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# Polypharmacy in the Geriatric Population

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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# Executive Summary: Clinical Practice Guideline

# Polypharmacy in the Geriatric Population

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## Summary

The project entailed the development and review of a clinical practice guideline (CPG) for reducing polypharmacy in the geriatric patient population. Polypharmacy is associated with increased risk of adverse drug events (ADEs) such as drug-drug interactions, poor adherence to pharmacotherapy, and increased risk of falls. Additionally, polypharmacy tends to increase high hospitalization rates and emergency department (ED) visits. From a nursing practice perspective, polypharmacy worsens patient outcomes and increases nurses' workload and healthcare costs for patients. The purpose of this project was to develop a CPG with evidence-based recommendations on how to reduce polypharmacy among older adults. The practice-focused question was What evidence based on content expert review using the AGREE II tool supports the quality and usability of the clinical practice guideline to reduce polypharmacy among geriatric patients in an outpatient mental health clinic? The CPG was presented to six healthcare experts who, using the AGREE tool, rated the six domain mean item scores between 6.39 and 6.71 and stated the guideline was well-developed and included clear recommendations that were relevant to nursing practice. These included steps nurses should follow while initiating polypharmacy management, screening patients for polypharmacy, deprescribing medications, and providing follow-up and monitoring. Therefore, the adoption of the proposed guideline into nursing practice can help promote individualization of psychotherapy and, in turn, enhance equity and inclusivity in geriatric care.

## Background

Polypharmacy is a worsening health concern globally, especially among older adults. Although there is still a lack of consensus on the definitory threshold for polypharmacy, the project was based on the widely used definition, which considers polypharmacy as using five or more medications concurrently (Bonanno et al., 2025). These medications include both prescription drugs, non-conventional medicines, and dietary supplements. About 35.8% of older Americans are on polypharmacy (Bonanno et al., 2025). A similar trend has been reported in Europe, where the prevalence of polypharmacy ranges between 26.3% and 39.9% (Bonanno et al., 2025). Several factors contribute to the rise in polypharmacy, but the role of increased multimorbidity is the most significant. Nearly 58.4% of Americans have multimorbidity, but the prevalence is highest among older individuals (Mossadeghi et al., 2023). Therefore, geriatric adults with multimorbidity are the target population for this project.

Polypharmacy is a significant practice problem because it is associated with more severe comorbidity and increased healthcare utilization (Doumat et al., 2023; Hung et al., 2024). Also, it increases the risk of inappropriate medications and ADEs such as disease-drug and drug-drug interactions (Nicholson et al., 2024). According to Bonanno et al. (2025), the prevalence of adverse drug-drug interactions involving hepatic cytochrome enzyme alone is about 80% among older adults on polypharmacy. Additionally, the risk of an ADE occurring is 88% higher among those on polypharmacy than in individuals who take fewer than five medications (Bonanno et al., 2025). Some of these events can be very severe and fatal. Other associated concerns include increased nonadherence to

treatment, frailty, risk of falls, functional impairment, and accelerated cognitive decline (Hung et al., 2024). Due to the high healthcare utilization, polypharmacy has been linked to a 30% rise in medical costs (Bonanno et al., 2025). It also increases care burden, which affects nurse well-being and quality of care.

The purpose of the project was to develop a comprehensive CPG for reducing polypharmacy in geriatric adults with the evidence-based practice question "What evidence, based on content expert review using the AGREE II tool, supports the quality and usability of the clinical practice guideline to reduce polypharmacy among geriatric patients in an outpatient mental health clinic?" Based on this question, the search for evidence entailed identifying current peer-reviewed research articles on evidence-based strategies for reducing polypharmacy.

While polypharmacy is widely acknowledged as a major health concern, there is still a lack of a comprehensive CPG on how to prevent and manage it. Bulushi et al. (2024) pointed out that a lack of CPGs is one of the key factors that precipitate the current ineffective management of polypharmacy. Similarly, Robinson et al. (2024) revealed that a lack of comprehensive evidence-based deprescribing guidelines has compounded the effects of other barriers. Some deprescribing management guidelines currently exist, but many of them focus on a single disease and are therefore ineffective (Kardas et al., 2023; Robinson et al., 2024). Deprescribing is one of the common interventions for reducing polypharmacy. Therefore, a lack of describing guidelines is a major challenge in polypharmacy management.

