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REVIEW ARTICLE

Approaches to Deprescribing Psychotropic Medications for Changed Behaviours in Long-Term Care Residents Living with Dementia

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Abstract

Psychotropic medications have a high risk of serious adverse events and small effect size for changed behaviours for people with dementia. Non-pharmacological approaches are recommended as first-line treatment for changed behaviours, yet psychotropic medications remain highly prevalent in long-term aged care settings. This narrative review describes the current evidence regarding deprescribing psychotropic medications for people with dementia in long-term care. Deprescribing psychotropic medications can be achieved without harm to the person with dementia, and most people experience no withdrawal symptoms. Interventions to deprescribe psychotropic medications should be multifactorial, including lowering the dose of the medication over time, educational interventions and psychological support. However, implementing this is a significant challenge due to the overreliance on psychotropic medications for behavioural management in long-term aged care. Facilitators to deprescribing psychotropic medications in long-term care include multidisciplinary teams with adequate training, education and managerial support, engaging residents and families and change 'champions'. Deprescribing practices should be person-centred, and an individualised deprescribing protocol should be in place, followed by careful monitoring of the individual. The person with dementia and their family, general practitioner, pharmacist, and allied health and direct care staff should all be involved throughout the deprescribing process. Direct care staff need adequate support, education and training, so they can effectively help the individual and implement person-centred approaches in the absence of psychotropic medications. Effective communication between residents and staff and amongst staff is consistently shown to be an important factor for deciding whether deprescribing of a medication should occur and the successful implementation of deprescribing psychotropic medications.

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Key Points

Psychotropic medications are frequently prescribed in long-term care for changed behaviours in people living with dementia, despite recommendations stating that non-pharmacological interventions should be used where possible.

Interventions have shown that deprescribing psychotropic medications in long-term care is feasible, with the majority of people experiencing no withdrawal symptoms.

Deprescribing regular psychotropic medications should be gradual and should actively involve the residents, their family members and a multidisciplinary team to personalise a deprescribing protocol and monitor the progress of the individual.

1 Introduction

Changed behaviours exhibited by people with dementia living in long-term care are often referred to as behavioural and psychological symptoms of dementia (BPSD), but dementia pathology is rarely the only underlying cause. Behaviours (e.g. agitation, depression) are often triggered by unmet needs that cause pain or distress, rather than dementia pathology [1]. International guidelines recommend non-pharmacological approaches for changed behaviours as first-line treatments, and pharmacological approaches should be only considered when non-pharmacological approaches fail or when the behaviour is severe and the person with dementia is at risk of harm to himself/herself or others [2–5]. Non-pharmacological approaches can offer a similar level of efficacy to pharmacological treatments, but without adverse side effects [6]. Despite these recommendations, psychotropic medication use remains high among people with dementia living in long-term aged care settings [7].

Deprescribing is the process of rational supervised withdrawal of medication for which the risk currently outweighs the benefit to the individual. Psychotropic medications, including antipsychotics, can be deprescribed without harm to the person with dementia and usually without relapse of symptoms if a person-centred care approach is established [8]. However, this is a clinical challenge given the overreliance on these medications for management of changed behaviours in people with dementia in long-term care settings [7], widespread misunderstanding about their use among staff [9] and prescribing physicians [10], and the serious impact of behaviour change on resident and staff wellbeing [11–13].

This article is not an exhaustive review of the vast literature on this topic. The aim of this review is to provide an overview of the evidence to inform practical approaches for deprescribing psychotropic medications for people living with dementia in long-term aged care settings, with a focus on strategies clinicians can apply to overcome the barriers to these approaches.

This review was informed by literature searches of PubMed and Google Scholar conducted in March 2018 using different combinations and variations of the keywords psychotropic*, antipsychotic*, antidepressant*, anxiolytic*, benzodiazepine*, hypnotic*, sedative*, deprescribing, withdrawal, nursing homes, residential aged care, behavioural/behavioral and psychological symptoms of dementia and linking terms using standard Boolean operators (AND/OR). The searches were limited from the year 2000 and to articles published in English. Further relevant articles were identified from reference lists and from clinical discussions.

