

A concept analysis of deprescribing medications in older people

Amy Page, MClinPharm, GradCertHPed, BPharm, BHSci, AdvPracPharm¹ , Rhonda Clifford, PhD, FPS¹, Kathleen Potter, MBChB, PhD, FRACGP², Christopher Etherton-Beer, MBBS GradCertHPed, PhD, FRACP¹

1 School of Medicine and Pharmacology, University of Western Australia, Crawley, Australia

2 Westland Medical Centre, Hokitika, New Zealand

Abstract

Aim: Deprescribing is an increasingly common term in the literature, although no specific accepted definition exists. We aimed to clarify the concept of deprescribing as used in research and clinical practice.

Methods: Deprescribing was examined using the eight-step Walker and Avant method of concept analysis that consisted of: (i) concept selection; (ii) determining the purpose of the analysis; (iii) identifying uses of the concept; (iv) determining the critical attributes; (v) identifying the model case; (vi) identifying borderline and contrary cases; (vii) identifying antecedents and consequences; and (viii) defining empirical referents. A literature search was conducted on the word *de?prescri**.

Results: We identified seven critical attributes: withdrawing medications, de-escalation, intended outcomes, structured and iterative process, intervention, risk to benefit, and patient-centred care. Deprescribing antecedents were identified as changing health, changing goals for health care, and polypharmacy. Deprescribing consequences identified were compliance, health outcomes, mortality and cost, and possibility for adverse drug withdrawal events to occur. We used the model case, borderline and contrary cases and empirical referents to illustrate the concept of deprescribing.

Conclusions: Deprescribing is a term used with varying degrees of precision, and there is no accepted definition. In this paper, we have analysed the concept of deprescribing and identified it as a patient-centred process of medication withdrawal intended to achieve improved health outcomes through discontinuation of one or more medications that are either potentially harmful or no longer required.

Keywords: deprescribing, concept analysis, discontinuation, medication optimisation.

INTRODUCTION

Good pharmaceutical care includes prescribing new medications, adjusting doses of existing medications and ceasing medications that are no longer required. Efforts to improve the quality use of medications have often focused on the under-use of indicated medications.¹ Once commenced, many medicines are difficult to withdraw.² These factors contribute to polypharmacy as a prevalent issue where two out of three older people are exposed to polypharmacy.³ The magnitude of polypharmacy continues to increase with older people today using an average of two medications more each day than their counterparts 10 years ago.⁴ The increasing prevalence and extent of polypharmacy among older

people has led to an emerging field of research to reduce inappropriate polypharmacy.

Polypharmacy is commonly used to mean the use of five or more medications,⁵ although definitions of two to 10 medications have been used in the literature.^{6,7} Discussions about reducing polypharmacy often suggest a distinction between appropriate and inappropriate polypharmacy,^{8,9} with some authors defining polypharmacy as the use of more medications than clinically necessary.¹⁰ Other work suggests that the number of medications is not the best indicator of prescribing quality in a clinical setting.¹¹ Epidemiological research has correlated polypharmacy to a range of undesirable health outcomes, including nutritional deficiencies, falls, frailty, impaired cognition, increased hospital admissions and adverse drug reactions,^{5,6,12-14} although it remains unclear whether polypharmacy directly causes these negative outcomes or is a marker of multiple failing systems.¹⁵

Researchers have speculated that reducing the total number of regular medications by ceasing inappropriate

Address for correspondence: Amy Page, School of Medicine and Pharmacology, University of Western Australia, 35 Stirling Hwy, Crawley 6009, Western Australia, Australia
E-mail: amy.page@uwa.edu.au

medications might improve health outcomes in older people.¹⁶ Inappropriate medications include those used without a valid indication, therapeutic duplication, ineffective medications and those where the potential risks outweigh the intended benefit.⁹ Interventions to reduce polypharmacy represent an emerging field of research known as deprescribing.⁹

The word 'deprescribing' first appeared in the literature in 2003,¹⁷ although the concept of withdrawing medications was reported in the medical literature about 30 years prior. Almost as soon as efficacious medications to control chronic conditions emerged, clinicians began to question whether medications were indicated indefinitely or if they could be withdrawn safely.^{18–20} The ideal treatment duration and potential benefit of ongoing treatment were unclear then^{21–23} and often remain unclear today.²⁴

No specific definition exists for the word 'deprescribing', and the term is used inconsistently.^{25–27} Two recent papers proposed definitions for deprescribing as a process to reduce medication use, although there is limited consensus on what does or does not constitute deprescribing.^{9,26} The inconsistent definition and conceptualisation is increasingly problematic.²⁶

The inconsistent application of the word 'deprescribing' suggests that the concept may be unclear. A 'concept' is an important theoretical component that communicates an abstract theoretical idea.²⁸ A concept analysis is a process to examine the essential components of a concept.²⁸ This concept analysis was undertaken to clarify the concept of deprescribing as used in research and clinical practice.

METHODS

This concept analysis used the Walker and Avant method of the Wilsonian version of concept analysis that entails eight consecutive steps (Figure 1) to provide a structural framework that is intended to be pragmatic and procedural.²⁸

A concept analysis is built on a literature review. The concept analysis does not include a critical appraisal of methodological quality of the literature as it is an analysis of the concept rather than the evidence.²⁸

Selection Criteria

This concept analysis uses all published peer-reviewed papers in medical journals that included the base word 'deprescribe' or its derivatives (e.g. deprescription, deprescribing, deprescriber or deprescribed) in the title, abstract or keywords to ensure the paper focused on deprescribing.

Search Strategy

This concept analysis considered all uses of 'deprescribing' in peer-reviewed published papers. To identify the relevant papers, a text word search in the MEDLINE, EMBASE, Scopus and CINAHL Plus databases was conducted in September 2016 using the text word *deprescri** or *de-prescri** in the title, abstract and keyword fields. The inclusion criteria were that the full manuscript must be available in English.