Measures to reduce polypharmacy involve multiple steps such as screening, medication review, formulation of a deprescription plan, patient education, and, in some cases, non-pharmacological interventions (Perron, 2024). However, most of the currently available CPGs do not comprehensively address these steps, making it difficult for care providers to integrate them into clinical practice (Robinson et al., 2024). There is consensus that comprehensive CPGs for reducing polypharmacy are still lacking (Bulushi et al., 2024; Robinson et al., 2024).

Studies were searched in three databases: PubMed. Google Scholar and ScienceDirect. The search terms were *polypharmacy*, *reduction*, *strategies*, and *barriers*. Evidence synthesis entailed identifying barriers to effective polypharmacy management and current strategies for reducing polypharmacy. The level of quality of evidence retrieved was mixed. Bulushi et al. (2024) provided high-quality Level III evidence since theirs is a theory-guided explorative qualitative study. Robinson et al. (2024) also provided Level III, high-quality evidence because it is a well-designed narrative review. Kardas et al. (2023) led a cross-sectional study, which is a Level III source of evidence.

## Clinical Practice Guideline Development

The review panel consisted of six healthcare experts: two medical doctors, one nurse practitioner (NP), and three registered nurses (RNs). One of the physicians has several years of experience in geriatric and primary care and currently serves as the acute care chief at the practice site and oversees the management of patients in the acute inpatient and urgent care units. The other physician has many years of professional experience in primary care and urgent care and serves as a hospitalist. One RN has over

20 years of experience in primary care, while another RN has 35 years of experience, working in multiple healthcare settings, including acute medicine, urgent care, and the emergency room. The third RN has 25 years of experience, specializing in emergency and acute medicine plus years of experience in emergency and acute medicine and is currently the nurse manager for acute care at the practice site. The panelists were selected based on three criteria: professional qualification, years of experience, and availability during the project period.

The review process involved the use of the Appraisal of Guidelines for Research and Evaluation (AGREE) II tool. Each panelist was issued the AGREE II score sheet and the proposed CPG. The AGREE II uses a 1-7 Likert scale, where 1 indicates *strongly disagree* while 7 represents *strongly agree*. Based on this scale, the panelists were required to rate the CPG within six domains. The first domain was the scope and purpose. In this area, the panelists reviewed the guideline in terms of the objectives, the practice questions, and the target population as indicated in the guideline. The second domain was the level of stakeholder involvement. This part of the review encompassed assessing whether the guideline development included all the necessary professional groups. Additionally, the review of stakeholder involvement entailed assessing if the end users were clearly defined and whether the target population was involved, and their views and preferences were sought.

The AGREE II tool allowed the panel to review the methodological rigor used in developing the guideline. This domain included items such as evidence search strategies, evidence selection, formulation of recommendations, potential benefits and risks, the link

between recommendations and evidence, external review by partners, and steps for updating the guideline. Under presentation clarity, the panel reviewed the specificness and unambiguity of the recommendations, presentation of options, and the ease of identifying key recommendations. The last two domains were applicability and the independence of the editorial process. Concerning applicability, the panel assessed the inclusion of information on barriers and facilitators, the translation of recommendations into practice, implications on the use of resources, and auditing criteria. Regarding editorial independence, each panelist reviewed and scored the guideline in terms of the funding body and the declaration of competing interests.

## Results

### Results from the Review Panel

The results show that the panel was convinced that the guideline was appropriately developed and incorporated many of the required elements. The Scope and Purpose domain had an average score of 6.67, which implies that the panelists agreed that the scope and aims of the guideline are clear. The mean score for the Stakeholder Involvement domain was 6.39. This shows the panel was convinced that individuals with relevant professional backgrounds were involved, that views from the target population were sought, and that the intended end users were clearly defined. One of the physicians commented that the guideline adequately involved patients in decision-making.

