ANTICHOLINERGIC BURDEN: A TOOLKIT TO IMPROVE RESIDENT OUTCOMES IN AGED CARE FACILITIES

April 2022

Independent, not-for-profit and evidence-based, NPS MedicineWise enables better decisions about medicines, medical tests and other health technologies.

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Suggested citation

NPS MedicineWise. Anticholinergic burden: A toolkit to improve resident outcomes in aged care facilities. Sydney: NPS MedicineWise, April 2022.

Acknowledgments

Funding

This toolkit is funded by the Australian Government Department of Health.

Contributors

NPS MedicineWise would like to thank the following organisations and individuals who provided feedback that informed the scope and direction of this toolkit.

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- Aged Care Quality and Safety Commission
- Australian Commission on Safety and Quality in Healthcare
- EzyMed
- Mederev
- Pharmacy Guild of Australia
- Ward MM

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ABBREVIATIONS LIST

ACQSC	Aged Care Quality and Safety Commission
ACSQHC	Australian Commission on Safety and Quality in Health Care
CMA	Comprehensive Medical Assessment
DBI	Drug Burden Index
GP	General Practitioner
MAC	Medication Advisory Committee
MMR	Medication Management Review
QI	Quality indicators
QUM	Quality use of medicines
RACF	Residential aged care facility
RACGP	Royal Australian College of General Practitioners
RMMR	Residential Management Medication Review

ABOUT THIS TOOLKIT

What is the aim of this toolkit?

This toolkit aims to help residential aged care facilities (RACFs) improve health outcomes for residents with identified anticholinergic burden associated with medicines, by reducing side effects such as dry mouth and constipation, and by decreasing the risk of falls due to dizziness. Reducing falls can assist with meeting quality indicators in the National Aged Care Mandatory Quality Indicator Program (QI Program).

Toolkit objectives

1. Raise awareness amongst RACF staff of anticholinergic burden and its impact on residents, such as increasing falls risk, cognitive impairment and other adverse effects.
2. Improve current RACF processes to support a person-centred multidisciplinary approach to reduce anticholinergic burden.
3. Optimise the use of non-pharmacological and pharmacological (where appropriate) alternatives to medicines with anticholinergic effects to reduce medicine-related harm in aged care residents.

What is included in this toolkit?

The toolkit includes resources for health professionals and consumers for use in your facility along with actions that can be taken to support implementation of these resources and improve health outcomes for residents.

The content is divided into four key areas:

- identifying anticholinergic burden
- assessing anticholinergic burden
- managing anticholinergic burden
- using a person-centred approach.

Who is this toolkit for?

Nursing staff and quality use of medicines (QUM) and accredited pharmacists working in aged care settings can use ***Anticholinergic burden: a toolkit to improve resident outcomes in aged care facilities*** as a guide to minimise anticholinergic burden in older people.

Anyone interested in improving health outcomes associated with anticholinergic burden of older people in aged care settings can use this toolkit. Nursing staff and other health professionals, team leaders and people with organisation-wide responsibilities may use the toolkit in different ways.

Implementing the toolkit

The toolkit has been designed to be flexible in how it is used. In implementing ***Anticholinergic burden: a toolkit to improve resident outcomes in aged care facilities***, it is recommended that:

- the toolkit is viewed as a guide to be adapted to local context
- implementers (eg, nurses and pharmacists) use the toolkit to identify and prioritise areas that would most benefit their residents
- other tools and resources are incorporated as relevant.

See Appendix for a sample plan to implement relevant areas of this toolkit in your aged care facility.

INTRODUCTION: WHAT IS ANTICHOLINERGIC BURDEN?

Overview

Anticholinergic burden is defined as the cumulative effect on a person taking one or more medicines with anticholinergic effects.[1]

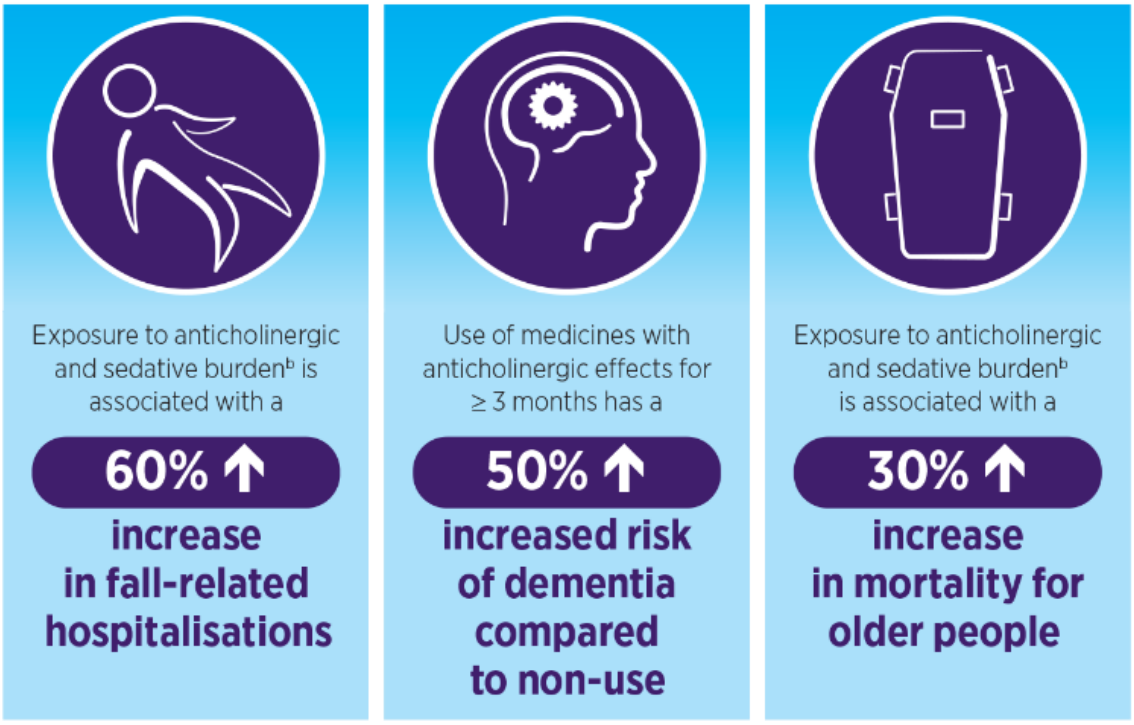
Medicines with anticholinergic effects are commonly prescribed in Australia. They can be prescribed for a wide range of conditions. These medicines block the action of the neurotransmitter acetylcholine. Their broad range of action on the central and peripheral nervous system may lead to various anticholinergic effects.[1,2] Common examples of medicines with anticholinergic effects include antihistamines for allergies, antidepressants for depression and antipsychotics for dementia with changed behaviour.[3-5]

It may be the case that anticholinergic activity is the prescriber's intended outcome for the treatment of specific conditions, such as histamine H1 receptor antagonists commonly used for allergic conditions. In other cases, medicines prescribed to treat certain conditions such as antipsychotics can have unintended anticholinergic effects. This may add to the overall anticholinergic burden.[1,2]

Why is this important?

If left unchecked, anticholinergic effects can cause substantial harm. The more serious impacts on patient health outcomes include increases in fall-related hospitalisations, risk of dementia and mortality.[6,7] See Figure 1. These statistics reflect patients in a community setting and the risks may be higher in RACFs.

