Strategies to simplify complex medication regimens

Background
Older people use increasingly complex medication regimens. Complex regimens are challenging to administer, particularly for those with cognitive impairment, frailty, poor eyesight or limited dexterity. Complex regimens have been linked to non-adherence, medication errors and hospital admissions.

Objective
The aim of this article is to describe strategies to reduce the complexity of medication regimens in community and residential aged care settings.

Discussion
Medication regimen simplification is the process of reducing medication burden through strategies such as consolidating dosing times, standardising routes of administration, using long-acting rather than shorter-acting formulations, and switching to combination products in place of single-ingredient products. Obtaining a best possible medication history, ensuring appropriateness of current therapy, and deprescribing are important steps prior to implementing regimen simplification. Implementing such strategies should be based on a discussion and consideration of patient preferences, and include clinical judgement to limit the risk of unintended consequences for patients or carers.

What makes a medication regimen complex?
Complexity of a medication regimen is correlated with the number of prescription, non-prescription and complementary and alternative medications (CAMs). Complexity can also arise because of the number of daily medication administration times, multiple or complicated dose forms, and special administration instructions (eg crush tablets, take with food).

Why reduce medication regimen complexity?
Complex medication regimens are associated with a higher number of errors (eg self-administration errors) and an increased risk of hospitalisation. Medication regimen complexity is also
an independent predictor of hospital discharge to non-home settings. There is emerging although inconsistent evidence that the overall complexity of an older person’s medication regimen is associated with non-adherence, with once-daily dosing associated with better adherence than twice, three times or four times daily dosing. A review of seven studies reported less frequent dosing is associated with similar or higher health-related quality of life in people with angina, asthma, chronic obstructive pulmonary disease, Parkinson’s disease and seizures.

Overall complexity should be considered in the context of an individual’s capacity to self-manage their medication regimen. Paradoxically, the most complex regimens are often prescribed to those with the least capacity to manage. This may include people with cognitive impairment, who are frail, have poor eyesight or limited dexterity. For example, older people with Parkinson’s disease or rheumatoid arthritis may have difficulty opening child-resistant containers and using medical devices (eg inhalers) because of dexterity changes. Poor health literacy may be associated with an inability to read or interpret complex instructions for medication use, leading to an increased risk of medication errors. When presented with the same medications, people with lower health literacy report taking their medications on more occasions throughout the day than those with higher health literacy.

While all older people may benefit from reduced treatment burden, other potential benefits are setting dependent. For community-dwelling older people, capacity to self-manage a medication regimen may be a requirement for continuing to live independently at home. Reducing the number of daily administration times to coincide with home visits by nurses, carers or family members may improve medication adherence. In residential aged care, simplifying complex medication regimens may assist residents with dementia-related swallowing difficulties and minimise nursing time required to prepare and administer medications. This may allow more time for nurses to focus on safe administration practices or other direct care activities. Medication administration is time-consuming and challenging for informal carers, nurses and personal care workers.

How can medication regimen complexity be reduced?

Steps for simplifying a complex medication include obtaining a best possible medication history (BPMH), ensuring appropriateness of current therapy and deprescribing, and medication regimen simplification. It is necessary to have an accurate medication list before initiating the process of deprescribing and medication regimen simplification. Deprescribing and medication regimen simplification are complementary services. Deprescribing involves the ‘stepwise reduction of unnecessary or potentially inappropriate medications after consideration of therapeutic goals, benefits and risks, and medical ethics’. Medication regimen simplification refers to reducing medication burden through strategies such as consolidating dose times and routes of administration. Unlike deprescribing, medication regimen simplification on its own does not seek to change the therapeutic intent of the regimen.

Obtain a best possible medication history

A BPMH is a current and complete list of an individual’s prescription, non-prescription and CAMs compiled from various sources including the patient or carer. A BPMH should include details such as medication dose, frequency and route of administration, recognising that these may not be in accordance with the prescriber’s intent. Any discrepancies between the BPMH and the intended medication regimen should be clarified and documented. Medication reconciliation is recommended at various points during patient care, and is a starting point for deprescribing and regimen simplification.

Ensuring appropriateness of current therapy and deprescribing

Once a BPMH has been obtained, it is important to confirm all medications are clinically indicated and appropriate. Home Medicine Reviews (HMRs) and Residential Medication Management Reviews (RMMRs) are collaborative services provided by general practitioners and pharmacists that involve identification of possible medication-related problems. For this reason HMRs and RMMRs may be useful for identifying opportunities for deprescribing. Pooled analyses of seven RMMR studies indicated 16% of pharmacist recommendations related to medication cessation. While overall evidence for medication review is mixed, HMR and RMMR in Australia has been associated with reduced numbers of medications, decline in potentially inappropriate medication use and fewer hospitalisations. Deprescribing is underpinned by complex decision-making processes, and requires shared decision making with prescribers, patients and their family, pharmacists, nurses and allied health professionals. Use of a decision aid in relation to deprescribing proton-pump inhibitors has been trialled with mixed success in Canada. However, the wider body of literature on decision aids suggests these may be valuable to promote active involvement in deprescribing decisions by helping patients become more knowledgeable, better informed and clearer about their values. It is important for clinicians to initiate discussions about deprescribing, because willingness to deprescribe is higher if physicians reassure patients it is possible.

Medication regimen simplification

When all current medications are deemed clinically appropriate, it may be possible to further reduce a patient’s medication burden through medication regimen simplification strategies (Box 1). When simplifying a regimen, the clinical benefit of administering medications at a specific time of day (eg administering a statin at night, thyroxine before breakfast) may need to be balanced against the likely benefits of simplifying.
benefits achieved through reducing the overall regimen complexity. The decision to reduce complexity should always involve a discussion with the patient and their carer to elucidate their preferences and perspectives.

