side effects are identified. Factors to consider are the patient reported outcomes (including side effects and any treatment burden), perceived adherence and administration technique. Balance these factors with the anticipated or actual benefits.
References: [12,14,15]		

3.1 Information gathering (history-taking and clinical assessment)

Information gathering and assessment includes collecting and discussing relevant medical history, current medicines, presenting symptoms/complaints and allergies.[12]

The Best Possible Medication History is a holistic and accurate record of all medicines patients are taking, which is typically obtained as early as possible via a structured interview, actively including the patient.[16] A structured approach to undertaking the Best Possible Medication History interview for optometrists is outlined in **Figure 2.**

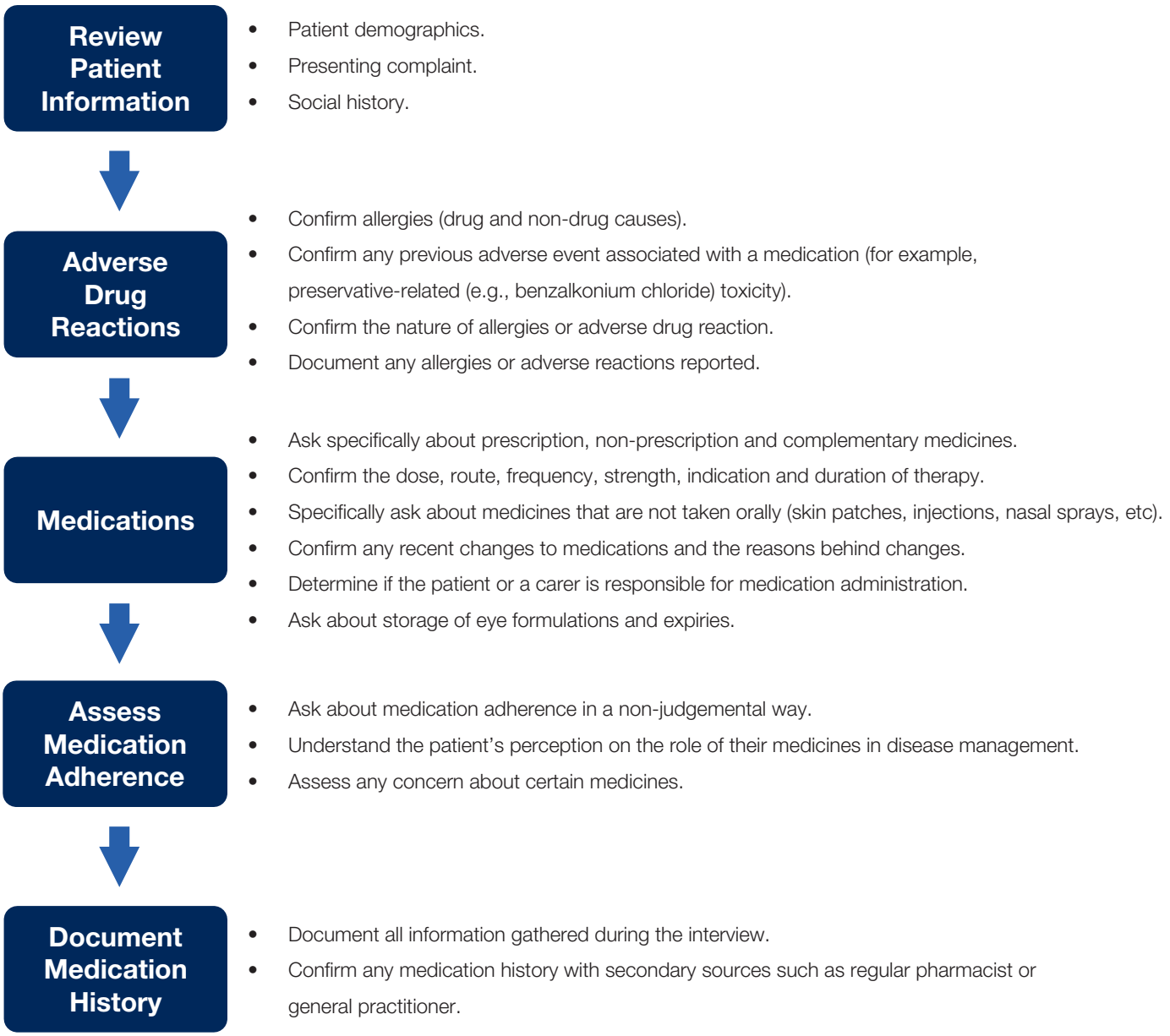

Figure 2: Stepwise approach to the best possible medication history interview, adapted from the Clinical Excellence Commission[15] for the optometry context

Part of the information-gathering process is to document adverse drug reactions or any form of allergy that patients may have.[17] Adverse drug reactions include allergic reactions, unwanted side effects and intolerances.[18]

Health professionals should always refer to allergy and adverse drug reaction history before deciding to prescribe a medicine to avoid preventable medicines-related harm.[17]

The medication history needs to be reconciled with the patient's medical history and presenting symptoms/complaints. Further investigations and/or examinations will need to be performed to inform decision-making. It is important to understand the patient's preferences, goals of care and treatment priorities. This may include ability and preference for the route of administration and frequency of administration.

It is also important to understand the patient's specific health needs and circumstances when diagnosing, treating and monitoring illness. Pathology services are designed to assist health practitioners in this process.[19] Laboratory markers such as creatinine clearance, liver function tests, and electrolyte levels are used to monitor drug effectiveness and adverse effect risks and guide drug selection to support the quality use of medicines.[20,21] The estimated glomerular filtration rate (eGFR) may indicate dose adjustment is required if renal function is impaired. Other information sources for optometrists could include a patient's general practitioner, community pharmacist, hospital discharge summaries or My Health Record, as applicable to the individual patient.