Figure 1: Impact on selected patient health outcomes[6,7]



b Based on the Drug Burden Index (DBI), which measures cumulative exposure to medicines with anticholinergic and sedative effects[5]

Falls and major injury, and medication management are two new quality indicators (QIs) added to the QI Program from 1 July 2021.[8] See Table 1.

Table 1: New QIs under the QI Program from 1 July 2021[8]

FALLS AND MAJOR INJURY	MEDICATION MANAGEMENT
% of residents who experienced **one or more falls**	% of residents who were prescribed **nine or more medicines**
% of residents who experienced **one or more falls resulting in major injury**	% of residents who received **antipsychotic medicines**

The QI Program defines polypharmacy as the prescription of nine or more medicines to a resident for the purposes of QI reporting. However, it includes the definition of polypharmacy as taking five or more medicines at the same time,[9] which is consistent with the definition from the Australian Commission on Safety and Quality in Health Care (ACSQHC) within Australia's response to the World Health Organization Global Patient Safety Challenge.[10]

The rate of polypharmacy (five or more medicines) among older Australians is relatively high (36%), affecting almost one million older people.[11] This number may be higher in aged care.

What can I do?

Actions

Implement ***Anticholinergic burden: a toolkit to improve resident outcomes in aged care facilities***.

Identify residents who may be at risk of anticholinergic burden to prevent further cognitive decline or falls before it happens.

Assess for anticholinergic burden when a resident is taking multiple medicines or experiences a fall or cognitive decline.[12]

Review your QI Program data reports for trends and compare them against the national benchmark to help you understand where quality improvement activities should be focused.[9]

Tips

Consult with the Medication Advisory Committee (MAC) and collaborate with the multidisciplinary team to identify opportunities and plan quality improvement interventions for minimising anticholinergic burden by adding it to the agenda of MAC meetings.

IDENTIFYING RESIDENTS AT RISK OF ANTICHOLINERGIC BURDEN

Anticholinergic burden: an important issue for aged care residents

Overview

In Australia, 21–34% of older people take medicines with anticholinergic effects.[13-15]

Why is this important?

- Older people are more susceptible to anticholinergic burden. They are more likely to be prescribed multiple medicines, some of which may have anticholinergic effects, leading to a cumulative anticholinergic burden.[14,16] Anticholinergic burden is associated with an increased risk of falls.[6]
- More than half of all residents in RACFs have at least one fall each year. Injuries from falls are common, with up to a half of these falls causing serious injuries such as fractures.[17]

What can I do?

☑ Actions

Identify residents who may be affected by anticholinergic burden by using Table 2.

Identify residents who are experiencing symptoms associated with anticholinergic burden using Figure 2.

Run education sessions with RACF staff using the NPS MedicineWise – Presentation Template.

Recommend residents, carers and their families to watch the NPS MedicineWise – videos on medicines and side effects that focuses on increasing awareness of medicines with anticholinergic effects.

Attend the NPS MedicineWise – Webinars (aimed at nurses, pharmacists and other aged care workers) which focus on how to enable optimal communication and collaboration, and the role of aged care workers in identifying anticholinergic-related adverse effects (available from March 2022).

☑ For nurses

Discuss a Residential Medication Management Review (RMMR) referral with the patient's GP for any patient identified as taking anticholinergic medicines or experiencing symptoms associated with anticholinergic burden.[18]

Use your psychotropic register and Table 2 to ensure that those residents taking antipsychotics are reviewed regularly, especially if the medicine is newly prescribed. If being used for responsive changed behaviours these medicines should be reviewed for potential discontinuation at least every 3 months.

☑ For pharmacists

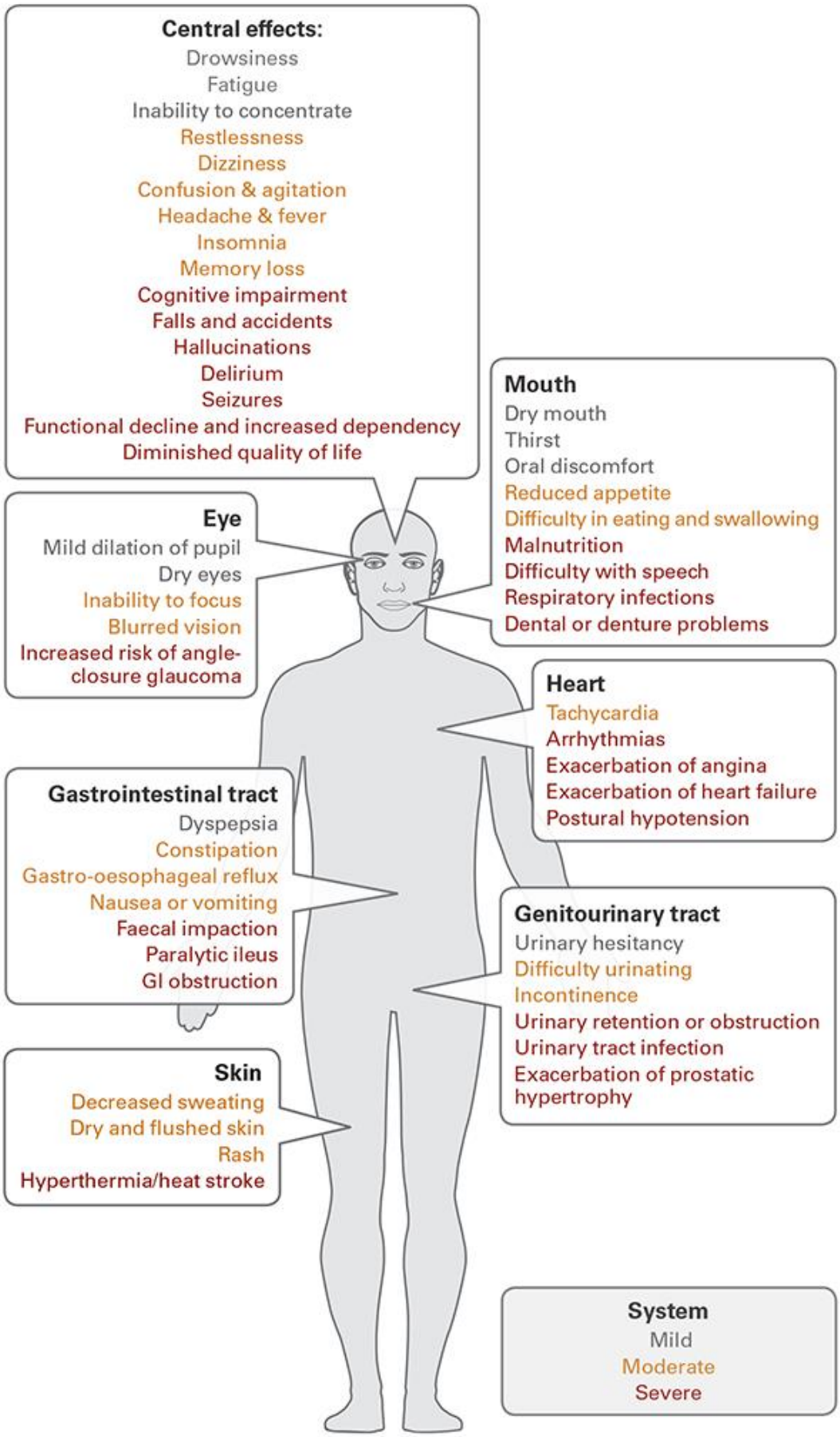
Document the reason for each medicine, the resident's response to their medicines and any adverse reactions.[19]

ⓘ Tips

Print and display copies of Table 2 and Figure 2 in the nursing station or medication chart storage areas to help you identify at-risk residents during routine assessments and medication chart reviews.