Data Collection

One author independently scanned the title and abstract of every record retrieved. All available full-text articles that used deprescribing were retrieved and investigated. The articles were read with attention to the use of the concept and to identify patterns in the literature. The definitions were imported into nVivo (nVivo 11 for Mac) where we undertook a word frequency analysis.²⁹

RESULTS

Our search returned 558 results, which was reduced to 191 results after removing duplicates. The full texts of 138 peer-reviewed journal articles were available in English and retrieved. Most ($n = 81$) were published in 2015 and 2016. Major findings related to each of the steps in the Walker and Avant method are summarised (Figure 1).

Use and Definition of the Concept Deprescribing

Deprescribing was first introduced to the literature in 2003, and its use was becoming more common by 2014 when Alldred described it as a new word.^{17,30} Early commentary by Iyer *et al.* and Alldred *et al.* focused on encouraging the use of the word deprescribing as a means to link relevant research.^{30,31} The need for consistent nomenclature to link studies that research medication withdrawal, to facilitate retrieval of relevant research was first raised as an issue in Iyer *et al.*'s 2008 systematic review.³¹ It was highlighted again in three more recent systematic reviews.^{2,32,33}

Deprescribing was defined as 'medication withdrawal in older people' in a 2008 systematic review of withdrawing individual medications.³¹ Le Couteur *et al.* clarified that this was the 'cessation of long-term therapy supervised by a clinician'.³⁴ These concepts were combined in a 2015 publication that proposed a definition as 'the process of tapering or withdrawing drugs with the goal of managing polypharmacy and improving

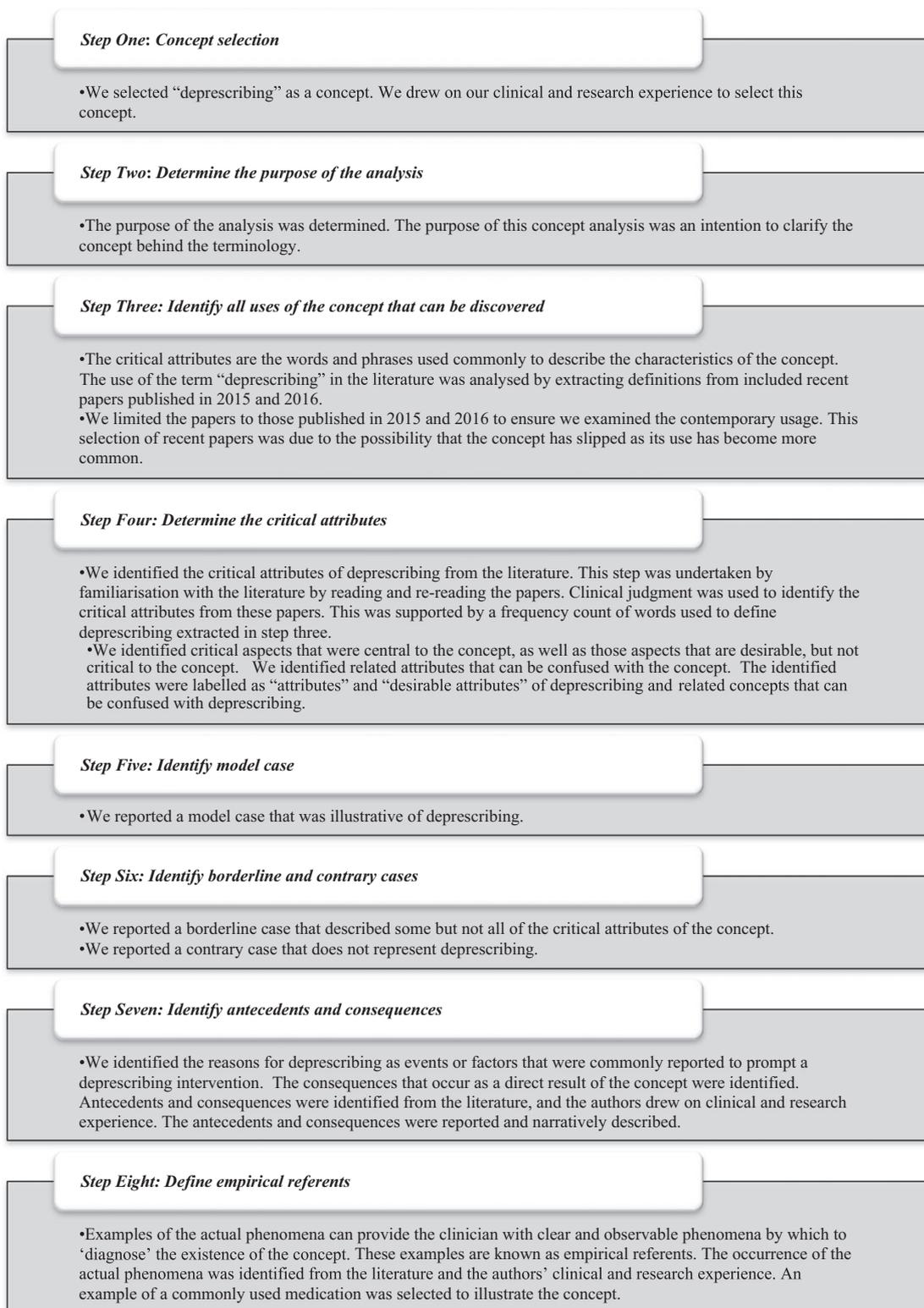


Figure 1 Concept analysis flow chart.

outcomes'.²⁶ An alternative definition was also published in 2015 as 'systematic process of identifying and discontinuing medicines where the actual or potential harms outweigh the benefits, within the context of an individual patient's care goals, current level of functioning, life expectancy, values and preferences'.⁹

A 2015 systematic review of the definition of deprescribing was of particular note for the purpose of concept analysis.²⁶ The various definitions highlight the inconsistent application of the word, and that little consensus exists on the definition.^{9,26} The papers that do define deprescribing usually use a synonym of medication withdrawal, discontinuation or cessation.²⁶ More than half of the papers that define deprescribing refer to a particular category of medications such as long-term, unsafe or inappropriate medications.²⁶ It was also common for the definition to include a reference to planning, supervised withdrawal, multiple steps, or as a structure or process.²⁶ Only a few papers referred to a desired outcome from deprescribing, and few talked about tapering, dose reduction or substitution.²⁶

Of the 81 articles published since the systematic review on the definition, 49 (60%) have included a definition of deprescribing (Table 1). Of these articles, 12 (15%) have used an original definition of the word. The most common definition ($n = 10$, 12%) was the one proposed by Scott *et al.*:⁹ 'systematic process of identifying and reducing or discontinuing drugs in instances in which existing or potential harms outweigh existing or potential benefits, taking into account the patient's medical status, current level of functioning, and values and preference'. A similar number of papers ($n = 8$, 10%) referenced the definition by Reeve *et al.*:²⁶ 'process of tapering or withdrawing drugs with the goal of managing polypharmacy and improving outcomes'. Multiple papers ($n = 4$, 5%) referenced Woodward's¹⁷ original paper to suggest that it was a process of medication withdrawal, although Woodward's original paper did not propose a precise definition.