3.2 Decision Making

Prescribing is a clinical decision-making process guided by assessment and information gathering in collaboration with the patient.[12] Prescribing requires specific knowledge and skills to safely recommend a medicines therapy considering a patient's medical and social circumstances.[13] Prescribers must also understand the available and appropriate treatment options given the vast array of medicines available on the market and different therapy guidelines.[13]

Both health professionals and patients are key stakeholders in achieving quality use of medicines. Health professionals are responsible for providing patients with accurate and sufficient information and education on all management options to support active participation in the decision-making process.[3] The Department of Health and Aged Care has published a series of documents with guiding principles on medicines management across the broader health system, the most relevant to optometry being the Guiding principles for medication management in the community which provides information on achieving person-centred care and shared decision-making.[22] Guiding Principle 1 identifies a person-centred approach as forming a respectful partnership between a patient and a health professional.

Health professionals should actively encourage patients to participate in formulating their care plan by tailoring information according to individual needs, health literacy and cultural beliefs.

Understanding health literacy is useful when demonstrating person-centred care. Health literacy is the ability of an individual to obtain, understand and apply information relating to their health when making informed decisions about their well-being.[23] Individuals with limited health literacy face an increased risk of poorer health outcomes because this cohort tends to utilise health services less often and is more likely to be non-adherent with taking medicines. One approach to improving concordance is to involve the patient in the decision-making process in an approach consistent with their health literacy. Health literacy can also determine the expectations a patient has about medicines.[24] Many patients may present with unreliable health information from the internet or believe that their symptoms warrant a particular prescription, resulting in direct requests for prescription medicines. Prescribers are responsible for engaging patients in discussions around their concerns, communicating effectively, and providing evidence-based information to support creating a management plan.[24]

Quality use of medicines is about recognising when it is clinically appropriate to prescribe a pharmacological agent (**Figure 3**).[25] Non-pharmacological interventions, including diet and exercise, may be sufficient to manage health conditions.[2,3] Furthermore, conservative interventions such as warm compresses may be appropriate management options in optometry.[26] Medicine continuation should be considered similarly to medicine initiation as the clinical picture may have changed, including disease progression or remission (**Figure 4**).[8,27] When making the clinical decision to prescribe or continue medicines, the potential benefits need to be balanced with the potential risks.[13]

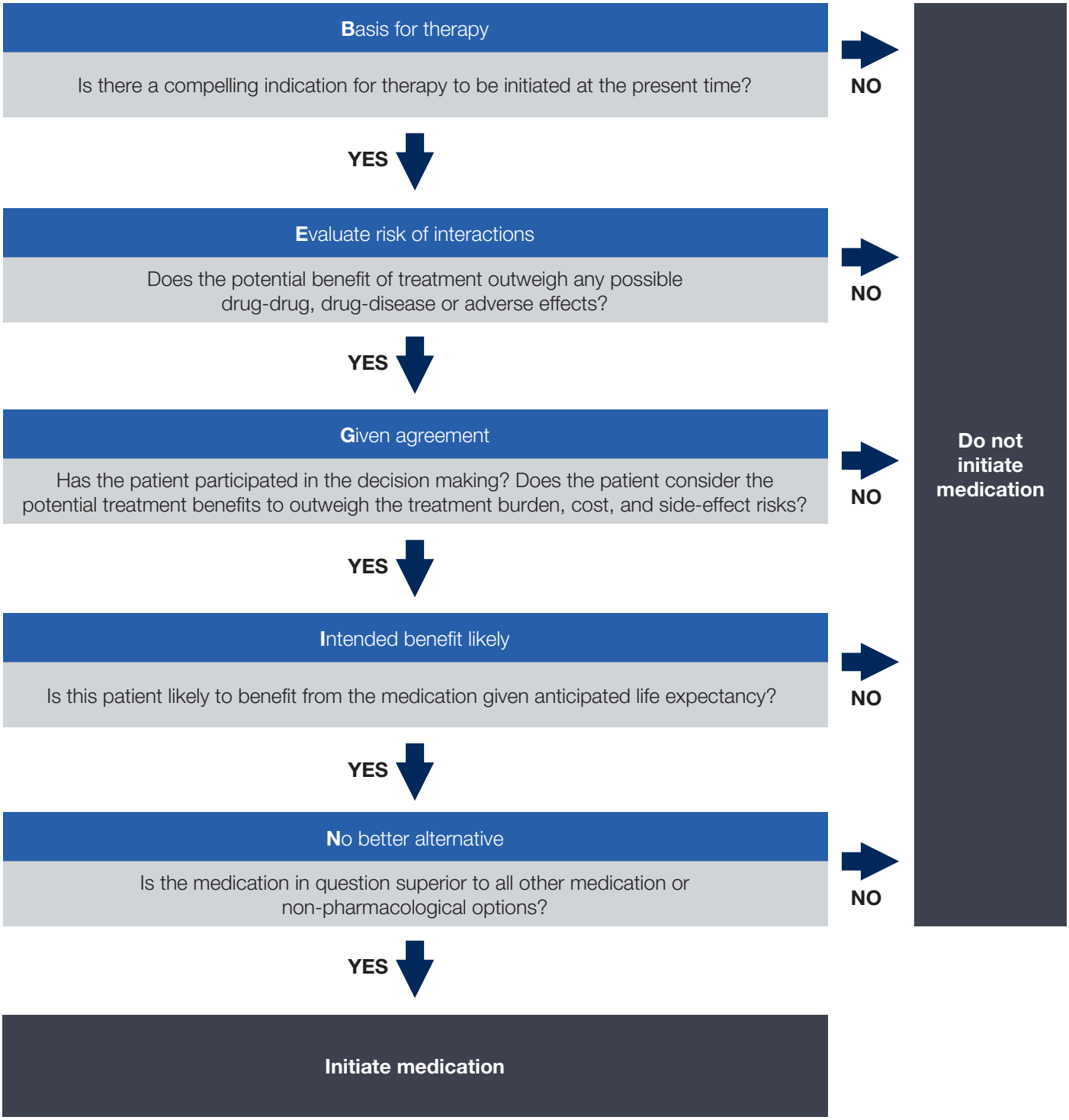

Figure 3: The BEGIN algorithm to guide appropriate initiation of new medicines[25]

Evaluate

Ascertain the evidence for current diagnosis. Evaluate if the diagnosis is certain and if there are appropriate and practical assessments or investigations that are required for re-evaluation of the diagnosis.