2 Psychotropic Use for People with Dementia Living in Long-Term Aged Care

Behaviour change is highly prevalent among people with dementia living in long-term care, especially apathy (49%), depression (42%), agitation/aggression (40%), anxiety (39%), and sleep disorders (39%) [14]. There is some evidence to support the use of psychotropic medications to treat some of these symptoms, but the effect size is small and similar to that of non-pharmacological interventions [6]. Some expert consensus guidelines state that selective-serotonin reuptake inhibitors (SSRIs) (particularly citalopram) may be appropriate for agitation for people with dementia [2]. The evidence of efficacy for SSRIs for treating depression in people with dementia has been mixed [17], with two large trials reporting negative findings [18, 19]. Atypical antipsychotics (particularly risperidone and olanzapine) and memantine (an *N*-methyl-D-aspartate antagonist) have small-modest effects for severe agitation and aggression [20, 21]. The recent international Delphi consensus for management of changed behaviours for people with Alzheimer's disease prioritised citalopram and a stepped protocol for analgesics ahead of antipsychotics if pharmacological approaches are needed after assessment and identification of underlying causes [22]. Benzodiazepines may be useful for short-term treatment of acute anxiety [23].

Some pharmacological treatments for behaviour change (particularly antipsychotics) are increasingly recommended against because of the risks associated with their use and availability of safer alternatives. Antipsychotic use is associated

with an increased risk of all-cause mortality in people with dementia [24, 25] and is estimated to contribute to 1800 deaths in the UK each year [20]. Several meta-analyses have demonstrated an increased risk for cerebrovascular effects, including stroke, extra-pyramidal side effects, somnolence, and gait abnormality [26]. Antipsychotic medications do not improve (and may worsen) function or quality of life [27]. Sustained use of benzodiazepines is associated with sedation, dizziness, falls, worsening cognition, respiratory depression, and paradoxical disinhibition [23], and there is little evidence for their efficacy in managing behaviour change [28]. Cognitive and cardiovascular adverse effects of citalopram should be considered before clinical use [15, 16]. Mood stabilisers have limited efficacy and may worsen behaviour symptoms [29].

3 Non-pharmacological Approaches for People with Dementia in Long-Term Aged Care

As the evidence base for non-pharmacological approaches for changed behaviours has been discussed in detail in previous systematic reviews [6, 39, 40], only a brief overview is provided here for context.

Non-pharmacological approaches to changed behaviours should be meaningful and tailored to the individual, using a person-centred approach [22, 41, 42]. Person-centred approaches are known to improve outcomes such as reduced agitation for the residents [43]; how care staff engage with residents to support shared decision making is critical [42]. Certain therapies and interventions will be more favourable for different people, depending on their personal enjoyment of the activities and subsequent willingness to participate, and it is likely such approaches will be better received by residents if they have been involved in the decision-making process about their care [39].

Some evidence exists to support the use of functional analysis-based interventions to treat changed behaviours in long-term care, whereby those involved in the care of a person with dementia actively seek an understanding of the meaning of the person's behaviour [44]. Evidence-based behaviour frameworks such as the Describe, Investigate, Create, Evaluate (DICE) approach or the Antecedent, Behaviour and Consequence (ABC) approach have been developed to help clinicians to assess the changed behaviours people with dementia experience and to guide subsequent person-centred interventions [45, 46].

Music therapy is a promising non-pharmacological approach for overall changed behaviours for people with dementia [22]; it can reduce depression and may improve emotional wellbeing, quality of life and reduce anxiety and mild-moderate agitation [40, 47–49]. Receptive music therapy (listening to preferred music in a quiet place) is more effective than interactive music therapy (singing or playing musical instruments with a music therapist or trained professional) for reducing agitation [50].

