



REDUCING  
ANTICHOLINERGIC BURDEN:  
FRAMEWORK FOR ACTION

Quality Use of Medicines  
Briefing Paper

December 2021

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- ▶ Aged Care Quality and Safety Commission
- ▶ Royal Australian College of General Practitioners (RACGP)
- ▶ Pharmaceutical Society of Australia (PSA)
- ▶ Society of Hospital Pharmacists of Australia (SHPA)
- ▶ Pharmacy Guild of Australia (The Guild)
- ▶ Carers Australia
- ▶ Older Persons Advocacy Network (OPAN)
- ▶ Federation of Ethnic Communities Councils of Australia (FECCA)
- ▶ The National Aboriginal Community Controlled Health Organisation (NACCHO)
- ▶ Royal Australasian College of Physicians (RACP)

## Other organisations

- ▶ Agency for Clinical Innovation NSW
- ▶ Australian Association of Consultant Pharmacy (AACCP)
- ▶ Australian College of Rural and Remote Medicine (ACRRM)
- ▶ Council on the Ageing (COTA)
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# ABBREVIATIONS

**ACSQHC:** Australian Commission on Safety and Quality in Health Care

**CALD:** culturally and linguistically diverse

**CIS:** clinical information system

**DBI:** Drug Burden Index

**EMM:** electronic medication management

**G-MEDSS:** Goal-directed Medication review Electronic Decision Support System

**GP:** general practitioner

**HMR:** Home Medicines Review

**KOL:** Key Opinion Leader

**MAC:** Medication Advisory Committee

**MBS:** Medicare Benefits Schedule

**MMR:** Medication Management Review

**PBS:** Pharmaceutical Benefits Scheme

**QoLY:** quality of life years

**QUM/T:** quality use of medicines and medical tests

**RACF:** residential aged-care facility

**RACGP:** Royal Australian College of General Practitioners

**RMMR:** Residential Medication Management Review

**SNRIs:** serotonin and norepinephrine reuptake inhibitors

**SSRIs:** selective serotonin reuptake inhibitors

**TAG:** Therapeutic Advisory Group

**TCA:** tricyclic antidepressant

# EXECUTIVE SUMMARY

## Key points

- ▶ Through consultation with the sector, anticholinergic burden has been identified as an important quality use of medicines (QUM) issue for people aged 65 years and over in Australia.
- ▶ There are multiple barriers to reducing anticholinergic burden in Australia.
- ▶ NPS MedicineWise has developed a QUM program that is implementing interventions to address some of these barriers and to complement existing programs and interventions.
- ▶ Other organisations also have programs and activities that tackle anticholinergic burden. However, further action is required to address barriers in Australia.
- ▶ This paper provides examples of interventions that can be developed and implemented to address these barriers.

## What is this framework for action?

NPS MedicineWise has developed a framework for action to reduce anticholinergic burden for Australians aged 65 years and over that can be used by government, health professional and consumer stakeholders.

The framework was developed as a key component of the QUM program *Anticholinergic burden: the unintended consequences for older people*, which NPS MedicineWise is delivering from October 2021 until June 2022.

The framework provides key insights about anticholinergic burden, including the scale of the issue, clinical practice challenges and barriers to reducing anticholinergic burden, and current programs and activities that are addressing the problem.

The aim of this framework is to build momentum for shared action to address barriers by:

- ▶ raising awareness of anticholinergic burden as an important QUM issue
- ▶ sharing key insights about barriers and associated interventions to provide guidance on potential solutions
- ▶ outlining current and emerging activities and opportunities for action.

## Anticholinergic burden is an important QUM issue

NPS MedicineWise regularly conducts a comprehensive and systematic assessment of the health and policy environment to identify areas of need for QUM. In early 2021, this assessment identified anticholinergic burden for people aged 65 and over as an important QUM issue in Australia.

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*Anticholinergic burden is defined as the cumulative effect on a person taking one or more medicines with anticholinergic effects.<sup>1</sup>*

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Medicines with anticholinergic effects are commonly prescribed in Australia; approximately 21–34% of older people take medicines with anticholinergic effects.<sup>2,3,4</sup>

Anticholinergic burden is associated with negative patient health outcomes including delirium,<sup>5</sup> risk of fractures,<sup>6,7</sup> and large increases in fall-related hospitalisations (60%), risk of dementia (50%) and mortality (30%).<sup>8,9</sup> This not only poses significant negative health impacts for individuals, but also corresponding broader economic impacts.<sup>10,11,12</sup>

## NPS MedicineWise program

Following the identification of anticholinergic burden as an important QUM issue, NPS MedicineWise developed the program *Anticholinergic burden: the unintended consequences for older people*, which aims to promote the efficacious and safe use of medicines that contribute to anticholinergic burden and improve health outcomes for people over 65 years. The program is funded by the Australian Government Department of Health.

The program development process included a comprehensive literature review, data analysis and qualitative interviews. It also included a structured co-design underpinned by evidence-based behaviour change implementation frameworks that identified barriers to reducing anticholinergic burden in Australia.

Understanding these barriers is critical to informing decisions about interventions, which act as drivers of behavioural change, that should be included in a program and how they should be developed.<sup>13,14,15,16</sup>

## Barriers to reducing anticholinergic burden

Barriers to reducing anticholinergic burden in Australia have been grouped in seven themes in this framework, including 'clinical practice and quality of care', 'professional roles, interactions and relationships' and 'consumer focus'.<sup>13,17</sup> The barriers vary from gaps in knowledge and skills through to inadequacies in clinical information systems (CISs) and remuneration. See [Table 1](#) for full details.

## Existing programs, interventions and activities

The NPS MedicineWise program primarily addresses barriers that relate to clinical practice knowledge and skills, health professional roles and interactions, and consumer literacy and empowerment. See [Table 2](#) for full details.

Organisations throughout Australia are also delivering programs and activities that tackle aspects of anticholinergic burden. These include the Australian Commission on Safety and Quality in Health Care's (ACSQHC) consultation papers, the University of Sydney's Goal-directed Medication review Electronic Decision Support System (G-MEDSS) project, NSW Therapeutic Advisory Group (TAG) deprescribing tools and Dementia Training Australia's education modules. See [Table 3](#) for full details.

## Further action to reduce anticholinergic burden

Although there are existing programs, interventions and activities targeting barriers to reducing anticholinergic burden, gaps remain which require action.

This framework presents examples of interventions that stakeholders can develop and implement as individual organisations and in collaboration as a collective of organisations, including:

- ▶ national guidelines for health professionals on the assessment and management of medicines with anticholinergic effects
- ▶ national quality indicators for Medication Management Reviews (MMRs) to measure impact and progress and address anticholinergic burden, medication safety and QUM
- ▶ a model for support and action of Medication Advisory Committees (MACs) medication management and QUM in residential aged-care facilities.



# KEY INSIGHTS ABOUT ANTICHOLINERGIC BURDEN

## Program development

NPS MedicineWise developed the *Anticholinergic burden: the unintended consequences for older people* program, which is being delivered from October 2021 to June 2022, using a six-stage process. See [Figure 1](#).

For more details about the topic selection, formative research, program design and intervention development stages, see [Appendix 1](#).

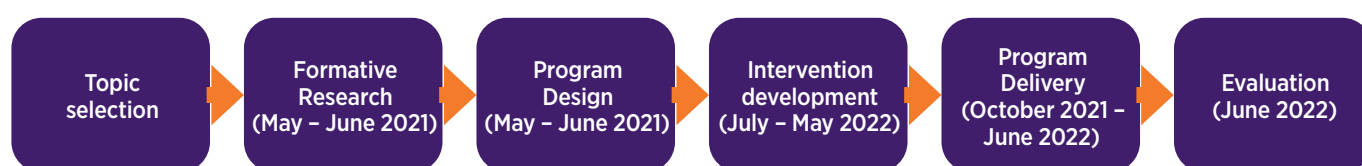


Figure 1: NPS MedicineWise standard process for QUM program development

## Key insights overview

A number of key insights were identified during the development of the program. Sharing these insights can help:

- ▶ increase awareness of the importance of anticholinergic burden as a QUM topic
- ▶ provide greater understanding of what needs to be done to reduce anticholinergic burden
- ▶ present what is already being done by different organisations, including NPS MedicineWise, to prevent duplication
- ▶ highlight what further actions are needed to reduce anticholinergic burden.

Key insights about anticholinergic burden as a topic in clinical practice are presented in the following sections:

- ▶ What is anticholinergic burden?
- ▶ Assessment and review of anticholinergic burden.
- ▶ Deprescribing for anticholinergic burden.
- ▶ Collaboration for health professionals and consumers.

Key insights about barriers to behaviour change and interventions to reduce anticholinergic burden in Australia are presented in the following sections:

- ▶ Barriers to reducing anticholinergic burden in Australia; see [Table 1](#).
- ▶ NPS MedicineWise program - interventions and barriers being addressed; see [Table 2](#).
- ▶ How other organisations are tackling anticholinergic burden; see [Table 3](#).
- ▶ Interventions still needed to reduce anticholinergic burden; see [section below](#).

Interventions to reduce anticholinergic burden were designed based on identified barriers using evidence-based implementation frameworks that are underpinned by a strong understanding of the drivers that health professionals and consumers experience.<sup>13,14,15,16</sup> For this framework for action, the barriers and interventions have been grouped in seven themes.<sup>13,17</sup>

# WHAT IS ANTICHOLINERGIC BURDEN?

*Anticholinergic burden is defined as the cumulative effect on a person taking one or more medicines with anticholinergic effects.<sup>1</sup>*

Medicines with anticholinergic effects are 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.<sup>1,18</sup> See [Figure 2](#).