Resolved conditions

Consider if the condition has resolved. The condition may have ameliorated, been short term, or been associated with a temporary factor (e.g a side effect of a medicine). Life style changes, non-pharmacological interventions or changes associated with ageing may have resulted in remission.

Ageing normally

Consider whether the current diagnosis is relevant for the older person. Consider physiological changes related to normal ageing.

Select targets

Adjust treatment targets for the individual. Critically review the treatment targets and diagnostic parameters for the older person. This may allow for individualised targets, or undiagnosis.

Eliminate

Eliminate the diagnosis from the current list of medical problems. Withdraw medicines used to treat the condition. Taper the medicine if required.

Figure 4: The ERASE algorithm to guide health professionals to consider if a medicine remains necessary[8]

References

1. Page A & Etherton-Beer C. Undiagnosing to prevent overprescribing. Maturitas 2019; 123: 67-72.
2. Hosking SM, Etherton-Beer C, Page AT. Undiagnosing: Correcting the medical record to prevent over-intervention. Case Reports in Women's Health 2019; 23: e00133

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Medicine-specific precautions when prescribing are outlined in **Table 3**.

Table 3: Prescribing precautions

Precaution	Clinical relevance
Dose selection[28]	Various factors impact dose selection. Individual factors include: • Age • Frailty • Comorbidities • Renal and hepatic function • Weight • Patient preferences/lifestyle Medicine-specific factors include: • Side effect profile • Indication • Medicine interactions (drug-drug, drug-food, drug-herb)
Side effect profile[21]	Some medicines are more likely to cause side effects than others. Side effects may impact adherence to therapy. Side effects may also indicate that a patient cannot take a medicine correctly in the first place (e.g. bad taste is a reported side effect of eye drops. This side effect can be reduced by applying pressure on the lacrimal sac and closing the eye lids after administration, which increases ocular absorption and reduces the medicine draining into the nose.)[29]
Medicine interactions[30]	Medicine interactions can occur between medicines, food products and medical conditions. Most commonly, interactions result in faster metabolism/excretion of medicine so that treatment is less effective or slower metabolism/excretion, increasing the risk of side effects. These effects are a result of alterations in bioavailability, clearance or distribution. Drug-drug interactions may be contraindications to use, but at other times, they can be manageable and preventable. Prescribers need to understand the pharmacological effects of the drugs they prescribe. This knowledge should be supplemented with medicine resources such as, drug monographs from independent drug references or Product Information developed by drug companies. Advice can be sought from local community pharmacies or by contacting Medicines Information hotlines at major tertiary hospitals.
Adherence[31]	Medicines cannot work if not used. Prescribers should consider and assess adherence when considering a response to therapy.
Cost[3]	Medicines need to be accessible. The financial costs associated with medicines impact accessibility. Prescribers should be vigilant about checking whether the medicines they prescribe are listed on the Pharmaceutical Benefits Scheme (PBS), whether a patient is eligible to have medicines covered on the PBS and the social/financial situation of the patient.

3.3 Communicate decision

Communication of medical information facilitates shared decision-making.[22] Patients should know the diverse evidence behind treatment options and the benefits versus risks of different management plans. Active involvement of patients and/or carers promotes a better understanding of their medicines so that quality use of medicines and improved health outcomes are observed.[22]

When commencing a medicine, the prescriber should communicate how treatment success will be measured. It should be noted as to when dose adjustments or frequency of administration may be adjusted, or when the medicine may be ceased or changed to a different medicine. Changing health needs and priorities may also require medicines adjustments.

Medicines management plans developed between a prescriber and a patient should also be relayed to relevant health professionals involved in the patient's care with patient consent.[13]

3.3.1. Writing a prescription

A prescription is a paper or digital order made by a health professional (e.g., medical practitioner, dentist, nurse practitioner, midwife, optometrist or podiatrist) that authorises a pharmacist to dispense and supply a specific medicine to a specific person.[32]

It is legally required that all Schedule 4 and Schedule 8 medicines be written as valid prescriptions.[33] The Optometry Board of Australia also encourages optometrists to write prescriptions for Schedule 2 and 3 medicines to facilitate effective communication of medicines orders to pharmacists. However, it is not a legal requirement.[33]

There are standards for writing prescriptions to ensure safety in Australia.[33]

Clear language for written prescriptions

It is important that prescriptions are written clearly using standard terminology and clear abbreviations to ensure that the intention is understood without risk of misinterpretation. Abbreviations are often used by prescribers when writing prescriptions for timesaving purposes.[34] Many commonly used and transferred abbreviations between countries have been developed. However, some abbreviations can appear unclear and leave room for misunderstanding from when a medicine is prescribed to when it is dispensed and supplied. Medicines errors still occur due to error-prone abbreviations, posing a risk to patient safety.[34] Furthermore, education and patient understanding of treatment options is a core component to the Quality Use of Medicines.[3] Prescribing using abbreviations that patients do not understand does not support this practice.[3]

The Australian Commission on Safety and Quality in Health Care (ACSQHC) has published recommendations on terminology and abbreviations for prescribing.[34] Although the ambiguity of error-prone abbreviations occurs mostly with hand-written prescriptions, these recommendations have been created to be used for both written and electronic orders across all healthcare settings. This document outlines error-prone abbreviations and provides alternative abbreviations that are safe to use when prescribing.

