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In-hospital de prescribing in the real world – a clinician-led approach to hyper poly pharmacy

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Abstract

Insufficient information on how to safely stop taking many medications has aided in the spread of polypharmacy. The chance to begin deprescribing is particularly useful during hospitalization. Pharmacists or multidisciplinary teams often lead deprescribing efforts, which are generally well-received by patients and have little risks. However, only a small number of research have looked into therapies that can really be used by doctors in the clinic.

The study's goal is to determine whether or not a deprescribing initiative guided by clinicians can be successfully implemented on an acute general medicine ward. Procedures Patients with hyperpolypharmacy (> 10 drugs) were subjected to a comprehensive intervention including (a) deprescribing education sessions and (b) a deprescribing alert in their bedside files. We used a historical cohort research design to compare the intervention cohort's data to those of a control group from the past. After the intervention was over, a sample of the group was queried to gauge sentiments about describing.

Conclusions Out of a total of 1333 patients enrolled, 1169 had full data sets analyzed (nintervention = 888, ncontrol = 281). Despite a drop in the prevalence of hyperpolyphar- macy from 28% to 26% in the intervention group, this difference was not statistically significant (net change = —1, IQR = —2-0; p = 0.26). Furthermore, the intervention did not lead to a statistically significant increase or decrease in medication use among any of the other categories. Many people who were interviewed about deprescribing agreed that they were taking too many drugs. In conclusion, we showed that it is possible to implement clinician-led deprescribing programs even in resource-poor, high-volume inpatient units, despite not finding a statistically significant impact of the intervention. Further research in large inpatient cohorts is needed to examine the long-term patient outcomes and harmful effects of medications after simple, creative deprescribing methods in hospitals.

Keywords: Deprescribing, Hyperpolypharmacy, Polypharmacy, Acute Medical Ward, and Clinician-Led.

INTRODUCTION

Many medicinal treatments have clear reasons for starting, but there are less guidelines for when to stop taking a prescription that has been given for lengthy periods of time. In other words, it is not normal practice to stop using a medicine for a chronic ailment after therapy has begun. Because of this, polypharmacy and hyperpolypharmacy have become more prevalent, especially among elderly patients. 1 The World Health Organization (WHO) defines polypharmacy as the use of five or more medications at once2, and the term hyperpolypharmacy might be used to describe the use of ten or more drugs at once. 3 Although statistics from other published publications reveal figures ranging from 36% to as high as 91%,4 the estimated incidence of polyphar- macy in older individuals on inpatient wards in Australia is 48%.

5–8 One negative aspect of polypharmacy is that it is often linked to the use of potentially inappropriate drugs (PIMs), in which the risks of adverse drug events are deemed to exceed the therapeutic benefits of the drug being taken. 9, 10 Polypharmacy is problematic since it has been linked to not just negative health outcomes but also functional decline, falls, disorientation, and increased healthcare expenditures.

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treatment in a hospital, and a higher risk of dying. 11 When many medications are used, the risk increases because of the different ways they interact with one another and the different ways they could cause unwanted side effects. Sedatives, antipsychotics, antidepressants, anticoagulants, anti-cholinergics, and antihypertensives all fall within this category. 9, 10

Deprescribing, or the elimination of unnecessary medicine with the aim of enhancing clinical results, is one method that has shown promise in this regard.

12 While being hospitalized is a good chance to start deprescribing, there are several obstacles in the way. Among the difficulties doctors confront include limited deprescribing guidelines, prescriber confusion, a lack of time, and an absence of evidence-based counseling. 13 Furthermore, it might be challenging and counterproductive to closely adhere to deprescribing guidelines or tools since the process has to be individualized, and patient-specific methods are linked to better results. 14 Concerns about recurrence of symptoms, reluctance to change, and a lack of information about deprescribing are all examples of patient-related obstacles to deprescribing. 13 Both pharmacist- and MDT-led deprescribing treatments should be reviewed by the medical team before being implemented.

15 Various methods were employed in earlier research to help in deprescribing suggestions. Many PIMs have been found with the use of the Beers Criteria. 10 Another intervention designed to cut down on PIMs and spot any prescription omissions is the STOPP (Screening Tool of Older Persons' Prescriptions)/ START (Screening Tool to Alert to Right Treatment) cri- teria. 9 There have been other deprescribing experiments that have relied on implicit criteria, such as evaluative questionnaires and consultations with the patient's primary care physician (GP). 16 It has been shown in previous research that medication reduction is possible after a deprescribing intervention, with normal median reductions ranging from a drop of one to three medicines per patient. 17–19 Deprescribing has been demonstrated to be effective in reducing the amount of drugs a patient is on, and it has also been proved to be safe, which might result in fewer adverse drug reactions and fewer unscheduled hospitalizations. 16, 17, 19

Deprescribing has been shown to improve clinical outcomes including depression, mental health, function, and frailty.