Attributes of deprescribing

We identified seven critical attributes for deprescribing. The critical attributes we identified were: withdrawing medications, polypharmacy de-escalation, appropriate medication use, intended outcomes, patient-centred care, active intervention, and a structured and iterative process.

Withdrawing medications is the most common attribute associated with deprescribing.^{9,16,17} Deprescribing refers to the withdrawal of regular medications, rather than stopping a medication that was only ever intended to be administered short term or infrequently.³⁵

Polypharmacy de-escalation can be a driver to de-prescribe as it can be an intervention undertaken to reduce or manage polypharmacy. Health professional motivation to reduce polypharmacy is often related to a desire to reduce the perceived negative implications correlated to polypharmacy.

Consumer drivers to de-escalate polypharmacy could be due to patient perception that they are taking many medications, and this interferes with adherence or causes distress.^{36,37} Polypharmacy is not a reliable indicator of consumer drivers to reduce and withdraw inappropriate medications, as the consumer desire to de-prescribe has been shown in both people who do and do not use polypharmacy.³⁸

Appropriate medication use is an attribute as it focuses on the reduction and withdrawal of inappropriate medications.⁹ Medications targeted for deprescribing interventions are those that are not underpinned by a current indication, are inappropriate, inconsistent with the patient's care goals, and those where actual side effects outweigh the potential benefits.³⁹ Further, some medications to prevent future serious events may have time to benefit that is longer than the person's anticipated prognosis.⁴⁰

Deprescribing does not deny people potentially beneficial treatment.⁹ It is possible that by reducing overall medication use through deprescribing, the deprescribing intervention may improve the willingness of prescribers to prescribe indicated medications at a later date.

Intended outcome of deprescribing is a critical attribute. Deprescribing is a purposeful activity.⁹ It is undertaken with the intent to improve health outcomes, manage polypharmacy or withdraw medications where actual side effects outweigh the potential benefit.³⁵ The intention to achieve a beneficial outcome distinguishes deprescribing from acts such as the health professional omitting an indicated medication or the consumer being non-compliant with a prescribed therapy.

Patient-centred care is critical to deprescribing. Deprescribing recognises that the appropriateness and usefulness of any specific medication can change as health and life goals change. Each particular individual needs to be involved in decisions about their care.⁴¹ Medico-legal concerns are an identified barrier to deprescribing,⁴² but this is less significant when undertaken as part of a shared-decision.⁴¹ Deprescribing should be considered from both a patient-centred ethical perspective as well as a clinical perspective.⁴³

Deprescribing is a variation from the status quo and is thus perceived as an *active intervention*.^{2,39} This perception of deprescribing as an active intervention differentiates it from simply omitting a medication without careful consideration.

Table 1 Definitions of deprescribing published in 2015–2016

Author	Article type	Definition	Definition cited
Ailabouni <i>et al.</i> ⁷⁷	Original research	Process of reducing or discontinuing medicines that are unnecessary or deemed harmful	5,54
Ailabouni <i>et al.</i> ⁷⁸	Original research	Process of safely reducing/discontinuing unnecessary/harmful medicines, has the potential to reduce polypharmacy, inappropriate medicine use and greatly improve health outcomes	26,54
Akinbolade <i>et al.</i> ⁷⁹	Review	Process of optimisation of medication regimens through cessation of potentially inappropriate or unnecessary medications	None
Anderson <i>et al.</i> ⁸⁰	Review	Systematic process of identifying and discontinuing the use of medicines where the actual or potential harms outweigh the benefits, giving due consideration to an individual patient's care goals, current level of functioning, life expectancy, values and preferences	9
Anderson <i>et al.</i> ⁴²	Review	Systematic process of identifying and discontinuing medicines where the actual or potential harms outweigh the benefits, within the context of an individual patient's care goals, current level of functioning, life expectancy, values and preferences	9
Andreassen <i>et al.</i> ⁸¹	Review	Process of withdrawal of an inappropriate medication, supervised by a healthcare professional with the goal of managing polypharmacy and improving outcome	26
Barras <i>et al.</i> ⁸²	Review	To help reduce unnecessary polypharmacy and reduce the potential for drug-related harm, particularly in the elderly population, who are at risk of adverse drug events	None
Bemben ⁸³	Review	Systematic process of identifying and discontinuing drugs in instances in which existing or potential harms outweigh existing or potential benefits within the context of an individual patient's care goals, current level of functioning, life expectancy, values, and preferences	9
Brandt ⁸⁴	Review	Process of identifying and discontinuing drugs that could potentially harm rather than benefit a patient	None
Conklin <i>et al.</i> ⁸⁵	Review	Stop or decrease doses of medications causing problems or that are no longer needed	None
Disalvo <i>et al.</i> ⁸⁶	Systematic review	Process of tapering or withdrawing drugs with the goal of managing polypharmacy and improving outcomes	26
Farrell <i>et al.</i> ⁸⁷	Review	Planned and supervised process of dose reduction or stopping of medication(s) that may be causing harm or are no longer providing benefit	None
Farrell <i>et al.</i> ⁸⁸	Original research	Act of tapering, reducing or stopping a medication	31,89,90
Galazzi <i>et al.</i> ⁹¹	Original research	Process of optimisation of medication regimens through the supervised withdrawal of potentially inappropriate medications (PIMs)	5,17,26
Gupta and Cahill ⁹²	Review	Systematic process of identifying and reducing or discontinuing drugs in instances in which existing or potential harms outweigh existing or potential benefits, taking into account the patient's medical status, current level of functioning, and values and preference	9
Jansen <i>et al.</i> ⁴¹	Review	Medication withdrawal	None
Kalogianis <i>et al.</i> ³⁸	Original research	Systematic process of ceasing medications, and it has been proposed as a way to approach the problem of inappropriate polypharmacy	27
Linsky <i>et al.</i> ⁹³	Original research	Systematic process of identifying and discontinuing drugs in instances in which existing or potential harms outweigh existing or potential benefits within the context of an individual patient's care goals, current level of functioning, life expectancy, values and preferences. Deprescribing is part of the good prescribing continuum [and is] not about denying effective treatment to eligible patients	9
MacMillan <i>et al.</i> ⁹⁴	Original research	Systematic process of stopping ineffective medications to reduce polypharmacy	9
Mudge <i>et al.</i> ⁹⁵	Original research	Rational withdrawal (including discontinuing or tapering) of inappropriate medications to reduce polypharmacy	89,96
Ni Chroinin <i>et al.</i> ⁹⁷	Original research	Supervised tapering or cessation of drugs, aiming to minimise inappropriate polypharmacy and improve patient outcomes	30
Oliveira <i>et al.</i> ⁹⁸	Original research	Withdrawal of drugs with limited benefit given the evolution of the clinical situation	99
Page <i>et al.</i> ³²	Systematic review	Process of withdrawal of inappropriate medication, supervised by a healthcare professional with the goal of managing polypharmacy and improving outcomes	26
Page <i>et al.</i> ³⁹	Original research	Optimise medicine use and improve function in older people by reducing the number of potentially harmful or inappropriate medicines prescribed	
Page <i>et al.</i> ²⁴	Review	Process of withdrawal of inappropriate medication, supervised by a healthcare professional with the goal of managing polypharmacy and improving outcomes	26