Regarding rigor and development, the average score for this domain was also high at 6.60. This suggests that the panel was persuaded that the guideline was developed based on a rigorous process. The panel affirmed that the evidence search was based on

systematic methods. They were also persuaded that the evidence selection criteria used and the formulation of recommendations were clear. The panelists did not leave any comment on the methodological rigor of the guideline development. The three items under the Clarity of Presentation domain scored an average of 6.78, affirming that the recommendations presented in the guideline are specific, easy to identify, and include a range of options for managing polypharmacy.

Results for Applicability and Editorial Independence domains also reveal strong approval by the panel. Each item under the applicability domain had a score of at least six and an average score of 6.71 out of the possible 7.0. These show that the panel was convinced that the guideline identified tools and provided advice on how to translate the recommendations into practice. Indeed, the guideline identifies tools such as the Screening Tool of Older Persons' Potentially Inappropriate Prescriptions (STOPP), which can be used to facilitate screening for polypharmacy risk. Nonetheless, one panelist commented that the guideline was missing a monitoring or auditing tool. Finally, results from the panel review affirmed that the editorial process was adequately independent. The experts strongly agreed with the two statements under this domain, giving an average score of 6.58. The results demonstrate that the CPG meets the minimum criteria for a well-developed and robust guideline.

**Review of Guideline by Proposed End Users**

The proposed CPG targets both RNs and NPs. It was for this reason that these key end users were included in the review panel. To facilitate a review by end-users, RNs and NPs were interviewed and asked to review the CPG and comment on its relevance to the

polypharmacy issue at the clinic. All the interviewed RNs and NPs acknowledged that polypharmacy is still a growing concern across many clinics. Additionally, these nurses noted that the CPG outlines several measures that align with nursing roles and can help address the polypharmacy issue. The feedback received suggested that the end users were impressed with how the guideline provides a step-by-step guide on how to reduce polypharmacy.

Another notable feedback from the end users was that the CPG is comprehensive and focuses on different clinical scenarios. For instance, it provides how to minimize polypharmacy both in individuals who are already on medications and those who are initiating treatment. It also outlines how NPs can deprescribe medications under complex situations, such as patients on antihypertensive therapy. End users also appreciated that the guideline incorporates evidence-based recommendations that range from initiation of polypharmacy management to follow-up and monitoring. Some of the interviewed nurses were concerned that the use of the proposed CPG may result in additional workload. However, they also recognized that the benefits of the CPG on patient and organizational outcomes outweigh these concerns.

**Potential Impacts on the Organization**

The CPG will impact the organization by improving patient outcomes. Its adoption will help minimize ADEs by preventing the prescription of inappropriate medications (Kurczewska-Michalak et al., 2021). By reducing these ADEs, the CPG will help the organization meet its quality targets, such as improved medication safety. Another potential impact of adopting the guideline is a reduction in readmissions and

avoidable healthcare utilization, which will translate into reduced workload on healthcare staff and increased cost savings. Polypharmacy increases hospitalization rates and ED visits (Earl et al., 2020). The proposed guideline can help reduce hospitalization and ED visits by minimizing ADEs. The CPG is also expected to help improve the overall quality of geriatric care at the clinic by guiding nurses on how to perform specific steps for reducing polypharmacy.

**Limitations**

This guideline has some limitations that negatively influenced the results. First, specific barriers and facilitators to the application of the guideline have not been identified or explained because this was beyond the scope of the project. This limitation affected the results, especially within the Applicability domain. Second, procedures for monitoring and updating the guideline were not comprehensively covered since this was beyond the scope of the project. The primary focus of the project was to develop a guideline with evidence-based recommendations on how to manage polypharmacy among older adults. This limitation affected the results by reducing the score on the applicability domain. Finally, the guideline does not cover deprescribing of all complex medications. Only antihypertensive drugs were covered. This also resulted in sub-optimal scores in the applicability domain.

**Importance Beyond the Local Site**

The guideline provides general recommendations that can be used in primary care settings beyond the local site. Like the practice site, the CPG can be used in other settings to initiate polypharmacy management, screen patients for polypharmacy risk, deprescribe

inappropriate medications, and provide monitoring and follow-up. This guideline can also be used in the community setting, among community-dwelling older patients. Based on this guideline, nurses can help patients understand why certain medications and dietary supplements have been deprescribed. Additionally, the guideline emphasizes a patient-centered approach to polypharmacy management. As a result, the recommendations can easily be adapted to suit community-dwelling patients. Furthermore, this CPG can be used as a basis for developing in-service nurse training on polypharmacy management.

