

Assessment and Management of Cancer Pain in Older Adults: Strategies for Success

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ABSTRACT

Pain is a significant problem in older adults with cancer as older adults often receive suboptimal pain management. While overmedication can lead to adverse effects, under management of pain can lead to physiological and psychological problems such as functional decline and depression. This manuscript will discuss the assessment and management of pain in older adults, in consideration of the pharmacodynamic changes related to aging and other individual considerations. Current evidence from filtered and unfiltered sources, PubMed, current guidelines.

Unrelieved pain can have a detrimental impact on older adults. A team approach is essential to assess patients at each encounter, consider the social environment in which the patient resides, and employ pharmacologic and nonpharmacologic strategies that are evidence-based and are tailored to the specific cancer pain syndrome.

Key words: Cancer, pain, older adults, elderly, geriatrics, pharmacokinetics, pharmacodynamics

Introduction

Pain is one of the most common symptoms experienced by patients with cancer and can occur at any time during the cancer trajectory. A recent meta-analysis of 122 studies found the prevalence rates of cancer pain 39.3% after curative treatment; 55% during anticancer treatment, and 66.4% in advanced, metastatic, or terminal disease.^[1] Since the prevalence of cancer is highest in the older adult population, cancer pain is also a significant issue in this population. This manuscript provides an overview of cancer

pain in older adults. The discussion will ensue on the pain experience in older adults, holistic assessment guidelines, and pharmacologic and nonpharmacologic strategies to optimally manage cancer pain in older adults with cancer.

The Experience of Cancer Pain in Older Adults

It is important for clinicians to understand how older adults construct the pain experience. Understanding their

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perspective can provide insights into the challenges of pain assessment and management of the population.

One of the biggest challenges is that most older adults and health-care practitioners perceive that pain is a normal part of aging. Interestingly, older patients have been found to be more satisfied with their pain treatment compared to middle-aged adults despite increasing levels of pain, which could be related to their perception that pain is to be expected as one grows older.^[2] A systematic review of 17 studies found that older adults also equated pain with disease progression, helplessness, and uncertainty about the future. Investigators also found that fear exists that analgesics contribute to untoward side effects.^[3] These perceptions may interfere with both the assessment and management of pain. A qualitative study of nine older patients with cancer pain found they denied pain, disliked analgesics, feared the loss of identity with cancer and pain, and strived to maintain control and independence.^[4]

A second challenge is the myth that older adults perceive less pain than older adults. Three decades of research have explored the association of pain prevalence/severity with age and report mixed results.^[5] Some studies indicate older adults have a higher prevalence of pain compared to younger populations^[6,7] while other studies have reported less.^[8-10] One meta-analysis did not find age to be associated with pain prevalence, although none of the studies noted above were included in this analysis.^[1]

Communication is another challenge that can impact both assessment and management of pain older adults. Some patients with sensory difficulties such as hearing loss may find it difficult to hear and understand questions related to the pain assessment. Cognitive impairment is another significant risk factor, as many patients with dementia or other age-related brain disorders may not be able to express or report pain. Reduced analgesic prescribing in patients with cognitive impairment is a significant problem according to a systematic review that examined cancer pain in older adults living in long-term care facilities. A caring and trusting relationship between the older adult and the health-care professional can lead to a better understanding of the older adult's pain experience.^[3]

Assessing Pain in Older Adults

Aging is a heterogeneous process and a personalized assessment of pain is essential for older adults. First, clinicians should recognize pain as a multidimensional experience that encompasses the whole person. "Total pain," a term deemed by Dame Cicely Saunders, is pain that involves the physical, psychological, social, and spiritual domains of a human being.^[11] These assessment domains apply to older adults, with individualized consideration for

each patient's overall functional status, mental processing, and their ability to report and communicate the pain.^[12,13]

Assessment should begin using a 5-step approach [Table 1].^[14-16] Self-report is the gold-standard for pain assessment, but some patients may not be able to verbally report pain. The subsequent steps should then be employed to determine the possible presence of pain. If any of the measures are positive, health-care professionals should assume that the patient has pain and begin analgesics. For example, if the patient was recently diagnosed with metastatic breast cancer, nonopioids along with opioids should be used.^[14,15]

If the patient is nonverbal and unable to communicate the presence of pain, several tools are available for both research and clinical purposes. Some include the Abbey pain scale (Abbey) assessment of discomfort in dementia protocol, checklist of nonverbal pain indicators, the Doloplus-2, the face, legs, activity, cry, and consolability pain assessment tool, noncommunicative patient's pain assessment instrument, pain assessment checklist for seniors with limited ability to communicate, pain assessment for the dementing elderly and pain assessment in advanced dementia. No one tool is recommended for practice. Clinicians should examine each tool for use and feasibility within their setting.^[17]