Psychological treatments (such as cognitive behavioural therapy, interpersonal therapy, counselling or multi-component interventions centred on psychological therapy) have small-to-moderate effect sizes for reducing depressive symptoms and anxiety for people with dementia [51]. However, the quality of evidence for psychological therapy is low-moderate overall, and further research is required [51]. Individual reminiscence therapy for long-term care residents is associated with improvements in mood [52]. Evidence is inconsistent about the benefits of other non-pharmacological therapies such as aromatherapy [53], exercise [54, 55], and animal-assisted therapy (pet therapy) for changed behaviours [56]. Person-centred care and novel strategies such as humour therapy have been shown to reduce agitation significantly in high-quality cluster randomised controlled trials [57–59]. Adaptations to the long-term care environment have also been recognised as promising approaches for changed behaviours for people with dementia [22]. Lower rates of psychotropic medications have been reported in Dutch small-scale homes and Australian clustered domestic homes compared to more traditional care [60, 61].

4 Approaches to Deprescribing Psychotropic Medications in Long-Term Aged Care

4.1 Guidelines and Recommendations

Clinical guidelines in Canada [4], the United States [5], the UK [3], Australia [2] and elsewhere recommend that psychotropic treatments should only be trialled after non-pharmacological therapies have failed for a specific indication (e.g. distressing delusions), and where the behaviour is severe and high risk to the individual or others around them. Antipsychotic medications should be prescribed at the lowest effective dose for the shortest time required and regularly reviewed. Nonetheless, psychotropic medications are routinely prescribed to long-term care residents with dementia. Approximately 60% are prescribed one or more psychotropic medications at any given time [7, 30, 31], most commonly anti-depressants (46% in the USA, 41% in Australia, and 40% in the UK), antipsychotics (29% in the USA, 22% in Australia, and 27% in the UK), and benzodiazepines (13% in the USA, 22% in Australia, and 15% in the UK) [7, 32–35]. Psychotropic polypharmacy is commonplace [36] despite very limited evidence of efficacy for combinations and the risk of cumulative toxicity from multiple drugs with sedative, anticholinergic and serotonergic effects. The extent

to which these prescriptions are inappropriate (i.e. off-label and/or contrary to guidelines for use) can be difficult to identify because indications and guidance vary internationally, but use of antipsychotics and benzodiazepines well in excess of the recommended duration [28, 37] and to treat non-indicated behaviour changes has been reported [30, 33, 38].

Deprescribing inappropriate psychotropic medications in long-term care residents with dementia is an area of clinical need, but is challenging in practice. The development of regulations to limit the amount of antipsychotics in long-term care is not new. In the USA in 1987, federal legislation was designed to reduce unnecessary use of psychotropic medications as part of the *Federal Nursing Home Reform Act* [or *Omnibus Budget Reconciliation Act* (OBRA '87)], and interpretive guidelines to fulfil the OBRA requirements were implemented in 1990 [62, 63]. Compliance with the regulations outlined in the OBRA has been shown to be good for more specific regulations (e.g. documenting target symptoms), but further interventions are needed to improve monitoring adverse effects and efficacy of medications and increase the use of non-pharmacological interventions [64]. Comparisons with other countries without such regulations suggest this policy has reduced the likelihood of being prescribed an antipsychotic or antianxiety/hypnotic medication in long-term care [65]. However, research has also shown variation in antipsychotic prescribing rates in the USA despite the regulations and may be influenced by the 'prescribing culture' of the particular aged care home [33, 66]. In Australia, risperidone is the only antipsychotic approved by the Therapeutic Goods Administration (TGA) for changed behaviours in dementia. Risperidone was previously indicated for the treatment of changed behaviours (referred to as behavioural disturbances) in dementia without strict limitations. Since 2015, restrictions have stated that for changed behaviours for people with dementia, risperidone is only to be used for moderate-to-severe dementia of the Alzheimer type for "up to 12 weeks of psychotic symptoms or persistent agitation or aggression unresponsive to non-pharmacological approaches" [67].