Table 1 (continued)

Author	Article type	Definition	Definition cited
Palagyi <i>et al.</i> ¹⁰⁰	Original research	Process of withdrawal of an inappropriate medication supervised by a healthcare professional with the goal of managing polypharmacy and improving outcomes	26
Pitkälä <i>et al.</i> ¹⁰¹	Review	Cessation of medications after consideration of therapeutic goals, benefits and risks, and medical ethics	102
Pollmann <i>et al.</i> ¹⁰³	Original research	Collaborative and supportive process of identifying, modifying and discontinuing therapies that are no longer indicated or may be causing harm to patients	17,104
Potter <i>et al.</i> ³⁵	Original research	Planned cessation of non-beneficial medicines	105–107
Qi <i>et al.</i> ¹⁰⁸	Original research	Process of tapering or stopping medications with the aim of improving patient outcomes and optimising current therapy	102,109
Reeve and Turner ¹¹⁰	Letter	Medication cessation, the term is broader than simply cessation and encompasses the process of trial medication withdrawal	None
Reeve <i>et al.</i> ¹¹¹	Original research	Process of medication withdrawal	17
Reeve <i>et al.</i> ⁴³	Review	Process of withdrawal of an inappropriate medication, supervised by a healthcare professional with the goal of managing polypharmacy and improving outcomes	26
Reeve <i>et al.</i> ³⁶	Original research	Supervised withdrawal of inappropriate medications	None
Rodriguez Perez <i>et al.</i> ²⁵	Letter	Not yet been standardised, and different points of view have thus been used to define it	None
Scott and Le Couteur ⁴⁵	Review	Act of systematically identifying and tapering, reducing or stopping medications that are not indicated (either because of previous misdiagnosis or evidence of no benefit or harm for a true diagnosis), or are causing, or have considerable potential to cause, adverse effects	None
Scott <i>et al.</i> ¹¹²	Review	Active process of systematically reviewing medicines being used by individual patients and, using best available evidence, identifying and discontinuing those associated with unfavourable risk–benefit trade-offs within the context of illness severity, advanced age, multi-morbidity, physical and emotional capacity, life expectancy, care goals and personal preferences	9
Scott <i>et al.</i> ⁹	Review	Systematic process of identifying and discontinuing drugs in instances in which existing or potential harms outweigh existing or potential benefits within the context of an individual patient's care goals, current level of functioning, life expectancy, values and preferences	None
Sharma <i>et al.</i> ¹¹³	Review	Systematic process of identifying and discontinuing drugs in instances in which existing or potential harms outweigh existing or potential benefits within the context of an individual patient's care goals, current level of functioning, life expectancy, values and preferences	9
Simonson ⁶⁴	Letter	Process by which the benefits and risks of therapy are assessed on an ongoing basis followed by a process of tapering, stopping or withdrawing medications that are no longer required, providing benefit, or that have the potential to cause potentially harmful consequences for an individual	114
Thompson <i>et al.</i> ¹¹⁵	Original research	Planned, supervised tapering and/or stopping of drugs	None
Turner <i>et al.</i> ¹¹⁶	Original research	Stepwise reduction of unnecessary or PIMs after consideration of therapeutic goals, benefits and risks, and medical ethics	16,17,110,117
Wallis ¹¹⁸	Review	Process of tapering and stopping drugs	9
Wallis ¹¹⁹	Original research	Process of tapering and withdrawing drugs	None
Walsh <i>et al.</i> ¹²⁰	Original research	Complex process of tapering or stopping medications to manage polypharmacy and improve patient outcomes	96
Wright <i>et al.</i> ¹²¹	Review	Process of tapering, stopping, discontinuing or withdrawing drugs, with the goal of managing polypharmacy and improving outcomes	96

Conceptualising deprescribing as an active intervention is not intended to contrast it to medication continuation, as both deprescribing and medication continuation can be considered active interventions. Each repeat

prescription or repeat dispensing should balance a careful consideration of the appropriateness of medication.

Structured and iterative processes involving multiple steps underpin deprescribing interventions. The steps

are often presented in a linear fashion, but it is an iterative process. In 'Deprescribing: a guide for medication reviews', we recently described the multi-step, co-operative process to deprescribing (Steps One to Five below).⁴⁴ The *BMJ* recently published a review on the need for health professionals and consumers to discuss deprescribing as a shared decision-making process.⁴¹ In this review, they outlined the steps A, B and C below, which are needed to discuss deprescribing with consumers to facilitate a shared decision.⁴¹ The combined steps from these papers detail the process.

