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## Deprescribing for frail older people – Learning from the case of Mrs. Hansen



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### ABSTRACT

Drug treatment is often an essential part in treatment and prevention of diseases in older people, but there is much concern about inappropriate medication use. This paper aims to describe the complexity of medication safety issues and clinical judgments when optimizing prescribing in older individuals. It uses the case of Mrs. Hansen, an aged nursing home resident, to illustrate the facilitators and barriers of this process. With decreasing life expectancy, medication use should shift from cure to care, focusing on symptomatic treatment to increase the patient's well-being. In Mrs. Hansen's case, the number of (potentially) dangerous medications were reduced, and non-pharmacological alternatives were considered. There were some medicines added, as underprescribing can also be a problem in older people. Deprescribing long-standing treatment can be interpreted by the patient and family as "giving up hope". More clinical evidence and practical communication tools are needed to guide deprescribing decisions, taking medical and patient-centered priorities into account. Studies evaluating such interventions should select outcome measures that are particularly relevant for frail old individuals.

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### 1. Introduction

Over the last decades, there has been a major increase in drug use, particularly in older people.<sup>1</sup> Although drug treatment is essential in both treatment and prevention of diseases among older people, this is of concern. Firstly, most evidence regarding medication efficacy and safety is derived from small samples of younger and healthier populations.<sup>2,3</sup> Secondly, older people are extra vulnerable to adverse effects of drug use due to age- and disease-related changes, multimorbidity, and complex drug regimens.<sup>4</sup> Research on prescribing quality in older people is rapidly expanding. A range of assessment tools have been developed to identify and measure inappropriate prescribing.<sup>5</sup> Although helpful in increasing awareness, such tools can never replace good clinical judgement. Multiple intervention studies have demonstrated improvements in prescribing quality based on reductions in

inappropriate prescribing; however, the question remains if the interventions also result in improved clinical outcomes.<sup>6</sup> Thus, there is no gold standard on how to ensure high quality of prescribing for older people. The aim of this paper is to describe the complexity of medication safety issues and clinical judgments when optimizing the prescribed medication of a frail old lady.

### 2. Medical history and diagnoses

Mrs. Hansen, a 90-year old widow, was admitted to the local nursing home four weeks ago. During the last months living at home she had severe functional decline, became disorientated and could no longer cope with daily activities. Her comprehensive care needs and increasingly demanding behavior for attention could no longer be met by her 65 year old daughter and the home care services. They flagged the need for admission to a nursing home. According to her general practitioner, Mrs. Hansen has had hypertension and intermittent atrial fibrillation for decades, a stroke 15 years ago, and an abdominal hernia 10 years ago. She complained repeatedly about back pains. Previously conducted X-ray and bone

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density measurement revealed osteoporosis with multiple vertebral compression fractures. She also had hearing problems but refused to use hearing aids.

Her daughter reported that Mrs. Hansen used to like gardening but lost the interest in flowers and being outdoors. Her daily activities in the last two years were restricted to cooking simple meals and shopping with her daughter. She has never been particularly socially active.

Prior to admission, the nursing home primary nurse obtained a list of prescribed medicines from the general practitioner and asked the daughter to bring along all the medicines used at home, including any “as required” medications. After reconciliation, the nurse recorded Mrs. Hansen’s actual medication regimen to consist of 13 regular medicines and 1 as required medicine, as shown in [Table 1](#). For three medicines (oxycodone, paracetamol and acetylcysteine), it was difficult to establish the exact frequency of use at home.

On the third day after admission, the nursing home physician conducted an admission consultation, focusing on the patient’s complaints and expectations, known conditions and possible dementia. Mrs. Hansen suffered from constant back pains and frequently asked for more painkillers. Also, she complained about constipation and itching legs. Clinical examination revealed arrhythmia, ankle edema, dry skin and scratches on both legs. She was clearly agitated and unable to complete the Mini Mental State Examination. After consulting a geriatric psychiatrist and the daughter, the nursing home physician decided to prescribe risperidone to alleviate agitation and restlessness.