Include information about anticholinergic burden in your monthly newsletters.

Figure 2: Anticholinergic effects and potential outcomes[2]



Courtesy of the Australian Department of Veterans' Affairs, reproduced from Figure 1 of Veterans'MATES Therapeutic Brief Brochure for *Topic 39: Thinking clearly about the anticholinergic burden*

Table 2: Examples of medicines with anticholinergic effects[3,4]

Class	Medicines[a] (active ingredient)
Antidepressants	***SSRIs:*** citalopram; dapoxetine; escitalopram; fluoxetine; fluvoxamine; paroxetine; sertraline ***SNRIs:*** desvenlafaxine; duloxetine; venlafaxine ***TCAs:*** amitriptyline; clomipramine; dosulepin; doxepin; imipramine; nortriptyline ***Other:*** agomelatine; mianserin; mirtazapine; moclobemide; reboxetine; vortioxetine
Antipsychotics[b]	amisulpride; aripiprazole; asenapine; brexpiprazole; chlorpromazine; clozapine; droperidol; flupentixol; haloperidol; lurasidone; olanzapine; paliperidone; periciazine; quetiapine; risperidone; ziprasidone; zuclopenthixol
Benzodiazepines	alprazolam; bromazepam; clobazam; clonazepam; diazepam; flunitrazepam; lorazepam; nitrazepam; oxazepam; temazepam
Opioids	buprenorphine; codeine; fentanyl; hydromorphone; methadone; morphine; oxycodone; tapentadol; tramadol
Gabapentinoids **(eg, neuropathic pain)**	gabapentin; pregabalin
Antihistamines	***Sedating:*** cyclizine; cyproheptadine; dexchlorpheniramine; diphenhydramine; doxylamine; promethazine ***Less sedating:*** cetirizine; desloratadine; fexofenadine; loratadine
Urinary anticholinergics **(eg, urinary incontinence)**	darifenacin; oxybutynin; propantheline; solifenacin; tolterodine
Drugs for Parkinson's	amantadine; benzatropine; levodopa; entacapone; trihexyphenidyl
Gastrointestinal drugs	domperidone; loperamide; metoclopramide; prochlorperazine

[a] List is not exhaustive

[b] Risperidone is the only antipsychotic TGA and PBS listed for the management of behavioural disturbances in patients with dementia of the Alzheimer type. The condition must be characterised by aggression and psychotic symptoms

PBS = Pharmaceutical Benefits Scheme; SNRI = serotonin and noradrenaline reuptake inhibitor; SSRI = selective serotonin reuptake inhibitor; TCA = tricyclic antidepressant; TGA = Therapeutic Goods Administration

Additional tools and resources to identify anticholinergic burden

TOOL/RESOURCE	SUMMARY
Anticholinergic burden: the unintended consequences for older people (NPS MedicineWise)	This web page contains resources for health professionals and consumers as part of the ***Anticholinergic burden: the unintended consequences for older people*** program.
Presentation Template (NPS MedicineWise)	This presentation template can be used by nurses and pharmacists to run subsequent short education sessions at your RACF, such as during staff handovers.
Videos on medicines and side effects (NPS MedicineWise)	A series of videos featuring health professionals talking about what patients need to know about taking medicines as they get older, focusing on increasing awareness of medicines with anticholinergic effects.
Webinars (NPS MedicineWise)	Two webinars aimed at nurses, pharmacists and aged care workers focusing on how to enable optimal communication and collaboration, and the role of aged care workers in identifying anticholinergic-related adverse effects. (available from March 2022)
Self-assessment tool for recording consumers receiving psychotropic medications (Aged Care Quality and Safety Commission)	This self-assessment tool aims to help aged care service providers record psychotropic use and assists with their management.
Antipsychotic Tracking Tool (Dementia Training Australia)	A tool developed for use in RACF settings to monitor residents' antipsychotic usage.
Behavioural assessment form (Dementia Support Australia)	A tool that can be used to comprehensively record changed behaviour. It includes an analysis of the things that happened before the behaviour, the behaviour itself and any consequences.
Standardised care process: polypharmacy (Department of Health and Human Services, Victoria)	A standardised care process to help RACFs provide high-quality care for residents.

Guidelines for medication management, QUM services and polypharmacy in RACFs

GUIDELINE	SUMMARY
Guidelines for Quality Use of Medicines (QUM) services (Pharmaceutical Society of Australia)	These guidelines have been developed for pharmacists providing QUM services to RACFs. The guidelines include a sample QUM plan and sample performance indicators.
Guiding principles for medication management in residential aged care facilities (Department of Health and Ageing)	These guiding principles promote the safe, quality use of medicines and medication management in RACFs.
Nursing guidelines: management of medicines in aged care (Australian Nursing & Midwifery Federation)	The aim of the nursing guidelines is to provide support and direction to registered and enrolled nurses in the administration of medicines in RACFs.
Guidance and resources for providers to support Aged Care Quality Standards (Aged Care Quality and Safety Commission)	This guidance material is intended to assist RACFs to implement and maintain compliance with the quality standards.
The Fourth Australian Atlas of Healthcare Variation: Polypharmacy, 75 years and over (Australian Commission on Safety and Quality in Health Care)	This chapter of the Fourth Australian Atlas of Healthcare Variation examines polypharmacy in older people.
RACGP aged care clinical guide (Silver book) Part A. Polypharmacy (Royal Australian College of General Practitioners)	A clinical resource for the medical care of older people in RACFs. It also includes a list of medicines based on the Beers and McLeod revised criteria, which has been further revised to ensure its relevance to medicines available in Australia.
Hospital-initiated medication management reviews (The Society of Hospital Pharmacists of Australia)	A resource with information on the RMMR pathway when RACF residents are admitted and/or discharged from hospital.

ASSESSING ANTICHOLINERGIC BURDEN

Existing systems, services and tools

Overview

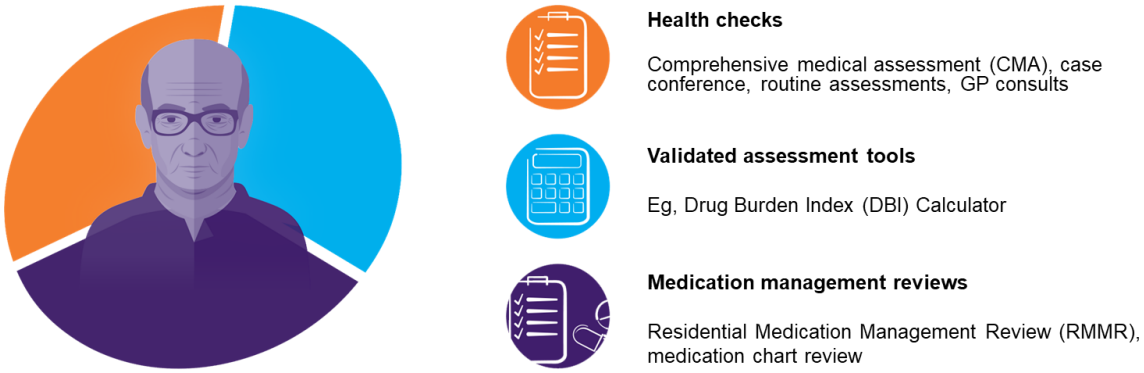
Many factors can increase the risk of falls, including use of one or more medicines with anticholinergic effects.[20]

At-risk residents may benefit from a health check such as a comprehensive medical assessment (CMA), case conference, routine assessment or GP consult. These are items under the Medicare Benefits Schedule, which provides rebates for GPs to organise, coordinate and participate in these services.