Active ingredient prescribing

The Pharmaceutical Benefits Scheme (PBS) has required medicines to be prescribed under their active ingredient name rather than a brand name since 2021.[35] Active ingredient prescribing supports the quality use of medicines by standardising medicine description, increasing patient awareness of the medicines they take, and encouraging the use of generic and biosimilar medicines to reduce medicine costs.[36,37] Patients are allowed to choose a specific brand of medicine when they get a prescription dispensed at a pharmacy, but the initiative ensures they understand what active ingredient is inside a brand of medicine, as there have been reports of consumers accidentally double dosing on the same medicines because they recognise one brand and not the other.[7]

Table 4 outlines exclusions to active ingredient prescribing; there are instances where prescribing by active ingredient (generic) and brand name together is recommended or where brand-name prescribing is preferred.[36]

Table 4:
ACSQHC guidance for prescribing with medicine brand names, specific to topical medications

Guidance	With generic name	In place of generic name	Example
The inclusion of active ingredient names is impractical, and the risk of dispensing error is high. Prescribe by brand for practicality and safety.		✓	• Ocular lubricants.
Medicines with a high risk of selection error e.g., similarity of active ingredient names	✓		• Multiple vs. single-use eye drops. • Strength of atropine eye drops. • Prednisolone acetate and prednisolone phosphate eye drops. • Ciclosporin eye drops. • Anti-hypertensive eye drops.
References[36]			

Electronic prescribing

Electronic prescribing is prescribing software that generates a cyber-secure token, which can be sent directly to patients or pharmacies for dispensing.[38] By avoiding the need to hand-write a medicines order, electronic prescribing reduces the risk of transcription errors, thus improving the safety of patients.[39] Transcription errors do not occur just from incorrect transcribing of ambiguous abbreviations or illegible handwriting. They can also occur as a result of incorrect manual entry during dispensing.[34,40] Electronic prescriptions automatically input most of the prescription information into dispensing software, reducing the likelihood of dispensing errors.[40] Electronic prescribing also assists telehealth service delivery and reduces the number of lost paper prescriptions, improving patient access to medicines.[2,39]

Prescribing under the Pharmaceutical Benefits Scheme (PBS)

The PBS is a government-funded program subsidising the cost of a wide range of medicines to make them more accessible to the general public.[41] Under the PBS, eligible patients can access medicines at a significantly reduced cost. Patients will pay a co-payment based on their concessional status, and the Government pays the remaining amount.[41] The PBS is a critical component of the Australian health system and the National Medicines Policy, ensuring citizens have access to quality and affordable medicines.[41,42]

Optometrists can prescribe medicines under the PBS listed on the Optometrical Schedule.[41] The PBS outlines various specifications for prescribers when writing PBS prescriptions. All prescribers are encouraged to refer to the PBS website to ensure that prescriptions will be valid upon dispensing so that patients can access medicines at an affordable price. In particular, prescribers should ensure that the legal aspects of a PBS prescription are fulfilled and consider the extra requirements for prescribing medicines where streamlined or full authority is required to prescribe.[41]

3.3.2. Interprofessional communication

The World Health Organization (WHO) characterises collaborative health practice as the cooperation of health professionals from diverse professional backgrounds working with healthcare patients to achieve optimal care.[43] From a quality use of medicines perspective, research indicates that engaging in interprofessional collaboration can mitigate risks associated with medicines, optimise the use, and prevent medicines-related hospital admissions.[44,45]

Competent prescribing of medicines includes effective collaboration with other health professionals.[13] Prescribers must also reflect on when the input of other health professionals is needed to develop a medicines management plan.[13] **Table 5** summarises the role of different health professionals in primary care settings involved in medicines management.

Table 5: Role of primary health professionals involved in medicines management	
Health professional	**Role in medicines management**
Registered nurses[22]	Nurses are heavily involved in the administration of medicines to patients. Nurses in community settings can have excellent insight into a patient's ability to self-administer and keep up with their medicine regime.
Pharmacists[22]	Pharmacists are responsible for the safe and effective supply of medicines to a patient. They collaborate with health professionals and patients to dispense and counsel patients on medicine use, and can prescribe and administer some medicines. Pharmacists are also responsible for medicine reviews upon receiving a prescription to ensure quality use of medicines. Credentialed pharmacists can conduct extensive medication reviews on referral from general practitioners. These medication reviews aim to optimise treatment plans and address patients concerns with their medicines.
Aboriginal health workers[46]	Aboriginal health worker responsibilities often include educating and empowering individuals within Aboriginal communities about proper medicine use, assisting in the communication between healthcare providers and patients, and supporting adherence to prescribed regimens. Additionally, Aboriginal health workers often act as advocates, ensuring that healthcare services align with the unique needs and perspectives of Indigenous populations.
Health professionals with prescribing rights	**Role in medicines management**
General practitioner and other medical practitioners[22,47]	General practitioners diagnose, prescribe and liaise with other health professionals to ensure continuity of care. Changes made to medicines management are usually communicated to the patient's regular general practitioner as it is them who coordinates care. Other medical practitioners with prescribing rights include ophthalmologists.
Optometrists[22,48]	Optometrists are authorised to prescribe topical eye formulations, so they are responsible for screening, diagnosing and treating various ocular conditions. Optometrists can also assist with monitoring ocular adverse effects associated with certain medicines.
Dentists[22,49]	Dentists incorporate short-term medicines management in the care of patients to manage acute pain and infection. Dentists can also assist patients in managing adverse dental effects from certain medicines.

Table 5: Role of primary health professionals involved in medicines management	
Health professional with prescribing rights	**Role in medicines management**
Nurse practitioners and midwives[22]	Nurse practitioners have authorisation to prescribe certain prescription medicines and may be a supplementary prescriber alongside a patient's regular General practitioner. Midwives have prescribing rights within their scope of practice.
Podiatrists[50]	Podiatrists can prescribe from a fixed list of medicines if they are endorsed.
Pharmacists	Pharmacists in some jurisdictions are authorised to prescribe select schedule 4 medicines. Schedule 3 medicines (pharmacist only) and schedule 2 medicines (pharmacy only medicines) can be initiated and supplied by pharmacists in community pharmacies.

Clinical communication entails sharing information regarding an individual's care among health professionals, members of a multidisciplinary team, consumers, families, and carers.[51]

Successful clinical communication between health professionals has been demonstrated to reduce length of hospital admissions and support quality use of medicines.[44,52]

However, breakdowns in clinical communication are still a significant complaint made by healthcare professionals.[53] A discussion paper on effective team-based healthcare identified a key strategy for communicating effectively within a team[54]: setting strong standards for professionalism when communicating to other health professionals; speaking/writing clearly and respectfully, eliminating jargon, and communicating information from an objective rather than personal perspective. An example of clear communication from an optometrist to pharmacist is provided in **Box 1**.