The following week, a multidisciplinary medication review was performed.<sup>7</sup> The primary nurse performed relevant measurements in advance, such as weight, blood pressure, heart rate, and ECG, as well as blood tests such as hemoglobin, renal function, electrolytes, HbA1C, glucose, thyroidal function, and cholesterol levels. The clinical pharmacist received the list of the patients’ current medication in advance and applied different tools (STOPP & START,<sup>8</sup> Beers list,<sup>9</sup> Interaction database<sup>10</sup>) to check for potentially inappropriate medication use, under-prescribing and drug interactions. The physician, the primary nurse and the pharmacist then performed a medication review, discussing pros and cons of the current drug regimen, taking into consideration the overall clinical picture and patient perspectives.<sup>11</sup>

### 3. Polypharmacy late in life

[Table 1](#) illustrates that Mrs. Hansen was exposed to excessive polypharmacy, i.e. > ten drugs, including six drugs affecting the central nervous system (analgesics and psychotropic drugs). In other words, Mrs. Hansen is a typical polypharmacy patient commonly seen in nursing homes.<sup>12</sup> Frail, older individuals like Mrs. Hansen have an increased risk to experience side effects from medicines, emphasizing the need to be cautious about prescribing. Holmes suggested a model with four components to guide the reconsideration of medication use late in life<sup>13</sup>: Remaining life expectancy of the patient, the time until benefit for each medication, pinpointing treatment targets for each medication, and shared decision-making among physicians, patients, and families all should inform the goals of care. Ideally, there is consistency among all four components. With decreasing life expectancy, medication use should shift from cure to care. Late in life, the focus should be on symptomatic treatment to increase the patient’s well-being. Consequently, the number of medicines prescribed should decrease, and non-pharmacological alternatives should be considered whenever possible. So, what would be a sensible way forward regarding the medical treatment of Mrs. Hansen? Firstly, one should address potentially dangerous medications, then those

considered unnecessary or troublesome. Lastly, one must consider any missing treatment options, as underprescribing can be a problem even in older people.<sup>14</sup>

### 4. The medication review

For Mrs. Hansen, the top priority was pain relief. Her complaints continued despite an excessive use of analgesics. Her constant pain may partly explain her demanding behavior and craving for the staff’s attention. The first drug the team decided to stop was ibuprofen due to the high risk of older individuals to develop gastrointestinal bleeding and a decrease in renal function due to taking NSAIDs. Because of an interaction with the ACE inhibitor, this was also increasing the risk for renal and heart failure. The team decided to stop amitriptyline as the patient presumably did not get any pain relief and because of the very strong anticholinergic side effects in older people. Likewise, pregabalin was stopped by step-wise reduction of the dose over the course of two weeks to prevent the patient from experiencing withdrawal symptoms. The team decided to tackle the pain by prescribing an immediate-release formulation of oxycodone six times daily and paracetamol four times daily for dose titration. If this regimen was sufficient, the patient would be changed to receive a modified released formulation of oxycodone twice daily and paracetamol four times daily (not more than 2 g to reduce the risk of liver toxicity on chronic use) as well as receive immediate-release oxycodone for breakthrough pain.

The team also decided to initiate a number of other options to address the patient’s pain, including physiotherapy and encouragement to take part in social activities. They also considered deprescribing her sleeping tablets zopiclone, being used long-term in the highest available strength. Sleeping tablets lose effectiveness in long-term use; additionally, they increase the risk for delirium, falls and fractures. The team decided to initiate a step-wise dose reduction leading to cessation and was looking for non-pharmacological alternatives for her. In addition, a number of other medications were stopped. Acetylcysteine was stopped due to lack of evidence for treatment effects. Estriol was stopped because there was no clear clinical indication for use. Iron was stopped as the patient’s hemoglobin was normal and because it may worsen the patient’s constipation. The itching on her legs improved when a moisturizing lotion for dry skin was applied, so it was decided to discontinue the dermatological preparation. She had not been prescribed secondary prevention for stroke, but considering that her stroke occurred 15 years ago, her high age and heavy drug load, a full cardiovascular risk management was not initiated.<sup>15</sup> Finally, vitamin D and calcium was started after the multidisciplinary medicating review because of her clinically manifest osteoporosis and low vitamin D-levels in an attempt to decrease her fracture risk. [Table 2](#) shows her updated list of pharmacotherapy.

### 5. Deprescribing

So, what was done to optimize Mrs. Hansen’s treatment? Overall, eight medicines were stopped due to high risk of side effects and the lack of effectiveness. Two medicines were added, Vitamin D/calcium and risperidone. The latter was then stopped within three months. What happened in Mrs. Hansen’s case can be called deprescribing. This was recently defined as “the process of withdrawal of an inappropriate medication, supervised by a health care professional with the goal of managing polypharmacy and improving outcomes”.<sup>16</sup> A small number of studies have examined the impact of deprescribing, suggesting benefits and an absence of harm. Examples include withdrawal of neuroleptics in older

**Table 1**  
Details of the prescribed medicine for nursing home patient Mrs. Hansen at admission, and comments from the multidisciplinary medication review.