RMMRs assist residents and their carers to better manage their medicines.[21] See page 18 for more information on RMMR.

Validated assessment tools may be incorporated into these health checks or reviews.

Figure 3: Existing systems and tools to assess anticholinergic burden



Why is this important?

Routine assessments and maintaining accurate medication charts (such as using the National residential medication chart (NRMC) or its electronic version, e-NRMC) provide current information about a resident's medicines, support continuity of care and help reduce medicine errors.

What can I do?

Actions

Organise a CMA for new residents within 6 weeks of admission (provided they haven't had one at another facility within the previous 12 months), and annually thereafter.[22]

Incorporate other relevant assessments available at the RACF into the CMA,[22] such as falls risk assessments and the DBI calculator if already implemented.

Use the DBI calculator to measure a resident's anticholinergic and sedative burden (see below).[5]

Screen all residents for falls upon admission or as soon as it is practicable using your facility's falls screening process, then regularly (every 6 months) or when a change in functional status is evident, as per your facility's policy.[23]

Monitor the results of interventions in place for minimising falls using quality indicators as per your facility's policy indicators to see where improvements can be made.

Complete a post-fall assessment for every resident who falls as per your facility's policy. This includes trying to determine how and why a fall may have occurred and implementing actions to reduce the risk of a subsequent fall.[23]

Recommend the resident has a RMMR upon admission, and then again if there is a clinical need.

Validated assessment tools

Conduct falls risk assessments using validated tools for all residents who:[23]

- exceed the threshold of a falls risk screening tool
- move to or reside in a setting where residents are considered to have a high risk of falls (such as dementia units)
- experience a fall.

Tips

The Peninsula Health Falls Risk Assessment Tool (FRAT) may be useful due to its applicability to Australian healthcare facilities.[23]

The DBI calculator is one of many available scales to measure anticholinergic burden. It calculates the score for each medicine from 0–1 and provides a total score expressed as a risk level: low risk; DBI = 0, moderate risk; 0 < DBI < 1, high risk; DBI ≥ 1.[5] See Figure 4 for an example of a report using the DBI calculator.

The DBI has advantages compared with other measurement scales. It:

- has been validated for older people in Australia[24]
- provides dose-dependent measures of anticholinergic burden[25]
- has a strong evidence base for anticholinergic burden, adverse effects and outcomes.[24]

The DBI includes medicines that have sedative and anticholinergic effects.[25] This is because in clinical practice they have a similar association with poor physical and cognitive outcomes, and require similar assessment and review, and deprescribing.[26]

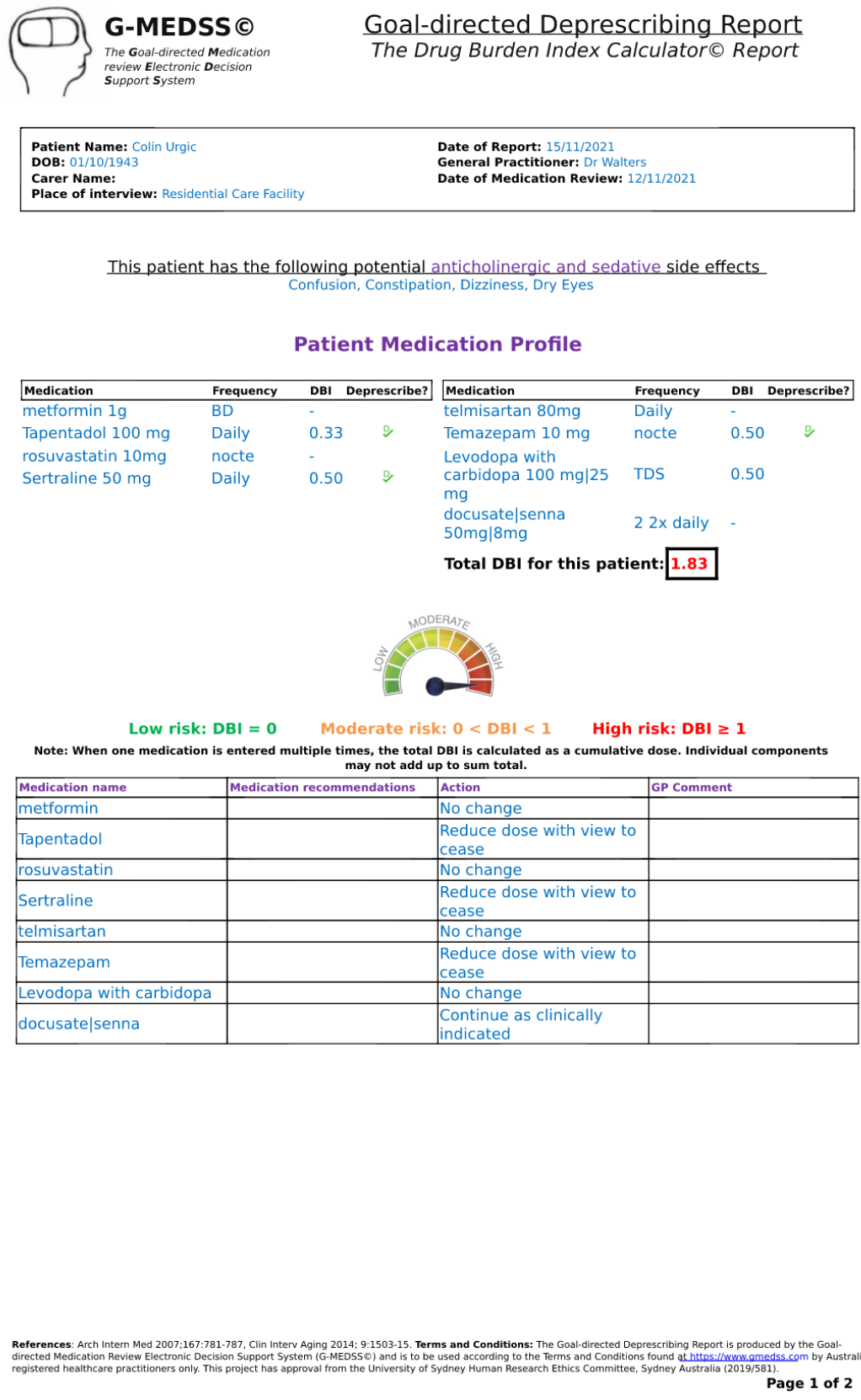
Other tools available include the:[16]

- American Geriatrics Society's Beers Criteria
- Screening Tool to Alert to Right Treatment (START); Screening Tool of Older People's Prescriptions (STOPP).

Tips

Identify where you can implement these assessment tools. Nurses may use them during routine assessments, while accredited pharmacists may incorporate them into the RMMR process.