A patient's history of pain should also be noted. Most older adults suffer from some chronic pain syndrome

Table 1: The 5-step approach to pain assessment

Step	Pain Assessment
1. Self-report	<ul style="list-style-type: none"> • Attempt to obtain a self-report of pain from the patient <ul style="list-style-type: none"> Use a 0-10 scale if able <ul style="list-style-type: none"> ◦ If the patient is unable to use a 0-10 scale, attempt a verbal descriptor scale such as mild, moderate, severe ◦ Ask the patient if they have pain or if they are hurting ◦ Ask the patient to squeeze your hand if they are hurting
2. Pathology	<ul style="list-style-type: none"> • Consider the patient's physiological condition (s) <ul style="list-style-type: none"> ◦ History of arthritis or chronic pain ◦ Type of cancer and its potential to cause pain ◦ Procedures that can cause pain • Physiologic measures such as heart rate and blood pressure are the least sensitive indicators of pain but can be elevated in the presence of acute pain
3. Behaviors	<ul style="list-style-type: none"> • Assess for any patient behaviors that may indicate the presence of pain <ul style="list-style-type: none"> ◦ Facial expressions ◦ Crying or yelling • Use a nonverbal pain assessment tool if the pain if the patient is unable to communicate the pain
4. Caregiver Input	<ul style="list-style-type: none"> • Ask the caregiver about their perceptions of their loved one's pain <ul style="list-style-type: none"> ◦ Recent change in behavior that could indicate pain - withdrawal or agitation ◦ Actions that indicate the presence of pain
5. Analgesic Trial	<ul style="list-style-type: none"> • Assume pain present <ul style="list-style-type: none"> ◦ If any of the above measures suggest pain, an analgesic trial should be initiated ◦ Analgesics should be consistent with the pathology of the pain, for example, opioids should be employed for cancer pain

and should be considered in the total pain assessment. Approximately 25%–76% of older adults living in the community experience chronic pain and 83%–93% of those living in residential facilities.^[18] Both cancer pain and the chronic pain should be included determined as the type of pain will provide information for the management plan.^[19]

For patients who can communicate, the impact of pain on the patient’s psychological, social, and spiritual well-being should be carefully assessed. For psychological assessment, pain often clusters with other symptoms such as anxiety and depression. These assessments should be routine in any patient with pain. Social assessment includes how the pain impacts the patient’s ability to function and interact with others. Often, pain can lead to isolation and loneliness. Spiritual assessment can include how spiritual beliefs influence suffering or facilitate coping with the pain.^[20,21]

Assessing the Care Environment

The environment in which the older adult lives should be carefully assessed for factors that can influence the overall management plan. First, older adults can be living in the home, with or without a caregiver, or in long-term care or hospice facility. Home health may or may not be available. Assessment of sight is essential for patients self-managing their care. Forgetfulness and confusion can impact medication adherence. Ensuring that the medication bottles are easy to read and understandable, and making sure an organization system is set-up for success is importance for proper administration and adherence. Pull boxes can be used to assist with tracking and dispensing medications daily. Health-care journals can be used to track pain scores and “as needed” medications taken for breakthrough pain.

This allows the clinician to better assess the effectiveness of the employed interventions. In addition, opioids should be locked in a cabinet, and patients and caregivers need to understand the risk of theft that can occur, even with known persons.^[22]

Managing Pain in Older Adults

Physiological changes associated with aging

As individuals age, a greater risk exists for drug-related toxicities and drug–drug interactions. First, older adults have a greater risk of polypharmacy issues. The median number of prescriptions has doubled from 2 to 4 in the U.S. and 12.8% of adults aged 65 and older are taking more than five prescriptions per day.^[23] This is consistent with other international studies.^[24] Overmedicating can lead to an increased risk of adverse events. However, clinicians also need to consider that under medicating older adults, which often occurs, has the risk of inadequately treating a patient’s pain.^[7] Second, the therapeutic window becomes narrow with changes in renal, hepatic, and other bodily functions. Age-related changes in the gastrointestinal tract, fat and lean mass, body water volume, and renal and hepatic function lead to reduced absorption, changed drug distribution, and modified metabolism and elimination associated with aging.^[22] Specific age-related changes are included in Table 2.^[18,22,25]