## Conclusions

Based on the average scores, the panelists agree that the CPG has a clear scope and purpose, was rigorously developed, was clearly presented, and is clinically useful. Additionally, the panelists were satisfied with the level of stakeholder involvement and editorial independence. The adoption of this CPG will positively impact the organization by preventing these adverse drug events and minimizing avoidable healthcare utilization. Additionally, it will reduce workload and operational costs related to adverse drug events. Future recommendations should include steps for deprescribing other high-risk medications, such as anticholinergics and hypoglycemics. One of the guidelines' implications for nursing practice is increased focus on individualization of care because medication management must be tailored to suit patient needs. By promoting individualized care, the guideline will enhance equity, inclusion, and social change in psychotherapy for the geriatric population. Additionally, the guideline suggests a need for more collaboration between nurses and patients to help identify potentially problematic

drugs. The impacts of this guideline can be evaluated by monitoring the post-implementation change in ADEs and drug-related hospitalization rates.

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# Appendix: Clinical Practice Guideline for Reducing Polypharmacy in Geriatric Patients

| Activity | Recommendation | Level of evidence /Quality rating | Comments | Source of evidence |
|---|---|---|---|---|
| Initiating Polypharmacy Management | 1. Patients who are on polypharmacy should be assessed for medication appropriateness at least once a year or when initiating new treatment<br>2. A polypharmacy review should also be initiated whenever an adverse event, such as a fall, is reported or when a patient is shifting to a new treatment setting. | Level V Quality A | Timely initiation of polypharmacy management reduces the risk of patients being exposed to inappropriate medications for an extended period and thus helps in preventing adverse outcomes. | Kurczewska-Michalak et al. (2021) |
| Screening Patients for Polypharmacy Risk | 1. Develop a comprehensive list of all current prescription drugs, over-the-counter medications, dietary supplements, and herbal products for each patient. This list should also include other details such as frequency of use, time of use, dose (quantity), and administration route.<br>2. Screen every patient who is on five or more medications for potentially inappropriate medications that pose the risk of falls or any other adverse drug event<br>3. Use an appropriate screening tool, such as the Screening Tool of Older Persons' Potentially Inappropriate Prescriptions (STOPP) or Screening Tool to Alert to Right Treatment (START), to assess patients for potentially inappropriate medications | Level III Quality A | Screening patients using STOPP or START helps in identifying duplicate therapies, potential adverse drug interactions, and any other inappropriate medication that has been prescribed to an older adult and should be deprescribed. | Earl et al. (2020) |
| Reviewing Medications | 1. Every patient flagged during the screening for having at least one inappropriate medication should be subjected to medication review<br>2. A medication review should be conducted to identify the inappropriate medications and should involve examining the | Level IV Quality A | -Medication review encompasses evaluating a patient's medication in a structured fashion to improve health outcomes by optimizing medication use. It is an effective strategy for reducing avoidable polypharmacy and has been associated with | Engels et al. (2025) |