Figure 4: Example report using the Drug Burden Index Calculator



G-MEDSS©
*The **G**oal-directed **M**edication review **E**lectronic **D**ecision **S**upport **S**ystem*

Goal-directed Deprescribing Report
The Drug Burden Index Calculator© Report

Patient Name: Colin Urgic
DOB: 01/10/1943
Carer Name:
Place of interview: Residential Care Facility

Date of Report: 15/11/2021
General Practitioner: Dr Walters
Date of Medication Review: 12/11/2021

This patient has the following potential anticholinergic and sedative side effects
Confusion, Constipation, Dizziness, Dry Eyes

Patient Medication Profile

Medication	Frequency	DBI	Deprescribe?
metformin 1g	BD	-	
Tapentadol 100 mg	Daily	0.33	↓
rosuvastatin 10mg	nocte	-	
Sertraline 50 mg	Daily	0.50	↓

Medication	Frequency	DBI	Deprescribe?
telmisartan 80mg	Daily	-	
Temazepam 10 mg	nocte	0.50	↓
Levodopa with carbidopa 100 mg|25 mg	TDS	0.50	
docusate|senna 50mg|8mg	2 2x daily	-	

Total DBI for this patient: 1.83

Low risk: DBI = 0 **Moderate risk: 0 < DBI < 1** **High risk: DBI ≥ 1**

Note: When one medication is entered multiple times, the total DBI is calculated as a cumulative dose. Individual components may not add up to sum total.

Medication name	Medication recommendations	Action	GP Comment
metformin		No change	
Tapentadol		Reduce dose with view to cease	
rosuvastatin		No change	
Sertraline		Reduce dose with view to cease	
telmisartan		No change	
Temazepam		Reduce dose with view to cease	
Levodopa with carbidopa		No change	
docusate|senna		Continue as clinically indicated	

References: Arch Intern Med 2007;167:781-787, Clin Interv Aging 2014; 9:1503-15. **Terms and Conditions:** The Goal-directed Deprescribing Report is produced by the Goal-directed Medication Review Electronic Decision Support System (G-MEDSS©) and is to be used according to the Terms and Conditions found at https://www.gmedss.com by Australian registered healthcare practitioners only. This project has approval from the University of Sydney Human Research Ethics Committee, Sydney Australia (2019/581).

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Professor Sarah Hilmer developed and continues to lead an active research program on the Drug Burden Index (DBI). Dr Lisa Kouladjian O'Donnell developed The Drug Burden Index (DBI) Calculator © and the Goal-directed Medication review Electronic Decision Support System (G-MEDSS) © under the supervision of Professor Sarah Hilmer. Associate Professor Danijela Gnjidic has actively contributed to research on the DBI. Hilmer, Kouladjian O'Donnell and Gnjidic provided expertise and resources related to DBI to inform the NPS MedicineWise 'Anticholinergic burden: the unintended consequences for older people' program.

Additional tools and resources to assess falls and anticholinergic burden

TOOL/RESOURCE	SUMMARY
The Goal-directed Medication review Electronic Decision Support System G-MEDSS: Drug Burden Index (DBI) calculator (The University of Sydney)	This tool provides a measure of a patient's cumulative exposure to anticholinergic and sedative medicines.
Falls risk assessment tool (FRAT) (Department of Health, Victoria)	A validated falls risk assessment tool.

Guidelines for falls assessment

GUIDELINE	SUMMARY
Preventing falls and harms from falls in older people: best practice guidelines for Australian residential aged care facilities (Australian Commission on Safety and Quality in Health Care)	These guidelines offer a nationally consistent approach to preventing falls in RACF settings, based on best practice recommendations.
RACGP aged care clinical guide (Silver book) Part A. Falls (Royal Australian College of General Practitioners)	A clinical resource for the medical care of older people in RACFs.

Residential medication management review

Overview

The RMMR program is intended to support the quality use of medicines and assist with minimising adverse medicine events for residents living in RACFs through medication reviews conducted by accredited pharmacists in the facility.[21]

Why is this important?

- RMMRs can identify, resolve and prevent medicine-related problems experienced by residents and can have a positive impact on resident outcomes.
- A systematic review found that on average, RMMRs identified 2.7–3.9 medicine-related problems per resident.[27]
- Undertaking accredited pharmacists' recommendations post-RMMR reduced residents' average DBI scores from 0.50 (equivalent to one minimum efficacious dose of a medicine with anticholinergic or sedative effects per resident) to 0.33 (equivalent to half a minimum efficacious dose of a medicine with anticholinergic or sedative effects per resident).[28]
- The RACGP aged care clinical guide (Silver Book) recommends that residents should receive a RMMR upon admission,[29] but fewer than one in five residents (19.1%) received a RMMR within 3 months of entry, and fewer than one in two (49.7%) within 2 years.[30]

What can I do?

Actions

Provide your residents with information on RMMRs using this factsheet: NPS MedicineWise – How a medicines review can help you get the most from your medicines.

Recommend to the resident's GP that the resident has a RMMR if there is a clinical need.

Liaise with the accredited pharmacist to organise a follow-up (up to two) after the initial RMMR if there is a clinical need.

Recommend residents for a RMMR if they have the following risk factors:[31]

- Recent admission to the facility.
- Significant changes to their medicines, including newly prescribed medicines.
- High-risk medicines that require close monitoring for adverse effects, including medicines with anticholinergic effects.
- Functional issues that increase the risk of harm and/or reduce the benefit from medicine use (eg, frailty, frequent falls, cognitive impairment).

Tips

A clinical need for a RMMR can be identified by the patient themselves, carers, medical practitioner, pharmacists or health professionals involved in the patient's care such as a nurse in a RACF.[32]

Under the program rules, a resident cannot receive another RMMR within 24 months of an initial review. However, they can be referred for a review within that period if there is a clinical need.

Examples of situations when a follow-up may be required:[32]

- The resident has been recommended to change high-risk medicines, including medicines with anticholinergic effects.
- Deprescribing of a medicine requiring slow tapering of the dose (eg, benzodiazepines).

Tips

Since April 2020, a resident can receive up to two follow-up services to resolve any medicine-related problems identified at the initial RMMR.[21]

The resident's care team will continue to provide ongoing care for the resident based on the intended goals of therapy, for example, documented actions that have been agreed between the medical practitioner and the patient, and documented in an individualised medication management plan.

Additional tools and resources for Medication Management Reviews (MMRs)

TOOL/RESOURCE	SUMMARY
Fact sheet for RMMRs and QUM services (Pharmaceutical Society of Australia)	This fact sheet provides an overview of how RMMRs and QUM services can support better medication management and reduce medication-related harm in RACFs.
How a medicines review can help you get the most from your medicines (NPS MedicineWise)	This fact sheet provides patients with information on MMRs.

Guidelines for MMRs

GUIDELINE	SUMMARY
Guidelines for comprehensive medication management reviews (Pharmaceutical Society of Australia)	This guideline outlines best practice for pharmacists providing comprehensive MMR services, regardless of practice setting.
Program rules: residential medication management review (Pharmacy Programs Administrator)	This document outlines the program rules governing the RMMR program.

MANAGING ANTICHOLINERGIC BURDEN

Deprescribing medicines with anticholinergic effects

Overview

Deprescribing is the planned and supervised process of dose reduction or stopping of a medicine that may be causing harm, or no longer be of benefit.[33] When a resident has been identified as being at risk of a moderate-to-high anticholinergic burden, deprescribing may be an option. Discuss with residents and their family or carers about the resident's goals and expectations, and then gain consent to implement the agreed options documented in the overall care plan.

Why is this important?

- A study found deprescribing medicines with anticholinergic and sedative effects reduced the DBI scores of residents in RACFs by 0.34 after 6 months, as well as significantly reduced the number of falls and adverse drug reactions.[34]

What can I do?