Medication use details	ATC code	Indication	Drug initiation	Comments from the medication review	Consequence of the review
1. Ibuprofen tablets 200 mg Two tablets	M01A E01	Pain	Before admission	Adverse drug profile	Cessation
2. Amitriptyline tablets 10 mg Once daily	N06A A09	Pain	Before admission	Lack of effect, adverse drug profile	Cessation
3. Pregabalin tablets 25 mg Once daily	N03A X16	Pain	Before admission	Lack of effect, adverse drug profile	Dose reduction, cessation
4. Oxycodone 5 mg sustained release tablets Frequency of administration before admission unclear	N02A A05	Pain	Before admission	Optimize pain treatment by dose titration using immediate release formulation and then convert to modified release formulation to be administered twice daily with an immediate release formulation for breakthrough pain.	Dose titration with immediate release formulation then conversion to modified release formulation
5. Paracetamol 500 mg Frequency of administration before admission unclear	N02B E01	Pain	Before admission	Ensure stable pain management. Water-soluble, with shorter half-life in old people. Chronic use should be no more than 2 g/day.	Now given 4 times/day
6. Zopiclone tablets 7.5 mg Once daily	N05C F01	Insomnia	Before admission	Lack of effect, adverse drug profile	Dose reduction, cessation
7. Movicol powder Makrogol, NaCl, NaHCO <sub>3</sub> , KCl Two sachets per day	A06A D65	Constipation	Before admission	Valid indication. Need for two laxatives?	Continuation, increase dose?
8. Sennosid A + B 20 mg syrop 2–3/ week	A06A B06	Constipation	Before admission		Dose reduction, cessation?
9. Iron sulphate sustained release tablets 100 mg Once daily	B03A A07	Anemia	Before admission	Normal hemoglobin levels measured	Cessation
10. Enalapril tablets 5 mg Once daily	C09A A02	Hypertension	Before admission	Valid indication	Continuation
11. Hydrocortisone/ Miconazol cream Twice daily	D01A C20	Fungal infection feet	Before admission	Symptoms (itch?) Duration? Effect? Long-term use in elderly not recommended.	Cessation
12. Estriol tablets 1 mg Once daily	G03C A04	Unknown	Before admission	Duration, symptoms (urinary tract infections, senile colpitis?)	Cessation and re-evaluation. If indicated, local application is preferred
13. Nitroglycerine spray 0.4 mg/dose As required	C01D A02	Angina pectoris	Before admission	Symptoms? Still indicated?	Continuation
14. Acetylcystein 200 mg Frequency of administration before admission unclear	R05C B01	Cough	Before admission	No documented effect	Cessation
15. Risperidon tablets 0.5 mg One tablet at night	N05A X08	Agitation, restlessness	Added 3 days after admission	Limited effectiveness, not indicated for long-term use	Cessation after 3 months
16. Calcium 1000 mg/ Vitamin D 800 International Units Once daily	A12AX	Reduce fracture risk	Added after medication review	Osteoporosis	Initiation after medication review

nursing home residents,<sup>17</sup> antidepressants in older patients with dementia,<sup>18</sup> and antihypertensives in older persons.<sup>19</sup> In Mrs. Hansen's case, the STOPP criteria<sup>8</sup> and the Beer's criteria<sup>9</sup> were used to guide decisions on which medication to discontinue. Studies have shown that these tools are useful in detecting drug-related problems.<sup>6</sup> Other tools may be also very useful, such as the Drug Burden Index<sup>20,21</sup> measuring the cumulative and anticholinergic drug load of patients. Their practical applicability however should be further developed from a research point-of-

view, to become a fully integrated part of prescribing support systems.<sup>22,23</sup> There are initiatives to develop deprescribing guidelines (e.g. <sup>24</sup>). Tools have also been proposed to support the decision-making around deprescribing.<sup>25</sup> But more research is needed to broaden the clinical evidence around some of the choices, e.g. when to discontinue antihypertensive medication.<sup>26</sup> Little is known to what extent deprescribing is implemented in clinical practice. A Norwegian study showed that 72.5% of deceased nursing home patients still had standing prescriptions of curative/

**Table 2**

Details of the prescribed medicine for nursing home patient Mrs. Hansen following the medication review.

