Review Article

NARRATIVE REVIEW OF CLINICAL PHARMACIST CONTRIBUTIONS TO CANCER PAIN CONTROL: INTEGRATION OF WHO GUIDELINES AND PAIN ASSESSMENT TOOL

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ABSTRACT:

Pain is a prevalent and distressing symptom in cancer patients, affecting up to 90% depending on cancer type and stage. It arises from multiple sources including the tumor, treatments, and comorbidities, significantly impairing quality of life, psychological well-being, and treatment adherence. Despite advances in pharmacologic therapies and evidence-based guidelines like the WHO's three-step analgesic ladder, cancer pain remains under-assessed and inadequately managed globally. Barriers include clinician knowledge gaps, opioid-related concerns, limited medication access, and fragmented care, especially in resource-limited settings. Emerging clinical pharmacist-led analgesic stewardship programs offer innovative solutions to these challenges by optimizing pain assessment, individualized treatment, opioid management, and patient education. Pharmacists bring specialized pharmacotherapeutic expertise, playing a vital role in tailoring analgesic regimens, monitoring efficacy and adverse effects, and fostering interdisciplinary collaboration. Studies demonstrate that pharmacist involvement improves pain control, medication adherence, and patient satisfaction while reducing medication-related complications and healthcare costs. Opioid stewardship is critical due to risks of misuse and regulatory scrutiny. Pharmacists contribute by applying guideline recommendations, individualizing therapy based on pharmacokinetics and pharmacogenomics, and implementing risk mitigation strategies consistent with CDC and international guidelines. Accurate pain assessment using validated tools—Visual Analogue Scale (VAS), Numerical Rating Scale (NRS), and Verbal Rating Scale (VRS)—is foundational to effective management. Pharmacists enhance guideline implementation by training healthcare teams, ensuring consistent assessment, and integrating pain evaluation into clinical workflows.Overall, clinical pharmacist-led interventions align with global best practices and are integral to comprehensive, patient-centered oncology pain management. Their involvement bridges the gap between guidelines and clinical practice, promoting safer, more effective analgesic use and improving outcomes in cancer patients experiencing pain.

1.INTRODUCTION:

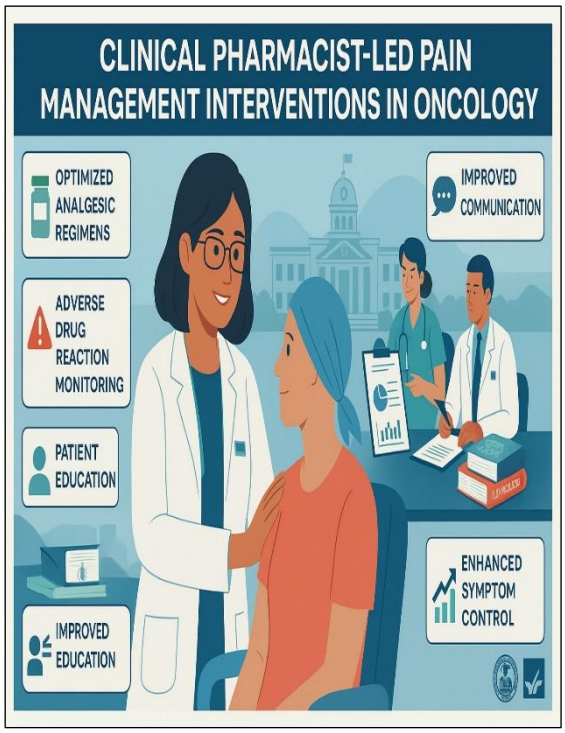
Pain is a ubiquitous and debilitating symptom among cancer patients, with prevalence rates ranging from 30% to 90%, depending on cancer type and stage [1]. It can manifest as acute, chronic, or breakthrough pain, and may arise from the tumor itself, treatment modalities such as chemotherapy, radiotherapy, or surgery, or from comorbid conditions. Poorly managed pain not only deteriorates the overall quality of life but also significantly impairs functional status, psychological well-being, and treatment adherence [2,3]. Patients suffering from uncontrolled pain often experience anxiety, depression, sleep disturbances, and social withdrawal, which further compounds the burden of illness and diminishes therapeutic outcomes. Despite advancements in pharmacological interventions, including the availability of opioids, adjuvants, and novel delivery systems, and the existence of evidence-based guidelines, pain remains under-assessed and inadequately managed in many oncology settings [4]. A range of factors contributes to this gap, such as clinicians' lack of training in pain assessment, fear of opioid addiction or adverse effects, limited

