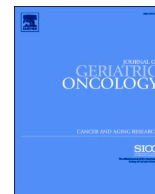




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Perspectives

Medication assessment in older adults with cancer – Current practices in clinical pharmacy

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1. Introduction

1.1. Background

The needs of older adults (aged ≥ 65 years) are evolving and complex, requiring a multidisciplinary approach. Guidelines from the International Society of Geriatric Oncology (SIOG) [1] advocate for healthcare providers to perform a comprehensive geriatric assessment (CGA). A CGA is a multidisciplinary diagnostic process, assessing a patient's medical, psychosocial, and functional capacity to tailor an integrated treatment plan, including long-term follow-up [1]. Nurses and allied healthcare professionals have a crucial role to play in the CGA process.

Clinical pharmacists working in oncology settings provide medication reconciliation, medication review processes, and interventions that

assist patients in managing their medications; reducing the financial burden of medications, and improving the earlier reporting of symptoms by patients [2]. The role of oncology pharmacists in medication management of older adults with cancer is outlined by Whitman et al. [3], which concluded that a pharmacist-led medication review should be standard of care when aligning medication management and anticancer treatment decisions.

This growing evidence base to support CGA and the role of clinical pharmacists as an integral member of a multidisciplinary team (MDT) caring for older adults with cancer led to guidance for conducting medication reviews in this population which was published by the Young International Society of Geriatric Oncology (SIOG) and Nursing & Allied Health (NAH) Interest Group [4].

Polypharmacy and potentially inappropriate medications (PIM) use in older adults with cancer is a significant area of interest; however,

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limited evidence exists to guide clinicians regarding polypharmacy and its implications.

One approach to address these broad and complex medication safety challenges is to implement team-based cancer care that includes clinical pharmacists. Clinical pharmacists can use their training and expertise to inform the geriatric oncology MDT about optimal treatment strategies by taking age-related changes in pharmacokinetics into account and applying them to systemic anti-cancer therapies [5].

The authors of this perspective paper are pharmacist members of the SIOG NAH group. They provide a collective view of their current clinical practice.

2. The Role of the Clinical Pharmacist in the Geriatric Oncology MDT

Clinical pharmacists perform structured medication reviews, which may include monitoring medication adherence and adverse effects, providing patient education to promote adherence, and performing medication reconciliation. They provide the geriatric oncology MDT with recommendations to improve medication safety; taking the patient's age, comorbidities, and other factors affecting drug metabolism and elimination into consideration. Patient's preferences and goals are also incorporated to promote shared decision making. Pharmacists work with patients and other healthcare professionals to develop individualised care plans to manage the symptoms and side effects of cancer treatments, improve treatment outcomes, and enhance quality of life.

2.1. Medication Reconciliation

Clinical pharmacists are responsible for ensuring the safe and effective administration of medications to patients. To ensure this, a medication reconciliation must first be performed. This entails obtaining a complete and accurate list of all medications that a patient is taking, both prescription and non-prescription, as well as any over-the-counter supplements and vitamins. The medication list should include the dose, frequency, route of administration, and indication for each medication. Accurate medication lists can be obtained from the patient, caregiver, general practitioner, community pharmacy and the patient's medical records. Using at least two sources is recommended. Ideally, the patient (or a caregiver) should bring their medications with them to their clinic visit, and these should be cross-referenced with a list obtained from one of the other sources listed above.

2.2. Medication Review

Medication review involves analysing the safety and efficacy of each medication and the appropriateness of the prescribed dose. This includes considering age-related factors that can affect pharmacodynamics and pharmacokinetics, hepatic and renal function, other relevant drug-specific biochemical parameters, and the appropriateness of the route of administration.

Medication reviews also assess the appropriateness of each medication, ensuring each medication has a clear indication, and whether the clinical situation that led to prescribing the medication no longer applies.