Medication use details	ATC code	Indication	Drug initiation	Follow-up
1. Movicol powder Makrogol, NaCl, NaHCO <sub>3</sub> , KCl Two sachets per day	A06A D65	Constipation	Before admission	Both medicines were kept. Likely to be constipated from the oxycodone. Evaluate the need for two laxatives in the following weeks.
2. Sennosid A + B 20 mg syrop 2–3/week	A06A B06	Constipation		
3. Enalapril tablets 5 mg Once daily	C09A A02	Hypertension		Blood pressure should be measured regularly.
4. Oxycodone 5 mg immediate release formulation, 6 times daily	N02A A05	Pain		Monitor effect; if pain is under control, then convert to modified release formulation to be administered twice daily; use oxycodone 5 mg immediate release formulation for breakthrough pain. Chronic use should be no more than 2 g/day.
5. Paracetamol 500 mg Four times daily	N02B E01	Pain		
6. Nitroglycerine spray 0.4 mg/dose As required	C01D A02	Angina pectoris		Continuation, but the patient does not seem to have symptoms. Evaluate the need in the following weeks.
7. Risperidon tablets 0.5 mg One tablet at night	N05A X08	Agitation, restlessness	Added 3 days after admission	Monitor effects on behavior, cessation after 3 months.
8. Calcium 1000 mg/Vitamin D 800 International Units Once daily	A12AX	Reduce fracture risk	After medication review	Continuation for prevention of osteoporosis.

preventive drugs on the day of death, and 47.3% of them also received palliative drugs.<sup>27</sup> This evidence argues the case for a more proactive approach to deprescribing in frail older people.

How should optimization of the pharmacotherapy in older people be organized? Mrs. Hansen received a medication review by a multidisciplinary team including a physician, a nurse and a clinical pharmacist. This is a mix of health professionals, each with different and complementary competences. The specific role of the pharmacist in this cooperation has been highlighted.<sup>28</sup> Direct collaboration between different professionals is very important.<sup>29</sup> Furthermore, a patient-centered approach is vital to allow for shared decision-making on pharmacotherapy. Deprescribing long-standing treatment can be interpreted by the patient and family as “giving up hope”. Good communication with the patient, family and carer is therefore crucial, but in many cases a challenge to realize, especially in patients with dementia. Important ethical implications of deprescribing such as how to deal with autonomy of patients are very important to overcome barriers in implementing deprescribing in practice.<sup>30</sup> Schuling et al.<sup>31</sup> suggested using a communication tool based on work by Fried et al.<sup>32</sup> to guide such conversations. Patients are asked to rank four components: staying alive as long as possible, being free of symptoms, being free of pain and remaining independent. More work has to be done to develop such tools for the nursing home setting. Planning and thorough follow-up of effects are other essential elements of the deprescribing process.<sup>33</sup>

What is the evidence that medication reviews are effective in older individuals? On one hand, a range of studies report positive effects of medication reviews on reducing the number of (inappropriate) medications and lowering the drug costs in different settings including nursing homes.<sup>34,35</sup> On the other hand, a systematic review and meta-analysis by Wallersted et al.<sup>36</sup> found no effects of medication reviews on mortality and hospitalization rates in nursing home residents. Similarly, a Cochrane Review by Alldred et al.<sup>37</sup> showed that interventions in nursing home residents, including medication reviews, did not have an effect on adverse drug events, hospital admissions or mortality.

Is it realistic to expect that medication reviews in patients like Mrs. Hansen will have any effects on mortality or hospital admission? In general, nursing home residents have a high mortality, and mortality is influenced by many co-variables. In line with policy for many other nursing home residents, the multidisciplinary team decided in collaboration with her daughter that Mrs. Hansen was

not to be admitted to hospital for intensive life-prolonging treatment, should her health deteriorate. The deprescribing of eight medicines may or may not have an impact on her life expectancy. Considering her case, relevant research outcomes would be improved quality of life, activities of daily living, satisfaction with treatment, and absence of adverse drug events. She may experience fewer side effects, but in a complex case like hers, causality would be difficult to establish. Mrs Hansen's own concern has mainly been the unsatisfactory pain treatment. Careful follow-up is needed to ensure that the new regimen is effective. Mrs. Hansen (and her daughter) was overall more satisfied with the pain treatment. The nursing staff found that Mrs. Hansen appeared to be calmer after the changes to her medication, possibly related to her experiencing less pain. More work is needed to develop a set of relevant outcome measures to evaluate health care interventions such as medication reviews.<sup>38</sup>

## 6. Conclusions

In recent years, some advances have been made to optimize polypharmacy late in life. Mrs. Hansen's case serves as an example of the complexity and difficulty of the decision making process during medication reviews. Further clinical evidence around deprescribing, alongside practical communication tools to support shared decision making, are needed for wider implementation. Studies evaluating such interventions should select outcome measures that are particularly relevant for frail old individuals.

## Authors' contributions

AGG and KT wrote the initial draft of the paper based on a nursing home patient from AGG. Personal and clinical details are changed to protect privacy. SR and MB contributed with clinical aspects to add depth and applicability to prescribers.

## Conflict of interest disclosures

We have no conflict of interest to report.

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