Further large-scale policy initiatives used to curb inappropriate prescribing of psychotropic medications include black-box warnings in the USA. Black-box warnings on atypical antipsychotic medications were introduced in 2005, with warnings of the increased risk of cerebrovascular events and death [68]. There is some evidence that these warnings may have contributed to a reduction in the use of atypical antipsychotics in long-term care, but it is not clear if this resulted in other psychotropic medications being substituted for antipsychotics or increases in diagnoses such as bipolar or schizophrenia in the older population to legitimise the prescribing [68]. In older people living with dementia living in the community, black-box warnings appeared to have no significant effect on atypical antipsychotic medication use, and the use of benzodiazepines and anti-dementia medications increased during this time [69]. Similar warnings were made in 2009 in the UK [20], and associated recommendations for use were incorporated as guidelines in a National Dementia Strategy. This made no difference to prescribing rates over the following 4 years [70].

Medication management reviews by doctors and pharmacists are recommended to regulate the quality of prescribing in long-term care in countries such as Australia (Residential Medication Management Reviews), the USA (Medication/Drug Regimen Review) [71] and the UK (Medication Reviews) [72]. The recommended frequency of medication reviews differs between countries (e.g. "monthly" in the USA [73], "interval between medication reviews should be no more than 1 year, and many residents will need more frequent medication reviews" and for new residents "as soon as possible after admission" in the UK [72], and on a "clinical needs basis" in Australia [74]). Pharmacists are usually involved in medication reviews, either alone or as part of a multidisciplinary team [75]. In the UK, medication reviews were traditionally conducted by general practitioners (GPs), but more recently, a programme to have pharmacy teams (pharmacists and pharmacy technicians) work with care staff, residents and families as a strategy to optimise medication prescribing in long-term aged care homes has been implemented [76]. A review is intended to identify any contraindicated medication use or inappropriate polypharmacy and suggest solutions in a written report to a primary care physician. Pharmacist-led medication reviews in long-term care have been shown to reduce anticholinergic and sedative medication prescribing [77] and may improve the quality of prescribing [78]. Guidance for medication reviews in the UK specifically states that during medication reviews there should be a re-assessment of the "need for unlicensed medicines, for example antipsychotics used for the treatment of behavioural and psychological symptoms of dementia" [79]. However, the impact of medication reviews on prescribing and deprescribing of psychotropic medications is influenced by the culture of the aged care homes. While this is a 'tool for change' in some aged care homes, it can be reduced to a 'box-ticking exercise', where reports are given to the primary care physician and no further action is taken [80].

Regulations also exist in countries such as Australia to ensure that appropriate 'substitute consent' is obtained for medical treatment for people who lack capacity to provide informed consent. This is an important issue for people with dementia, as cognitive impairment associated with dementia may interfere with a person's capacity to provide consent, depending on the individual and the progression of dementia. Yet, there are poor rates of adherence to regulations to obtaining substitute consent for psychotropic medications for people with dementia in Australia who do not have capacity to give informed consent [81].

4.2 Evidence of the Benefits and Harms of Deprescribing Psychotropic Medications

Despite the potential harms of psychotropic medications and small effect sizes for changed behaviours, prescribing rates of psychotropics for people living with dementia in long-term care remain high. Even where regular antipsychotic medication use has declined, as required [pro re nata (prn)] antipsychotic and benzodiazepine use has increased [7]. This suggests these medicines are being used as substitutes for long-term antipsychotic use despite guidelines recommending non-pharmacological approaches as alternatives.

Concerns from residents and family members about the potential for withdrawal symptoms, exacerbation of behaviour changes, and negative impacts on quality of life and wellbeing upon the deprescribing of psychotropic medication are common, particularly in cases of long-term use [82]. A recent Cochrane review examining long-term antipsychotic medication use in older people with dementia concluded that deprescribing can be achieved without worsening behaviour, although the quality of the evidence was low [8]. A US study of 180 people with Alzheimer's disease identified a slightly increased risk of re-emergence of agitation and psychosis, but included people living at home and in assisted-living facilities where fewer non-pharmacological alternatives might be available [83].