Box 1: Practice point – brand name prescribing of atropine eye drops

Atropine eye drops are commercially available in two strengths.[55] These drops should be prescribed with the active ingredient name and brand name together to reduce the risk of dispensing errors.

- Atropine 0.01% drops (brand name Eikance)
- Atropine 1% eye drops (brand name Atropt)

Atropine 0.01% drops (brand name Eikance) are TGA-approved to delay myopia progression in children aged 4 to 14.[55,56] Since becoming available as a commercial product, atropine 0.01% eye drops are no longer compounded in Australia therefore must be specified by brand name.[57] Alternative strengths of low dose atropine eye drops may still be prescribed, for example 0.025% or 0.05%, clearly labelling prescriptions with 'To Be Compounded' is considered best practice.[58]

Accidental supply of atropine 1% eye drops to children can cause significant harm.[56]

Communication strategies to reduce the risk of error when prescribing Atropine (Eikance) 0.01% drops

On the written prescription: The strength should always be underlined.

Communication to the patient: Ensure patients are aware of the medicine that they are prescribed, including generic and brand name and strength.

Communication to the pharmacist: The consumer can choose pharmacies to visit. Ask if they intend to visit just one, and if they do, consider contacting the pharmacist to inform them of the prescription so additional care is taken.

3.4 Monitor and review

To ensure quality use of medicines, prescribers should follow up with patients at regular intervals to review the outcomes of an established treatment plan.[13] The ACSQHC emphasises health professionals prioritise medicine reviews where appropriate to reduce medicines-related harm.[59] A medication review can include or consider medicine appropriateness, clinical relevance, usage, or adherence review.[60] These components contribute to the continued access to medicines and safe and quality use of medicines.[13]

It is important to identify the prescriber who is responsible for medicines decisions at different time points in a patient's journey with medicine use.[59,60] Considering the issues contributing to quality use of medicines for the individual patient, and whether multidisciplinary input is required.[60]

4. Special prescribing considerations

4.1. Medicines adherence

Medicines adherence refers to whether patients follow their prescribed treatment plan, including taking medicines at the correct dose and frequency with the correct administration.[31,61] Medicines concordance or compliance may sometimes be used interchangeably with adherence, but can be used to suggest a degree of shared-decision making. Medicines concordance is crucial to the quality use of medicines as it supports the success of the medicines regime, improves patient health outcomes and reduces overall costs on the wider health system.[31,61,62]

Medicines non-adherence to ophthalmic products is common.[63] Non-adherence is a multifaceted and intricate problem that can be categorised as intentional or unintentional.[31,63] Intentional nonadherence occurs when patients make a conscious choice not to adhere to the prescribed regimen, often driven by factors such as a desire to avoid therapy side effects or a belief that the treatment is unnecessary.[63] Alternatively, unintentional nonadherence is a passive phenomenon resulting from inadequate instillation technique or physical and cognitive limitations.[63]

Health professionals are often poor at detecting non-adherence.[64]

Specific questions about addressing missed doses are nearly four times more effective in prompting patients to disclose non-adherence behaviour patterns than other questions.[64]

Some patients may choose not to disclose information about adherence because they do not wish to be perceived as deviating from instructions given by health professionals.[65] It is possible that dispensed products are used past their expiration dates, or shelf life once opened, which is a problem particularly observed with topical ophthalmic preparations. **Table 6** summarises common causes of medicine non-adherence specific to ophthalmic preparations and suggests strategies to improve adherence rates.

Table 6: Common causes and strategies for managing non-adherence with ophthalmic medicines		
Cause of non-adherence	**Description**	**Improvement strategies**
Poor self-administration technique[63,66]	91% of patients using topical eye formulations do not use them correctly. • Incorrect use includes: • hygiene practice • aim • appropriate expulsion of the formulation • avoiding delivery device-eye contact.	Patient education and demonstration on applying topical eye formulations during the initial prescribing/ dispensing and periodically throughout the year. Provision of printed or video demonstrations on administration techniques. Administer drops lying down rather than seated. Enlist the help of a family member or carer.
Dexterity issues [63, 66]	Medical conditions such as arthritis prohibit the ability to correctly self-administer topical eye formulations. Additionally, diseases such as Parkinson's result in tremors, as does age.	Provision of eye drop delivery devices and administration aids.
Cognitive decline[63]	As forgetfulness increases with age, so too does non-adherence. Patients may forget to administer their medicines and specific dosing instructions (e.g., patients often forget the frequency of administration).	Automated administration reminders. Prescribe medicines that require less frequent administration. Prescribe combination medicines.
Costs[41,66]	Patients who cannot afford the cost of their medicines will naturally be non-adherent as their accessibility to medicines is compromised.	Prescribers should consider treatments listed on the PBS and confirm patient eligibility to receive certain medicines on the PBS. Prescribers should also confirm any required authority approvals to prescribe certain medicines to ensure the prescription meets PBS requirements.
Side effects[66]	Experiencing medication side effects increases the likelihood of non-adherence. For example, topical eye formulations containing preservatives can cause ocular surface disease that discourage patients from using their eye drops consistently.	Consider alternative medicines that avoid unpleasant side effects (e.g. preservative-free eye drops). Improvement of administration techniques can reduce systemic side effects.
Health literacy[23, 65, 67]	Patients with lower health literacy are less likely to take their medicines as prescribed because they lack an understanding of the importance of adhering to medicines.	Prescribers should educate patients on the role of medicines about their health and their impact on chronic disease control.