Step One: Identify people suitable for deprescribing

Step Two: Take a medicine-focused history

Step Three: Write a medicine withdrawal plan

Step A: Creating awareness that options exist

Step B: Discussing the options and their benefits and harms

Step C: Exploring patient preferences for the different options

Step Four: Stop the medicines according to the plan

Step Five: Monitoring and follow-up

The CEASE acronym is a mnemonic for the steps involved in the deprescribing process.⁴⁵

Current medications: undertake a medication reconciliation

Elevated risk: consider the potential risk from each medication

Assess: assess the potential benefit and harm from each medication, and the patient values and preferences

Sort: prioritise medications for cessation

Eliminate: implement cessation and monitor

Desirable attributes of deprescribing

Shared decision-making is a desirable aspect of deprescribing as patient involvement is advisable and preferable, but not a mandatory attribute of deprescribing.³³ The intervention needs to be undertaken under the supervision of, and in conjunction with a health professional.^{26,41} The involvement of a health professional and a patient making the decision together with the goal of improving health outcomes or managing polypharmacy sets deprescribing apart from non-adherence.

Related concepts that can be confused with deprescribing

We identified five attributes that are not related to deprescribing, which were therapeutic substitution,

medication simplification, withholding medication, dose reduction and medication non-adherence. These attributes are detailed below.

Therapeutic substitution involves withdrawing one medication to commence another.⁴⁶ In medication substitution, the intention is not to reduce medication use.⁴⁷ The intention can be to change to a more appropriate medication, reduce side effects, cost savings, change to an alternative dose form that has different characteristics, or to accommodate patient preferences.^{4,48}

Medication simplification is an intervention to manage the complexity of medication regimens that can be associated with polypharmacy.⁴⁹ Many older adults have complex medication regimens and can include multiple daily dosing and special instructions. They can experience physical challenges in using the medication, with evidence showing that as many as one in four older adults struggle to open the packaging.^{50,51} Simplifying is undertaken to reduce complexity without changing the therapeutic intent of the regimen.⁴⁹ This intention to maintain therapeutic intent contrasts simplification to deprescribing where there is an intent to change the therapy.⁵²

Withholding medication intends for the period to be temporary. It is not a permanent withdrawal, and it is often done due to a temporary change in circumstances or an acute illness.⁵³ The monitoring phase of the deprescribing process can identify a need to reinstate a medication because the original condition has returned.^{9,54} This reinstatement due to a return of the original condition contrasts deprescribing to withholding medications. The intent to reinstate the withheld medication after a defined interval makes medication withholding distinct from deprescribing.⁵⁵

Dose reduction is related to deprescribing. Dose reduction can improve medication safety.⁵⁶ For medications intended to provide present relief from symptoms but the symptoms are currently stable, the medication may be trialled for deprescribing.⁵⁴ The deprescribing process will often include the tapering of the medication to avoid rebound symptoms or the return of the underlying condition. Where the medication is not successfully withdrawn, the tapering process may find a lower effective dose.³⁵ This dose reduction is part of optimising the medication regimen, but it is not deprescribing.²⁶

Medication non-adherence is not undertaken in conjunction with a health professional, and it is not an intervention.⁵⁷ In fact, non-adherence can often lead to poorer health outcomes.^{58,59} Medication non-adherence can be related to forgetfulness or poor health literacy, but it has also been shown to result from a consumer's intention to formulate their decisions with the information available.⁶⁰ In non-adherence the consumer unilaterally

making the decision to stop medication without any input from a health professional.⁶⁰

Illustrative Cases

The model case (Table 2) illustrates a case where medications have been withdrawn despite clinical guidelines providing no distinct stop date. The decision has been made to stop medications despite a valid indication still existing as the risks now outweigh the benefits.

The borderline case (Table 3) illustrates a case where medications have been withdrawn which suggested a deprescribing intervention, but in this case the withdrawals were achieved by adhering to the current guidelines. This intervention is regular care, and is consistent with current practice.

The contrary case (Table 4) illustrated a case where the medication regimen was optimised. The medication regimen was optimised through therapeutic substitution and commencing indicated medications.

Antecedents to Deprescribing

Four antecedents to deprescribing were identified, namely health changes, changed goals for health care, polypharmacy and adverse effects. These attributes are discussed below.

Health changes over time, and as such the signs and symptoms of the disease and medication-related issues change and evolve.⁹ This change means that new conditions may be identified, and new signs or symptoms of the disease may occur.^{61,62} It also means that signs and symptoms pass and no longer remain a current concern.⁹ These changing symptoms are an antecedent for deprescribing. Changing health that prompts deprescribing is particularly prominent when the symptoms are part of a prescribing cascade, and the causative medication is withdrawn.⁶³

Changed goals for health care can be an antecedent. Medication that was appropriate for a person 20 years ago may not still be suitable today as care goals and priorities change. The goals for health care change as the person progressively moves from a focus on preventative health care to symptom management and palliation.⁶⁴ These changed goals of health care can be reflected in the medications used to prevent disease deterioration or to prevent a serious future event.²⁴ The focus can slowly morph to symptom management and relieving discomfort rather than preventative health care. It is less clear at what point the changing focus should begin, and the consideration of the individual's health goals may be one approach to guide this.

The issue of time to benefit is similar. Medications can require a minimum treatment duration to be effective, and in the context of a limited prognosis, it may be that the person no longer has the necessary time to benefit from the medication use.⁴⁰

Polypharmacy can be an antecedent to deprescribing, as a commonly identified goal of deprescribing is to manage polypharmacy and to reduce medication burden. A positive consequence of deprescribing is a reduction in polypharmacy. It is challenging to reduce the total number of medications taken, but recent research has indicated it is feasible.^{32,35}

Adverse effects can prompt deprescribing.³⁵ Many people experience side effects of their medications that can range from mildly irritating to intolerable or life-threatening.⁴⁹ The risk of side effects increases with the use of many medications, and with age. The presence of actual side effects that outweigh the potential benefits can be a rationale to deprescribe.³⁵ Adverse effects do not consistently prompt deprescribing interventions as this may leave a condition untreated. In the circumstance where continued treatment is indicated, adverse effects may lead to therapeutic substitution rather than deprescribing.