It may be the case that anticholinergic activity is the medical practitioner's intended outcome for the treatment of specific conditions, such as bladder antispasmodics for urinary urge incontinence. In other cases however, medicines prescribed to treat certain conditions can have unintended anticholinergic effects, which add to the overall anticholinergic burden.<sup>1,18</sup>

Common examples of medicines with anticholinergic effects include antihistamines for allergies, antidepressants for depression and antipsychotics for dementia with changed behaviour.<sup>19,20,21</sup>

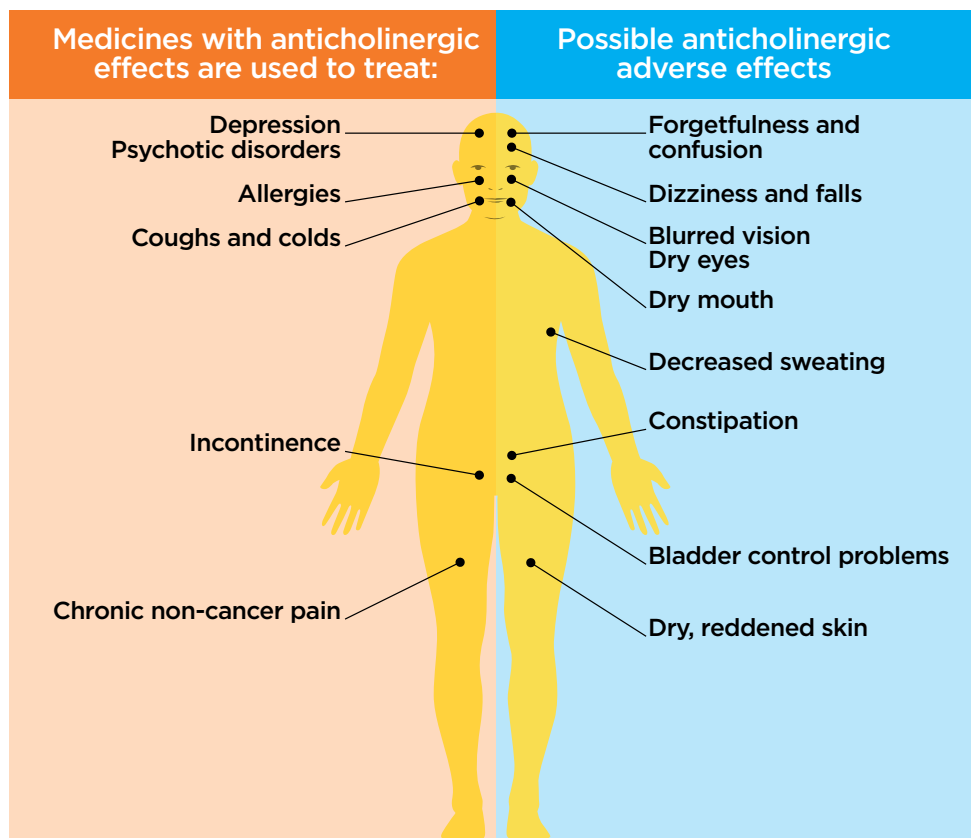


Figure 2: Indications for medicines with anticholinergic effects and their possible adverse effects<sup>a \* 18,19,20</sup>

a List is not exhaustive

\* Courtesy of the Australian Department of Veterans' Affairs, adapted from Figure 1 of the Veterans' Medicines Advice and Therapeutics Education Services Veteran Brochure for Thinking clearly about your medicines: managing side effects

If left unchecked, anticholinergic effects can cause substantial harm. The impact of anticholinergic burden on patient health outcomes includes increased severity of delirium,<sup>5</sup> risk of fractures,<sup>6</sup> large increases in fall-related hospitalisations, the risk of dementia and mortality.<sup>8,9</sup> See [Figure 3](#).

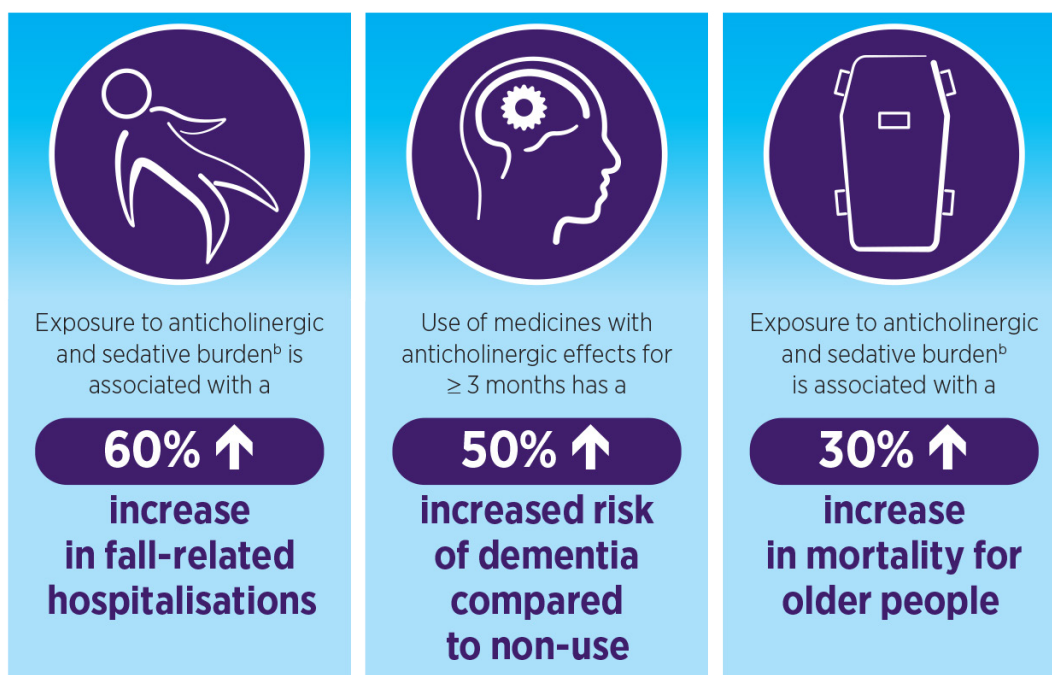


Figure 3: Impact on selected patient health outcomes<sup>8,9</sup>

<sup>b</sup> Based on the Drug Burden Index (DBI), which measures cumulative exposure to medicines with anticholinergic and sedative effects<sup>21</sup>

## Who is affected?

How a person experiences anticholinergic burden depends on multiple factors. These include their individual pharmacokinetics and pharmacodynamics, number of medicines taken, dosages prescribed, drug interactions and the prevalence and severity of comorbidities.<sup>18</sup>

Standout features of the epidemiology of anticholinergic burden are:



- 1) Dose-dependency – people taking higher doses of medicines with anticholinergic effects have a higher risk of adverse effects and poor health outcomes.<sup>22,23</sup>

Cumulative effect – this often involves a person taking multiple medicines that sometimes are not typically thought of as having anticholinergic effects.<sup>3,24</sup>



- 2) Older people are more susceptible, due to:

- a) physiological and pathological processes associated with ageing including changes to the size and function of organs<sup>1</sup>
- b) being more likely to be prescribed multiple medicines, some of which may have anticholinergic effects and contribute to cumulative anticholinergic burden.<sup>3,25</sup>

Australian studies have found that 21–34% of older people take medicines with anticholinergic effects.<sup>2,3,4</sup> Aboriginal and Torres Strait Islander people are more likely to be affected by ageing-related conditions at a younger age than other Australians (55 years and over).<sup>26,27</sup>

A September 2021 NPS MedicineWise MedicineInsight study of general practices in Australia found that 7% of older patients living in the community have a DBI score  $\geq 1$  which is associated with poor outcomes such as falls and an increased risk of all-cause mortality.<sup>8,28</sup> See [Figure 4](#).

For more details about the DBI, see [Drug Burden Index, anticholinergic burden and sedative burden](#) section below.

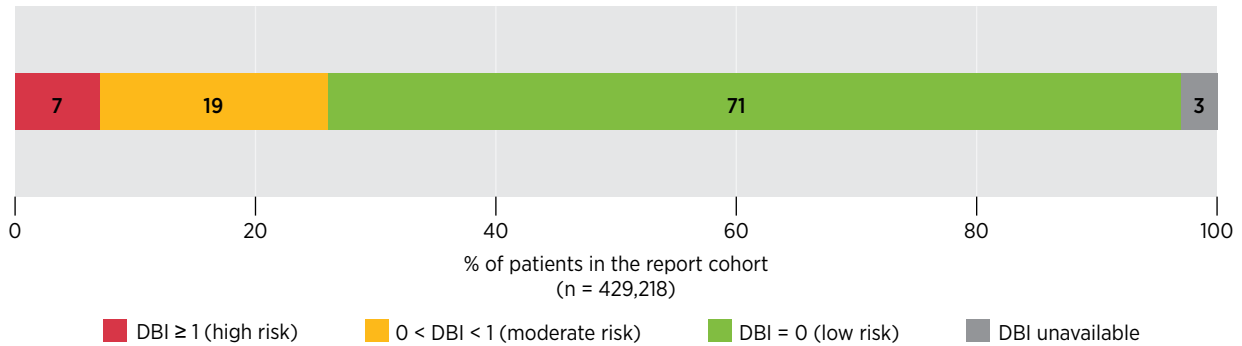


Figure 4: DBI score for older people in Australian general practice (NPS MedicineWise MedicineInsight data)<sup>29</sup>

Specific groups of older people may experience higher rates of anticholinergic burden compared to the general older population. These may include:

- ▶ people with disabilities<sup>30,31,32</sup>
- ▶ people from culturally and linguistically diverse (CALD) communities<sup>30</sup>
- ▶ Aboriginal and Torres Strait Islander peoples.

Older people may have specific needs and interactions with health professionals determined by their place of residence, which include living:

- ▶ at home independently
- ▶ at home independently with home care services or support funded by the National Disability Insurance Scheme (NDIS)
- ▶ in a residential aged-care facility (RACF).

## Consumers

'Consumer' is used throughout this briefing paper to refer to the patient (eg attending general practice and living in the community) or resident in an RACF receiving care from a health professional. The following people may also have an important role regarding the patient's care:<sup>30</sup>

- ▶ carer
- ▶ family and friends
- ▶ authorised representative/substitute decision maker, who may be a carer, family member or legal guardian.

## Health professionals

Health professionals that have key roles in reducing anticholinergic burden include:

- ▶ Medical practitioners; GPs (primary care) and specialists (secondary and tertiary care) such as geriatricians, psychiatrists and urologists. Variation in frequency and specific medicines prescribed may be present, depending on scope of practice.<sup>30</sup>
- ▶ Pharmacists; there are multiple medication management services delivered by accredited and community pharmacists under the 7th Community Pharmacy Agreement. Accredited pharmacists are defined as pharmacists who have undergone formal training, and are annually accredited to conduct MMRs.<sup>33</sup> Accredited pharmacists can work collaboratively with GPs and specialists in the community to provide HMR services for people living in the community.<sup>34</sup> See [MMRs section](#) below. Community pharmacists can provide other relevant services including MedsCheck and dose administration aids. Pharmacists also work collaboratively with medical practitioners providing Residential Medication Management Reviews (RMMRs) and QUM services to RACFs.<sup>35</sup>
- ▶ Nurses; including practice nurses, nurse practitioners and nurses working in aged care and general practice.