Actions

Use the deprescribing tools to support your recommendations and communication to the GP.

Carefully monitor for withdrawal effects when following a tapering plan. See Table 4.[35]

Discuss with residents, their families and carers whether pharmacological options without anticholinergic effects and non-pharmacological options may be available. See Table 5.

Optimise non-pharmacological management options to help achieve the best possible outcomes.[36-46] This is particularly important when deprescribing isn't an option.

Plan any medicine changes and monitor the effects of the changes using this patient resource: NPS MedicineWise – Planning for a change: when my medicines may be causing side effects.

Table 3: Risk of withdrawal event[35,47]

MEDICINES	RISK OF WITHDRAWAL EVENT OR SYMPTOM RECURRENCE
Benzodiazepines, antipsychotics, antidepressants, opioids, sedating antihistamines	Likely – tapering is needed before stopping
Less sedating antihistamines, urinary anticholinergics	Less likely – tapering is not needed when stopping

Table 4: Monitoring withdrawal effects when a medicine is deprescribed[47]

MONITOR SHORT TERM (WITHIN 1–3 DAYS)	MONITOR LONG TERM (> 7 DAYS)
Monitor for withdrawal symptoms Symptoms can occur within 1–3 days of dose reduction	**Monitor for recurrence of symptoms** Recurrence of previous or new symptoms may occur within 1–2 weeks of dose reduction or cessation
▷ Common withdrawal symptoms when deprescribing medicines with anticholinergic effects include irritability, anxiety, insomnia and sweating. ▷ Withdrawal symptoms are usually mild and can last up to 6–8 weeks. ▷ If severe symptoms (eg, tachycardia, profuse and persistent sweating, severe anxiety, or severe insomnia) occur, restart at the previous lowest effective dose.	

Table 5: Examples of guidance to manage anticholinergic effects of medicines[3-5]

MEDICINES (list is not exhaustive)	PHARMACOLOGICAL CONSIDERATIONS TO REDUCE ANTICHOLINERGIC BURDEN	NON-PHARMACOLOGICAL OPTIONS (optimise throughout management)
SSRIs (depression) citalopram escitalopram fluoxetine paroxetine sertraline **SNRIs (depression)** desvenlafaxine duloxetine venlafaxine **Other (depression)** mirtazapine	All antidepressants have some degree of anticholinergic or sedative effects. If considered essential, use lowest possible dose.	**Lifestyle modifications** ▷ Sleep hygiene ▷ Adequate physical activity ▷ Healthy diet ▷ Minimise alcohol consumption ▷ Reduce stress ▷ Social support
Antipsychotics (dementia with changed behaviour) olanzapine quetiapine risperidone **Benzodiazepines (dementia with changed behaviour)** oxazepam	Use non-pharmacological options first to manage behaviour. All antipsychotics have some degree of anticholinergic or sedative effects. If considered essential, use lowest possible dose. When stopping or tapering an antipsychotic, create a management plan that includes psychosocial interventions (to decrease caregiver depression and delay RACF admission[48]). Note: avoid benzodiazepines to treat agitation, aggression and psychosis of dementia. If an antipsychotic or antidepressant cannot be used, a benzodiazepine with a short half-life and no active metabolites may be considered for a maximum of 2 weeks.	**Person-centred approach** ▷ Person-centred care techniques ▷ Behavioural therapies ▷ Environmental changes
Benzodiazepines (insomnia) temazepam	Use non-pharmacological alternatives to assist with sleep. Melatonin may be an option for people aged > 55 years. Consider melatonin for an initial period of 3 weeks then review. If needed, continue use for an additional 10 weeks.	▷ Sleep hygiene/education ▷ Relaxation techniques ▷ Sleep restriction ▷ Stimulus control
Opioids (chronic non-cancer pain) codeine fentanyl oxycodone tapentadol tramadol **Non-opioids (chronic non-cancer pain)** **TCAs** amitriptyline nortriptyline **Gabapentinoids** gabapentin pregabalin **SNRIs** duloxetine venlafaxine	Consider an integrated multidisciplinary approach to pain management. Paracetamol and NSAIDs have no anticholinergic or sedative effects. Topical NSAIDs have fewer adverse effects than oral NSAIDs and may be more suitable in aged care. Lidocaine 5% patches are preferred if the patient has localised neuropathic pain.	**Physical therapies[49,50]** ▷ Exercise and activity ▷ Physiotherapy ▷ TENS Engage the resident in self-management strategies that focus on the patient's active contribution to their pain management. This includes physical activity, social connection, good nutrition and sleep.
Antihistamines (allergies) **Sedating** cyproheptadine promethazine **Less sedating** cetirizine fexofenadine loratadine	Intranasal corticosteroids are most effective for symptoms of allergic rhinitis, particularly for nasal congestion. Topical treatments (moisturisers, eye drops, anti-inflammatories, local anaesthetics) have fewer adverse effects than oral antihistamines.	**Environmental** ▷ Minimise contact with allergens **Physical[45]** ▷ Sodium chloride irrigation for eyes/nose ▷ Wet/cold compress ▷ Moisturise skin
Anticholinergics (urinary urge incontinence) oxybutynin	Mirabegron may be an option for people with urge incontinence intolerant of anticholinergic effects, or when anticholinergics are not effective or contraindicated. Botulinum toxin may be considered for people with urge incontinence intolerant of anticholinergic effects.	▷ Bladder assessment ▷ Pelvic floor exercises ▷ Modify fluid intake ▷ Lifestyle (weight loss/smoking cessation) ▷ Incontinence aids ▷ Avoid constipation ▷ Minimise diuretics

NSAID = non-steroidal anti-inflammatory drug; SNRI = serotonin and noradrenaline reuptake inhibitor; SSRI = selective serotonin reuptake inhibitor; TCA = tricyclic antidepressant; TENS = transcutaneous electrical nerve stimulation

Additional tools and resources for deprescribing medicines with anticholinergic effects

TOOL/RESOURCE	SUMMARY
Deprescribing tools (NSW Therapeutic Advisory Group Inc.)	These deprescribing resources have been developed by a translational research project team led by Professor Sarah Hilmer for health professionals to support deprescribing in older hospital patients.
Deprescribing resources (Primary Health Tasmania)	These guides outline recommended deprescribing strategies for a range of commonly used medicines, where ongoing use is not appropriate. They have been revised and updated by geriatrician Dr David Dunbabin, GP Dr Amanda Lo and pharmacist Dr Peter Tenni.
Deprescribing algorithms (Canadian Deprescribing Network)	These evidence-based guidelines for deprescribing were developed by researchers from the Bruyère Research Institute and the Ontario Pharmacy Research Collaboration. Each guideline is summarised in an easy-to-use algorithm and information brochure. These algorithms can help health professionals safely stop or reduce medicines for specific drug classes.
Planning for a change: When my medicines may be causing side effects (NPS MedicineWise)	This deprescribing patient action plan can be used to plan changes in any medicines with anticholinergic effects and keep track of how the patient is feeling.

Guidelines for deprescribing

GUIDELINE	SUMMARY
RACGP aged care clinical guide (Silver book) Part A. Deprescribing (Royal Australian College of General Practitioners)	A clinical resource for the medical care of older people in RACFs.