Pharmacologic management

Nonopioids, opioids, and coanalgesics are all employed in the management of older adults with cancer.^[26] Agents should be administered in consideration of the physiologic changes in the older adult and the individual patient’s status. For example, not all older adults have renal compromise

Table 2: Physiologic changes with aging

Pharmacodynamic property	Physiologic change	Consequences	Pharmacologic implications
Absorption	Reduced gastric and intestinal motility Increased pH Decreased digestive enzyme activity Mucosal atrophy	Prolonged colon transit times Higher risk of constipation Gastrointestinal distress Swallowing difficulties	Decreased and inadequate absorption of drugs Difficulty taking oral medications Higher risk for developing opioid-induced constipation
Distribution	Increased ratio of fat to lean body mass Reduction in the total water in the body	Increased fat and reduced water leads to an increased distribution of lipophilic agents Decreased distribution volume of hydrophilic agents Reduced body water leads to dehydration, hypoalbuminemia, and anemia	Delayed onset of effect and a delayed rate of elimination of lipophilic agents such as fentanyl leading to toxicity Increased plasma levels of hydrophilic agents Drugs that are protein-bound are retained systemically for longer periods in older adults with anemia
Hepatic	Function is reduced with age Reduction in the amount of cytochrome P450 (CYP450) enzymes	Effects on aging pathways unclear Probable alteration in metabolism as P450 metabolizes 40%-50% of all medications	Potential for prolonged drug half-lives, leading to extended periods of drug circulation, uptake, and distribution Potential for adverse effects from drug-drug interactions when patients are co-administered medications processed by the CYP450 enzyme system
Renal	Reduction in mass and blood flow	Lower renal clearance and glomerular filtration rate (<60 mL/min)	Potential for the accumulation metabolites in drugs eliminated primarily by the kidney leading to increased toxicity

even though physiologic changes are occurring. Regardless of the analgesic administered, the principle of “start low” and “go slow” should be employed consistently.^[22]

Nonopioids

Paracetamol is commonly used to manage musculoskeletal pain and is well-tolerated in older adults. As metabolism involves the liver, paracetamol should be avoided or used with caution in patients with hepatic insufficiency. Patients should also be instructed to not exceed 4 g of paracetamol in 24 h. Cold medicine and over-the-counter labels should be checked carefully as they commonly contain paracetamol and their amounts should be included in the 24 h totals. Nonsteroidal anti-inflammatory drugs should be used with extreme caution in older adults. They are over-the-counter agents commonly used by older adults for self-medication but are dependent on protein binding for transport and distribution. Lower albumin levels in older adults lead to drug accumulation systemically, leading to a higher risk for NSAID toxicities including gastrointestinal disturbances (e.g., dyspepsia, peptic ulceration, and hemorrhage), renal failure, and bleeding.^[18,26]

Opioids

Opioids are the mainstay of cancer pain management. This includes patients of all ages, including older adults. Several opioid options exist including morphine, oxycodone, hydromorphone, hydrocodone, fentanyl, and methadone.^[21] The risk–benefit ratio of each opioid should be carefully weighed, keeping in mind the patient’s physiological status such as renal function and absorption issues. For example, while morphine is the gold standard for opioid comparison, it has two metabolites, morphine-6-glucuronide (M6G) and morphine-3-glucuronide (M3G) which can accumulate in patients with renal compromise. M6G contributes to the pain relief but can accumulate and cause oversedation while M3G can lead to neuroexcitatory effects and counteracts analgesic effects. Clinicians should be especially cautious with methadone. Due to its strong binding to protein, the agent can compete with other protein-bound drugs leading to systemic accumulation and a plethora of side effects such as constipation, sedation, and even death.^[22] The commonly employed opioids are included in Table 3.^[22,27]

Clinicians should be aware of opioid-related adverse events and recognize that they can be compounded in older adult populations. Constipation is the most common opioid-related adverse effect. Opioids cause three effects on the bowel: lack of peristalsis decreased fluid in the stool and increased anal muscle tone. Constipation is common in older adults, even without the use of opioids; therefore, the addition of opioids commonly compounds the problem. Patients, including older adults, should be prescribed a stool