## What is the economic cost?

Studies on the economic cost of anticholinergic burden are limited. The most researched area is for older people living in the community and RACFs, who have urinary urge incontinence (overactive bladder), a condition for which people are commonly prescribed medicines with anticholinergic effects.

These international studies have found that increased healthcare resource utilisation and costs are more likely with high anticholinergic burden and among older people.<sup>10,11,12</sup>

For example, a 2021 US cohort study of 154,432 adults (18 years and over) with urinary urge incontinence investigated the predicted annual costs for utilisation of healthcare resources (such as outpatients visits, hospitalisations, medicines) due to falls/fractures, according to the level of anticholinergic burden (none, low, medium, high). It found the highest predicted annual costs were for adults aged 66–75 years with a high anticholinergic burden (US\$22,408 for males, US\$22,752 for females).<sup>10</sup>

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# ASSESSMENT AND REVIEW OF ANTICHOLINERGIC BURDEN

In clinical practice, identifying people aged 65 years and over and Aboriginal or Torres Strait Islander peoples aged over 55 years who are affected by anticholinergic burden is an essential first step when addressing this QUM topic.<sup>18</sup>

This can be achieved through using validated tools and existing systems and resources for an assessment and review of medicines with anticholinergic effects and whether a person is experiencing anticholinergic burden.<sup>1,18,36</sup>

These validated tools and existing systems include:<sup>1,18,36</sup>

- ▶ measurement scales
- ▶ MMRs.

## Measurement scales

Recognition of the negative impact of medicines with anticholinergic effects on older people has led to the development and validation of measurement scales to quantify anticholinergic burden since the early 2000s. Each medicine is given a score and the total sum creates an overall burden score, which may be categorised as risk levels, such as none, low, medium and high.<sup>1</sup>

Eighteen anticholinergic burden measurement scales developed in many countries around the world have been identified in the literature.<sup>37</sup> These scales are used in population-based studies and may be used to help health professionals identify the risk of a patient's adverse effects and negative health outcomes being due to anticholinergic burden.<sup>1</sup>

However, a key limitation of these scales is the variability between them with regards to:<sup>1,23,38</sup>

- a) which medicines are defined as having anticholinergic effects (and hence, included in a scale), and
- b) the level of anticholinergic effect each medicine has once it has been included.

The Salahudeen 2015 systematic review of seven measurement scales, including 195 medicines with anticholinergic effects found, for example, that quetiapine was rated as having high effects in one measurement scale, moderate in another scale and low in two other scales.<sup>23</sup>

In the Duran 2013 systematic review of seven measurement scales, temazepam (a benzodiazepine that may be used for insomnia), for example, was not included in four of the scales.<sup>38</sup>

The main reason for this variability is that scales use different methods for determining which medicines have anticholinergic effects and the level of these effects, including:<sup>1</sup>

- ▶ serum anticholinergic activity studies
- ▶ expert consensus
- ▶ assessment of drug monographs and pharmacological action
- ▶ some exclude what they determine is minor anticholinergic activity.

## Drug Burden Index, anticholinergic burden and sedative burden

The DBI is a measurement scale that was developed in Australia. It can be applied in population studies and also as a risk-assessment tool in clinical practice. The tool calculates the score for each medicine from 0–1 and provides a cumulative score expressed as a risk level: low risk; DBI = 0, moderate risk;  $0 < \text{DBI} < 1$ , high risk;  $\text{DBI} \geq 1$ .<sup>21</sup> The DBI Calculator<sup>®</sup>, which uses the DBI, was developed and validated to calculate and report DBI within clinical practice.<sup>39</sup>

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

- ▶ has been validated in older people in Australia<sup>36</sup>
- ▶ provides dose-dependent measures of anticholinergic burden<sup>39</sup>
- ▶ has a strong evidence base for anticholinergic burden, adverse effects and outcomes.<sup>36</sup>

A key feature of the DBI that differentiates it from other measurement scales, which is relevant to clinical practice for health professionals, is the inclusion of both medicines with anticholinergic effects and medicines with sedative effects.<sup>39</sup> This is because in clinical practice, they have a similar association with physical and cognitive outcomes, and hence require similar assessment and review, and deprescribing.<sup>22</sup>

One key limitation to the use of the DBI (and other measurement scales) is the administrative burden of inputting the patient's medicines, including doses, into the complex equation, as the DBI Calculator is not currently integrated into CIs.

Other measurement scales recommended for use in clinical practice in Australia include the:<sup>25</sup>

- ▶ American Geriatrics Society's (AGS) Beers Criteria for alerting potentially inappropriate prescribing of medicines for older people, including medicines with anticholinergic effects
- ▶ Screening Tool to Alert to Right Treatment (START); Screening Tool of Older People's Prescriptions (STOPP).

## Most prescribed medicines in practice

The *Anticholinergic burden: the unintended consequences for older people* program analysed a list of medicines with anticholinergic effects based on the DBI and the top 200 Pharmaceutical Benefits Scheme (PBS)-subsidised medicines by prescription volume 2019–2020. Over-the-counter medicines with anticholinergic effects were also included in the list.

The classes of medicines selected for the program and conditions they are used to treat are:

- ▶ antidepressants (SNRIs, serotonin and norepinephrine reuptake inhibitors; SSRIs, selective serotonin reuptake inhibitors; mirtazapine) for depression
- ▶ antipsychotics for dementia with changed behaviour
- ▶ benzodiazepines for insomnia
- ▶ opioids and non-opioids (SNRIs, TCAs, tricyclic antidepressants; gabapentinoids) for chronic non-cancer pain
- ▶ antihistamines (sedating and less sedating) for allergies
- ▶ anticholinergics for urinary urge incontinence.

## Difficulties in classifying medicines based on ‘high’ and ‘low’ anticholinergic effects

In some of the literature, measurement scales present individual medicines in tables with categories of high and low anticholinergic effects.<sup>18,23</sup> However, there are many inconsistencies in classifications and approaches between measurement scales, as described in the [Measurement scales section](#). This is an area that requires further research to resolve these differences.

### MMRs

MMRS include the Home Medicines Review (HMR) and the RMMR.<sup>40</sup>

A clinical need for a HMR or RMMR can be identified by the patient themselves, carers, doctors, pharmacists or health professionals involved in the patient’s care such as a senior nurse in a RACF. The referral pathway may be started in the community, a RACF or an acute care setting.<sup>41</sup>

### HMR

A HMR is a review of a person’s medicines conducted in their home by an accredited pharmacist. It involves a series of steps including a signed referral by a medical practitioner (eg, GP or specialist), patient interview and development of a report and management plan.<sup>34</sup>

The HMR program is funded by the Australian Government under the 7th Community Pharmacy Agreement. The program’s intent is to support QUM and reduce medication misadventure, by assisting patients to better manage and understand their medicines through a medication review conducted by an accredited pharmacist in the patient’s home.<sup>34</sup>

The HMR seeks to:<sup>34</sup>

- ▶ support safe, effective, and appropriate use of medicines.
- ▶ detect and address medicine-related problems that interfere with desired patient outcomes
- ▶ improve the patient’s quality of life and health outcomes using a best practice approach, which involves collaboration between the referrer, GP (if this is not the referrer), pharmacist, other relevant health professionals and the patient (and where appropriate, their carer).
- ▶ improve the patient’s, and health professional’s understanding of the medicines the patient is taking.
- ▶ facilitate collaborative working relationships between members of the health care team in the best interests of patient health and wellbeing.
- ▶ provide medication information to the patient and other health care providers involved in the patient’s care.

### RMMR

A RMMR is a similar type of service to a HMR for people permanently residing in approved Australian Government-funded aged-care, National Aboriginal and Torres Strait Islander Flexible Aged Care program and Multipurpose Services (MPS) facilities, and transition care facilities for more than 14 consecutive days. The RMMR program is intended to support QUM for these residents, by assisting residents and their carers to better manage their medicines.<sup>35</sup>



# Benefits of MMRs

## Clinical practice

There is good evidence that MMRs can be used to identify and address QUM problems experienced by patients and have a positive impact on patient outcomes.

The efficacy of MMRs was assessed in an Australian study of 35 systematic reviews, including relevant reviews that incorporated international literature of MMRs such as home-based reviews. The study found that significant reductions in medication and/or healthcare costs were reported in 35% of primary research studies. A meta-analysis of 12 systematic reviews found positive impacts on glycosylated haemoglobin, blood pressure, cholesterol, and number and appropriateness of medications<sup>42</sup>

A systematic review of Australian studies investigating RMMRs in RACFs found that, in five included studies, RMMRs identified on average 2.7–3.9 medicine-related problems per resident, although the authors concluded that the impact on clinical and resident-centred outcomes remains unclear.<sup>43</sup>

For anticholinergic burden specifically, Australian studies have investigated the impact of MMRs using the DBI as the measurement scale. A 2010 retrospective study of 372 community-dwelling older individuals who received a HMR showed a significant decrease in DBI scores after pharmacists' recommendations were undertaken. Moreover, there was a reduction in use of potentially inappropriate medicines post-HMR as well.<sup>44</sup>

A 2019 study investigated pharmacists integrating the DBI Calculator tool in their HMRs. The results of DBI reports were used by GPs to discuss medication management alternatives with their patients.<sup>45</sup>

After three months, the median DBI reduced from 0.82 to 0.67. Among those patients with DBI > 0 at the start of the study, DBI decreased in 36.4% of the patients; 89% of accredited pharmacists and 67% of GPs agreed on the feasibility of the DBI report as a risk assessment tool.<sup>45</sup>

## Economic outcomes

MMRs have demonstrated viable cost effectiveness, including generating improvements in quality of life and future net benefits.