2.3. Monitoring Adherence

Low rates of medication adherence have been observed in older adults with polypharmacy [6]. Monitoring patient adherence is a challenge for clinical pharmacists. In clinical practice, most pharmacists monitor adherence informally through face-to-face patient consultations (Table 1). Typically, adherence is assessed by checking community pharmacy dispensing records, cross-referenced with the patient's own supply of medications brought to the clinic visit. Discrepancies between general practitioner prescriptions, community pharmacy dispensing lists

Table 1
Medication review process in older adults with cancer.

| Medication Review Process | Methods for conducting a medication review in older adults with cancer |
|--|---|
| Identify Which Patients May Benefit from a Medication Review | <p>The age cut off for inclusion in a geriatric oncology medication review varied across institutions and settings. We have observed cut off points of:</p> <ul style="list-style-type: none"> • ≥ 65 years • ≥ 70 years • ≥ 75 years <p>Inclusion criteria for medication review can be all patients above a certain age, or patients who meet one or more of the following criteria:</p> <ul style="list-style-type: none"> • Patients referred to a service in the consultative model • Polypharmacy • Commencing systemic anticancer therapy • Taking at least one high risk medication • Abnormal score using a geriatric screening tool |
| Identify Appropriate Multidisciplinary Team (MDT) Members to Conduct a Medication Review | <p>Medication review is usually conducted by the clinical pharmacists. An initial medication reconciliation may be conducted by another member of the MDT, and if a comprehensive medication review is required, they are then referred to the clinical pharmacist.</p> <p>Sources used to obtain a medication history include, but are not limited to:</p> <ul style="list-style-type: none"> • Patient • Caregiver • Medical record (electronic health record or paper based medical notes) • Previous outpatient correspondence • Community pharmacist • General practitioner • Previous medication administration record from a hospital admission <p>Methods to monitor adherence include, but are not limited to:</p> <ul style="list-style-type: none"> • Face-to-face patient consultation • Telephone consultation • Analysing community or hospital pharmacy dispensing records • Patient self-reporting • Validated questionnaires <p>Tools used to identify PIM include, but are not limited to:</p> <ul style="list-style-type: none"> • STOPP/START (8) • Beer's criteria (9) • Medication Appropriateness Index (10) <p>Tools used to identify drug-drug interactions include, but are not limited to:</p> <ul style="list-style-type: none"> • Stockley's Drug Interactions (https://www.medicinescomplete.com/#/interactions/stockley) • Cancer drug interactions by Radboud/University of Liverpool (https://cancer-druginteractions.org/) • British National Formulary (BNF) (https://www.medicinescomplete.com/#/browse/bnf) • ONCOassist (https://oncoassist.com/) • Drugs (https://www.drugs.com) • UptoDate (https://www.uptodate.com/) • eviQ (https://www.eviq.org.au/) |
| Methods used to obtain a full medication history | <p>Methods to monitor adherence include, but are not limited to:</p> <ul style="list-style-type: none"> • Patient • Caregiver • Medical record (electronic health record or paper based medical notes) • Previous outpatient correspondence • Community pharmacist • General practitioner • Previous medication administration record from a hospital admission <p>Methods to monitor adherence include, but are not limited to:</p> <ul style="list-style-type: none"> • Face-to-face patient consultation • Telephone consultation • Analysing community or hospital pharmacy dispensing records • Patient self-reporting • Validated questionnaires <p>Tools used to identify PIM include, but are not limited to:</p> <ul style="list-style-type: none"> • STOPP/START (8) • Beer's criteria (9) • Medication Appropriateness Index (10) <p>Tools used to identify drug-drug interactions include, but are not limited to:</p> <ul style="list-style-type: none"> • Stockley's Drug Interactions (https://www.medicinescomplete.com/#/interactions/stockley) • Cancer drug interactions by Radboud/University of Liverpool (https://cancer-druginteractions.org/) • British National Formulary (BNF) (https://www.medicinescomplete.com/#/browse/bnf) • ONCOassist (https://oncoassist.com/) • Drugs (https://www.drugs.com) • UptoDate (https://www.uptodate.com/) • eviQ (https://www.eviq.org.au/) |
| Monitor adherence | <p>Tools used to identify PIM include, but are not limited to:</p> <ul style="list-style-type: none"> • STOPP/START (8) • Beer's criteria (9) • Medication Appropriateness Index (10) <p>Tools used to identify drug-drug interactions include, but are not limited to:</p> <ul style="list-style-type: none"> • Stockley's Drug Interactions (https://www.medicinescomplete.com/#/interactions/stockley) • Cancer drug interactions by Radboud/University of Liverpool (https://cancer-druginteractions.org/) • British National Formulary (BNF) (https://www.medicinescomplete.com/#/browse/bnf) • ONCOassist (https://oncoassist.com/) • Drugs (https://www.drugs.com) • UptoDate (https://www.uptodate.com/) • eviQ (https://www.eviq.org.au/) |
| Resources used to identify potentially inappropriate medications (PIM) | <p>Tools used to identify PIM include, but are not limited to:</p> <ul style="list-style-type: none"> • STOPP/START (8) • Beer's criteria (9) • Medication Appropriateness Index (10) <p>Tools used to identify drug-drug interactions include, but are not limited to:</p> <ul style="list-style-type: none"> • Stockley's Drug Interactions (https://www.medicinescomplete.com/#/interactions/stockley) • Cancer drug interactions by Radboud/University of Liverpool (https://cancer-druginteractions.org/) • British National Formulary (BNF) (https://www.medicinescomplete.com/#/browse/bnf) • ONCOassist (https://oncoassist.com/) • Drugs (https://www.drugs.com) • UptoDate (https://www.uptodate.com/) • eviQ (https://www.eviq.org.au/) |
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(continued on next page)