4.2. Safe prescribing in pregnancy and breastfeeding

Health professionals must exercise caution when prescribing medicines during pregnancy and breastfeeding due to potential risks to the developing foetus or nursing infant.[68] Medicines can cross the placenta or transfer into breast milk, potentially impacting the health and development of the baby. The safety profile of many drugs in these situations may not be well-established, and the potential benefits of medicines must be carefully weighed against potential risks. It is crucial to consider the specific circumstances, potential alternatives, and the latest evidence to ensure the safest course of action for both mother and baby.[68]

The Australian categorisation system for prescribing medicines during pregnancy aims to guide health professionals in assessing medicines' potential risks and benefits during pregnancy.[68] The system categorises drugs into six classes (A, B1, B2, B3, C, D, X) based on the available evidence regarding their safety. Category A indicates medicines with a proven safety record in pregnancy. In contrast, categories B1 to B3 and C denote increasing levels of potential risk based on the data of medicine used in pregnancy, the data results from animal studies and whether any determined or potential effects on a foetus are reversible. Category D signifies evidence of harm, including foetal malformation or irreversible damage, while Category X implies contraindication due to substantial risks.[68]

Although readily available and updated periodically, reliance on the categorisation system may not provide a comprehensive understanding of medication safety in pregnancy so its use as a primary resource is not recommended.[69] The issue lies in the alphabetical arrangement of the A–X, wrongly suggesting a hierarchy of risk where category C is perceived as 'worse' than categorisation category B. Other downfalls of the classification include the fact that it is not consistently updated with the latest evidence, drugs within the same category may have varying degrees of risk, and the categories do not consider the stage of pregnancy.

Health professionals should always refer to additional information sources, such as medicine references (e.g., the Australian Medicines Handbook or TGA website).[69] If further advice is required, contact a Drug Information Centre at a local/state-based Women's and Children's hospital.

Most topical eye formulations are considered safe in pregnancy and breastfeeding, as systemic absorption is minimal[55,70] although as systemic absorption is still possible, caution is required.[71] There are a few exceptions, including the following[55]:

- Caution is advised with topical beta-blockers in pregnancy and breastfeeding due to the risk of adverse cardiovascular effects.
- The use of prostaglandin analogues has not been studied in pregnancy, so use is not advised.
- Although considered safe, there is limited data on the use of alpha2-agonists, pilocarpine and carbonic anhydrase inhibitors in pregnancy and breastfeeding.
- Topical non-steroidal anti-inflammatories can be used in pregnancy short-term.
- Phenylephrine eye drops should be avoided in pregnancy, especially in the first trimester due to the potential for causing renal failure in newborns.[72] Tropicamide has a short duration of action so is the preferred mydriatic drop for diagnostic and therapeutic purposes in pregnancy.[72]

All optometrists should cross-check appropriate references whenever a medicine is prescribed during pregnancy and breastfeeding.[69] In situations where data is conflicting or unclear or there is no other suitable therapy determined to be safe, optometrists could call a pharmacist or ophthalmologist for advice. Alternatively, most states have obstetric medicine information phone lines that patients and health professionals can call with medicine enquiries. These are usually located in tertiary hospitals specific for people during pregnancy and newborn infants.

4.3. Safe prescribing for older adults

Managing the medication requirements of older adults presents distinct challenges, so considerable thought is required when devising medication management plans for this age group.[10] Metabolic changes in older adults increase their vulnerability to adverse drug reactions.[5] Prescribers must also factor in the natural cognitive decline and reduced dexterity often observed in older adults, influencing medicines administration and adherence.[7] A key factor contributing to unfavourable medicine outcomes in older adults is polypharmacy.[9] Polypharmacy is characterised by a patient's use of multiple medicines, typically considered to be five or more medicines.[73] Adverse consequences can occur due to polypharmacy. Although eye drops have lower systemic absorption than medicines administered orally, severe systemic side effects such as bradycardia have been identified from the use of certain eye drops.[71]

Certain medicines may potentially have an increased risk of harm for older adults compared to younger people.[74] Medicines anticholinergic properties can potentially result in poorer health outcomes for older people, including an increased falls risk, and side effects such as dry eyes.[75] Anticholinergic medicines may be identified using explicit lists. There are other medicines where the harm potentially outweighs the benefits, which are known as potentially inappropriate medicines lists. The most commonly known lists are the United States' Beers Criteria or the Irish Screening Tool of Older Persons' Prescriptions (STOPP) criteria. There is an Australian list of potentially inappropriate medicines available open access that identifies 19 medicines or medicines classes that may be high risk for older people.[76]

If an optometrist identifies systemic medicines that may potentially be causing harm, the person should be encouraged to visit their general practitioner to discuss.

This undertaking should not be isolated, and practitioners are also encouraged to engage with other professionals who have contributed to the patient's medicines prescriptions to discuss the ongoing necessity.[77]

4.4. Safe prescribing for children

Administration of medicines can be one of the most challenging aspects of paediatric care.[78] Children may refuse to take their medicines for various reasons, including taste, texture, fear and swallowing difficulties. A 2021 review described the practical use and prescription of ocular medications in children and infants and can be used as a general guide for optometrists.[79]

4.5. Safe prescribing for Aboriginal and Torres Strait Islander people

Aboriginal and Torres Strait Islander people have higher rates of chronic eye disease than non-Indigenous Australians.[80,81] To provide person-centred and culturally appropriate care, prescribers must reflect on cultural factors when prescribing medicines for Aboriginal and Torres Strait Islander people.[13] Cultural elements such as shame, family, community, men's versus women's business and local culture may impact communication about medicines, medicine adherence and continual access to medicines.[82] In the prescription process, practitioners should consider strategies for sustaining the supply of medicines, simplify medicines regimens when feasible, and seek input from Aboriginal Health Workers whenever possible to enhance cultural understanding and relevance.[46,83]

4.6. Adverse event reporting

Health professionals should always report suspected adverse drug reactions.[84] However, some adverse drug reactions are not known and can occur during or directly after a consult.[17] The Therapeutic Goods Administration (TGA) in Australia oversees the safety of medicines to enhance comprehension of potential adverse effects.[85] The TGA and other regulatory bodies encourage all health consumers, health professionals and industry stakeholders to report adverse drug reactions to contribute to effective monitoring.[33,85] The ACSQHC includes adverse drug reaction reporting as a standard in adequate documentation of patient information.[17] From an optometry practice perspective, optometrists should report adverse drug reactions directly through the TGA's Australian Adverse Drug Reaction Reporting System. Optometrists working in larger health organisations, such as hospitals, should report adverse drug reactions through the TGA reporting system but are also encouraged to consult with appropriate representatives who keep records of adverse drug reactions within that organisation. These health organisations often provide training on internal protocols for reporting adverse drug reactions, which all health professionals are encouraged to complete.[17]