The 2015 Australian VALMER study found that the average health resource cost saving per HMR was \$128.25 in the 12 months follow-up conducted in the review, and in a longer duration of follow-up, it is probable that the cost savings would be substantially higher. There was also a significant increase in the Quality of Life Years (QoLY) measure for patients, with an estimated average incremental cost-effectiveness ratio of AUD\$64,949 per QoLY gained.<sup>46</sup>

A 2000 study that assessed over 1000 medication reviews carried out in South Australia found a net saving to the health system of AUD\$120 per person per review.<sup>47</sup> These savings are based on tangible 'explicit dollar' figures and therefore can be viewed as conservative. If broader intangible benefits were included (eg, improved health outcomes or quality of life), it is reasonable to expect that the total benefits would be even more compelling.<sup>47</sup>

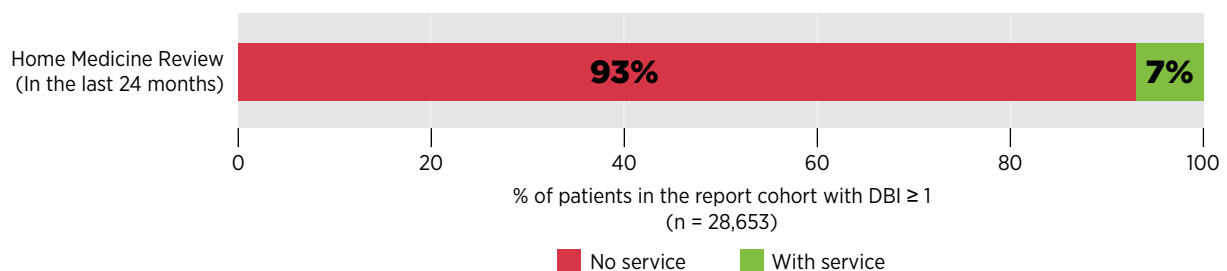
## Key issues

### HMR

- ▶ HMRs are underutilised for people taking medicines with anticholinergic and sedative effects based on DBI measurements of patients attending Australian general practices.

A study of 131,483 people aged  $\geq 45$  years, prescribed medicines under the Australian PBS found that 7.4% of those exposed to anticholinergic and sedative medicines using the DBI had a HMR during a 5-year period (2009–2014).<sup>48</sup>

A September 2021 NPS MedicineWise MedicineInsight study of general practices in Australia found that 93% of those with a DBI score  $\geq 1.0$  (which is associated with poor clinical outcomes in older people such as falls and an increased risk of all-cause mortality) have not had a HMR during the past 2 years.<sup>8,28</sup> See [Figure 5](#)



Report cohort: all regular patients aged over 65 years or Aboriginal or Torres Strait Islander people aged over 55 years, living in the community with DBI  $\geq 1$

DBI score unavailable: no DBI score calculated due to incomplete data for medicine strength or frequency or dose.

Figure 5: HMRs received in the last 2 years by older people with a DBI score  $\geq 1$  in Australian general practice (NPS MedicineWise MedicineInsight data)<sup>28</sup>

- ▶ Low awareness of available services and associated benefits by consumers which may lead to slow adoption.<sup>49</sup>
- ▶ Limited access to HMRs in regional or rural areas.<sup>50</sup>
- ▶ GPs' previous negative experiences with HMRs can influence perception about benefits of the service and subsequent patient referrals.<sup>47</sup>
- ▶ Variabilities in quality of referrals for HMRs from GPs and quality of HMR recommendation reports from pharmacists.<sup>49</sup>
- ▶ Lack of strong and consistent relationships between pharmacists and GPs can affect the quality of the service and adoption of recommendations.<sup>50</sup>
- ▶ Some carers may have misconceptions about the role of HMRs and can be fearful or mistrusting that they may lead to punitive actions if the pharmacist comes into the home and 'assesses' the level of care provided.<sup>30</sup>

### RMRR

- ▶ There have been reports of substantial underuse of RMRRs with MBS claims for RMRRs being lodged for fewer than one in five residents within 3 months of RACF entry, and fewer than one in two within 2 years.<sup>51</sup>
- ▶ Lack of structure around the pharmacist's role means there are a lack of formal mechanisms in place for pharmacists to communicate with doctors, nursing staff or RACFs.<sup>52</sup>
- ▶ Underused medication reviews are a missed opportunity to address the needs of the aged-care population, especially during transitions of care.<sup>51</sup>
- ▶ Variabilities in quality of referrals for HMRs from GPs and quality of HMR recommendation reports.<sup>49,52,53</sup>

# DEPRESCRIBING TO REDUCE ANTICHOLINERGIC BURDEN

When a patient has been identified as being at risk of anticholinergic burden after using validated tools and existing systems such as MMRs, deprescribing may be recommended as the next step in the care of the patient.

Deprescribing is defined as the thoughtful and planned process of stopping or reducing the dose of inappropriate medicines that:<sup>54,55</sup>

- ▶ have no clear benefit
- ▶ may cause harm
- ▶ are being used for an indication that is no longer required
- ▶ no longer fit with the current goals of care.

This involves following a series of steps including:<sup>54,55</sup>

- ▶ assessing the patient to establish goals of care
- ▶ obtaining a comprehensive medication history
- ▶ identifying medicine/s that may be appropriate to stop or reduce
- ▶ prioritising medicine/s that should be stopped or reduced first
- ▶ developing a plan for stopping or reducing the medicines
- ▶ monitoring and documenting outcomes after each medicine has been stopped or reduced.

No guidelines or position statements specifically developed for deprescribing to reduce anticholinergic burden were found.<sup>1,20</sup>

However, there is some guidance for deprescribing for specific classes of medicines that have anticholinergic effects, including; antidepressants, antipsychotics, benzodiazepines, opioids, antihistamines and anticholinergics for urinary urge incontinence.<sup>56,57,58,59,60,61,62,63,64,65,66</sup>

The plan for deprescribing varies for each medicine class; it may involve abrupt cessation, a tapering approach and/or switching to another medicine. For all classes of medicines, non-pharmacological management options should be optimised to help achieve the best possible outcomes.<sup>56,57,58,59,60,61,62,63,64,65,66</sup>

Key opinion leaders (KOLs) expressed the view that the overall goal of deprescribing should be to improve patients' quality of life, as opposed to simply wanting to reduce the number of medicines that they are receiving, and that deprescribing decisions should consider what patients' value most.

## Benefits of deprescribing

There is a strong body of evidence for many different classes of medicines that deprescribing is safe and effective in both community and RACF settings.<sup>67</sup>

While there is limited evidence that deprescribing can have benefits specifically for anticholinergic burden, the findings have been positive. A 2019 study of a patient-centred deprescribing intervention led by a pharmacist resulted in a significant reduction of participants' DBI scores, by 0.34 at 6 months post-deprescribing. The number of falls and adverse drug reactions were also reduced. Moreover, participants reported lower depression scores and scored lower frailty scores 6 months after deprescribing.<sup>68</sup>

## Key issues

- ▶ In Australia, approximately 20–50% of individuals aged 65 years and older are prescribed one or more potentially inappropriate medicines, with higher rates seen in RACFs.<sup>69</sup>
- ▶ Prescribing of potentially inappropriate medicines is independently associated with adverse drug events, hospital presentations, poorer health-related quality of life and death.<sup>69</sup>
- ▶ A review by the ACSQHC found that 40–50% of residents in RACFs are prescribed potentially inappropriate medicines (as defined by explicit criteria such as the Beers or McLeod's).<sup>70</sup>
- ▶ A 2020 PSA report noted that over half of all people living in RACFs are prescribed medicines that are considered potentially inappropriate in older people.<sup>71</sup>
- ▶ One in five unplanned hospital admissions among people living in RACFs are a result of taking medicines generally considered potentially inappropriate for older people.<sup>71</sup>
- ▶ Targeted engagement is required to raise awareness of the risks of polypharmacy in RACFs and encourage acceptance of deprescribing amongst residents and their relatives. GPs are integral to the success of deprescribing initiatives within this sector.<sup>72</sup>

# COLLABORATION FOR HEALTH PROFESSIONALS AND CONSUMERS

Collaboration between health professionals (GPs, specialists, pharmacists, nurses) and with consumers themselves is important at all stages of a person's care in relation to anticholinergic burden.

## Age-friendly health systems: the 4M Framework

The Anticholinergic burden program Expert Working Group recommended that collaboration be viewed through the Age-friendly health systems: the 4M Framework.

The 4Ms are:<sup>73</sup>

- ▶ **What Matters:** know and align care with each older adult's specific health outcome goals and care preferences including, but not limited to, end-of-life care and across all settings of care (these may include primary, secondary and tertiary care settings, the disability sector, CALD communities and Aboriginal and Torres Strait Islander peoples).<sup>30</sup>
- ▶ **Medication:** if medication is necessary, use age-friendly medications that do not interfere with the other three 'Ms' – What Matters to the older adult, Mobility or Mentation across settings of care.
- ▶ **Mentation:** prevent, identify, treat and manage dementia, depression and delirium across settings of care.
- ▶ **Mobility:** ensure that older adults move safely every day in order to maintain function and do What Matters to them.

An expert panel review of literature relating to the 4M Framework found that evidence was in support of the framework's positive clinical outcomes. The strength of the evidence was found to be robust.<sup>74</sup>

The 4Ms Framework makes care of older adults, which can be complex, more manageable. It identifies the core issues that should drive all decision-making in the care of older adults and organises care and focus on the older person's wellness and strengths rather than solely on disease. The 4Ms are relevant regardless of an older person's individual disease(s). They apply regardless of the number of functional problems an older person may have, or that person's cultural, racial, ethnic, or religious background.<sup>73</sup>

Despite being initially developed for the US healthcare system, there is interest in expanding this framework globally,<sup>75</sup> including in Australia.<sup>76</sup>

## MACs

A specific aspect of collaboration that has an important place for RACFs is the MAC.<sup>77</sup>

The MAC is a group of advisors usually comprised of representatives of RACF management, nurse/s, medical practitioner/s, pharmacist/s and residents.<sup>77</sup>

The intended purpose of the MAC is to:<sup>77</sup>

- ▶ provide a multidisciplinary partnership approach to medication management, supports evidence-based practice, and provides a forum in which to raise policy and practice issues
- ▶ represent all partners' views in medication management

- ▶ ensure that residents' rights, including consent and privacy, are taken into account in medication management policy and practice
- ▶ provide expert advice on legislative, regulatory and professional standards and requirements in relation to medication management
- ▶ ensure a systematic overview of all aspects of medication management in the RACF
- ▶ monitor, review and evaluate the safe and quality use of medicines and recommend any corrective action
- ▶ review medication incidents, adverse drug reactions and adverse drug events and their reporting; and
- ▶ advise on information, education and training resources to assist medication management.