Interventions to optimise prescribing in long-term care by examining the whole medication regimen suggest appropriateness of medications can be improved through multi-component interventions including pharmacist-led medication reviews, transfer of information and multidisciplinary case conferencing, but the long-term effects on resident outcomes are unclear [71]. A recent longitudinal study examining a multi-component antipsychotic deprescribing protocol in Australian long-term care settings indicated that antipsychotics can be withdrawn without an increase in changed behaviours or adverse outcomes or a significant increase of prn antipsychotic or benzodiazepine prescriptions [84]. This intervention included re-education and training of care staff (registered nurses, GPs and pharmacists involved in the supply of medications to care homes) and a personalised deprescribing protocol developed by pharmacists. An 81.7% reduction in regular antipsychotic use after 12 months was reported [84]. Effective communication between GPs, families and care staff coupled with managerial support in the long-term care facility and deprescribing nurse 'champions' who were empowered to lead the change process were shown to be crucial to help care staff apply a person-centred approach to changed behaviours [85]. A different longitudinal study of a multi-component intervention in Australian long-term care settings showed a cessation or reduction in antipsychotics or benzodiazepines for 39% of the residents over 6 months with no substitution for other psychotropic medications [86]. This intervention included education for staff to challenge beliefs that antipsychotics and benzodiazepines were effective for changed behaviours, training for champion nurses and psychotropic audits and feedback to prescribers [86].

Previous studies have shown staff training interventions alone may reduce antipsychotic use in long-term care by 19.1% [87], whereas interventions which actively involve a multidisciplinary team involved in the direct care of the individual may improve deprescribing success rates [88]. A randomised controlled trial in the Netherlands found that 6-monthly medication reviews by a multidisciplinary team (GP, pharmacist and nurse) can improve appropriate psychotropic prescribing in long-term care defined by the Appropriate Psychotropic drug use in Dementia (APID) score [89]. Withdrawing antipsychotics can also improve survival rates in long-term care residents [90]. The Australian guidelines for the use of antipsychotics in long-term care recommend that withdrawing antipsychotics should be considered when the individual has not experienced the targeted changed behaviours for a period of time, such as 3 months [91]. Deprescribing should happen gradually, with the support of a secondary care mental health team. The longer the medication has been prescribed for, the slower the withdrawal should be.

Benzodiazepine withdrawal is also feasible without affecting sleep quality or quality of life [92], though withdrawal rates vary according to the interventions and the population (reported rates 27–80%) [93]. As previously described, a multi-component intervention showed a reduction in benzodiazepine use in long-term care following deprescribing recommendations, education for staff, and implementation of 'champion' nurses. This intervention resulted in a 21% reduction in the proportion of residents regularly prescribed benzodiazepines [86]. Tapering benzodiazepine use in conjunction with cognitive behaviour therapy may enhance success rates and could be considered for individuals who are more resistant to withdrawal protocols, though this has not been examined specifically in long-term care. Cognitive behaviour therapy may improve some outcomes for people with mild dementia such as clinician-rated anxiety symptoms [51, 93–96]. Similarly to deprescribing antipsychotics, a personalised person-centred approach is recommended for benzodiazepines, with gradual withdrawal and continued monitoring from a multidisciplinary team [50].

Withdrawing antidepressants should also be considered in long-term care because of the high rate of use and risk of therapeutic substitution when withdrawing other psychotropic medications. There have been few studies conducted which have examined the potential benefits and harms of deprescribing antidepressants for people with dementia in long-term care, despite the potentially low efficacy reported for depression for people with dementia and potential

adverse effects [15, 16, 97]. Potential withdrawal symptoms may occur with any type of SSRI from treatment durations as short as 2 months [98]. One randomised controlled trial showed that withdrawing antidepressant medications for people with dementia in long-term care resulted in worsening of depressive symptom scores after 25 weeks. However, the authors questioned whether this change was clinically significant as most people who were withdrawn from antidepressants remained in the same subgroup for depression scale scores [99].