| Activity | Recommendation | Level of evidence /Quality rating | Comments | Source of evidence |
|---|---|---|---|---|
| | patient's medication list. This can be accomplished through collaboration with pharmacists and other interprofessional team members.<br>3. Patient preferences should be taken into account while conducting the medication review. If possible, the patient should be actively involved or engaged during the review process<br>4. A priority list of medications that should be discontinued should be developed based on insights from the medication review | | improved medication-related patient outcomes.<br>-Patient preferences should be factored in during the medication review to ensure that the patient's needs are met. This can, in turn, promote adherence to treatment as well as the polypharmacy management plan | |
| Initiating Deprescribing | 1. Begin by evaluating medications in the priority list to understand the benefits and potential risks associated with deprescribing each.<br>2. Safely introduce the patients to the need to deprescribe some of their medications, emphasizing the health risks associated with continued use of the specific medications identified in the priority list.<br>3. Explain to the patient the rationale for deprescribing some medications, emphasizing the potential benefits and how this aligns with their care goals. | Level III Quality A<br><br>Level I Quality A | -Deprescribing is effective in reducing inappropriate medications, polypharmacy, and associated adverse drug events<br>-Safely introducing patients to the deprescribing concept minimizes fear or anxiety that may arise after learning that some of the medications they have been taking are inappropriate. | Earl et al. (2020)<br><br>Lee et al. (2021) |
| Planning and Initiating Medication Withdrawal | 1. Develop a plan for how each of the inappropriate medications will be discontinued. The plan should indicate when and how the medication will be withdrawn, whether immediately or gradually<br>2. Discuss the medication withdrawal plan with the patient and help them understand the details | Level V Quality A | Effective planning of medication withdrawal helps in minimizing the side effects of abrupt or unsafe discontinuation of certain medications. | Kurczewska-Michalak et al. (2021) |
| Deprescribing Antihypertensive Treatment | 1. Antihypertensive therapy using calcium channel blockers (CCBs), ACE inhibitors, or angiotensin II receptor blockers (ARBs) is not associated with any | Level IV Quality B | Optimizing antihypertensive treatment while describing other medications helps in ensuring that any | Scott et al. (2019)<br><br>Wiersinga et al. (2025) |

| Activity | Recommendation | Level of evidence /Quality rating | Comments | Source of evidence |
|---|---|---|---|---|
| | increase in the risk of orthostatic hypotension (OH). Thus, OH should not be a reason for deprescribing antihypertensive drugs, specifically<br>2. CCBs, ARBs, and ACE inhibitors and not regarded as OH-aggravating medications and should not be discontinued unless it is established that having a systolic blood pressure of below 140 mmHg might harm the patient. This decision should be made on a patient-by-patient basis.<br>3. For patients with OH, other strategies for reducing the risk of falls should be considered. These include counter-manoeuvres, volume repletion, and withdrawal of non-hypertensive medications. | | intervention to reduce polypharmacy does not adversely impact hypertension management or worsen other health outcomes. | |
| Deprescribing herbal supplements | Herbal supplements and vitamins can contribute to polypharmacy and are associated with adverse side effects, including drug interactions. Therefore, unnecessary or unjustified herbal supplements should be deprescribed, but a patient-centered approach is strongly recommended. | Level IV Quality B | Deprescribing herbal supplements helps reduce the complexity of the treatment plan and minimize the risk of adverse drug interactions associated with polypharmacy. | Hoel et al. (2021) |
| Monitoring, Support, and Follow-up | 1. Patients who have had their medications deprescribed should be monitored as they implement their medication withdrawal plans.<br>2. Patients should receive ongoing support, such as guidance on how to manage symptoms, to help them achieve complete discontinuation<br>3. The follow-up should be as regular as needed to help ensure that the patient receives adequate monitoring and support | Level V Quality A | Monitoring and support are necessary for a successful discontinuation of deprescribed medications since they can help prevent the reintroduction of medication. | Kurczewska-Michalak et al. (2021) |

| Activity | Recommendation | Level of evidence /Quality rating | Comments | Source of evidence |
|---|---|---|---|---|
| Use of Decision Support Systems | The use of computer-based decision-support systems is highly recommended when screening patients for polypharmacy, conducting medication reviews, and monitoring patients during polypharmacy management. | Level V Quality A | Polypharmacy management is a complex and time-consuming process, but these challenges can be overcome effectively through the use of decision support systems. | Kurczewska-Michalak et al. (2021) |
| Nonpharmacological interventions | 1. Nonpharmacological interventions are strongly recommended whenever possible to minimize overreliance on medication and reduce polypharmacy.<br>2. Nonpharmacological interventions should be considered as an alternative to prescribed medications whenever appropriate | Level IV Quality B | Use of nonpharmacological interventions reduces dependence on medications and is associated with fever or no side effects. | Hoel et al. (2021) |
| Preventing Polypharmacy | For patients who are previously not on any medications and are initiating pharmacotherapy, appropriate prescribing is highly recommended. A medication risk-benefit analysis should be conducted for every medication prescribed. | Level V Quality A | Appropriate prescribing is an effective strategy for preventing polypharmacy. It ensures that no inappropriate medications are prescribed and reduces the need to deprescribe. | Kurczewska-Michalak et al. (2021) |