Consequences of Deprescribing

Consequences of deprescribing are the events that occur because of withdrawing medications, and these can be both positive and negative. Four potential consequences of deprescribing were identified, which were namely the effect on adherence, health outcomes, mortality and cost. Adverse drug withdrawal events were identified as a possible consequence, with two distinct sub-categories for medications intended to manage symptoms compared to those intended to prevent disease progression or a serious future event.

Adherence may be improved by deprescribing.⁵⁴ Improved adherence may be related to fewer medications to monitor, or a reduced personal cost for purchasing medications. Alternatively, it may be related to the shared decision-making the process of deprescribing so that the consumer is prescribed only the medications they perceive as important using a shared-decision model.

Cost may be altered by deprescribing, but a health economics analysis was not found for deprescribing. Reduced cost of medications to both the healthcare system and the individual is a potential benefit of deprescribing.⁶⁵ The effect on health service utilisation during and after deprescribing did not appear to be substantially altered,^{35,66,67} but studies to date included health service utilisation as a secondary outcome, and may not

Table 2 A model case – deprescribing

Mr Jones is 89 years old. He lives in the community with assistance from a carer. He has normal cognition, but requires some assistance in activities of daily living.

Blood pressure: 130/80 mmHg
 Heart rate: 75 beats per minute
 Mini-Mental State Examination (MMSE): 28
 Modified Bartel Index (MBI) score: 62
 Cornell Scale for Depression Score: 5

Serum potassium: 4.2 mmol/L
 Vitamin D: 69 nmol/L

Medical history:
 Osteoarthritis – reports mild current pain in his knees
 Depression
 Hypertension
 Peripheral oedema
 Hyperlipidaemia
 Sleep apnoea
 Insomnia
 Four falls over previous year
 Low vitamin D – diagnosed 2 years ago
 Hypokalaemia – diagnosed 3 years ago

Medication	Strength	Dose	Decision	Rationale	Cease abruptly or taper?	Monitoring required Potential adverse withdrawal effects Cautions
Rosuvastatin	10 mg	One tablet daily	Cease	Primary prevention aged over 80	Abrupt	Hypercholesterolaemia
Pantoprazole	20 mg	One tablet daily	Cease	No indication, possible cascade prescribing	Taper	Gastrointestinal symptoms
Candesartan	16 mg	One tablet daily	Decision deferred	Blood pressure to be monitored and decision to be made about candesartan to be monitored after ceasing amlodipine	Taper	Increase in blood pressure Increase in heart rate Monitor blood pressure and heart rate during and after withdrawal weekly Recommence if blood pressure or heart rate above target levels on three consecutive readings
Calcium carbonate	600 mg	One tablet nightly	Cease	No history osteoporosis or osteopenia, history constipation	Abrupt	Monitor serum calcium levels Decreased bone mass density
Temazepam	10 mg	One tablet nightly	Cease	Inappropriate for long-term use – inappropriate with sleep apnoea	Taper	Insomnia
Vitamin D	1000 IU	One tablet daily	Cease	Diagnosis not current	Abrupt	Vitamin D deficiency
Furosemide	20 mg	One tablet daily	Cease	No history of congestive heart failure or renal impairment	Taper	Increase in blood pressure, oedema and/or shortness of breath
Mirtazapine	30 mg	One tablet nightly	Cease	No current evidence of depression – uncertain when it was started	Taper	Depression symptoms Insomnia
Amlodipine	10 mg	One tablet daily	Cease	Constipation and blood pressure stable	Taper	Increase in blood pressure Increase in heart rate Monitor blood pressure and heart rate during and after withdrawal weekly

Table 2 (continued)

Paracetamol 500 mg	Two tablets four times a day	Continue	Current pain documented		Recommend if blood pressure or heart rate above target levels on three consecutive readings
Macrogol	One sachet nightly	Decision deferred	Possible cascade prescribing – defer decision until other medications deprescribed		Constipation, monitor bowels
Slow K 600 mg	One tablet daily	Cease	Currently normal, ceasing frusemide, and one tablet daily is often inadequate Potassium levels to be monitored	Abrupt	Monitor serum potassium levels

Actions

Rosuvastatin is ceased as the evidence for its use for primary prevention in a person of 89 years old is uncertain.

Pantoprazole, calcium, vitamin D, frusemide, mirtazapine, amlodipine and potassium are ceased as there is no current indication for their use. These are withdrawn consecutively at monthly intervals to ensure that any change in clinical signs or symptoms can be attributed to just one medication.

Candesartan may be able to be withdrawn depending on his blood pressure after withdrawing amlodipine and frusemide. The decision is deferred until after these are ceased.

Constipation is a common side effect of potassium, calcium and amlodipine. This means his constipation may ameliorate once they are ceased. The decision on whether to continue laxative will be deferred until after they are withdrawn.

What are the key features that makes this deprescribing?

This is deprescribing as medications have been stopped despite clinical guidelines providing no distinct stop date. The decision has been made to stop medications despite a valid indication still existing as the risks now outweigh the benefits.

have been adequately powered to detect changes. The true health economic ramifications of deprescribing are unknown, as it is not clear if health service utilisation is unchanged, increased or decreased because of deprescribing.

Health outcomes can potentially change because of deprescribing medications. These altered health outcomes can include mortality and adverse drug withdrawal events (as discussed below).

Mortality has been correlated to polypharmacy and inappropriate medication use. It is not yet clear if deprescribing can reverse this trend. Two recent reviews of deprescribing interventions found no significant reduction in mortality overall, although they found a reduction in mortality in subgroup analyses.⁶⁷ Johansson *et al.* found no effect on mortality in randomised studies (odds ratio (OR) 1.02, confidence interval (CI) 0.84 to 1.23), which was similar to Page *et al.* (OR 0.82, CI 0.61 to 1.11). The discontinued medications are often indicated to delay mortality, so no change in mortality can be viewed as a positive finding in systematic reviews of this nature.

