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Nature and extent of deprescribing during medicines optimisation reviews in care homes

Suggested Title Change

Impact of medication review within a shared decision making framework on deprescribing in people living in care homes

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ABSTRACT

Objectives

To evaluate and understand the nature and extent of deprescribing when medicines are optimised in a pharmacist-led multidisciplinary clinic with care homes.

Methods

A retrospective analysis was carried out on a quality improvement project where 422 care home residents in 20 care homes received a medicines optimisation review with a pharmacist and other members of the healthcare team (general medical practitioner, care home nurse). Data on number, type and cost of medicines were collected. Statistical analysis was performed to test for differences between pharmacist-only review and the pharmacist plus general practitioner (GP), and to identify any correlation between the original number of medicines and the number of medicines stopped.

Results

Of the 422 patients reviewed, 298 (70.6%) had at least one medicine stopped with 704 medicines being stopped. This represented 19.5% of the medicines originally prescribed (3602 medicines). There was no statistically significant difference between pharmacist-only and pharmacist-plus-GP in terms of stopping medicines. The main groups of medicines stopped were laxatives, skin products and bone protection. There was weak correlation between the original number of medicines prescribed and the number stopped.

Conclusion

This study has shown that medicines optimisation reviews can lead to a reduction in polypharmacy for care home residents through a deprescribing process. Patients' medicine regimens were simplified and optimised whilst making financial significant savings for the NHS.

Key Messages

What is already known on this subject

- Polypharmacy can lead to adverse events
- Deprescribing medicines can improve quality and reduce healthcare costs
- Deprescribing is difficult with few tools or guidelines to support practitioners

What this study adds

- Structured medicines optimisation reviews allow medicines to be deprescribed safely in a care home setting
- Most medicines stopped had no indication or purpose
- Medicines can be stopped across a wide range of therapeutic areas

INTRODUCTION

While polypharmacy can be essential to improve the quality of life for many patients, it can also lead to increased risks of adverse drug reactions, drug interactions and reduced medicines adherence. There is a body of evidence to suggest that potentially inappropriate prescribing (PIP) and polypharmacy is common in elderly populations residing in nursing home settings.(1, 2) Targeting and reducing such prescribing should be a key priority for clinicians, not solely to reduce negative clinical outcomes and the adverse effects of inappropriate drugs, but also to reduce the financial burden upon healthcare providers.

To minimise these effects, a key component of medicines optimisation is the avoidance of unnecessary or harmful medicines, with studies showing that input from a multidisciplinary team (MDT) or a pharmacist-led review can facilitate the reduction of polypharmacy.(3-5)

Deprescribing is a term frequently used to describe the planned reduction and stopping of medication.(6-8) It is an important part of the prescribing process as medicines should be regularly reviewed and when a medicine stops benefiting a patient it should be stopped.

Guidance for withdrawing medication, as with starting treatments, will help to ensure that deprescribing becomes part of a prescribing process. However, there is little support for practitioners who wish to stop medicines. Solutions to support deprescribing include tools which identify potentially inappropriate medication, such as the STOPP-START tool(9) and Beers criteria.(10) Although studies have demonstrated their impact on reducing inappropriate medicines, they are neither patient-centred nor transferrable to all patients. All patients should receive a regular benefit-harm assessment of their medication as circumstances change, bearing in mind age and comorbidities, to identify medicines which are providing little benefit. Stopping criteria based on therapeutic failure is typically left to clinical judgement.

Deprescribing to support patient outcomes. Scott et al JAMA 2015; Gnjidic et al BMJ 2014

Rational medication use should involve patients in decision-making about their medication and consider when medication may no longer be beneficial. Prescribers must acknowledge and overcome uncertainties inherent in deprescribing of medication.(11) Barriers to patient-centred deprescribing include disagreement with the appropriateness of cessation, fear of consequences of cessation, absence of a process for cessation and negative influences on patients' decisions to cease medication.(12)

There are emerging studies on the potential benefits of deprescribing. For instance, Todd *et al* and Lindsay *et al* showed the potential to stop medicines in patients with lung cancer.(13, 14)

This study aimed to investigate whether medicines review led by pharmacists would lead to deprescribing of medications. Secondary aims were to assess the reasons for and impact of deprescribing.