# BARRIERS TO REDUCING ANTICHOLINERGIC BURDEN IN AUSTRALIA

Barriers to reducing anticholinergic burden in Australia were identified during the development of the *Anticholinergic burden: the unintended consequences for older people* program.

These barriers are found across a wide range of settings and in relation to all aspects of clinical practice for anticholinergic burden, including the assessment, review and deprescribing of medicines with anticholinergic effects and collaboration between health professionals and consumers. The barriers are presented in Table 1, grouped under seven themes.

Table 1: Barriers to reducing anticholinergic burden in Australia, grouped in seven themes<sup>13,17</sup>

## Theme 1 – Clinical practice and quality of care

Knowledge barriers may impact on health professional behaviours including:

- ▶ underestimating and overlooking the risk of negative impacts associated with the use of medicines with anticholinergic effects<sup>18,78</sup>
- ▶ medical practitioners may be less likely to identify anticholinergic burden in patients taking multiple medicines that are not typically thought of as having anticholinergic effects.<sup>3</sup>

Knowledge and skills barriers among health professionals can make it more challenging for them to identify adverse effects and poor health outcomes associated with medicines with anticholinergic effects and anticholinergic burden compared to other high-risk medicine classes such as bleeding from anticoagulants and hypoglycaemia from insulin.<sup>36</sup>

These knowledge and skills barriers include:

- ▶ it can be challenging to assess and manage anticholinergic burden because it involves medicines across multiple classes, which makes it more complex compared to the adverse effects or burden of a high-risk single class of medicines<sup>36</sup>
- ▶ adverse effects/poor health outcomes of anticholinergic burden are non-specific and difficult to distinguish from other causes (such as a new condition or natural aging processes)<sup>36</sup>
- ▶ adverse effects and poor health outcomes may not be as immediately apparent as the therapeutic benefits of medicines with anticholinergic effects.<sup>79</sup>

Current clinical practice guidelines have inadequacies that can contribute to knowledge and skills barriers that impact on behaviours of health professionals. These inadequacies include:

- ▶ the quality use of medicines with anticholinergic effects and contributing to anticholinergic burden either not specifically addressed,<sup>25</sup>  
or
- ▶ when the topic is addressed, some guidance in the different guidelines is inconsistent.<sup>80,81</sup>

Lack of guidelines or position statements available about:

- ▶ the quality use of medicines with anticholinergic effects and contributing to anticholinergic burden, in particular the assessment/review and management of patients
- ▶ multimorbidity.

Variation in the quality of medical practitioner referral letters for HMRs to pharmacists and HMR/RMMR reports from pharmacists to medical practitioners.<sup>52,53</sup> Similar variations were reported for the quality of RMMR referrals.

## Theme 2 – Professional roles, interactions and relationships

GP–specialist roles and interactions:

- ▶ non-alignment of role expectations: some GPs expect deprescribing to be implemented by specialists; some specialists expect this to be part of the GP's role.<sup>33</sup>
- ▶ difficulty to deprescribe medicines initiated by specialists.<sup>33</sup>
- ▶ reluctance to question a specialist's prescribing decisions due to respect for professional autonomy or a perception of medical hierarchy between doctors.<sup>33</sup>
- ▶ among the specialists, geriatricians described being closely involved with therapeutic management, whereas other specialists did not recognise deprescribing as part of their role.<sup>33</sup>

GP–pharmacist relationships:

- ▶ GPs experience a lack of strong or consistent relationships that enable effective referral process for HMRs between themselves and pharmacists.<sup>50</sup>

Pharmacist–GP interactions:

- ▶ limited collaboration and follow up between pharmacists and GPs perceived by pharmacists regarding HMRs.<sup>82</sup>
- ▶ frustration from pharmacists if recommendations to deprescribe medications are ignored and dismissed.<sup>33</sup>

Pharmacist role and interactions:

- ▶ lack of structure around the pharmacist's role in the RMMR and lack of formal mechanisms in place for pharmacists to communicate with doctors, nursing staff or RACFs.<sup>52</sup>

Communication skills barrier can lead to poor communication about care (including MMRs and deprescribing) between multiple medical practitioners and between medical practitioners and pharmacists for a single patient.<sup>33</sup>

## Theme 3 – Consumer focus

Knowledge barriers among consumers may be present including:

- ▶ lack of awareness that symptoms (eg, dizziness, forgetfulness) may be caused by the adverse effects of medicines with anticholinergic effects/mistaken belief that these symptoms are a normal part of ageing or worsening of existing condition<sup>18,83</sup>
- ▶ perception and belief may be present that some medicines are life long<sup>84,85</sup>
- ▶ lack of understanding of the purpose of an HMR<sup>82</sup>
- ▶ pressure from patients and/or caregivers to continue prescribing anticholinergic medications was described by health professionals.<sup>33</sup>
- ▶ lack of awareness of informed consent processes and privacy rights amongst carers and authorised appointed representatives, which limits their capacity to advocate for the person they're caring for<sup>30,33</sup>

Personal and relationship barriers include:

- ▶ privacy/safety concerns with HMR pharmacist visiting a patient's home<sup>86</sup>
- ▶ fear that a HMR can adversely affect the quality of a patient's relationship with their GP<sup>86</sup>
- ▶ ambivalence and resistance to deprescribing for reasons such as a preference to continue with something that is familiar<sup>87</sup>
- ▶ cultural barriers and challenges that influence communication with people from CALD communities and Aboriginal and Torres Strait Islander peoples<sup>30</sup>
- ▶ hearing, vision and/or cognitive impairment can affect capacity to gain knowledge<sup>30</sup>
- ▶ language barriers (CALD) /health literacy of the disability support sector<sup>30</sup>
- ▶ carers experiencing reduced recognition and awareness by GPs and pharmacists about the importance of their role as a 'partner of care'<sup>88</sup>
- ▶ lack of multi-disciplinary team case conferences including carers, family and care staff<sup>89</sup>



## Theme 4 – Capability and competence of health professional to deliver quality care

- ▶ lack of quality indicators for MMRs (HMRs and RMMRs) can negatively impact on referrals for these services.<sup>90</sup>
- ▶ traditional training for pharmacists is not focused on communication with consumers with complex needs (CALD, people with disabilities etc.)<sup>30</sup>
- ▶ physical infrastructure gaps in RACFs eg, lack of consulting rooms to conduct medication management<sup>91</sup>

## Theme 5 – Capacity of staff and systems

Lack of structured training for aged-care workers about QUM and anticholinergic burden.

Resource barriers may be present such as:

- ▶ limited access to accredited pharmacists and long wait times for HMRs in regional or rural areas<sup>50</sup>
- ▶ significant number of accredited pharmacists choose more secure employment other than providing HMRs and RMMRs because of barriers such as travel, insufficient support and service caps (eg maximum 30 HMRs/month)<sup>30</sup>
- ▶ RMMRs are a multi-step process, which rely on the compliance and availability of the medical practitioner, patient/carer, pharmacist and RACF staff<sup>52</sup>
- ▶ external barriers to deprescribing, including regulatory, pharmaceutical and supply shortage issues<sup>33</sup>
- ▶ practice-based issues, including lack of time, pressure, effort, knowledge and resources.<sup>33</sup>

## Theme 6 – Information management

Resources for health professionals may be limited due to CIS gaps including:

- ▶ no integration of validated tools (measurement scales) in CIS of general practices
- ▶ no pop-up alerts in CIS of general practices when prescribing medicines with anticholinergic effects about risk of anticholinergic burden<sup>92</sup>
- ▶ no integration and lack of compatibility between CIS of general practices and medication management systems of RACFs<sup>93</sup>
- ▶ information management infrastructure gaps in RACFs eg, absence of electronic CIS<sup>91</sup>
- ▶ no one source of truth for medicines in aged care, which can result in errors when prescribing and administering medicines<sup>91</sup>

## Theme 7 – Funding, remuneration, costs

Capacity barriers may be present due to inadequate remuneration for health professionals including:<sup>30</sup>

- ▶ for MMRs (HMR and RMMR) to enable the collaboration required between health professionals
- ▶ for health professionals providing sufficient services in aged care, particularly patients with complex needs
- ▶ for GPs to attend MACs in RACFs.

This may also be present due to inadequate financial incentives for training of health professionals providing services in aged care.<sup>30</sup>

CIS = clinical information system; HMR = Home Medicines Review; MAC = Medication Advisory Committee; MMR = Medication Management Review; RMMR = Residential Medication Management Review; RACF = residential aged-care facility.

# NPS MEDICINEWISE PROGRAM – INTERVENTIONS AND BARRIERS BEING ADDRESSED

The *Anticholinergic burden: the unintended consequences for older people* program aims to achieve its goal and outcomes by providing interventions to achieve behaviour change among health professionals (GPs, pharmacists and nurses), aged-care workers and consumers (patients/residents, carers and family) in various settings in general practices and RACFs.

These interventions are presented below in Table 2. They are mapped to the barriers to reducing anticholinergic burden that they are addressing, which are presented in Table 1.