Table 3: Opioid considerations in older adults

Opioid	Older adult considerations
Morphine	Potential for accumulation of M3G and M6G in patients with renal compromise Consider lowering the dose of morphine or choosing an alternative opioid in patients with renal insufficiency
Oxycodone	Metabolism mediated by the CYP450 enzyme, but clinical implications are unclear Consider
Hydromorphone	Two active metabolites exist, H3G and H6G, although the impact of these metabolites is unclear Approximately 6x more potent intravenously than morphine so caution should be used with dosing Lack of CYP450 metabolism can be an advantage for older patients
Fentanyl	Highly lipophilic and onset dependent on route of administration Metabolized by CYP450 but implications unclear Transdermal route Potential for a delayed onset and rate of elimination in patients with higher amounts of adipose tissue Should not be used in patients with cachexia who lack sufficient body fat Best to use for stable pain as it is more difficult to titrate than oral opioids Ease of administration of one patch every 3 days may be an advantage for older adults Transmucosal fentanyl is easily absorbed through the oral mucous membranes resulting in a rapid onset for breakthrough pain episodes
Methadone	Highly protein bound resulting in an extended half-life which can lead to drug accumulation and oversedation QTc prolongation, especially in higher doses > 100 mg/day Drug-drug interactions are common, especially in older adults who are often prescribed multiple medications

M3G: Morphine-3-glucuronide, M6G: Morphine-6-glucuronide, H3G: Hydromorphone-3-glucuronide, H6G: Hydromorphone-6-glucuronide

softener and a bowel stimulant prophylactically, to prevent constipation. Assessment should occur ongoing to ensure that bowel movements are regular. Additional laxatives may need to be employed.^[28] For refractory constipation, methylnaltrexone is an option that reverses the opioid receptors in the bowel to promote evacuation, usually within an hour.^[29]

Other side effects of concern include oversedation and confusion. Risk factors include dementia or confusion, dehydration, and concomitant use of other central nervous system agents. While confusion and/or delirium can occur, a differential diagnosis is essential. The opioid may not be primarily responsible. Other agents such as benzodiazepines should be considered.^[30]

Co-analgesics

Co-analgesics have three roles as follows: (1) increase the efficacy of other analgesics, (2) provide analgesia for specific pain syndromes, and (3) counteract analgesic adverse effects. The use of co-analgesics can minimize opioid requirements; however, many have adverse properties of their own that should be carefully weighed when prescribed. Some of the most common categories of co-analgesics are discussed below.^[22]

Anticonvulsants are the co-analgesic of choice for neuropathic pain. Gabapentin and pregabalin are the two agents most commonly employed. The dosing for gabapentin is complex. Doses should be initiated at 100 mg to 300 mg/day and titrated gradually every 3 days to an upper dose of 3,600 mg. Titrations should occur more slowly in older adults due to potential adverse effects such as somnolence, dizziness, fatigue, ataxia, and weight gain. Pregabalin employs more simplistic dosing schedule, 75 mg to 15 mg/day in 2–3 divided doses per day. Sedation may occur, and lower doses should be used in patients with renal compromise.

Antidepressants, specifically tricyclic antidepressants (TCAs) and serotonin-norepinephrine reuptake inhibitors (SNRIs) may also be used in the management of neuropathic pain. TCAs are associated with atrioventricular heart block and orthostatic hypotension; therefore, side effects often outweigh benefits in older adults. The two SNRIs, duloxetine and venlafaxine, are usually well-tolerated and may be an option for older adults. Cardiac monitoring is recommended in patients with a history of cardiac disease.^[22]

A variety of other coanalgesics are available to manage pain in older adults. Corticosteroids are helpful in the management of visceral pain, bone-modifying agents, and radionuclides are indicated for pain related to bone metastases. A tailored approach that considers the older adult's pharmacodynamics and specific pain syndrome will lead to improved pain outcomes.^[22]

Nonpharmacologic management

Nonpharmacologic interventions are essential to include in the pain management plan. A recent systematic review of 154 studies found several nonpharmacologic modalities that are recommended for practice or likely to be effective according to the current evidence. A handful of procedures are recommended including celiac plexus block for pain related to pancreatic and abdominal cancers and radiation therapy for bone pain. Psychoeducational interventions are likely to be effective and should be used routinely when caring for older adults. These include education about pain and its management, coaching, relaxation, and interactive groups, which engage patients and caregivers in self-care strategies to manage the pain.^[31]

Summary

Older adults are a disparate population regarding pain management. While overmedicating can lead to a risk of adverse effects, unrelieved pain can have both physiological and psychological consequences. As patients grow older, physiologic changes can alter absorption, distribution, metabolism, and elimination of pharmacologic analgesics.

Older adults are also at risk for polypharmacy due to the increase of comorbidities and agents employed to manage their chronic conditions. Each of these factors is individualized. Therefore, a tailored approach is essential to safely and adequately control pain in the older adult population. Finally, a team approach is necessary for success, which includes the patient, the caregiver, and the healthcare team.

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