METHODS

This was a retrospective analysis of the Shine Medication Optimisation Project; a quality improvement project where care home residents were reviewed and medicines optimised within a shared decision-making framework.⁽¹⁵⁾ The project used a patient centred approach where the answer to three questions (Northumbria 3Q) were discussed with residents in 20 care homes and joint decisions made.⁽¹⁵⁾ The three questions were: (i) is there an indication for the medication (i.e. where the medicine is neither treating nor preventing any disease nor alleviating symptoms)? (ii) is the indication appropriate when co-morbidity and current clinical situation is taken into consideration (e.g. bone protection treatments for bed-bound residents)? and (iii) is the medication safe?⁽¹⁵⁾ Clinical judgement backed up by a review of the clinical notes was used to assess appropriateness of medicine. The final decision to stop or continue the medicines was made jointly with the patient or their advocate.

All carehomes across a Clinical Commissioning Group (CCG) were invited to participate, with residents based in 20 homes receiving medication optimisation reviews. As this was a quality improvement project, care homes were not randomly selected, but selected based by their willingness and that of their general medical practice to participate in the project. Care homes across two CCGs in North East England were invited to participate. Of the 20 care homes, 15 were mixed (nursing, EMI (elderly & mentally infirm) and residential) with three being residential and two nursing only.

The review process involved a pharmacist-led review of medicines, where each medicine was questioned using the Northumbria 3Q approach. This was followed by a multidisciplinary team (MDT) meeting involving pharmacists and care home nurses, with other professionals (e.g. general medical practitioners and mental health professionals) joining when required. Whenever possible, the final decisions were made with patients and their families. After the review, the project database was updated to show medicines taken prior to review, medicines stopped, started or changed and any other interventions made.

In total, 422 residents were reviewed, with pharmacists and other professionals making 1346 interventions jointly with care home residents.⁽¹⁵⁾ The most common intervention was to stop medicines, accounting for 704 medicines stopped in 298 (70.6%) of patients.⁽¹⁵⁾

The project database was analysed and data presented descriptively. The number and type of medicines stopped as well as the cost saving associated with deprescribing was reported. The reasons why medicines were stopped were collated and these data were extracted from the project database for this study. All medicines prices were calculated using the National Health Service (NHS) Drug Tariff and savings annualised, thus making the assumption that the medicine would have been taken for another 12 months after deprescribing. The Kings Fund predicts a 65% increase in patients needing advanced care by 2030.⁽¹⁶⁾ The Nuffield Trust have estimated a median length of stay of 18 months for people admitted to permanent residential care.⁽¹⁷⁾ This is consistent with a BUPA 2012 survey of its care homes which demonstrated a median length of stay of 20 months.⁽¹⁸⁾

In the project there were two models of working: pharmacists working independently of general practitioners, making prescribing decisions, including decisions to stop medicines; and prescribing

decisions made jointly by pharmacists and general practitioners. Both models of working were part of a shared decision-making approach with residents or their families

IBM® SPSS® Statistics (Version 21) was used to determine statistical differences, on the basis of a t-test, between number of medicines stopped, between pharmacists working independently or with general medical practitioners. To understand whether the deprescribing was affected by the original number of medicines prescribed to the patient a Pearson's correlation was performed.

This project was funded by the Health Foundation as part of the Shine 2012 programme. This was run as a quality improvement project. Advice on ethical approval was sought from the Trust's research and development lead. It was agreed that ethical approval for the QI project and this subsequent analysis was not required.

RESULTS

422 residents were reviewed in 20 care homes (2 residential, 3 nursing and 15 mixed) between January 2013 and March 2014. The average age of the cohort was 85.5y with 77.7% being female. The 422 residents were collectively taking 3602 medicines prior to the review, with 704 (19.5%) stopped in 298 residents during the review. The 298 residents who had medicines stopped were taking a total of 1346 medicines prior to review, with 704 (52.3%) of their medicines stopped. The mean number of medicines stopped was 2.36 (SD 1.53) ranging from 0 to 9. There was no statistical difference between numbers of medicine stopped by pharmacist prescribers (53.4% stopped) and numbers stopped (51.9%) where general practitioners were involved ($p=0.9702$; 95% Confidence Interval: -0.39 to 0.38).

Of the 704 medicines that were stopped, 142 were acute medicines and 562 were regular repeat medicines. The primary reason for stopping medicines was that the medicine had no current indications ($n=400$; 56.8%) with 15.9%, 8.7%, 6.5% of deprescribing accounted for by, respectively, patient choice, the indication no longer being appropriate and safety reasons (Table 1).