Table 2: Interventions, audiences/settings and barriers addressed by the *Anticholinergic burden: the unintended consequences for older people* program

Intervention	Audiences/settings	Barriers addressed
<p><b>Educational visits</b> (face-to-face and virtual) delivered as:</p> <ul style="list-style-type: none"> <li>▶ one-on-one: a 30-minute in-practice discussion for GPs, tailored to individual learning needs</li> <li>▶ small group: a 1-hour facilitated group discussion for GPs, pharmacists and nurses.</li> </ul>	<p>Health professionals (GPs and nurses) in general practices and RACFs</p>	<p><b>Theme 1</b> – Clinical practice and quality of care knowledge and skills barriers.</p> <p><b>Theme 2</b> – Professional roles, interactions and relationships between GPs, nurses, specialists and pharmacists.</p>
<p><b>Health professional resources</b> disseminated through educational visits and promoted through other channels, including:</p> <ul style="list-style-type: none"> <li>▶ Educational visiting card and insert: a leave-behind resource that includes visual information about anticholinergic burden as well as details of medicines with anticholinergic effects and guidance for starting, stopping, switching and non-pharmacological management</li> <li>▶ Toolkit for RACFs focused on strengthening clinical governance processes and incorporating the assessment, review and deprescribing of anticholinergic burden into the facilities' workflow.</li> </ul>	<p>Health professionals (GPs, pharmacists and nurses) in general practices, the community and RACFs</p>	<p><b>Theme 1</b> – Clinical practice and quality of care knowledge and skills barriers.</p> <p><b>Theme 2</b> – Professional roles, interactions and relationships between GPs, nurses, specialists and pharmacists.</p>

Intervention	Audiences/settings	Barriers addressed
<p><b>MedicineInsight Practice Report and Aggregate Data Handouts</b></p> <p>MedicineInsight is a large-scale primary care data set of longitudinal de-identified electronic health records in Australia. It collects general practice data to support quality improvement in Australian primary care and post-market surveillance of medicines.</p> <p>The data are analysed, and insights provided to practices through educational visits as a:</p> <ul style="list-style-type: none"> <li>▶ MedicineInsight Practice Report: information based on practice's own data</li> <li>▶ Aggregate Data Handout: aggregated summary of national data.</li> </ul>	GPs	<p><b>Theme 1</b> – Clinical practice and quality of care knowledge, skills, belief about consequences barriers.</p>
<p><b>Online case study</b></p> <p>An online learning module (hosted on the NPS MedicineWise website) centred around a clinical case scenario with reflective questions focused on medical decision-making and patient-centred care.</p>	Pharmacists and GPs	<p><b>Theme 1</b> – Clinical practice and quality of care knowledge and skills barriers.</p> <p><b>Theme 2</b> – Professional roles, interactions and relationships between GPs, nurses, specialists and pharmacists.</p>
<p><b>MMR template and/or guiding principles</b></p> <p>Provides guidance on how to write a quality MMR report</p>	Pharmacists	<p><b>Theme 1</b> – Clinical practice and quality of care knowledge and skills barriers.</p>
<p><b>Consumer resources including:</b></p> <ul style="list-style-type: none"> <li>▶ Choosing Wisely 5 questions about anticholinergic burden</li> <li>▶ HMR/RMMR factsheet</li> <li>▶ Deprescribing anticholinergic medicines: <ul style="list-style-type: none"> <li>○ patient decision aid</li> <li>○ patient action plan.</li> </ul> </li> <li>▶ Consumer resources that are targeted for Aboriginal and Torres Strait Islander communities</li> <li>▶ Translated resources for CALD communities</li> </ul>	<p>Consumers, carers and family in the community and RACFs</p> <p>CALD communities</p> <p>Aboriginal and Torres Strait Islander communities</p>	<p><b>Theme 3</b> – Consumer focus knowledge, personal and relationship barriers.</p>
<p><b>Webinars</b></p> <p>A multidisciplinary panel discussion on topics such as:</p> <ul style="list-style-type: none"> <li>▶ MMRs and deprescribing.</li> <li>▶ Common adverse effects and warning symptoms associated with anticholinergic burden.</li> </ul>	<p>Health professionals (GPs, pharmacists, nurses)</p> <p>Aged-care workers in the community and RACFs</p>	<p><b>Theme 1</b> – Clinical practice and quality of care knowledge and skills barriers.</p> <p><b>Theme 2</b> – Professional roles, interactions and relationships between GPs, nurses, specialists and pharmacists.</p>

Intervention	Audiences/settings	Barriers addressed
<p><b>Support meetings</b></p> <p>Meetings facilitated by Educational Visitors offered to RACF staff who have participated in the educational visits to share learnings with colleagues.</p>	<p>Nurses and pharmacists in RACFs</p>	<p><b>Theme 1</b> – Clinical practice and quality of care knowledge and skills barriers.</p> <p><b>Theme 2</b> – Professional roles, interactions and relationships between GPs, nurses, specialists and pharmacists.</p>
<p><b>Virtual information for RACF residents and carers/families</b></p>	<p>Aged-care residents, carers, family in RACFs</p>	<p><b>Theme 3</b> – Consumer focus knowledge, personal and relationship barriers.</p>

# HOW ORGANISATIONS IN AUSTRALIA ARE TACKLING ANTICHOLINERGIC BURDEN

Environmental scans, stakeholders and experts have identified the following programs and initiatives for tackling anticholinergic burden in Australia.

**Please provide feedback on any interventions that haven't been included.**

Table 3: Programs and activities that tackle anticholinergic burden provided by organisations in Australia, grouped in seven themes<sup>13,17</sup>

Theme 1 – Clinical practice and quality of care	
<p><b>University of Sydney (Professor Sarah Hilmer and Dr Lisa Kouladjian O'Donnell)</b></p> <p><u>Goal-directed Medication review Electronic Decision Support System (G-MEDSS)<sup>®</sup></u>, includes the Drug Burden Index (DBI) Calculator<sup>®</sup> tool, a risk assessment tool for anticholinergic and sedative burden.</p>	<ul style="list-style-type: none"> <li>▶ Provides clinical decision support for Australian healthcare practitioners conducting medication reviews for older patients with and without dementia, to tailor care to meet their goals and preferences.</li> <li>▶ The DBI Calculator tool is currently <u>being integrated</u> into a number of NSW hospitals.</li> <li>▶ A national rollout project in primary care is undergoing <u>an evaluation study</u> of G-MEDSS (which has the DBI Calculator tool together with other tools) in practice.</li> </ul>
<p><b>NSW Clinical Excellence Commission (CEC)</b></p> <p><u>The Older Persons' Patient Safety Program</u></p>	<ul style="list-style-type: none"> <li>▶ Program includes medication review, designed to help reduce serious harm and to improve the safety of older people.</li> <li>▶ It includes the Comprehensive Care – Minimising Harm model and the Falls Prevention Program. The CEC also provides resources on falls prevention.</li> </ul>
<p><b>NSW Agency for Clinical Innovation (ACI)</b></p> <p><u>Frailty Taskforce</u></p>	<ul style="list-style-type: none"> <li>▶ Supports improvements to care for people living with or at risk of frailty including medication review.</li> </ul>
<p><b>Therapeutic Guidelines</b></p>	<ul style="list-style-type: none"> <li>▶ Provide indication/condition-specific guidance on medicines with anticholinergic effects at the point of care, including when and how:             <ul style="list-style-type: none"> <li>○ to start pharmacotherapy</li> <li>○ to not start (or delay starting) medicines (eg, psychological therapy for anxiety and depression)</li> <li>○ to stop medicines and deprescribe.</li> </ul> </li> </ul>
<p><b>NSW Therapeutic Advisory Group (TAG)</b></p> <p><u>Deprescribing tools</u></p>	<ul style="list-style-type: none"> <li>▶ Provides guidance for medical practitioners for a wide range of classes of medicines including;             <ul style="list-style-type: none"> <li>○ Psychotropics; benzodiazepines and Z Drugs (eg zopiclone, zolpidem), antipsychotics for behavioural and psychological symptoms of dementia, Selective Serotonin Reuptake Inhibitors (SSRIs) and Serotonin Noradrenaline Reuptake Inhibitors (SNRIs) and tricyclic antidepressants</li> <li>○ Anticholinergic drugs for Parkinsonism</li> <li>○ Anticholinergic drugs for Urinary Incontinence (Antimuscarinics)</li> <li>○ Allergy and Anaphylaxis Drugs; sedating antihistamines</li> <li>○ Regular Long Term Opioid Analgesic Use in Older Adults.</li> </ul> </li> </ul>

## Theme 1 – Clinical practice and quality of care

<p><b>Primary Health Network (PHN) Tasmania</b> <a href="#">Managing Medicines programme</a></p>	<p>▶ Includes a range of tools and guidelines for minimising polypharmacy and improving patient outcomes for deprescribing for the following medicines.</p> <ul style="list-style-type: none"> <li>◦ allopurinol</li> <li>◦ antipsychotics</li> <li>◦ benzodiazepines</li> <li>◦ cholinesterase inhibitors</li> <li>◦ NSAIDs</li> <li>◦ Opioids.</li> </ul>
<p><b>Health Pathways</b></p>	<p>▶ Offers medical practitioners locally agreed information to inform decision-making process at the point of care, including a range of tools and links to resources about medicines management and deprescribing.</p>
<p><b>North Western Melbourne Primary Health Network</b> <a href="#">Quality use of medicines</a></p>	<p>▶ Provides a range of information, tools and links about medicines management.</p>
<p><b>South East Melbourne Primary Health Network</b> <a href="#">Deprescribing</a></p>	<p>▶ Provides a range of information, tools and links about deprescribing.</p>
<p><b>Health Victoria</b> <b>Australian Centre for Evidence Based Care (ACEBAC) LaTrobe University</b> <a href="#">Standardised Care Process (SCP) for polypharmacy</a></p>	<p>▶ Promotes evidence-based practice to the management of medicines for older people who live in residential care settings to minimise the risks associated with polypharmacy.</p>
<p><b>NSW Government Health Education and Training Institute</b> <a href="#">Polypharmacy in older inpatients – eLearning module</a></p>	<p>▶ Online course designed for health professionals involved in care of older inpatients, with the following learning outcomes:</p> <ul style="list-style-type: none"> <li>◦ identify the importance of reviewing polypharmacy in older inpatients</li> <li>◦ define your role, as part of the interdisciplinary team, in reviewing polypharmacy in older inpatients</li> <li>◦ list the tools that support assessment of polypharmacy; and</li> <li>◦ find available protocols and resources for deprescribing.</li> </ul>
<p><b>Dementia Training Australia</b> <a href="#">Too much of a good thing: fundamentals of deprescribing</a></p>	<p>▶ Online course for health professionals about maximising benefit and minimising harms when deprescribing for older people with dementia.</p>
<p><b>Australian Commission on Safety and Quality in Health Care (ACSQHC)</b> <a href="#">Response to the 3rd Global Patient Safety Challenge – Medication without Harm by the World Health Organization</a></p>	<p>▶ Includes polypharmacy as one of the key action areas.</p>
<p><a href="#">National Safety and Quality Primary Health Care Standards – Public consultation</a></p>	<p>▶ A consultation document to help inform the development of the National Safety and Quality Primary Healthcare (NSQPH) Standards.</p>