The Medication Regimen Simplification Guide for Residential Aged CarE (MRS GRACE) is a newly developed, implicit five-step process for guiding the simplification process (Box 2). Using the MRS GRACE tool, two pharmacists independently simplified 29 and 30 out of 50 residents’ medication regimens, respectively, with fair agreement. Simplification was possible for the majority of residents with four or five daily medication administration times. A cluster randomised controlled trial in South Australian RACFs showed that applying the principles in the MRS GRACE tool reduced residents’ number of daily administration times (odds ratio –0.36; 95% confidence interval: –0.63, –0.09; P = 0.01) at the four-month follow-up, with no measurable impact on secondary outcomes including resident satisfaction, quality of life, falls, hospitalisations or mortality. However, the impact of the one-off simplification intervention on number of daily administration times was sustained over 12 months. A multi-component intervention that involved obtaining a BPMH and medication regimen simplification was successfully piloted among 25 recipients of community-based home care services, with simplification opportunities identified for 14 individuals.

Box 3 provides an example of how a hypothetical medication regimen may be simplified. This example incorporates the acquisition of a BPMH, ensuring clinical appropriateness and deprescribing, and medication regimen simplification.

Reasons for not simplifying medication regimens
Clinical judgement is required before implementing simplification strategies to avoid any unintended consequences or inadvertently reduce medication adherence. There are circumstances in which simplification may not be appropriate. These include patient-related factors (eg patient prefers to spread medication-taking across day; patient is unable to swallow modified-release formulations whole), likelihood of medication interactions (eg orthostatic hypotension from co-administration of cardiovascular medications), possible unintended consequences (eg need for invasive monitoring) and setting-specific factors (eg qualified staff not available to administer medications at specific times).

Medication management strategies
Dose administration aids (DAAs) supplied by pharmacies can be used to aid medication management in community and RACF settings. Examples of DAAs include compartmentalised plastic boxes (eg Dosette), blister packs (eg MedicoPak, Webster-Pak) and sachet systems (eg APHS medication sachets, MPS Packettes). DAAs are widely used to aid medication administration in RACFs. Potential benefits of DAA use in the community include increased communication between healthcare professionals and better disease control. However, DAAs do not address intentional non-adherence. DAAs are most effective in patients motivated and willing to take their medications, and who have the ability to use the DAA. A DAA may not be appropriate for all patients – for example, if the regimen is frequently changing, or the medications are not appropriate for inclusion in a DAA (eg inhalers, hygroscopic tablets). Reducing the complexity of a patient’s medication regimen may also avoid the need for a DAA. Resources in relation to medication management strategies are provided at the end of this article.

Activities post-regimen simplification
Medication regimen simplification includes documenting and communicating regimen changes with the patient and others involved in medication management (eg medical specialists, RACF staff, community pharmacists, carers, nurses, providers of community-based home care services). Ongoing assessment of the suitability of the new regimen and monitoring for any potential unintended consequences is also important. The provision and maintenance of an up-to-date medication list may aid the patient’s understanding.
Box 3. Example simplification of a hypothetical medication regimen

1. Obtain a best possible medication history
Mrs AB is a patient at your general practice clinic. You create a best possible medication history through non-judgementally interviewing Mrs AB about her current medications, proactively asking about any non-prescription medications or complementary and alternative medications (CAMs), reviewing medical records and inspecting her dose administration aid.

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<tr>
<th>Medication</th>
<th>Dose</th>
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<td></td>
<td>Breakfast</td>
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<tr>
<td>Atorvastatin 10 mg</td>
<td>1</td>
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<tr>
<td>Amlodipine 5 mg</td>
<td>1</td>
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<tr>
<td>Metformin 500 mg</td>
<td>1</td>
</tr>
<tr>
<td>Paracetamol 500 mg</td>
<td>2</td>
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<tr>
<td>Pantoprazole 40 mg</td>
<td>1</td>
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<tr>
<td>Ferrous sulfate 325 mg CR</td>
<td>1</td>
</tr>
<tr>
<td>Latanoprost 0.005% eye drops</td>
<td>1</td>
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<tr>
<td>Timolol 0.5% eye drops</td>
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2. Ensure appropriateness of current therapy and deprescribing
You review the ongoing clinical appropriateness of each medication and discuss deprescribing with Mrs AB. With permission you also involve Mrs AB’s carer.

- Mrs AB’s GORD symptoms are well controlled. You suggest reducing the dose of pantoprazole to 20 mg daily with the view to possible cessation.
- Recent iron levels suggest no sign of iron deficiency. On interview, Mrs AB discloses that she started taking iron tablets because her neighbour suggested they would ‘make her feel more energetic’. You suggest cessation.
- Mrs AB states that her chronic pain has improved since commencing an exercise regimen recommended by her physiotherapist. You suggest reducing the daily paracetamol dose, with a plan to review and adjust as appropriate.

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Clinical

Strategies to simplify complex medication regimens

Box 3. Example simplification of a hypothetical medication regimen (cont’d)

3. Medication regimen simplification

Once you are satisfied all medications and doses are appropriate, you implement regimen simplification strategies with no changes to the therapeutic intent:

- atorvastatin prescribed in combination with amlopidine
- metformin switched to the XR formulation
- paracetamol rationalised to the CR formulation
- latanoprost prescribed in combination with timolol.

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Overall result

- Daily administration times reduced from four to two
- Daily tablets reduced from 14 to seven
- Daily eye drop administrations reduced from two to one
- Eight medication products reduced to five

CR, controlled release; GORD, gastro-oesophageal reflux disease; XR, extended release

Medication regimen simplification


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References


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47


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