The literature on the impact of deprescribing on quality of life, falls, and cognitive function is conflicting. 16, 17.\s16, 17, 19 Prescription medication overuse and PIMs may be reduced by the use of deprescribing techniques, as shown by the available data. Targeted interventions have been shown to be successful, with 72%-91% of deprescribing recommendations provided by pharmacists or MDTs being put into practice. 16–19 In addition, a Canadian research looking at the financial effects of deprescribing indicated that patients may save an average of CA$94.28.18 per year when their pharmacists used the STOPP criterion.

The lack of a dedicated pharmacist, large multidisciplinary teams (MDTs), and generally short durations of stay might make it difficult to adopt most existing techniques for deprescribing on an acute general medicine ward. Therefore, a concrete intervention that is simple for a hospital-based doctor to undertake at the bedside is required to enable deprescribing.

For this reason, we evaluated a real-world, clinician-led intervention to decrease polypharmacy in a busy, acute general care ward that lacked an electronic medical record system as part of a retrospective cohort research. The intervention's efficacy was the major focus of our investigation. The feasibility of such an intervention in this context was a secondary goal of this study. We postulated that a deprescribing strategy would be practically and clinically practicable in reducing overall drug loads, without impeding physicians' discretion.

METHODS

Intervention

To aid in the decline of polypharmacy, a multimodal intervention was developed to enhance doctors' knowledge and shift their perspective on deprescribing. This was accomplished in two stages: first, doctors were educated, affecting all patients in the intervention group; second, individuals with hyperpolypharmacy were educated. During the first stage, top medical professionals conducted weekly education sessions regarding deprescribing during morning clinical handover meetings. Sessions discussed the research supporting deprescribing, referencing a number of relevant standards and resources, including the Beers Criteria developed by the American Geriatrics Society. 10 Education sessions occurred continuously during the intervention period and took the form of brief oral presentations (often between two and three minutes) given to senior and junior medical personnel, senior nursing staff, pharmacists, allied health professionals, and medical students. The second step was to have all clinical and ward personnel engaged in the care of patients with hyper- polypharmacy fill out a deprescribing alert form (Figure 1) and put it on the front cover of the patient's bedside folder.

was bolstered by interdisciplinary team meetings held daily in the ward and educational seminars.

In addition, the investigator group (consisting of the hospital's Director of General Medicine, the ward's Nurse Unit Manager, and the hospital's Director of Pharmacy) kept their respective teams updated on the project through regular email correspondence and in-person meetings. The medical team during rounds, the ward pharmacist during admission medication reconciliation, the nursing staff during medication rounds, and the junior medical staff during charting of routine prescriptions are all instances when hyperpolypharmacy was found and the alert form was established. At the conclusion of each workday, an investigator checked the medication records of all admitted and discharged patients to see whether any of them had hyperpolypharmacy and, if so, if an alert form had been properly filed away. In the event that a patient had been forgotten, the ward personnel would get a reminder email. The notification form was developed.

It is highlighted in the patient's folder with purposeful use of color and font size to stand out during the daily morning ward round. Moreover, the form was laminated so that it could be used more than once, meaning that it was not thrown away when a patient was released. Forty alert forms were kept on hand in the ward at all times for quick use.

Simple instructions for the medical staff were included in the warning form, and six high-priority drug classes that should be considered for deprescribing were highlighted: statins, anti-hypertensives, proton pump inhibitors (PPIs), opioids, anticoagulants, and psychiatric drugs. These medications were regularly found in patients admitted to the ward and are included in the Beers and STOPP criteria as being acceptable for deprescribing9, 10. Otherwise, it was up to the treating medical teams to deprescribe on their own.

Study Cohort

Patients hospitalized to the General Medicine ward at Maroondah Hospital in Ringwood, Melbourne, Australia, were included in the research group. Patients who received the intervention between January and July 2018 (the study cohort) were followed and compared to a separate group of patients who did not get the intervention between September and October 2016 (the control group) (historical control group).