## Theme 1 – Clinical practice and quality of care

<p><a href="#">Review of national quality use of medicines publications</a></p>	<p>▶ The QUM and medicines safety landscape has evolved since these guiding principles were originally published. The review and update of these documents will consider contemporary QUM and medicines safety literature. Stakeholder feedback on common areas will be reflected across all three national QUM publications.</p>
<p><a href="#">Guiding principles to achieve continuity in medication management</a></p>	<p>▶ A literature review and environmental scan is underway to guide the consultation process. A comprehensive range of stakeholders will be engaged to provide advice on the guiding principles to achieve continuity in medication management.</p>
<p><b>Choosing Wisely Australia</b> <a href="#">Hospital implementation toolkit</a></p>	<p>▶ A toolkit for enabling behaviour changes in hospitals in areas such as addressing unnecessary tests, treatments and procedures.</p> <p>▶ Provides best-practice information, tools and templates on governance, change management, communications, design, evaluation and intervention needs.</p>
<p><b>Pharmaceutical Society of Australia</b></p> <p><a href="#">Medication management guidelines</a></p> <p><a href="#">Quality use of medicines (QUM) guidelines</a></p> <p><a href="#">Psychotropic medicines and QUM services</a></p> <p><a href="#">Providing a Quality Use of Medicines (QUM) service</a></p> <p><a href="#">Antimicrobial stewardship and the QUM service</a></p> <p><a href="#">Fact sheet for RMMR and QUM services</a></p>	<p>▶ Two sets of guidelines developed in partnership with the Australian Government Department of Health: Guidelines for Comprehensive Medication Management Reviews and Guidelines for Quality Use of Medicines (QUM) services in RACFs.</p> <p>▶ Guidelines developed for pharmacists providing QUM services to RACFs.</p> <p>▶ Online module for pharmacists to implement a QUM service that improves the use of psychotropic medicines in RACFs.</p> <p>▶ Online module for pharmacists provides an introduction to QUM services delivered by pharmacists to RACFs.</p> <p>▶ Online module for pharmacists to implement a QUM service that improves antimicrobial use in RACFs.</p> <p>▶ Factsheet for pharmacists presenting information about medicine safety in aged care and their role in providing QUM services.</p>

## Theme 2 – Professional roles, interactions and relationships

<p><b>NSW Government Health Education and Training Institute</b></p> <p><a href="#">Polypharmacy in older inpatients – eLearning module</a></p>	<p>▶ Online course designed for health professionals involved in care of older inpatients, with the following learning outcomes:</p> <ul style="list-style-type: none"> <li>◊ identify the importance of reviewing polypharmacy in older inpatients</li> <li>◊ define your role, as part of the interdisciplinary team, in reviewing polypharmacy in older inpatients</li> <li>◊ list the tools that support assessment of polypharmacy</li> <li>◊ find available protocols and resources for deprescribing.</li> </ul>
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### Theme 3 – Consumer focus

#### NSW Therapeutic Advisory Group (TAG)

[Deprescribing consumer information leaflets](#)

- ▶ Includes guidance on benzodiazepines and antipsychotics.

#### Older Persons Advocacy Network (OPAN)

[Medication: It's your choice](#)

- ▶ Includes a 6-minute video, booklet, brochure and webinars providing information that aims to enable older aged people to have an informed and active role in decisions about what medications they take.

### Theme 4 – Capability and competence of health professional to deliver quality care

#### Queensland Health

[Medication review or polypharmacy – referral criteria for GPs](#)

- ▶ Service provided based on clinical criteria and seen within 30 or 90 days.

### Theme 5 – Capacity of staff and systems

None identified

### Theme 6 – Information management

None identified

### Theme 7 – Funding, remuneration, costs

#### Australian Government Department of Health.

[7th Community Pharmacy Agreement \(7CPA\)](#)

- ▶ An agreement on funding of services performed by accredited pharmacists between the:
  - Commonwealth Government
  - Pharmacy Guild of Australia
  - Pharmaceutical Society of Australia (PSA).

#### Society of Hospital Pharmacists of Australia (SHPA)

[Hospital-initiated medication reviews framework](#)

- ▶ Supports the identification and referral by hospital-based medical practitioners of high-risk patients to medication reviews.



# FURTHER ACTION TO REDUCE ANTICHOLINERGIC BURDEN

Beyond the programs, interventions and activities outlined in previous sections, further action is required to meet the goal of achieving better health care and outcomes for Australians aged 65 and over by reducing anticholinergic burden.

Some examples of interventions are provided below, grouped in seven themes.<sup>13,17</sup>

Consumer, government and health professional stakeholders can see these examples as options to work on:

- ▶ as individual organisations and
- ▶ in collaboration as a collective of organisations.

Experience suggests that it is not always feasible to implement all interventions identified in the common agenda. On the contrary, it is important to pursue a portfolio of interventions that offer a combination of easy but substantive short-term gains to sustain early momentum for continuous improvements in the local context, and the arrival of new insights and priorities.

As such, the examples of interventions outlined below are denoted a classification for their development and implementation timeline. Focusing on interventions which can be implemented in the short term is key for initiating and gaining momentum for further action, while work continues with other interventions that require medium- or long-term development and implementation.

## Theme 1 – Clinical practice and quality of care

### National guidelines

There is a need for more guidance/guidelines to support health professionals to:

- ▶ assess, review and manage anticholinergic burden
- ▶ determine options that will reduce anticholinergic burden
- ▶ deprescribe medicines for older people.

The main challenge for their development is finding agreement between stakeholders on the definition of anticholinergic burden, which medicines have anticholinergic effects and their degree of effect and the place of measurement scales and risk assessment tools in clinical practice.

### Medium-term development and implementation.

### Development of national quality indicators for MMR services

Development of national quality indicators for MMR services is an important aspect to optimise the quality of the service. This will also facilitate more robust research into the impact and outcomes of the service both in the community and in aged-care settings.

### Long-term development and implementation.

## Theme 2 – Professional roles, interactions and relationships

### Integrating pharmacists in RACFs and general practices

Over the past few years, the role of pharmacists has been expanded with successful pilots of pharmacists working in general practices. There is also mounting evidence for pharmacist-led interventions in RACFs improving quality use of evidence.

Integrating pharmacists in general practices and RACFs can be a sustainable intervention to improve medication management at a system level. This strategy would also support the increased demand on pharmacy services and would assist with relieving capacity and time barriers in these settings. This will also help promote greater interdisciplinary collaboration and improve medication management.

It should be noted that successful adoption of these models more widely requires a refined and structured framework to facilitate the advanced scope of practice through training and a formalised approach to skills development.

**Long-term development and implementation.**

### Small scale interventions in acute care settings

Interventions can be developed that support and facilitate the implementation of hospital-based pilots leveraging the [Choosing Wisely Hospital implementation toolkit](#). These pilots can be led by hospital staff (eg medical practitioners, nurses and hospital pharmacists) and can utilise and adapt existing relevant resources (eg consumer factsheets and deprescribing tools). The pilots may also extend to outreach services provided by hospitals to optimise continuity of care for people transitioning between different settings.

**Medium-term development and implementation.**

### Awareness campaign for health professionals

Increasing awareness of existing medication management services (eg, HMRs, RMMRs, MedChecks) and ways to integrate these services into clinical practice among health professionals (eg, relevant specialists in the community) who are likely to prescribe medicines with anticholinergic effects.

**Medium-term development and implementation.**

## Theme 3 – Consumer focus

### Direct-to-consumer campaigns

The research and design phase of the *Anticholinergic burden: the unintended consequences for older people* program identified a clear consumer health literacy gap as it relates to use of medicines with anticholinergic effects. This could be addressed through multi-faceted direct-to-consumer campaigns to:

- ▶ raise awareness of anticholinergic adverse effects and medication management services
- ▶ raise awareness about informed consent and privacy rights and build consumer confidence in asking questions about care being provided and seeking alternative management options
- ▶ address misconceptions about deprescribing and long-term use of medicines
- ▶ raise awareness about existing medication management services and ways to access these.

The campaigns can include tailored language, messaging and resources such as factsheets targeted to specific groups such as:

- ▶ people with disability
- ▶ CALD communities
- ▶ Aboriginal and Torres Strait Islander peoples
- ▶ carers
- ▶ authorised representatives/substitute decision makers, who may be a carer, family member, legal guardian or someone with enduring power of attorney

The campaigns can leverage and promote existing consumer resources, content and messaging.

**Short-, medium- and long-term development and implementation.**

## Theme 4 – Capability and competence

### Training structure for RACF staff

There is a need for structured education, training and capacity-building models for aged-care staff (both health professional and non-health professionals) and for staff to be supported.

**Long-term development and implementation.**

## Theme 5 – Capacity of staff and systems

### Workforce utilisation

Establishment of working group of organisations with an interest in medication management services to provide review and development of policy/strategy to address workforce shortage in rural and remote communities, and strategies for maximising existing workforce.

**Medium- and long-term development and implementation.**

## Theme 6 – Knowledge and information management

### Integration of anticholinergic burden assessment (decision support) tools as decision support aids into CIS

Timely access to evidence-based drug burden assessment (decision support) tools is essential to optimising medication management pathways. One of the main barriers with currently available assessment tools is the administrative burden of data input. Integrating assessment tools into the CIS can facilitate early identification and detection of at-risk patients and ultimately enhance care of these patients.

**Medium-term development and implementation.**

### National implementation of electronic medication management in RACFs

Implementing a unified electronic medication management (EMM) system with decision support tools can help address current barriers to record keeping and medication reconciliation at RACFs. It is critical that any EMM implementation uses a consistent and standardised system that is compatible with the CIS used in general practice.

**Long-term development and implementation.**

## Theme 7 – Funding, reimbursement, costs

### Models for MACs

Optimising medication management in RACFs requires a robust clinical governance process that draws on existing mechanisms and workflows. There is a clear need for more integrated interdisciplinary teams operating within RACFs to implement patient-centred medication management outcomes. MACs are multidisciplinary committees that can play an integral role in providing clinical governance and oversight of medication management and quality improvement activities at facilities.

Introducing an appropriate model that supports the establishment and empowerment of the multidisciplinary committees is key to optimising the role of MACs and successful adoption of this more integrated clinical governance model.

### **Long-term development and implementation.**

# APPENDIX 1 – NPS MEDICINEWISE ANTICHOLINERGIC BURDEN PROGRAM

## Program development

NPS MedicineWise developed the *Anticholinergic burden: the unintended consequences for older people* program, which is being delivered from October 2021 to June 2022, following its six-stage process. See [Figure 6](#).