The Black Triangle Scheme serves as a visual prompt for health professionals and patients to report suspected adverse drug reactions linked to new medicines on the market or established medicines used for new indications.[84] It involves labelling new prescription medicines with a black triangle on information such as Product Information or Consumer Information documents. Health professionals can identify medicines listed under this scheme in the Australian Register of Therapeutic Goods, which will remain under the scheme for five years.[84]

4.7. Medication shortages and cancellations

A shortage of medicines on a national scale occurs when the anticipated supply is insufficient to meet the regular or expected consumer demand in Australia over the next six months.[86] Information regarding national medicine shortages can be found via the TGA's Medicine Shortage Database, or optometrists can follow the TGA's social media channels to receive medicine shortage alerts. There are several ways medicines can still be accessed, even under a shortage.[86] To navigate these pathways, prescribers can refer to the TGA website on medicine shortages. They may need to collaborate with other health professionals, particularly pharmacists, to enquire about stock or consider alternative medicines.

All medicines available in Australia are first approved by the TGA who assign an AUST-R or AUST-L number. A medicine is referred to as cancelled if it is removed from the TGA approval. Cancellation can be initiated by the sponsor if they no longer intend to provide it as a commercial product. After cancellation, the sponsor can no longer import in to or manufacture it in Australia. TGA maintain a list of cancelled products here: https://www.tga.gov.au/how-we-regulate/compliance-and-enforcement-hub/compliance-actions-and-outcomes/cancellations

Medicines that are not approved for use in Australia should be avoided in favour of approved products. If required, they can be accessed through the Special Access Scheme (SAS) for unapproved products for individual patients. More information about the SAS scheme and the required forms are available here: https://www.tga.gov.au/products/unapproved-therapeutic-goods/prescribe-unapproved-therapeutic-good-health-practitioners

4.8. Antimicrobial stewardship

Antimicrobial stewardship refers to the coordinated effort of health systems to optimise antimicrobial agents, such as antibiotics, to ensure their effectiveness and minimise the development of drug-resistant bacteria.[87] It involves a set of strategies and practices aimed at promoting appropriate prescribing and monitoring of antibiotic use alongside patient outcomes. Antimicrobial stewardship has been implemented widely in Australia since 2014 in an effort to tackle the emergence of antimicrobial resistance, which has been declared an international health threat by the WHO.[88,89] With minimal development of upcoming agents on the market, the risk of being unable to treat drug-resistant infection is growing.[88,89]

Promoting appropriate, effective and safe prescribing/use of medicines is the exact terminology used to describe the goals of Quality Use of Medicines, in which antimicrobial stewardship is specific to antimicrobial use.[87,90] It emphasises evidence-based prescribing, monitoring of patient outcomes and minimising harms from antimicrobial use, including treatment resistance. By ensuring these agents' judicial use, antimicrobial treatments' effectiveness is maximised, improving patient outcomes and, most importantly, protecting global health.[87,90]

Safely prescribing antibiotics involves a thoughtful and evidence-based approach.[88] Prescribing guidelines, such as Therapeutic Guidelines (a subscription service), play a pivotal role in antimicrobial stewardship by providing an evidence-based framework for health practitioners to make informed decisions when prescribing antimicrobial agents.[88] Using guidelines has been effective in preserving antibiotic effectiveness. They act as an educational tool to encourage prescribers to think critically, not only about antibiotic prescribing but prescribing behaviour in general.[88] The Australian Medicines Handbook (a subscription service) is also a significant clinical reference offering guidance on medicine-specific particulars to antimicrobials. This encompasses information on contraindications, precautions, side effects, dosage instructions and counselling points.[91] The ACSQHC also has a publicly available resource, Antimicrobial Stewardship in Australian Health Care, that can be accessed by all optometrists.

Optometrists have to regularly consider the need for antibiotic use associated with treating infectious eye disease or preventing eye infection post-procedure.[92]

The National Antibiotic Prescribing Survey is an antibiotic-prescribing auditing program that assists monitoring of antibiotic use.[93] The National Antibiotic Prescribing Survey data does not differentiate between the different types of prescribers (e.g. ophthalmologist versus optometrist versus medical practitioner), but the information provided is useful in understanding antibiotic use for ophthalmic purposes. The findings are as follows:

- The top 10 most commonly prescribed antimicrobials include aciclovir, cefazolin, cefotaxime, ceftriaxone, chloramphenicol, ciprofloxacin, doxycycline, flucloxacillin, ofloxacin and valaciclovir.[93] Topical administration of antibiotics accounted for 61.5% of prescriptions in hospital settings, 93.2% in aged care and 41.6% in surgical settings. The high degree of topical antibiotic use could result from chloramphenicol being the most prescribed antibiotic across all three health settings.[93]

- Assessment of antimicrobial use in surgical settings also revealed antibiotic prescribing was non-compliant with recommended guidelines.[93] Post-procedural prophylactic use of antibiotics was the most common reason for prescribing. However, 73% of these prescriptions were prescribed for inappropriate lengths of time.[93] Post-procedural use of antibiotics ranged from zero to 37 days, with 585 of these prescriptions prescribed longer than 7 days. Guidelines do not typically recommend topical antibiotic use post-procedure for more than 7 days.[93,94] In the case of cataract surgery, a single intracameral injection of an antibiotic, such as cefazolin, is considered sufficient to prevent infection, rendering antibiotic eye drop use unnecessary.[95]

- Bacterial conjunctivitis is one of the most common bacterial eye infections that is typically self-limiting and not harmful to vision.[93,96] It is often treated in primary care, including general practice, pharmacy and optometry clinics.[93] Most cases of bacterial conjunctivitis resolve within 7 days; however, patients often request antibiotic therapy due to how contagious this form of conjunctivitis can be. Topical chloramphenicol has been found to shorten the duration of moderate symptoms of conjunctivitis.[97] The prevalence of bacterial conjunctivitis may explain the high use of chloramphenicol in the National Antibiotic Prescribing Survey data. Although it is an extremely common condition, chloramphenicol accounted for the highest number of inappropriate antibiotic prescriptions.[93]