Collecting Information

Medication used during hospitalization and after release was documented (see the Supplementary Material for data col- lection methods). To simplify matters, just the active component of typical drugs was included in the tally. Regular drugs did not include those that were short-term in nature or had an established end date (such as antibiotics or brief courses of oral or topical corticosteroids). Also excluded were medications that required regular administration but were not included because of their minimal risk of drug interactions and harmful effects, such as topical skin moisturisers, ocular lubricants, vitamins, minerals, and plant or animal extracts. A drug was considered deprescribed only if it was a regular medicine at admission but no longer was upon discharge. However, dose decreases were not considered deprescribing. The confidentiality of the data was protected by keeping the treating physicians in the dark about the analytical criteria for the medications being used.

After discharging from the hospital, patients who had been exposed to the intervention and who were willing to be contacted again were polled about their feelings regarding their drug regimen and the concept of deprescribing. They were asked questions on a five-point Likert scale by an investigator who was unaware of whether or not the patient was in the intervention or control group. Patients' Attitudes to Deprescribing (PATD) questionnaire items were selected since they were shown to be most predictive of deprescribing intent. 22

Analytical Statistics

RStudio was used for the data analysis (Version 1.3.1093, Posit PBC, Boston, MA, USA). The Shapiro-Wilk test was used to check the normality of the 'net change' data (i.e. difference in number of drugs from admission to discharge) for each cohort. Due to the non-normal distribution of the data, the Mann-Whitney U test was used to evaluate the disparity in 'net change' between the control group and the experimental group. Influence size was determined by determining the Mann-Whitney U's r value. The statistical threshold for significance was set at a p value of less than 0.05. You may learn more about the techniques used in statistical analysis by checking out the supplementary materials.

RESULTS

There were a total of 1333 individuals in the cohort, albeit only 1169 had full drug dataa. Of the 1052 patients who were part of the intervention group, 888 had full medication dataa available. Some 281 patients were randomly selected to serve as the historical control group. The Supplemental Materials provide a recruiting process flowchart (Figure S1). From admission to discharge, there was a small rise in the rates of polypharmacy and hyperpolypharmacy in both the control and study groups. While hyperpolypharmacy was still somewhat common among the study population, its frequency fell from 28% to 26%. The characteristics of both cohorts are included in Table 1, as well as the rates of polypharmacy, hyperpolypharmacy, and high-risk prescription types at both admission and discharge.

In none of the overall cohorts did the number of medications alter (IQR -1-1) between admission and discharge. There was no discernible net change in either cohort, but when the data was narrowed down to only those patients who had

polypharmacy, a statistically significant difference in net change emerged between the two groups (p = 0.009). There was no net change in the control group (0, IQR —1-0) but there was in the research cohort (—1, IQR —2-0) after excluding patients with hyperpolypharmacy. However, there was no statistically significant difference between the two groups. There was no statistically significant difference between the control and study groups when individual high-risk medications were included. Table 2 provides a summary of the data, and figures are provided in the Appendices (Figure S2).

Patient Opinions on Drug Reduction

After being released from the hospital, 30 patients in the intervention group shared their thoughts on their drug regimens and their views on deprescribing. Two-thirds of patients felt they were taking too many prescriptions and wanted to stop taking at least one. While the majority of patients were pleased with their current medicine, approximately a third were not.

. These results are summarised inFigure 2.

Table 1 Characteristics and prevalence of medications in historical control and study cohorts

Group	Control cohort, *n* (%[a]) *n* = 281	Study cohort, *n* (%[a]) *n* = 888
On admission		
Patients with polypharmacy	159 (57%)	610 (69%)
Patients with hyperpolypharmacy	61 (22%)	253 (28%)
Any medication	214 (76%)	828 (93%)
Opioids	75 (27%)	251 (28%)
Antihypertensives	130 (46%)	518 (58%)
Anticoagulants	112 (40%)	408 (46%)
Proton pump inhibitors (PPIs)	104 (37%)	406 (46%)
Psychotropics	97 (35%)	375 (42%)
Statins	81 (29%)	316 (36%)
On discharge		
Patients with polypharmacy	162 (58%)	621 (70%)
Patients with hyperpolypharmacy	64 (23%)	230 (26%)
Any medication	217 (77%)	856 (96%)
Opioids	94 (33%)	354 (40%)
Antihypertensives	121 (43%)	443 (50%)
Anticoagulants	112 (40%)	387 (44%)
PPIs	111 (40%)	417 (47%)
Psychotropics	97 (35%)	391 (44%)
Statins	75 (27%)	288 (32%)

[a]Percentage of total, control, or study cohort.