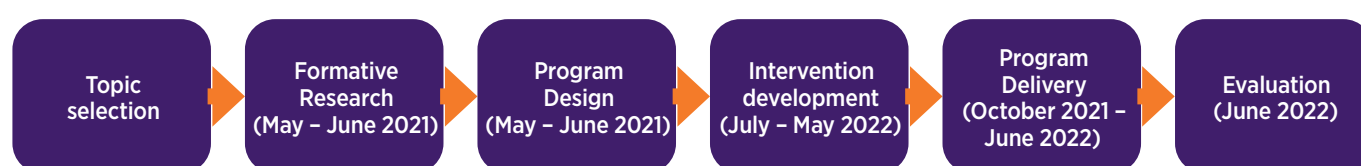


Figure 6: NPS MedicineWise standard process for QUM program development

## Topic selection

NPS MedicineWise regularly conducts a comprehensive and systematic assessment of the health and policy environment to identify areas of need regarding quality use of medicines (QUM).

QUM is defined as wisely selecting management options including medicines, choosing suitable medicines if a medicine is considered necessary, and using medicines safely and effectively.<sup>94</sup>

The goal of this assessment is to inform the selection of topics for its QUM programs and activities, which are funded through the Australian Government Department of Health Quality Use of Diagnostics, Therapeutics and Pathology Program Grant.

The topic selection process rigorously considers the needs of consumers and health professionals through extensive stakeholder feedback, advisory group feedback, insights from qualitative interviews conducted as part of previous programs and a review of the published and grey medical literature.

The process also considers the release of new guidelines, publications, external activities, as well as the ability of a proposed behavioural change program to deliver significant benefit in response to identified unmet needs within the possible parameters, for example, a required timeframe.

Potential topics are then identified and prioritised for selection based on their relevance, importance, opportunity and value for improving health outcomes for Australians.

In early 2021 a topic focused on reducing anticholinergic burden in Australians aged over 65 years was selected as a priority because:

- ▶ anticholinergic burden has a significant negative impact on the health of older people
- ▶ medicines-related issues were highlighted by the Royal Commission into Aged Care Quality and Safety
- ▶ NPS MedicineWise is able to build on a previous QUM program that were implemented in residential aged-care facilities (RACFs) focusing on [dementia and psychotropics medicines](#)
- ▶ reducing anticholinergic burden crosses multiple settings and conditions, increasing opportunities for partnership with stakeholders.

## Formative research

The formative research stage aims to gain an in-depth understanding of the QUM issue and identify the key clinical and behavioural change barriers for the topic that has been selected.

Beginning in May 2021, this involved a rigorous, systematic process drawing information from an assessment of anticholinergic burden QUM gaps and undertaking targeted research to provide sufficient understanding of potential issues and how these can be addressed.

The process was conducted iteratively based on prioritisation of research questions by the program team and in view of feedback from stakeholders, including:

- ▶ **Targeted medical literature review and data analysis** to identify key Australian studies, and relevant international systematic reviews, highlighting QUM barriers and drivers of behaviour change within the identified priority areas including use of medicines with anticholinergic effects, medication management reviews (MMRs) – home medicine reviews (HMRs) and residential medication management reviews (RMMRs) – and deprescribing.
- ▶ **Environmental scan** to identify relevant tools, resources and initiatives published by stakeholders that focus on the identified priority areas.
- ▶ **Key informant interviews** to explore experiences, knowledge, attitudes, behaviours, high-level gaps, barriers and opportunities relating to medicines in general, anticholinergic burden and the healthcare system with health professionals (seven GPs, eight pharmacists and three nurses, in concordance with a current Royal Australian College of General Practitioners [RACGP] National Research and Evaluation Ethics Committee program ethics approval [Application ID: RG02310]), consumers (recruited by the Council on the Ageing) and KOLs.

## Program design

The program design stage aims to scope and develop the goal and outcomes, and to identify barriers to behavioural change and interventions that act as drivers of behavioural change.

Program design began in May 2021 and ran concurrently with formative research, with each stage guiding further reviews of the medical literature, environmental scanning, consultation with stakeholders, collaboration with experts on the topic and interviews with stakeholders, health professionals and consumers.

Significant consultation, collaboration and input was sought from stakeholders, health professionals and consumers (some of which were involved in the topic selection stage) including:

- ▶ Consumer organisations
  - Council on the Ageing (COTA)
  - Carers Australia
  - Consumers Health Forum (CHF)
  - Federation of Ethnic Communities Councils of Australia (FECCA)
  - Older Persons Advocacy Network (OPAN)
  - The National Aboriginal Community Controlled Health Organisation (NACCHO)
- ▶ Government bodies
  - Australian Government Department of Health
  - Australian Government Department of Health Pharmacy Branch
  - Australian Commission on Safety and Quality in Healthcare (ACSQHC)
  - Aged Care Quality and Safety Commission
  - Department of Veterans' Affairs (Veterans' MATES)
  - New South Wales Therapeutic Advisory Group (NSW TAG)

- ▶ Health professional organisations
  - Australian Association of Consultant Pharmacy (AAPC)
  - Australian College of Rural and Remote Medicine (ACRRM)
  - Pharmaceutical Society of Australia (PSA)
  - Pharmacy Guild of Australia (The Guild)
  - Primary Health Networks (PHNs)
  - Royal Australian College of General Practitioners (RACGP)
  - Royal Australasian College of Physicians (RACP)
  - Society of Hospital Pharmacists of Australia (SHPA)
  - The Council of Australian Therapeutic Advisory Group (CATAG).

A Stakeholder Reference Group was established to inform the strategic direction of the *Anticholinergic burden: the unintended consequences for older people* program.

## Advice provided by an Expert Working Group

An Expert Working Group (EWG) was established by NPS MedicineWise to provide advice to inform the research, environmental scan, and design and development of the program's interventions.

The group consisted of individuals with relevant experience in the topic, including:

- ▶ consumer representatives
- ▶ health professionals (GPs, experts, a researcher, a registered nurse and an accredited pharmacist).

## Behaviour change analysis

Overall, the program design process utilised evidence-based implementation frameworks to assess and frame which factors influence a target behaviour within QUM programs including:<sup>13,14,15,16</sup>

Theoretical Domains Framework (TDF) to inform the assessment of behavioural drivers (ie, barriers and enablers).

- ▶ Behaviour Change Techniques (BCTs) to inform the construction of interventions that will address key barriers.

The design approach to identifying audience barriers to changing behaviours was predominantly informed by the TDF. This framework is a structured and comprehensive way to identify the barriers and enablers from the perspective of consumers and health professionals.

As identified from the findings of the literature review, qualitative and quantitative research analysis, the themes for each audience were mapped to the domains of the TDF (eg, knowledge, skills, environmental context and resources, beliefs about capabilities, beliefs about consequences, social/professional role). These domains describe the 'barriers' to change.

Once the barriers to change were identified using the TDF, appropriate BCTs were mapped to the specific issues experienced. The BCT model distils the thousands of psychological change techniques down to a usable list that are suggested to be relevant specifically to medical practitioners and consumer healthcare change.

## Design outcomes

At the conclusion of the design phase, the program scope, focus, key audience, objectives and interventions were confirmed.

The program's title is *Anticholinergic burden: the unintended consequences for older people*.

Its goal is to promote the efficacious and safe use of medicines that contribute to anticholinergic burden and improve health outcomes for people over 65 years across primary care, RACFs and at transitions of care.

The intended outcomes include:

- ▶ increased health professional knowledge of medicines with anticholinergic effects and how to individualise the approach to reducing the anticholinergic burden that is aligned to consumer goals
- ▶ increased level of consumer health literacy related to QUM, including potential benefits and harms
- ▶ increased use of medication safety tools which impact the safe use of medicines with anticholinergic effects
- ▶ reduced inappropriate use of medicines with anticholinergic effects
- ▶ reduced medicine-related harm in older people
- ▶ reduced medicine-related hospital admissions.

The proposed interventions to achieve the behaviour changes to meet the program goal included educational outreach for health professionals through to consumer resources such as a patient decision aid and factsheet See [Table 2](#) for full details.

## Intervention development

The development of interventions for the *Anticholinergic burden: the unintended consequences for older people* program started in July 2021.

It involved a team including medical writers, a GP medical advisor, pharmacist clinical advisor, editor and data analysts utilising agile methodologies. The areas of work included:

- ▶ **Further research and environmental scan:** this added to the earlier research and environmental scan conducted during Formative Research and Design.
- ▶ **Consultation and collaboration with stakeholders and experts:** these included reviews of content developed for the interventions.
- ▶ **User testing:** end users of the interventions, including GPs, pharmacists, nurses and consumers, were given an opportunity to use and give feedback on interventions during content development, which helped guide the changes and improvements that were made to the interventions.



# APPENDIX 2 – EXAMPLES OF INTERNATIONAL PROGRAMS AND RESOURCES

Some of the current and upcoming actions overseas, including programs and development of resources, have been identified by NPS MedicineWise following an environmental scan, consultation with stakeholders and interviews with KOLs, including:

- ▶ **[Deprescribing.org](#)**: a Canada-based organisation with information and resources about deprescribing medicines.
- ▶ **[iSIMPATY](#)** (Implementing Stimulating Innovation in the Management of Polypharmacy and Adherence Through the Years) is a 3-year EU-funded project in Scotland, Northern Ireland and parts of the Republic of Ireland. Project to train healthcare professionals to deliver 15,000 medication reviews by the end of September 2022.
- ▶ Polypharmacy and deprescribing – on-demand online course for pharmacists by the Pharmaceutical Society of New Zealand (members-only access).
- ▶ **[Deprescribing guidelines and algorithms](#)** by the Bruyère Research Institute, Canada. Developed for five classes of medications and include a decision support algorithm, infographic, patient pamphlet and a whiteboard video.
- ▶ **[iAM](#)** medical guidelines app developed by the Information Technology Primary Care Research Group (ITPCRG).
- ▶ **[Polypharmacy manage medicines app](#)** by NHS Scotland provides toolkits for healthcare professionals and patients and carers.
- ▶ **[How to stop medicines programme – medication safety projects – Appropriate prescribing toolkit](#)** by the Health Quality and Safety Commission New Zealand.
- ▶ **[Deprescribing in Ontario long-term care](#)** by Deprescribing.org which includes resources created for residents in RACFs, families, caregivers and healthcare professionals to enable the adoption of behaviours that help with deprescribing.
- ▶ **[Polypharmacy Medicines Review](#)** leaflet by NHS Scotland which includes information leaflet for patients detailing questions to ask.
- ▶ **[Anticholinergic side-effects and prescribing guidance](#)** developed by NHS West Essex for medical practitioners.
- ▶ **[More harm than good: Why more isn't always better with older people's medicines](#)** developed by Age UK is a policy paper about polypharmacy including anticholinergic burden.

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