When withdrawing psychotropic medications, the person should be carefully monitored for recurrence of symptoms (such as depression after withdrawal of antidepressants) or other negative outcomes such as a reduction in quality of life or an increase in other changed behaviours. Non-pharmacological alternatives should be employed before and after cessation of the medication. If negative withdrawal symptoms occur and represcribing, abandoned deprescribing or prescribing of an alternative medication is considered necessary, monitoring should continue, and the medication should be reviewed at least 12 weekly. Discussions should continue with the person with dementia, staff, and family members about whether to attempt to withdraw the medications again. If the medication is reinstated, it should be restarted at the lowest effective dose that was established during weaning.

5 Facilitators and Barriers to Deprescribing Psychotropic Medications in Long-Term Aged Care

The facilitators and barriers to deprescribing have been previously reviewed [100, 101] although these may differ between people living in long-term care and people living in the community. Much of the research of facilitators and barriers to deprescribing has been conducted with GPs in primary care settings [102]. Fewer studies have investigated the views of other healthcare professionals, residents, and family members, and none has been specific to psychotropic medications. A summary of the most important facilitators and barriers to deprescribing is presented in Table 1.

It is often difficult for GPs, nurses and pharmacists to consider deprescribing psychotropic medications when residents are newly admitted, especially when insufficient information about treatment indication and longitudinal course are provided [82]. Residents and family members will not always be able to identify when and why a medication was prescribed. Further studies should examine a more efficient method of communicating medication histories about new residents to staff. Furthermore, initiation of psychotropic medications for residents of long-term aged care settings often occurs in hospital and outpatient settings, and communication of why the medication was prescribed, or what the outgoing plan is, does not always occur [103]. Frequent review of medications for residents in long-term care settings, including during transitions between hospital and long-term care, is critical to optimise prescribing of appropriate medications [104].

Table 1 Summary of the facilitators and barriers to deprescribing in long-term aged care

Facilitators	Barriers
Engaging residents and families to make an informed choice	Silos of care
Decision aids (e.g. education of risks of medications and explanation of alternative approaches)	Overreliance on psychotropic medications (prescribing culture)
Multidisciplinary teams	Insufficient resources and staff to facilitate use of alternative approaches
Sufficient education and training for multidisciplinary staff at all levels	Inadequate training of staff and/or inefficient skills mix of staff
Managerial support	Lack of managerial support. A culture of use of medications as first-line therapy
Mutually respectful communication	Medication reviews adopted by long-term aged care homes as a 'box ticking exercise'
Continuity of staff	
Change 'champions'	
Sufficient information provided to care team about why a medication was started for new residents	
Mandatory medication reviews fully supported by long-term aged care homes as a lever of change	
Regulations about use of psychotropic medications and assessments of current practice	

Engaging individuals and their carers in healthcare decisions (shared decision making) is the most important attribute of person-centred care [105]. Deprescribing is likely to be acceptable to residents if a clinician says it is possible, but this has not been specifically investigated in relation to psychotropic medications [106]. Residents and their family members may be unaware that different options for their medications exist and may not know that deprescribing is an option [107] and may be unaware that they have a legal right to approve the use of the medication. The views of a clinician are highly valued by older people and can affect their inclination to withdraw or continue a medication. Involving family members in discussions about the resident's medications and potential underlying causes of behaviours enable partnerships to be formed between staff and family members, further enabling appropriate person-centred care [85]. Optimising clinician knowledge and confidence will facilitate these discussions, and deprescribing guidelines such as guidelines produced in Canada for deprescribing antipsychotics are important to support this [4].