DISCUSSION

To date, there hasn't been a lot of research done on deprescribing in hospital settings, so this study is a welcome addition. 16–21 However, its methodology is unusual in that it combines a first stage of education for physicians with an intervention based on visual alerts. Instead of relying on a more systematic, inflexible strategy to alert placement that would be impossible to execute in a busy, resource-poor situation, an opportunistic approach was used to assure sustainability of the intervention. The two parts of the intervention were simple to set up and keep going. While previous interventions have usually been pharmacist-led or directed by a multidisciplinary team (MDT), the intervention itself allowed for more clinician autonomy to give a more straightforward and easily accessible manner of deprescribing. 17–21 It also presented an original Australian viewpoint on dealing with polypharmacy in an emergency inpatient medical facility. The visual warning is similar to the warnings shown on electronic medical record systems when some medications are about to expire. The paper form, on the other hand, was expected to offer a more noticeable signal to the physician, since electronic notifications have a propensity to be disregarded and frequently do not improve patient care. 23

For either the "all patients" or the "polypharmacy" group, the intervention did not significantly improve deprescribing rates. Similarly, it seemed that none of the high-risk pharmaceutical categories were affected. The number of drugs taken by patients with hyperpolypharmacy was lower in the study cohort than in the control cohort at discharge (-1, IQR -2-0), albeit this difference was not statistically significant. Patients with hyperpolypharmacy are at the highest risk of medication-related adverse effects and have higher overall morbidity and mortality24; therefore, they are the group that will benefit the most from deprescribing, even though this shift was not replicated in other subgroups of the study cohort. However, it is debatable as to whether or not a decrease in drug count that is too modest to be statistically significant has any therapeutic significance at all. If this modification were to minimize medication-related side effects and increase patient quality of life, it would need to be connected to long-term patient outcomes. Patient-specific deprescribing treatments were linked with significant decreases in mortality in people with polypharmacy, according to a study published by Page et al.14, while general educational interventions did not have this effect. Given that patient-specific therapies are not always possible in resource- and time-poor settings, we think it is necessary to examine teaching techniques. Moreover, deprescribing benefits extend beyond this, and a decrease in unpleasant effects and drug interactions connected to medications may still be attainable via deprescribing educa- tion for physicians even if mortality benefits are not.

As was previously mentioned, the drop in drugs found in our trial was not statistically significant, and the decrease in the hyperpolypharmacy group was somewhat smaller than what has been produced by prior deprescribing interventions17-19. Due to time constraints, a lack of patient history, and the likelihood that patients will need drugs to manage acute illnesses, deprescribing in hospital settings is undeniably challenging. In outpatient or primary care settings, it is frequently easier to identify

and discontinue unneeded drugs. For patients who have experienced or are at high risk of medication-related side effects or interactions, we feel that an individualized approach to beginning deprescribing in an inpatient environment is useful and may offer benefit. Improved results have been linked to individualized deprescribing, according to recent meta-analyses. 14 Similar gains in clinical outcomes and patient satisfaction have been shown using the Garfinkel approach of deprescribing, which is guided by clinicians.

Table 2 Median net change in number of medications from admission to discharge, stratified by type of medication

Group	Control cohort[a] (n = 281)	Stu y cohort[a] (n = 888)	p value[b]
All patients			
All medication types	0 (IQR —1–1)	0 (IQR —1–1)	p = 0.58
Opioids	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.78
Antihypertensives	0 (IQR —1–0)	0 (IQR —1–0)	p = 0.90
Anticoagulants	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.29
Proton pump inhibitors Proton pump inhibitors (PPIs)	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.49
Psychotropics	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.49
Statins	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.82
Patients with polypharmacy on admission			
All medication types	0 (IQR —1–1)	0 (IQR —2–1)	p < 0.01*
Opioids	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.26
Antihypertensives	0 (IQR —1–0)	0 (IQR —1–0)	p = 0.59
Anticoagulants	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.18
Proton pump inhibitors (PPIs)	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.53
Psychotropics	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.75
Statins	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.58
Patients with hyperpolypharmacy on admission			
All medication types	0 (IQR —1–0)	—1 (IQR —2 to 0)	p = 0.26
Opioids	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.42
Antihypertensives	—1 (IQR —1–0)	—1 (IQR —1 to 0)	p = 0.57
Anticoagulants	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.73
Proton pump inhibitors (PPIs)	0 (IQR 0 to 0)	0 (IQR 0 to 0)	p = 0.86
Psychotropics	0 (IQR 0 to 0)	0 (IQR 0 to 0)	p = 0.17
Statins	0 (IQR 0–0)	0 (IQR 0–0)	p = 0.84