Table 1 (continued)

| Medication Review Process | Methods for conducting a medication review in older adults with cancer |
|---------------------------|---|
| Deprescribing methods | <ul style="list-style-type: none"> Memorial Sloan Kettering Cancer Centre evidence-based information on interactions, vitamins and dietary supplements (https://www.mskcc.org/cancer-care/diagnosis-treatment/symptom-management/integrative-medicine/herbs/) <p>Deprescribing typically rests with the consultant oncologist/geriatrician, or the general practitioner, pending the outcome of the MDT discussion after a medication review has been completed.</p> |
| Common interventions | <p>Common interventions by pharmacists (or other healthcare professionals) conducting medication reviews include, but are not limited to:</p> <ul style="list-style-type: none"> Dose adjustments (either changing a dose, or the interval between dosing) Suggesting alternative medications Suggesting alternative dosage forms (where access via the prescribed route is challenging) Stopping a regular medication Changing a regular medication Recommending additional monitoring <p>These can be due to abnormal biochemistry, the presence of a drug-drug interaction, reviewing the therapeutic goals of the patient, or where an adverse effect is suspected. If an intervention is based on a transient event (for example a short-term course of an antibiotic, or a transient rise in hepatic enzymes), the intervention should be re-assessed when the transient event is expected to have subsided.</p> <p>The rationale for suggested interventions should be discussed with their patient during their clinic visit, and effective communication to the patient's parent oncologist and/or geriatrician, other relevant specialties, general practitioner and, if appropriate, community pharmacy should take place. The optimal method of communication may vary, depending on the healthcare setting of the medication review.</p> |

and the patient's own medications can highlight potential non-adherence for practitioners. Collateral consultation with family and caregivers can also highlight non-adherence. For medications that require therapeutic drug-monitoring, consistent subtherapeutic drug levels can be an indication of non-adherence.

2.4. Drug Interaction Checking

The presence of drug-drug interactions are associated with adverse outcomes in older adults with advanced cancer receiving systemic anticancer therapy [7]. Identifying drug-drug interactions and making recommendations on how to manage these are important aspects of conducting a medication review. Recommendations related to drug interactions may include additional monitoring, dose adjustment, changing or discontinuing a drug.

2.5. Identifying Potentially Inappropriate Medications

Validated tools to identify PIMs are used in clinical practice, such as Screening Tool of Older Persons' Prescriptions (STOPP)/ Screening Tool to Alert to Right Treatment (START) [8], the Beers Criteria [9], and the

Medication Appropriateness Index [10]. These tools have been validated in the general geriatric population and shown to be effective at identifying PIMs in older adults with cancer. In patients with cancer, there are clinical scenarios where a medication typically deemed inappropriate in an older adult may in fact be appropriate. Validated tools specific to older adults with cancer have yet to be determined. Clinical pharmacists use their expertise, combined with these tools, to make recommendations to the geriatric oncology MDT.

2.6. Deprescribing

Deprescribing is the patient-centred process of intentionally reducing (or stopping) the number of medications prescribed to a patient in accordance with the patient's treatment goals and objectives. Turner et al. [11] outlined a six-step process for deprescribing medications in older adults with cancer. Clinical pharmacists require pharmacist prescribing privileges to deprescribe, also known as non-medical prescribing in some jurisdictions [12].

3. Challenges for Pharmacists in Geriatric Oncology

3.1. Conducting a Medication Review

The recommended process for conducting a medication review is shown in Table 1, which represents Kantilal et al.'s guidance on conducting a medication review in older adults with cancer [4].