- Other forms of literature reporting antimicrobial use in optometric practice are limited. Although antimicrobial guidelines, such as the Therapeutic Guidelines, are available, National Antibiotic Prescribing Survey data has proven that antibiotic prescribing often deviates from the recommendations.[93]

5. Prescribing in optometric practice

Working within the boundaries of one's scope of clinical practice protects healthcare patients and health practitioners.[98] Each practitioner should reflect on and address gaps in their own knowledge, skills and experience to ensure they are providing safe, effective, and ethical patient care.[99,100]

The Optometry Board of Australia have published guidelines on the use of scheduled medicines in optometric practice that specifically outline the expectations of optometrists when prescribing medicines.[33,101] Endorsement to prescribe scheduled medicines also includes the supply of these medicines by optometrists, which includes appropriate labelling. Best practice supports pharmacists dispensing and supplying pharmaceuticals prescribed by optometrists. However, there will be instances where medicine access from a pharmacy might be impractical. Optometrists must ensure that the supply of any scheduled medicine meets labelling and documentation requirements. Patients must be adequately advised on how to use the prescribed medicine/s at the point of supply. Optometrists can refer to the TGA website to locate Product Information and Consumer Medicine Information leaflets on the medicines they prescribe.[33]

5.1. Ocular effects of systemic medications

Many parts of the eye are susceptible to systemic drug penetration due to its rich blood supply and small mass, which may result in adverse ocular effects.[102] Consideration of a patient's medicines may guide an informed differential diagnosis for ocular complaints as it is well known that many prescribed medicines used systemically can cause ocular adverse effects.[103]

Of relevance to optometrists in the management of cataract patients pre-operatively, the Royal Australian and New Zealand College of Ophthalmologists (RANZCO) outlines on the Choosing Wisely webpage that tamsulosin and alpha-1 adrenergic blockers should not be prescribed without first asking the patient about a history of cataract or impending cataract surgery.

5.2. Topical ocular agents

Topical eye administration involves the application of medicines directly onto the eye's surface, typically in the form of eye drops or ointments.[104] This method allows for localised treatment and diagnoses of ocular conditions.[104] Prescribing topical eye formulations is a common and fundamental practice in optometry, with topical use accounting for most ocular products.[104]

Although topical drug delivery into the eye is non-invasive, absorption through the conjunctiva and cornea is minimal, thus compromising bioavailability.[104] This is compounded by the impact of blinking, tear formation and accidental systemic absorption.[104] There is a wide range of topical formulations, including drops, solutions, sprays, ointments, emulsions and suspensions. Each formulation has its benefits and downfalls, which can be found in **Table 8**.

Table 8: Topical eye formulation

Formulation	Advantages	Disadvantages
Drops	• Easy administration. • Good formulation stability. • Widely accepted by patients. • Cost-effective.	• Low retention time. • Low bioavailability. • Side effect risk with frequent administration.
Suspensions	• Increased retention time.	• Low formulation stability. • Can cause transient blurred vision after administration.
Emulsions	• Effective at delivering hydrophobic drugs into the eye. • Increased retention time. • Increased bioavailability.	• Can cause transient blurred vision after administration. • Needs to be shaken before administration to ensure the correct drug concentration is delivered.
Gels	• Increased retention time. • Increased bioavailability.	• Can cause transient blurred vision after administration.
Ointments	• Effective at delivering lipophilic and moisture-sensitive drugs into the eye. • Increased retention time. • Increased bioavailability.	• Causes significant transient blurred vision after administration.
Sprays	• Volume of medicines administered can be much lower to achieve the same effect.	• Need to have the correct distance between the eye and the spray device.
References[104,105]		

RANZCO outlines on the Choosing Wisely webpage that topical antibiotics should not be used pre- or post-intravitreal injections and topical steroids should not be used unless infection has been ruled out in any patient with red eye.

5.3. Oral medications for ocular conditions

Due to the Trans-Tasman Mutual Recognition Act, Australian optometrists must also know how to prescribe oral medications safely and effectively and monitor their usage. The list of oral medicines most commonly prescribed by New Zealand optometrists, includes antibiotics, antivirals, antihistamines, analgesics and acetazolamide.[106] An independent study in New Zealand reviewed dispensed optometry prescriptions between 2014 and 2019.[107] The Optometrists and Dispensing Opticians Board in New Zealand was not alerted to any out-of-scope prescribing over this time period, nor were there any adverse incident reports involving oral medicines prescribed by an optometrist. Optometrists in the United Kingdom and the United States of America also have prescribing rights for oral medicines to treat ocular conditions.[106]

6. Medication safety resources and tools

Continuing professional development is crucial in all healthcare fields as it ensures clinicians stay updated with emerging technologies, evolving clinical practices and advancements in their respective industry.[108,109] In turn, this supports the quality use of medicines as clinicians can make informed decisions on treatment plans in a time when pharmacotherapy is so dynamic. Professional development helps to prevent medication errors, enhance adherence, and promote safe and effective use of medicines, ultimately improving patient outcomes.[108, 109] Optometrists with prescribing rights must be conscious of their learning needs around medicines.[108]

The NPS MedicineWise was an Australian not-for-profit organisation committed to promoting the safe and effective use of medicines.[110] As of 1st January 2023, the Australian Commission on Safety and Quality in Health Care has absorbed the NPS; however, their website remains available for health professionals.[110] The online learning platform provides educational resources to enhance practitioner knowledge and skills in medicine management, proving valuable to all healthcare providers.[111] The platform has accredited courses covering evidence-based prescribing, medicines safety, therapeutic guidelines and disease management. These courses are designed to keep health professionals up-to-date with best practices in the use of medicines.[111]

Useful resources	NPS MedicineWise resources and publications Guiding Principles for Medical Management in the Community Medication Safety Standard Pharmaceutical Society of Australia QUM guideline Oral medicine guidelines for NZ optometrists Services Australia: Writing PBS Prescriptions Therapeutic Goods Administration Pharmaceutical Benefits Scheme for Optometrists
Other resources (subscription services)	Australian Medicines Handbook Therapeutic guidelines MIMS

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