IQR = interquartile range.
[a]Data are presented as 'Median net change in number of medications from admission to discharge (quartile 1 – quartile 3)'.
[b]As per Mann–Whitney U test comparing median net change in medications in study cohort compared to median net change in medications in control cohort.
*p values < 0.05 were considered statistically significant.

contentment and signs and symptoms16 The burden of overtreatment is likely to be underestimated by several recommendations and generalized methodologies, such as Beer's Criteria10 and the START/STOPP criteria9, to tally each patient' PIMs. As a result, we believe that deprescribing should only be attempted after thorough review of each patient's unique circumstances by the treating team. Our interventions had a small impact on overtreatment rates, but they provide credence to the concept that a clinician-led strategy to deprescribing is doable and warrants further investigation as a form of individualized deprescribing.

While the deprescribing in this initiative was initiated by clinicians, we acknowledge the need of considering polypharmacy from a variety of angles. Deprescribing may be accomplished with the help of multidisciplinary teams (MDTs), and pharmacist participation in particular has been demonstrated to be beneficial. 17–19 Nevertheless, primary care physicians (PCPs) should not be overlooked in discussions about how to begin and maintain deprescribing. Considering primary care physicians' continuing interaction with their patients, sustained

Deprescribing is impossible without the help of primary care physicians. According to Nguyen et al.25, primary care physicians place a premium on receiving up-to-date information on their patients from hospital-based doctors while those patients are still in the facility. If GPs are to understand and continue deprescribing following a patient's release, it is crucial that discharge summaries be thorough and provide sufficient information regarding the reason for deprescribing.

Patients are a crucial group to consider as a stakeholder in deprescribing. Deprescribing is more likely to be successful and long-lasting if patients' drug preferences are taken into account. Based on our analysis of patient opinions towards deprescribing, it seems that the vast majority of patients want to lessen their drug load. This is particularly crucial to think about in low-resource countries where the combined expense of many prescriptions may be too much for a patient to bear. Several research, both in Australia and elsewhere, seem to corroborate this, showing that patients are ready to and willing to participate in deprescribing. 26–28 On the other hand, a major