To assist with optimal decision making around deprescribing, healthcare professionals can discuss the options with residents and families using decision aids. Decision aids may include educational materials explaining the risks and benefits of withdrawing psychotropic medications and an explanation that non-pharmacological approaches are the preferred method of treatment based on current available evidence. Qualitative research in long-term care involving residents and healthcare professionals is inconsistent with regard to what factors are perceived to be the most important when deciding on whether to deprescribe medications [102]. However, both healthcare professionals and residents have stressed the importance of communication (e.g. between residents and health professionals and between healthcare professionals such as nurses, pharmacists, GPs and specialist physicians) [102].

Inadequate staffing and/or training or inefficient skills mix of staff can be barriers to effective communication and behaviour management. Staff who are inexperienced or time poor will find it difficult to engage the person in non-pharmacological approaches such as music therapy [85], leading to an overreliance of psychotropic medications to help people with changed behaviours. Organisational culture is also a key factor that profoundly shapes decisions to use psychotropic medicines, as it is the frame by which staff manage perceptions about the work environment (e.g. staff levels, workload, inter-professional conflict) with ideal practices [108]. On-site and visiting staff perceptions of staffing levels, low managerial expectations and poor teamwork among care staff are important barriers to appropriate psychotropic prescribing in long-term care [109]. Managerial prioritising of non-pharmacological approaches for changed behaviours and adequate support for care staff to monitor and review psychotropic medications can improve teamwork and reduce reliance on psychotropic medications [109]. The attitudes of healthcare professionals may lead to a 'prescribing culture' where medications are first-line treatments and non-pharmacological methods are not favoured. Deprescribing may be viewed as too time-consuming or not valuable. Further, healthcare professionals may lack confidence to recommend non-pharmacological approaches for changed behaviours if they think they lack sufficient knowledge regarding different treatment options or if they do not have confidence that the facility can provide these [110]. Changing the behaviours of healthcare professionals to reduce reliance on psychotropics may be facilitated by increased awareness of appropriate guidelines and reimbursement systems that acknowledge the time needed to adequately implement deprescribing [111], as well as adequate resources for non-pharmacological alternatives.

A multidisciplinary approach should be taken when deprescribing, to ensure all staff involved with an individual's use of psychotropic medications are adequately supported, educated and trained to improve deprescribing practices. By improving the whole 'prescribing culture' rather than focusing only on people who prescribe medications, all stakeholders become agents of change [112].

Recommendations by direct care staff regarding psychotropic medications will only be effective if prescribers act on them. Communication between direct care staff, pharmacists, GPs, family members, and residents must be based on mutual respect to ensure potential opportunities for deprescribing are not missed [102, 109, 112]. Continuity of staff should be encouraged where possible as residents have described that unfamiliar staff are less likely to be aware of medication histories [102].

That most of those prescribed psychotropic medications in long-term care have cognitive impairment or dementia adds a level of complexity regarding capacity for individuals to make a decision on deprescribing. People living with dementia should not be presumed to be unable to make a choice regarding their medications, and health professionals must work with residents and their families/supporters to plan the withdrawal of long-term medications. Questionnaires have been developed to capture beliefs and attitudes towards deprescribing for people living with mild-to-moderate dementia [113] and for carers [114] and may be useful to determine a person's willingness to deprescribe or perceived barriers to deprescribing.

Continuity of staff is also important for choice, as clinicians who know the residents better will be better informed about the capacity of the individual to make a decision regarding withdrawal of medications [102]. Residents may be anxious about withdrawing a medication that they have been taking for a long time; educational materials may help, and staff can help residents work with the clinician to make an informed choice. In many instances, the resident may prefer to have a