Table 1: Reasons why medicines were deprescribed

Reason	n medicines
No indication	400
Patient refusing medicine	112
Indication not appropriate	61
Safety	46
Ineffective treatment	29
Therapeutic Switch	17
Duplication	12
Other	27

Medicines were stopped from all but three (malignant disease, immunology, and anaesthesia) sections of the British National Formulary. The most common groups of medicines deprescribed

were laxatives (14.5%), skin products (8.4%), bone protection drugs (7%), acid regulating medicines (5.4%), antidepressants (4.7%), antihypertensives (4.3%) and lipid regulating medicines (4.3%) (Table 3). All medicines were stopped after involving residents and/or their families/advocates and taking their views into account.(15)

Table 2: Common Groups of medicines deprescribed

Type of drug	Number	%
Laxatives	102	14.4
Skin	59	8.4
Bone Protection	49	7.0
Acid regulating	38	5.4
Antidepressants	33	4.7
Hypertension	30	4.3
Lipid regulation	30	4.3
Others	363	51.5

Many residents were prescribed a number of laxatives and the main drugs stopped were sodium docusate, macrogols and senna. Bone protection medicines were all stopped because the resident was immobile (bed or chair bound) and at low risk of falls. Many acid regulating drugs were no longer indicated (e.g. they were originally prescribed short term). Antidepressants were deprescribed after consultation with resident, family and care home staff, sometimes also involving the relevant old age psychiatrist. Hypertension medicines were only stopped where blood pressure was low or where there was a falls risk. Lipid regulating medicines were mainly statins and were stopped after discussing their benefits and risks.

All residents were monitored following any deprescribing and adverse events documented. Only seven events (0.99%) were reported (Table 4). The events were all minor and were reversed. In one case, the patient became very weepy and tearful and the antidepressant (citalopram) was restarted. For four situations another medicine was started and the for the remaining two cases the medicine was started at a lower dose and monitoring was put into place.

Table 3: Adverse events caused by deprescribing

Event	Cause	Action
Hypertensive (BP increased from 130/80 to 158/80)	Stopped bendroflumethiazide	Monitor but leave off bendroflumethiazide
Swelling legs	Furosemide stopped	Restarted but lower dose
UTI	Stopped trimethoprim	treated and restarted prophylaxis
BP 170/90	Amlodipine stopped (leg swelling)	Start another hypertensive
Weepy and tearful	Stopped citalopram	Restarted
BM raised	Stopped metformin	Increase insulin
GI - heartburn	Stopped omeprazole	Start Lansoprazole

The relationship between the number of medicines originally prescribed and number stopped was investigated using the Pearson's correlation. There was a weak positive relationship ($r=0.333$) which tailed off at 15 medicines originally prescribed.

The assumption that each medicines would have been taken for another year was made when measuring the financial impact of deprescribing. The medicines stopped amounted to £65,471 in terms of annualised savings.(15)

DISCUSSION

This study aimed to uncover the extent to which deprescribing could be conducted using a structured medication review within a MDT across 20 nursing homes in North East England. Overall, 1 in 20 medicines were stopped for every resident reviewed, with medicines being stopped in over two thirds of residents reviewed. With this ageing cohort, it is expected that there will be multiple co-morbidities and complex clinical presentations. It is, perhaps, not surprising that patients were prescribed an average of 9 medicines per resident prior to the medication reviews, yet this was reduced to an average of 7 medicines per person reviewed.

Using two models of delivery for the service (pharmacist actioning decisions or pharmacist and general practitioner actioning decisions); there was no statistical difference in number of medicines deprescribed between the two methods.

The main reason for stopping a medicine was when there was no current indication for the drug, followed by discontinuation on patient request. Other studies have found reasons for polypharmacy include the prescribing of duplicate medicines or the use of medicines no longer required which have yet to be removed from the repeat prescription.(19, 20)

It was determined that there was only a weak positive relationship between the number of drugs suitable for discontinuation and the number of medicines taken prior to review. It can be concluded that it is not always necessary for patients to be taking large numbers of drugs to allow successful deprescribing to take place.

There were nine adverse effects reported thought to be related to the cessation of a medicine during the study. None of the effects was serious and they were appropriately rectified by either monitoring the patient or re-instating the drug or an alternative. Through careful review using a multi-disciplinary approach, deprescribing can be performed effectively and safely. It is also clear that appropriate monitoring post-cessation is important to pick up any untoward effects that may occur. One of the limitations in attributing adverse effects to the cessation of a drug is that it is difficult to be certain of causation, bearing in mind the complexity of co-morbidities in the older population.

To assess the financial impact, we assumed that residents would have taken medicines for at least another 12 months after it was deprescribed. This is an underestimate as on average care home residents live for 18 months.(17) It is a limitation of this study that actual lifespan was not measured. Significant savings were shown from the primary care medicines budget (in excess of £60,000), which if scaled up could potentially reduce healthcare expenditure globally. There is also

the possibility that sequelae from inappropriate prescribing may have increased healthcare costs further, had the drug not been stopped. It is impossible to predict the extent to which deprescribing may have prevented such complications of therapy.