Currently, tools validated in the general population are used to identify PIMs, drug interactions, and deprescribing. Tools specific to older adults with cancer remain to be developed. Deprescribing requires an MDT input, patient acceptance and an evidence-based rationale. The implementation of deprescribing, post pharmacist review, and sustainability of interventions as patients transition in care are significant challenges for pharmacists embedded in geriatric oncology clinics.

3.2. Barriers to Incorporating Pharmacists in Geriatric Oncology Care Models

Some of the barriers to incorporating pharmacists into geriatric oncology MDTs are outlined in Table 2. These include the current lack of training opportunities for pharmacists in geriatric oncology. Deficits in workforce planning/capacity have been highlighted as barriers to implementing and conducting medication reviews, particularly in institutions that have large patient populations. Further, communicating recommendations and tracking changes to medications can be difficult for healthcare systems that do not have electronic health records or information systems with shared access among the patient's oncology team and their primary health care team. Other barriers include a lack of dedicated space for a pharmacist in the clinic setting and a lack of administrative support, creating a time burden on pharmacists performing administrative tasks as well as medication reviews.

3.3. Barriers to Implementing Medication Changes

Pharmacists focus on optimising medication regimens, addressing drug-related problems, and improving medication safety in older adults with cancer. They also make recommendations to specialists (geriatricians and/or oncologists) in secondary care or general practitioners in primary care to optimise chronic medications. However, there is often a lack of clarity about who is responsible for managing medication for chronic long-term conditions. Secondary care practitioners may prefer to defer decisions about long-term medication to primary care practitioners [13]. Where recommendations from a medication review are deferred to the primary care team, pharmacists described lack of capacity to follow-up on the implementation of these changes in the primary care setting. Lack of integration of electronic health records between primary and secondary care also makes follow-up challenging.

Table 2
Areas for potential improvement and additional comments on the medication review process in older adults with cancer.

| Areas for potential improvement | Problems | Goals and potential solutions |
|-----------------------------------|--|---|
| Pharmacist Role/ opportunities | <ul style="list-style-type: none"> • Application of pharmacist recommendations fully relies on prescribers where pharmacists do not have prescribing capabilities • Follow-up of pharmacist recommendations can be difficult when recommendations are not applied directly but forwarded to the general practitioner • Haematologists and oncologists are not always sensitized to geriatric issues in older patients with cancer, which can limit the acceptance of pharmacists' recommendations • In inpatient settings, there are limited opportunities to perform optimization on chronic medications as acute events are prioritized • Limited pharmacist time available, preventing from seeing all patients and/or performing a comprehensive intervention | <ul style="list-style-type: none"> • Develop a collaborative practice agreement (physician-pharmacist) so pharmacists can optimize certain medications directly. • Promote direct and secure communication channels with general practitioners and other primary care providers, such as community pharmacy • Setting up follow up clinics and increasing capacity of the core members of the team as well as expanding the roles of other colleagues by incorporating CGA into daily practice • Ensure pharmacists recommendations are either built into discharge planning or shared with primary care providers • Have a clearly defined referral pathway for medication review • Define prioritization factors, based on clinical concern, geriatric syndromes and/or results of clinical frailty scores • Implement digital tools to facilitate medication reconciliation and review • Support funding of pharmacist's positions in geriatric oncology teams |
| Feasibility | <ul style="list-style-type: none"> • Heterogeneity of prescribing tools and medical records across settings, making medication reconciliation difficult • Time-consuming administrative tasks (recording of information, formatting of documents) • Limited opportunities to share recommendations with prescribers face-to-face due to distant consultation locations, remote interventions and/or limited pharmacist time • Difficulty performing remote interventions, when necessary, due to unavailable tools and/or patient's incapacity • Lack of specific tools to monitor adherence • Lack of validated tools to identify PIMs adapted to the specificities of older patients with cancer | <ul style="list-style-type: none"> • Develop secure shared electronic medical record, including medication history, across hospital and primary care settings • Develop tools and reports integrated to the electronic medical record • Implement secure messaging to forward reports and documents • Implement regular meetings to share recommendations and discuss complex medication related issues • Implement adapted remote consultation tools • Develop alternative follow-up methods, such as smart-phone apps • Involve caregivers in remote interventions • Implement adherence monitoring tools adapted to older adults • Develop specific tools for PIM identification in older adults with cancer |