Management of falls

Overview

Falls are the leading cause of injury among older people. According to the Royal Commission into Aged Care Quality and Safety, 10.5% of residents in RACFs were admitted to the hospital or emergency department due to a fall in 2018–2019.[51]

Medicines with anticholinergic effects can increase the risk of falls. Studies show a 60% increase in fall-related hospitalisations in patients exposed to medicines with anticholinergic and sedative burden.[6]

Why is this important?

In addition to an increased risk of seriously harmful falls, the consequences of falls resulting in minor or no injury are often neglected, but factors such as fear of falling and reduced activity level can profoundly affect the resident's function and quality of life.[23]

What can I do?

☑ Actions

Implement standard falls prevention strategies.[23] See Table 6.

Identify falls risk and implement targeted individualised strategies that are monitored and reviewed regularly.[23]

Table 6: Examples of strategies to minimise falls in RACFs[23]

STANDARD FALLS PREVENTION STRATEGIES	MANAGEMENT STRATEGIES FOR COMMON FALLS RISK FACTORS	MINIMISING INJURIES FROM FALLS
Falls risk screening: screen upon admission, then regularly (every 6 months) and when a change in functional status is evident	▷ Implement supervised and individualised balance and gait exercises ▷ Check for dementia or delirium and treat possible medical conditions that may contribute to an alteration in cognitive status ▷ Screen for ill-fitting or inappropriate footwear ▷ Assess and manage syncope, postural hypotension and vestibular dysfunction ▷ Review medicines regularly by a pharmacist after a fall, after initiation or escalation in dosage of medicine, or if there is multiple medicine use ▷ Arrange regular eye examinations (every 2 years) ▷ Conduct environmental reviews regularly, and consider combining them with occupational health and safety audits ▷ Individual observation and surveillance for at-risk residents	▷ Use hip protectors to reduce the risk of fractures for frail, older people ▷ Residents with a history of recurrent falls should be screened for osteoporosis and considered for a bone health check
Falls risk assessment: use for residents who exceed the threshold of a falls risk screening tool, who suffer a fall, or who move to or reside in a setting where most people are considered to have a high risk of falls (eg, dementia units)		
If a more detailed assessment is necessary, discuss with the resident's GP and, if appropriate, arrange for a **referral** to a specialist (eg, geriatrician) or a falls clinic		

Additional tools and resources for managing falls

TOOL/RESOURCE	SUMMARY
Standardised care process: falls (Department of Health and Human Services, Victoria)	A standardised care process to help RACFs provide high-quality care for residents.

Guidelines for managing falls

GUIDELINE	SUMMARY
Preventing falls and harm from falls in older people: best practice guidelines for Australian residential aged care facilities (Australian Commission on Safety and Quality in Health Care)	A guideline to help RACFs reduce the number of falls and the harm from falls experienced by older people.

Management of constipation and dry mouth

Overview

Older people are more susceptible to the anticholinergic effects of medicines.[1] These effects can include constipation and dry mouth.[2] While some residents may tolerate these symptoms, they can develop into serious symptoms for others.

Ceasing a medicine with anticholinergic effects may not always be possible. Non-pharmacological management options may help minimise the impact of these adverse effects.

Why is this important?

- Constipation is a common problem in older people, especially for immobile residents. This can severely reduce quality of life.[52]
- About 25% of older people have dry mouth. Dry mouth is associated with oral and dental disease in older people.[53]

What can I do?

Actions

Implement management strategies to reduce constipation and dry mouth.

Some management strategies to reduce constipation include:[52,54]

- increasing dietary fibre such as eating more vegetables (particularly beans, peas, broccoli) and fruits (dried fruit, prunes, avocado), which can be assisted by the RACF kitchen's weekly meal plan
- adequate fluid intake (residents with heart or kidney disease may have fluid intake restrictions)
- increasing exercise if able as it helps ensure regular bowel movements
- advising resident to visit the toilet soon after meals or hot drinks when gastrocolic reflex is maximal
- reviewing the medicine dose regimen.

Some management strategies to reduce the effects dry mouth include:[53,55]

- dental products with high fluoride, calcium or casein to help prevent tooth decay
- white petroleum jelly for dry lips
- avoiding lollies and alcohol-containing mouthwashes
- stabilising dentures with adhesives to prevent ulcers and remove during sleep
- high pH artificial saliva without citric acid.

Tools and resources for managing constipation and dry mouth

TOOL/RESOURCE	SUMMARY
Standardised care process: constipation (Department of Health and Human Services, Victoria)	A standardised care process to help RACFs provide high-quality care for residents.
Therapeutic brief 10 – Constipation: a quality of life issue for veteran patients (Veterans'MATES)	This therapeutic brief discusses management strategies to help avoid and treat constipation, with considerations for treating constipation in residents of RACFs.
Standardised care process: oral and dental hygiene (Department of Health and Human Services, Victoria)	A standardised care process to help RACFs provide high-quality care for residents.

ANTICHOLINERGIC BURDEN: A PERSON-CENTRED APPROACH

Multidisciplinary opportunities for collaboration within RACFs

Overview

Multidisciplinary opportunities may support person-centred care and help address any concerns or issues.

- RMMRs are good opportunities to collaborate with the accredited pharmacist as they can assess the appropriateness and effectiveness of the resident's current medicines. This process can identify medicines with anticholinergic effects and deprescribing opportunities, and help minimise medication misadventure.[56]
- Case conferences with RACF staff, healthcare professionals, the resident and their family or carer allow for good communication and consent for setting goals and plans for the resident.[56]
- QUM services promote the safe and effective prescribing, dispensing and administration of medicines. Collaboration between RACF staff, and dispensing and QUM pharmacists is essential to this process.[57]
- MACs play a key role in the governance of medication management in RACFs and bring significant benefits through improved interdisciplinary communication, collaboration and understanding of the medication management process.[58]

Why is this important?

- The increasing complexity of care needs for older people requires a team-based approach, particularly for residents of RACFs who often have multimorbidity and may be prescribed five or more medicines.[59]
- QUM services improve practices and procedures relating to medicines use and assist RACFs in complying with the Aged Care Quality Standards.

What can I do?

Actions

Suggest to the GP that a multidisciplinary case conference may be warranted, where several cases can be discussed in the same session.[59]

Approach the MAC to seek their endorsement and to assist in the implementation of this toolkit within the RACF. Individual RACFs may have different avenues for implementing processes.

Attend the NPS MedicineWise – Toolkit Q&A support meeting after you have participated in the educational visit. It provides a platform for sharing learnings and driving greater engagement with this toolkit.

Tips

Treat management plans as living documents that can be modified and adjusted after discussion with the rest of the multidisciplinary team (eg, individually or in subsequent team meetings).[59]

Additional tools and resources to strengthen clinical governance processes through MACs

TOOL/RESOURCE	SUMMARY
Toolkit Q&A support meeting (NPS MedicineWise)	This optional meeting is offered to nurses and pharmacists who have participated in the educational visits to provide a platform for sharing learning and driving greater engagement with the toolkit.

Guidelines for collaboration within RACFs

GUIDELINE	SUMMARY
RACGP aged care clinical guide (Silver book) Part B. Collaboration and multidisciplinary team-based care (Royal Australian College of General Practitioners)	A clinical resource for the medical care of older people in RACFs.

Person-centred care for aged care residents

Overview

Goals of care are important for older people but are infrequently identified or addressed. Their attitudes towards medicines, preferences for involvement in decision-making and openness to deprescribing vary considerably.[60]

Collaboration between health professionals (GPs, specialists, pharmacists, nurses) and shared decision-making with the resident, their family or carer is important to determine the most appropriate care to manage and reduce anticholinergic burden. Collaboration can be viewed through the age-friendly health systems: the 4Ms framework.