Adverse drug withdrawal events (ADWEs) are a potential risk of deprescribing.⁶⁸ ADWEs are noxious, unintended and undesired effects as a result of medication

withdrawal.⁶⁹ ADWEs are detected as clinically significant signs or symptoms that occur because of medication withdrawal.³² ADWEs are an emergence or re-emergence of clinical signs or symptoms.⁶⁹ They may range from mild to serious and temporary to permanent reactions.⁶⁹ Physiological withdrawal reactions include rebound symptoms where the body overcompensates for abrupt medication withdrawal.⁶⁹ Many medications to provide symptom relief and to act on the cardiovascular or nervous system are now tapered to minimise the risk of rebound symptoms.^{68,70}

Medications intended to provide symptom relief may continue to be used even after symptoms are no longer reported. It is often not possible to tell if the symptoms have resolved and that is why they are not current, or if it is that the medication is continuing to provide symptom relief.^{39,71} These medications are trialled for deprescribing, rather than decisively targeted. The medications are usually tapered, so that if symptoms re-emerge, then the medication can be promptly reinstated. These medications can be re-instated without any long-term consequences.

On a population level, the benefits of many medications are understood.⁷² However, it may be challenging

Table 3 Borderline case

Mrs X is 79 years old. She lives in a residential aged care facility. She has normal cognition and needs some support with her activities of daily living.

Blood pressure: 135/85 mmHg

Heart rate: 69 beats per minute

Mini-Mental State Examination (MMSE): 29

Modified Bartle Index (MBI) score: 54

Cornell Scale for Depression Score: 7

Vitamin D: 59 nmol/L

Medical history:

Depression – diagnosed with depression after her husband and daughter died suddenly in a car accident 6 years ago. Commenced sertraline after this. Depression now in remission.

Three falls over the last 2 years. No injuries.

One fracture 6 years ago – diagnosed with osteoporosis afterwards and commenced on alendronate.

Several seizures 6 and 5 years ago. Commenced on the antiepileptic 5 years ago. No seizures since.

Normal electroencephalogram (EEG) at recent checks.

Gastric reflux – mild symptoms once or twice weekly.

Two previous myocardial infarctions (10 and 8 years ago) after which she commenced rosuvastatin, perindopril, metoprolol and aspirin. She had a stent inserted after the second ST-segment elevation myocardial infarction 8 years ago after which she commenced both the clopidogrel and pantoprazole. She reports no current symptoms.

Medication	Strength	Dose	Decision	Rationale for deprescribing	Cease abruptly or taper?
Sertraline	50 mg	One tablet daily	Cease	Weaned due to resolution of depression (guidelines recommend use for 1 year after remission in a single episode of depression)	Taper
Alendronate	70 mg	One tablet weekly	Cease	Has used for over five years already	Abrupt
Valproate	1 g	One tablet twice daily	Cease	5 years asymptomatic (guidelines state discontinuation can be attempted after 2 years seizure free)	Taper
Metoprolol	50 mg	One tablet daily	Continue		
Pantoprazole	40 mg	One tablet daily	Dose reduction	Dose reduced to a maintenance dose	
Aspirin	100 mg	One tablet daily	Continue	Previous myocardial infarct	
Clopidogrel	75 mg	One tablet daily	Cease	Weaned as it is only recommended for 12 months post-stent	Taper
Perindopril	5 mg	One tablet daily	Continue		
Rosuvastatin	10 mg	One tablet daily	Continue		
Vitamin D	1000 IU	One tablet daily	Continue		
Calcium carbonate	600 mg	One tablet daily	Continue		

Actions

Valproate is weaned with careful monitoring following 5 years asymptomatic (guidelines state discontinuation can be attempted after 2 years seizure free).

Sertraline – weaned due to resolution of depression (guidelines recommend use for 1 year after remission in a single episode of depression).

Clopidogrel – weaned as it is only recommended for 12 months post-stent

Alendronate – ceased due to continuous use for 5 years

Pantoprazole – dose reduced to a maintenance dose of 20 mg daily

Why is this borderline?

This review identified 11 regular medications, and identified six that could be safely ceased according to current guidelines. It is borderline because although deprescribing has occurred in six out of 12 (half) of her medications, it is achieved by adhering to the current guidelines. This is regular care, and is consistent with current practice.

to ascertain the likely benefit of medications intended to prevent future serious events for any one individual. At the individual level, it is not possible to determine who may have had an event with or without the treatment. The possible consequences of deprescribing a medication intended to prevent future decline or a serious event is that the person experiences: deteriorating health outcomes or premature mortality, no change in health outcomes or mortality but continues with a similar health outcome but reduced medication use, improved health outcomes or mortality through reduced experience of side effects and reduced risks associated with polypharmacy.

It is very challenging to know which of the three possible outcomes any individual will experience because of deprescribing any particular medication. Those people at the highest absolute risk of a cardiovascular event have both the greatest potential to benefit from their medication and simultaneously the greatest potential to experience harm from their medications.

Consideration for a Particular Medication

Statins were chosen as a medication class to illustrate the concept as they are commonly prescribed for older people.⁷³ They are indicated to reduce cholesterol with the intention to reduce premature mortality and to reduce the risk of cardiovascular events such as myocardial infarction and stroke.⁷⁴ For healthy older adults without established cardiovascular disease, use of statins for primary prevention may reduce risk of myocardial infarction or ischaemic stroke, but does not alter all-cause mortality.⁷⁵ The contribution of the statin to polypharmacy and the actual side effects experienced would need to be considered along with the anticipated prognosis and the person's own goals and preferences. This uncertainty indicates that the health professional needs to consider patient preference and individual factors and that deprescribing could be a shared decision. Deprescribing statins for people who had limited life expectancy was studied and found no change in clinical outcomes.⁷⁶

DISCUSSION

Some ambiguities associated with deprescribing have been addressed through this concept analysis. The concept of deprescribing is applied with varying degrees of precision, and there is no accepted definition after 13 years of use. In this paper, we have developed the concept of deprescribing by following the process for concept analysis. We identified seven critical attributes

that illustrate the concept, namely withdrawing medications, de-escalation, intended outcomes, structured and iterative process, intervention, the risk to benefit, and patient-centred care. The consequences of deprescribing identified were namely the effect on adherence, health outcomes, mortality and cost, and possibly ADWEs. We provided the model case, borderline and contrary cases and empirical referents to illustrate the concept of deprescribing.