A further limitation of this study is that the impact of deprescribing on pharmaceutical waste was not measured. Further research into financial savings from reduced medicines waste would be useful. The longer term clinical outcomes for the patients undergoing deprescribing also remain uncertain. In the short term, patients tolerated the reduction in medication reasonably well, but data collection was not continued over an extended period which would have allowed any longer term complications to be detected.

Another limitation of the study was the measure of intervention quality. Pharmacist and physician interventions were not externally validated by an independent clinician for standardisation. It can be assumed that approaches to deprescribing will depend on the individual clinician, based upon their experience and profession.

In conclusion, this study has shown that structured reviews with patient involvement and a multi-disciplinary approach can lead to a reduction in polypharmacy for care home residents through a deprescribing process. Patients' medicine regimens were simplified and optimised whilst making financially significant savings for the NHS.

REFERENCES

1. Alldred DP, Raynor DK, Hughes C, et al. Interventions to optimise prescribing for older people in care homes. *Cochrane database of systematic reviews (Online)*. 2013;2:CD009095.
2. Ruths S. Multidisciplinary medication review in nursing home residents: what are the most significant drug-related problems? The Bergen District Nursing Home (BEDNURS) study. *Quality and Safety in Health Care*. 2003;12(3):176-80.
3. Crotty M, Halbert J, Rowett D, et al. An outreach geriatric medication advisory service in residential aged care: a randomised controlled trial of case conferencing. *Age Ageing*. 2004;33(6):612-7.
4. Zermansky A, Alldred D, Raynor DRP, et al. Clinical medication review by a pharmacist of elderly people living in care homes—randomised controlled trial. *Age Ageing*. 2006;35:586-91.
5. Furniss L, Burns A, Craig SK, et al. Effects of a pharmacist's medication review in nursing homes: a randomised controlled trial. *Br J Psychiatry*. 2000;176:563-7.
6. Describing deprescribing. *Drug and Therapeutics Bulletin*. 2014;52(3):25.
7. Alldred DP. Deprescribing: a brave new world? *Int J Pharm Prac*. 2014;22(1):2-3.
8. Frank C. Deprescribing: a new word to guide medication review. *CMAJ*. 2014;186(6):407-8.
9. Gallagher P, O'Mahony D. STOPP (Screening Tool of Older Persons' potentially inappropriate Prescriptions): application to acutely ill elderly patients and comparison with Beers' criteria. *Age Ageing*. 2008;37(6):673-9.
10. American Geriatrics Society Beers Criteria Update Expert Panel. Updated Beers Criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc*. 2012;60(4):616-31.
11. Todd A, Holmes HM. Recommendations to support deprescribing medications late in life. *Int J Clin Pharm*. 2015;37(5):678-81.

12. Reeve E, To J, Hendrix I, et al. Patient barriers to and enablers of deprescribing: a systematic review. *Drugs & aging*. 2013;30(10):793-807.
13. Lindsay J, Dooley M, Martin J, et al. Reducing potentially inappropriate medications in palliative cancer patients: evidence to support deprescribing approaches. *Supportive Care in Cancer*. 2014;22(4):1113-9.
14. Todd A, Williamson S, Husband A, et al. Patients with advanced lung cancer: is there scope to discontinue inappropriate medication? *Int J Clin Pharm*. 2013;35(2):181-4.
15. Baqir W, Barrett S, Desai N, et al. A clinico-ethical framework for multidisciplinary review of medication in nursing homes. *BMJ Quality Improvement Reports*. 2014;3(1):u203261.w2538-u.w2538.
16. The Kings Fund. Care demands and dementia. Available from: <http://www.kingsfund.org.uk/time-to-think-differently/trends/disease-and-disability/care-demands-dementia> (last accessed 25/1/2016)
17. Nuffield Trust. Estimating length of stay in publicly-funded residential and nursing care homes: a retrospective analysis using linked administrative data sets. London. 2012.
18. BUPA. A profile of residents in BUPA care homes: results from the 2012 BUPA Census. Available from: <http://www.cpa.org.uk/information/reviews/Bupa-Census-2012.pdf> (last accessed 25/1/2016)
19. Finkers F, Maring JG, Boersma F, et al. A study of medication reviews to identify drug-related problems of polypharmacy patients in the Dutch nursing home setting. *Journal of Clinical Pharmacy and Therapeutics*. 2007;32(5):469-76.
20. Somers M, Rose E, Simmonds D, et al. Quality use of medicines in residential aged care. *Australian Family Physician*. 2010;39(6):413-6.