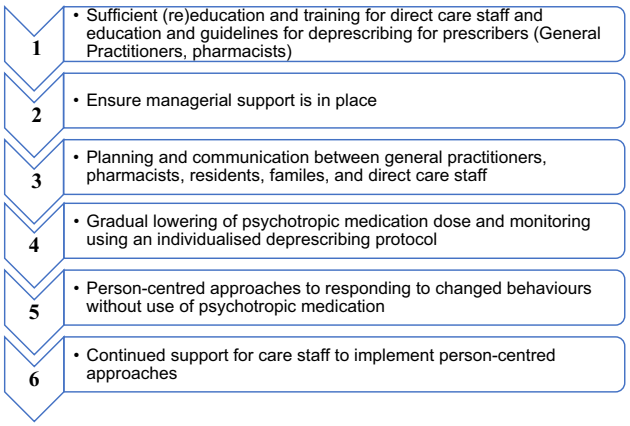

Fig. 1 Steps to manage deprescribing psychotropic medications in long-term aged care for people living with dementia

family member involved in the decision-making process, and residents and their family members may be fearful of deterioration if they change their current medications [102]. Explaining the process of deprescribing and ensuring residents and their family members are fully informed of both the risks and benefits of deprescribing psychotropic medications may help [92]. Figure 1 provides an overview of the steps to take when deprescribing psychotropic medications in long-term aged care settings.

6 Areas for Future Research

The risks associated with inappropriate prescribing of psychotropic medications and benefits of deprescribing are well established. Multi-component deprescribing interventions that target several levels of organisational structure simultaneously appear to be most effective at reducing inappropriate psychotropic use in long-term care. Further evidence from randomised controlled trials on the prescribing and clinical outcomes of interventions that encourage healthcare professionals to initiate deprescribing of psychotropics would be beneficial.

As discussed in this review, psychotropic medications may have been prescribed prior to the resident starting long-term care. This adds a level of complexity, as the indications for prescribing may be unclear and the residents and family members will not always be able to describe the reason, response or intended duration. Further studies should examine prescribing trajectories of psychotropic medications for older people prior to starting long-term care to enable a clear understanding of when, why and where these medications are prescribed before long-term care and how the staff of long-term care could be better informed about the prescribing history of the resident.

Work remains to close the gap between clinical guidelines and practice, and research can be useful to expedite this process. Implementation trials that consider the contextual barriers and facilitators to deprescribing can provide important insights for long-term care settings working to make positive change. As mentioned, the need to limit prescribing of inappropriate therapeutic substitutes has been identified [e.g. 7, 115]. It is evident that physicians and care staff need adequate access to resources, education, and support to deprescribe and to transition to managing behaviour change with non-pharmacological means. Research demonstrating the cost-effectiveness of this transition will help to establish a business case for policy-makers and providers. In addition, some research examining the efficacy of collaborative or system-based interventions is underway [116, 117] and should help to demonstrate the broader contextual and policy factors that facilitate sustained change. As mentioned, large scale policy initiatives (such as black-box warnings or medication review systems) have had limited effects to date. Policy-makers need guidance about legislative or regulatory measures that could promote best practice.

7 Conclusions

The high prevalence of psychotropic medications in long-term aged care settings demonstrates the gap between guidelines for the treatment of changed behaviours for people with dementia and clinical practice. Psychotropic medications can be effectively deprescribed using multi-component, multidisciplinary and person-centred interventions. Suitable education, training and support of clinicians deprescribing and of direct care staff, GPs and families to effectively help people experiencing changed behaviours without the use of psychotropic medications is needed. It is important to identify and address elements of culture which hinder appropriate psychotropic prescribing. Improved communication (between GPs, pharmacists, care staff, residents and their families) and appropriate managerial support coupled with training of care staff will promote optimal outcomes from deprescribing psychotropic medications in people living with dementia in long-term care.

Compliance with Ethical Standards

Conflict of interest Henry Brodaty is an Advisory Board Member for Nutricia. Monica Cations has been employed in the past 5 years to assist with data collection for Alzheimer's disease drug trials funded by Janssen and Merck. Stephanie Harrison, Tiffany Jessop, Sarah Hilmer and Mouna Sawan report no conflicts of interest.

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