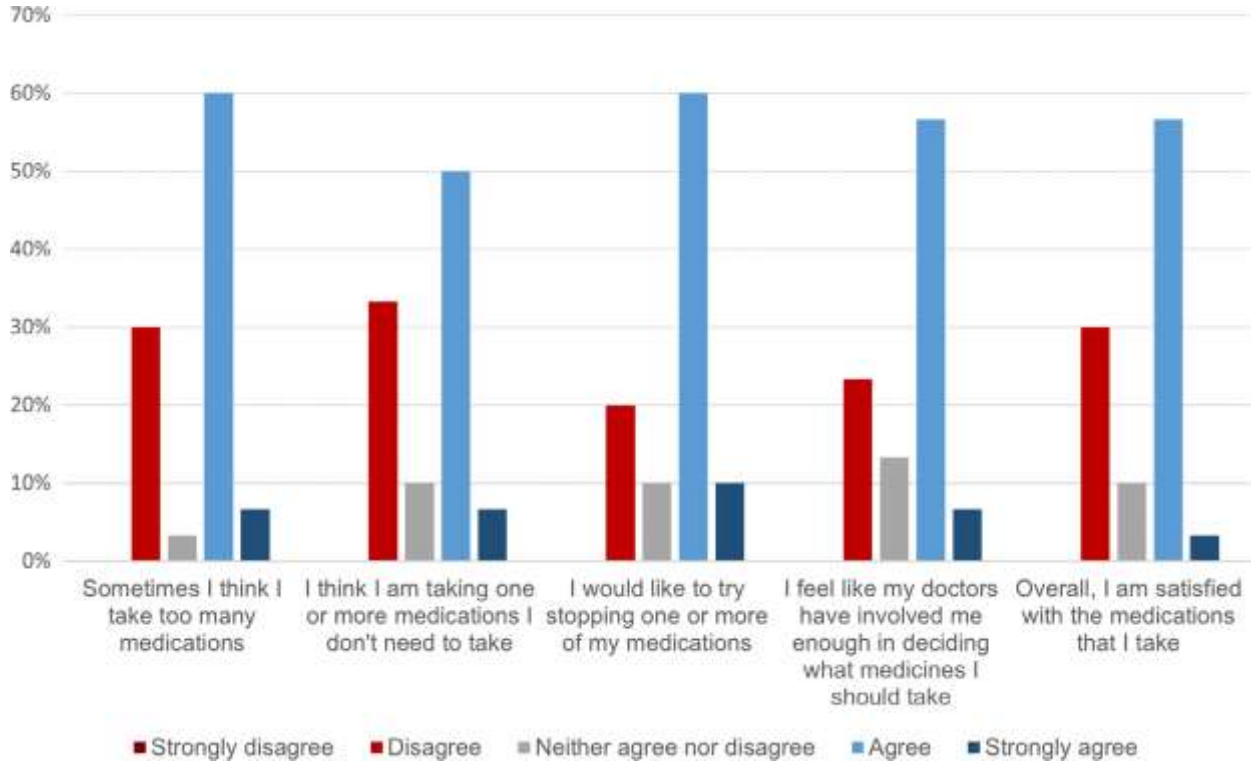

Figure 2 Patient attitudes toward their medication regimen and deprescribing as assessed by their responses to five questions recorded on a five-point Likert scale, adapted from the Patients' Attitudes Toward Deprescribing (PATD) questionnaire.

however a significant percentage of patients reported being happy with their treatment. Similar discrepancies in attitudes about deprescribing were identified by Hopper et al.29; many patients reported being satisfied with their prescriptions, but their treating doctors had better ideas of which drugs they would deprescribe. Because of this discrepancy, it is crucial that clinician-led deprescribing strategies take into account patient perspectives about their drugs. Before stopping any drugs, the patient and their doctor should have a conversation about which ones may be unneeded.

This study's merits include its large sample size (1333 total patients), which is greater than the majority of studies of this kind, and its careful documentation of different drug types, especially those used by high-risk populations. Another point in the positive direction is the inclusive nature of the process used to identify patients with hyper- polypharmacy on the ward. This'real-world,' opportunistic method demonstrated that diagnosing hyperpolypharmacy on a busy medical inpatient unit was feasible, even in resource-poor settings without electronic medical records (such as rural and regional hospitals) or the resources to produce electronic warnings. The supplementary

The use of hyperpolypharmacy warning actions may lead to unwarranted attempts at deprescribing. Determining the efficacy of alternative or complementary approaches to deprescribing in an emergency care context necessitates the exploration of novel approaches to deprescribing.

CONCLUSION

Clinicians learned not just when to deprescribe but also how and when to prescribe new drugs in these educational sessions.

Our method may have underestimated the frequency of hyperpolypharmacy since some patients with the condition may have been overlooked, particularly on weekends and during times of ward staff turnover. It's also important for the strategy to be constantly pushed at an institutional level, as it may otherwise lose steam as time goes on and people who work on the intervention leave and are replaced. Since we didn't evaluate whether or not deprescribing was warranted, we couldn't say whether or not the deprescribing that really occurred was clinically beneficial. Still, most deprescribing was probably clinically sound since it was only performed by experienced doctors who had been trained in deprescribing. Finally, the study's use of a historical control group rather than a parallel control group may have limited the ability to draw meaningful comparisons.

To more accurately monitor the long-term benefits of deprescribing and to ascertain whether or not an intervention has therapeutic significance, future studies should attempt to gather continuous clinical outcome and patient satisfaction data. Researchers might potentially learn whether comparable results were seen by linking their findings to clinical outcome data

It might be difficult for clinicians to practice deprescribing in an acute medical ward because of the urgency of patients' conditions and the limited time they spend in the hospital. Overall, individuals with hyper-polypharmacy did not show statistically significant reductions in prescriptions as a consequence of the intervention reported in this research. The majority of patients we surveyed expressed a desire to decrease their drug load, and we discovered that inpa- tient settings

provide excellent possibilities for depre- scribing to be addressed and begun. To further understand the therapeutic significance of deprescribing strategies led by clinicians, future research should focus on assessing their long-term efficacy and sustainability, as well as their connection to patient outcomes and medication-associated side effects.

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