Table 2 (continued)

| Areas for potential improvement | Problems | Goals and potential solutions |
|---------------------------------|--|--|
| | <ul style="list-style-type: none"> • Difficulty conducting patient interviews due to patient's incapacity (hearing loss, cognitive disorders, language, or cultural barriers) | <ul style="list-style-type: none"> • Develop age-friendly simple educational tools in multiple formats and languages • Involve caregivers in the medication reconciliation process and share information with caregivers |
| Training opportunities | <ul style="list-style-type: none"> • Lack of opportunities for specialized training in geriatric oncology for pharmacists • Lack of clinical pharmacy training in initial education of pharmacists | <ul style="list-style-type: none"> • Develop geriatric oncology training courses for pharmacists • Implement companion training with geriatricians and/or geriatric oncologists and/or regular cases reviews • Develop specialized training for clinical pharmacists on conducting person-centred conversations, medication review and reconciliation |

Effective follow-up by pharmacists may be hampered by lack of formalised referral or communication channels; lack of integrated technical platforms between secondary and primary care; competing priorities; lack of expertise; lack of reimbursement; and lack of time and resources.

3.4. Pharmacist Prescribing Privileges

Pharmacist prescribing privileges, or non-medical prescribing, have been implemented in many countries to improve patient care and increase access to healthcare [12]. Different models of prescribing—dependent (or supplementary), collaborative, and independent—have been described in the literature. While pharmacist prescribing was introduced in the UK in 2003, pharmacists do not currently have the right to prescribe in other countries such as the Republic of Ireland, France, and Spain. The UK authors highlighted lack of funding as a key barrier to pharmacist prescribing. Other common barriers to pharmacist prescribing, described by Zhou et al. [14], include inadequate training in diagnostic skills, inadequate support from employers, and insufficient reimbursement. Legislative and policy changes as well as structural and organisational changes are needed to support pharmacist prescribing in geriatric oncology clinics. Pharmacist prescribing has the potential to improve patient care and increase access to healthcare. To realise this potential, several barriers need to be overcome, including regulatory and legal restrictions, reimbursement, underutilisation of pharmacist prescribing, limited education and training, inadequate support, and recognition. Pharmacists with prescribing privileges in geriatric oncology should work closely with a geriatric oncologist within their scope of practice.

3.5. Considerations for Integrating Pharmacists into a Geriatric Oncology MDT

Pharmacists new to geriatric oncology can use the NAH/Young SIOG guidance published in 2022 [4] to inform their practice. Alongside other nursing and allied health professionals, clinical pharmacists embedded into such teams provide medication expertise to support and contribute to the decision-making process for geriatric oncologists, haematologists, and geriatricians.

Clinical pharmacists working in geriatric oncology need to work with other members of the MDT and patients/caregivers to collaboratively make these recommendations and decisions. A fundamental aspect of clinical pharmacy in geriatric oncology is the use of clinical judgement

and expertise to rationalise and prioritise pharmaceutical care interventions. A recent systematic review by Herledan et al. [15] found that pharmacist medication reviews were effective at highlighting and reducing medication-related problems in older adults with cancer but acknowledged the need for more robust research to assess the clinical impact of adopting pharmacist recommendations.

4. Conclusion

Clinical pharmacy practice in geriatric oncology settings has many similarities internationally, but there are some important differences. Collaboration by pharmacists working in integrated multidisciplinary teams is essential to ensure that knowledge gaps in clinical practice, research, and in the literature are identified and addressed. Further research is warranted to overcome the barriers and identify the optimal strategy for integrating pharmacists into a geriatric oncology model of care. The SIOG NAH pharmacist subgroup welcomes all pharmacists working in geriatric oncology, or with an interest in geriatric oncology to join the group.

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Data Collection: All authors.

Analysis and Interpretation of data: All authors.

Manuscript writing: Darren J. Walsh, Kavita Kantilal.

Approval of Final Article: All authors.

Declaration of Competing Interest

Maria-Estela Moreno-Martinez reports receiving honoraria from GSK SA, Gilead, Eisai, Roche Farma SA, Celgene SLU, Sanofi, Pfizer, Kyowa, and Daiichi Sankyo España, as well as travel support from Gilead. She also serves on boards for Incyte, AstraZeneca, Daiichi Sankyo España SAU, Salud Advisory Partners SL, Janssen-Cilag SA, Celgene SLU, Bayer, Eisai, HARMON Corporate Affiliars SL, and Takeda and holds leadership/fiduciary roles in GEDEFO-SEFH, ESOP, and Pharmacist Committee EBMT.

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