Deprescribing is the concept that involves reducing medications to reduce the risks associated with polypharmacy; it is an intrinsically individualised process with the intent to improve patient outcomes. It recognises that the appropriateness and usefulness of medication changes as health and life goals change. Deprescribing is applied with varying degrees of precision, although it is recognisable in practice. The person who withdraws a statin in a palliative care setting is deprescribed, while the person who stops one antihypertensive to start another because of side effects is not deprescribed. Despite the ambiguities, the defining attributes of deprescribing such as patient-centred care, the intended outcomes, the process, and the appropriate medication use, distinguish deprescribing as a concept.⁹

The main strength of this paper is the use of the Walker and Avant method to provide a structure to methodically analyse abstract concepts. We have elucidated the defining elements of the concept and elements that are not related to the concept. Examples are provided to guide a unified understanding of what the concept describes. The manuscript is an in-depth analysis of what the word has been used to describe with clear boundaries set to guide future use. This paper has several weaknesses worth noting. The main weakness is that the approach to data extraction could be considered subjective. Further, the paper focuses on deprescribing in older people, and it cannot be generalised that the concept would be applied consistently in other populations. Likewise, the inclusion criteria were peer-reviewed papers that included the term deprescribing or its variants in their title or abstract. The search strategy focusing solely on the word itself may exclude papers that exemplify the concept but did not use the word deprescribing. Similarly, the concept analysis did not include the usage of the word in consumer resources and grey literature. Limiting the concept analysis to peer-reviewed papers in older adults allowed us to analyse the concept in a defined situation as applied by researchers and clinicians interested in medication use for older adults.

Interventions to optimise medication use for older people are complex. Reviews on deprescribing interventions have repeatedly commented on the challenge to identify relevant research due to the inconsistent use of

Table 4 Contrary case

Mr Jones is aged 76 years. He lives in a residential aged care facility. He is cognitively intact and can perform many activities of daily living with minimal assistance.

Blood pressure: 145/90 mmHg

Heart rate: 87 beats per minute

Mini-Mental State Examination (MMSE): 28

Modified Bartel Index (MBI) score: 82

Cornell Scale for Depression Score: 5

Vitamin D: 39 nmol/L at the end of winter

Medical history:

Paroxysmal atrial fibrillation – diagnosed 5 years ago

His CHADS2 (congestive heart failure, hypertension, age greater than 75, diabetic and history of stroke) score then was one, and he and his doctors agreed to use aspirin to prevent a future ischemic event

Amiodarone was prescribed for the atrial fibrillation

Hypertension – diagnosed 5 years ago

Osteoarthritis – pain currently well controlled, with occasional twinges

Hypothyroidism – diagnosed 3 months ago

Weight has reduced since admission to aged care facility 1 year ago and diet has improved.

Gastric reflux symptoms – current

Medication	Strength	Dose	Decision	Rationale
Amiodarone	100 mg	One tablet daily	Cease	Amiodarone is ceased and metoprolol is commenced. The metoprolol is intended to be used as rate control and for blood pressure control.
Aspirin	100 mg	One tablet daily	Cease	Mr Jones' CHADS2 score is now two (one point for each of hypertension and age). His aspirin is ceased and warfarin is commenced.
Perindopril	5 mg	One tablet daily	Continue	Mr Jones is under 80 and has existing cardiac disease
Atorvastatin	80 mg	One tablet daily	Continue	
Thyroxine	100 micrograms	One tablet daily	Continue	Monitor as the need may change over the next 6 months after ceasing amiodarone
Paracetamol	500 mg	Two tablets twice daily	Continue (dose form changed)	Changed to paracetamol sustained release 665 mg taken two tablets three times daily to reduce dose administration times
Warfarin	Variable	Variable	Commenced	
Pantoprazole	20 mg	One tablet daily	Commenced	
Metoprolol	50 mg	One tablet daily	Commenced	
Metoprolol 50mg	One tablet daily	Commenced		

Changes

The amiodarone is ceased and metoprolol is commenced.

He is identified as having gastric reflux, and pantoprazole is commenced as a gastro-protective agent and for symptom control

He is identified as having low vitamin D, so vitamin D supplementation is commenced.

Why is it not deprescribing? It is optimising

Amiodarone is ceased and a beta-blocker commenced after hypothyroidism is identified.

The aspirin is ceased and warfarin is commenced as his risk factors have changed.

Pantoprazole is commenced as an untreated symptom was identified.

Vitamin D is commenced as an untreated condition was identified.

The medications were not ceased to manage polypharmacy. Although two of his medicines have been deprescribed, this was done to optimise his regimen, not to deprescribe medications. He is on more medications overall, although the regimen is more appropriate.

a common word.^{2,32,33,54} As described earlier, the use of the word 'deprescribing' is a suggested approach to link relevant research.^{30,31} This challenge to search and retrieve relevant research is a barrier to research distribution. By clarifying the concept of deprescribing, this research could support the uptake of the word deprescribing as applied to this research. The consistent use of the word deprescribing will enable researchers to retrieve relevant work on the topic. The implication for clinical practice is that a defined concept can improve communication between healthcare professionals to develop strategies to optimise medication use that includes deprescribing interventions.

Clarification of deprescribing is fundamental to ensure that we have a shared concept for application in clinical practice and future research. This concept analysis has identified deprescribing as a patient-centred process to withdraw medications with the intention to achieve improved health outcomes through discontinuation of one or more medications that are potentially either harmful or no longer required. Deprescribing is a consequence of the changing health and care goals over time, as well as polypharmacy and adverse effects. Deprescribing can have consequences on adherence, cost, adverse drug withdrawal effects and health outcomes.

Conflict of interests statement

The authors declare that they have no conflicts of interest.

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This activity has been accredited for 0.5 hours of Group 1 CPD activity (or 0.5 CPD credits) suitable for inclusion in an individual pharmacist's CPD plan, which can be converted to 0.5 hours of Group 2 CPD (or 1 CPD credit) upon successful completion of the relevant assessment activity. No: S2018/18.