The 4Ms:[12]

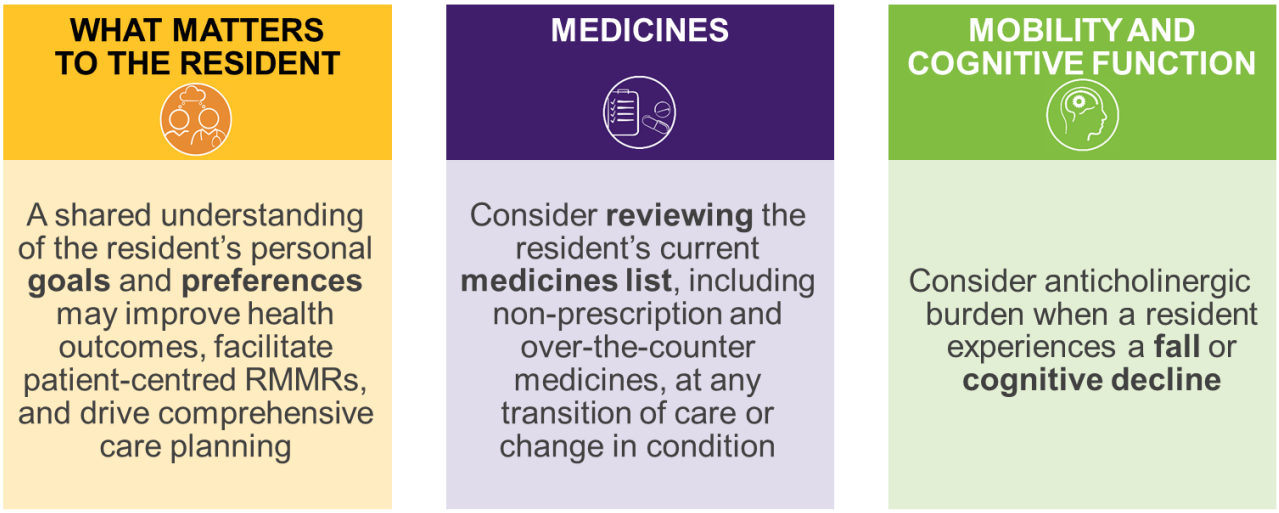
- What Matters: know and align care with each resident's specific health outcome goals and care preferences.
- Medication: if medication is necessary, use age-friendly medications that do not interfere with the other three 'Ms'.
- Mentation: prevent, identify, treat and manage dementia, depression and delirium across settings of care.
- Mobility: ensure residents move safely every day to maintain function and do What Matters to them.

The framework includes evidence-based interventions to address these four elements, which drive all decision-making in the resident's care.

The 4Ms framework aligns with the following Aged Care Quality Standards:[61]

- Assessment and planning of the resident's needs, goals and preferences supports the delivery of tailored personal and clinical care.
- Effective management of high-impact or high-prevalence risks (such as medicines with anticholinergic effects) associated with the care of each resident.
- Deterioration or change of a resident's mental health, cognitive or physical function, capacity or condition is recognised and responded to in a timely matter.
- Provision of safe and effective services and supports for daily living that optimises the resident's independence, health, wellbeing and quality of life.

Figure 5: Person-centred care for older people (adapted from the 4Ms framework)[12,62]



Why is this important?

The 4Ms framework makes care of residents, which can be complex, more manageable.[12]

What can I do?

Tips

You may find you already provide care aligned with one or more of these elements for your residents. Incorporate the other elements and organise care so that all elements guide every interaction with the resident and their family or carers.[12]

Actions

What matters to the resident

Discuss with the resident, their family or carer, their priorities, goals and preferences for managing anticholinergic side effects, utilising RMMR recommendations where appropriate. For some residents, using this patient decision aid may be appropriate: NPS MedicineWise – Exploring my options: when my medicine may be causing side effects.

Identify and align care with the resident's specific health outcome goals and preferences to manage anticholinergic burden through shared decision-making and care planning.

Capture these health outcome goals and preferences in your facility's electronic health records and make them available across care teams and settings.

Medicines

Assess anticholinergic burden using existing systems and tools, and routine assessments of the resident's medicines, such as RMMRs (accredited pharmacists) or falls risk assessments (nurses).

Consider medicines (if prescribing is necessary) with less anticholinergic burden when making RMMR recommendations to ensure these medicines have less impact on what matters to the resident, their mobility, and cognitive function.

Encourage residents to speak with their GP or pharmacist if they are experiencing any side effects, and to ask if there are other treatment options by using this patient resource: NPS MedicineWise – Side effects from your medicines? 5 questions to ask.

Complete this optional online case study for pharmacists and nurses to increase your knowledge and capability of using a person-centred approach to assess and review anticholinergic burden: NPS MedicineWise – Online case study. (available from May 2022)

Mobility and cognitive function (adapted from the 4Ms Mobility and Mentation)

Consider anticholinergic burden when assessing residents for physical and cognitive decline, including falls assessment, and delirium and mobility screenings. This will ensure that a resident's acute deterioration is recognised promptly and appropriate action is taken.

Additional tools and resources to facilitate person-centred care

TOOL/RESOURCE	SUMMARY
Charter of Aged Care Rights (Aged Care Quality and Safety Commission)	This booklet informs residents of their rights as an aged care resident and how they can exercise them, including the right to be informed about their care and services and to have control over and make choices about their care, including where the choices involve personal risk.
Side effects from your medicines? 5 questions to ask (NPS MedicineWise)	This resource can be used to encourage residents, their family or carer to ask the GP or pharmacist if they are experiencing any side effects, and to ask if there are other treatment options.
Exploring my options: when my medicine may be causing side effects (NPS MedicineWise)	This decision aid can be used to discuss the resident's priorities, goals and preferences for managing anticholinergic side effects, using RMMR recommendations where appropriate. It can be used to highlight the risk of continuing some medicines long term and the benefits of deprescribing; to introduce the concept of a deprescribing trial; and set expectations about the process (such as red flags and reviews).
Online case study (NPS MedicineWise)	This online case study aims to reinforce the program messaging to increase knowledge and capability of using a person-centred approach to assess and review anticholinergic burden, with a focus on optimising multidisciplinary communication and collaboration.

Guidelines for person-centred care

GUIDELINE	SUMMARY
Age-friendly health systems: Guide to using the 4Ms in the care of older adults (Institute for Healthcare Improvement)	This guide contains robust tools for health systems to apply the 4Ms framework to deliver age-friendly, evidence-based care for older adults.
Guidance and resources for providers to support Aged Care Quality Standards (Aged Care Quality and Safety Commission)	This guidance material is intended to assist RACFs to implement and maintain compliance with the quality standards.

APPENDIX: SAMPLE IMPLEMENTATION PLAN

Anticholinergic burden: a toolkit to improve resident outcomes in aged care facilities SAMPLE IMPLEMENTATION PLAN		
STEPS FOR IMPLEMENTATION	**DATE**	**STAFF RESPONSIBLE**
Identifying and assessing residents at risk of anticholinergic burden		
Eg, education session for RACF staff		
Managing anticholinergic burden		
Implementing a person-centred approach		

Agreed and signed by QUM service provider: _____ Date: _____

Agreed and signed by Director of Nursing: _____ Date: _____

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