availability of medications, and inadequate communication between patients and healthcare providers. To address this, the World Health Organization (WHO) introduced its three-step analgesic ladder in 1986 as a foundational framework for cancer pain management, emphasizing the use of non-opioids, mild opioids, and strong opioids in a stepwise manner based on pain severity [5]. However, translating these guidelines into clinical practice remains a challenge, particularly in resource-limited settings where access to medications and palliative care services is constrained and where interdisciplinary collaboration is often lacking [6]. Fragmented care and inconsistent application of guidelines can lead to both undertreatment and overtreatment of pain, undermining patient outcomes. Recently, clinical pharmacist-led analgesic stewardship programs have emerged as innovative and effective strategies for optimizing pain control in cancer patients [7]. By leveraging their pharmacotherapeutic expertise, clinical pharmacists play a pivotal role in assessing pain, recommending individualized treatment plans, adjusting opioid dosages, and monitoring for efficacy and adverse effects. These programs not only enhance the safe and effective use of analgesics but also address critical aspects such as patient education, adherence support, and prevention of medication misuse [8]. Furthermore, such pharmacist-led interventions align with international best practices, being guided by WHO-recommended pain assessment tools and supported by authoritative global guidelines from organizations including the Centers for Disease Control and Prevention (CDC), the European Society for Medical Oncology (ESMO), and the European Association for Palliative Care (EAPC) [9–11]. These collaborative, multidisciplinary approaches are increasingly recognized as integral to delivering comprehensive, patient-centered oncology care.

2.CLINICAL PHARMACIST-LED PAIN MANAGEMENT INTERVENTIONS:

The integration of clinical pharmacists into oncology care teams is increasingly recognized for its substantial contributions to improving clinical outcomes in cancer pain management. These healthcare professionals bring pharmacotherapeutic expertise that complements the roles of physicians and nurses, enhancing individualized patient care and ensuring evidence-based treatment decisions. Li et al. conducted a prospective, multicenter, randomized controlled trial to assess the impact of a clinical pharmacist-led guidance team on cancer pain management. The study included a substantial number of patients from multiple centers and reported significant improvements in pain control in the intervention group compared to the control group. Clinical pharmacists were actively involved in optimizing analgesic regimens, monitoring for adverse drug reactions, maintaining detailed documentation of pain assessments, and conducting educational sessions for both patients and other healthcare providers—underscoring the multifaceted nature of their contribution to oncology pain care [12]. Similarly, Koshy et al. highlighted the added value of incorporating oncology pharmacists into multidisciplinary care teams. Their research demonstrated notable improvements in symptom control, medication adherence, and overall patient satisfaction. Importantly, pharmacists served as crucial liaisons in facilitating effective communication between physicians, patients, and other care team members—an aspect particularly vital for managing complex and persistent symptoms such as cancer-related pain [22]. In China, Zhang et al. evaluated the physician-pharmacist collaborative care model, demonstrating that such interprofessional partnerships significantly enhanced clinical outcomes and provided greater economic efficiency in cancer pain management. Patients receiving co-managed care experienced improved pain relief, a reduction in medication-related complications, and overall lower healthcare expenditures compared to those managed by physicians alone. This model not only reflects a scalable strategy for optimized care but also exemplifies the global relevance of pharmacist-led interventions in oncology [20]. Collectively, these studies reinforce the role of clinical pharmacists as essential contributors to standardized, safe, and effective cancer pain management, bridging the gap between guidelines and clinical practice. [Figure 1]

Figure 1 Clinical Pharmacist-Led pain management interventions in oncology



3.OPIOID STEWARDSHIP AND PRESCRIBING GUIDELINES:

Opioids remain the cornerstone in the pharmacologic treatment of moderate to severe cancer pain, but their use poses several clinical and regulatory challenges. These include issues related to dependence, tolerance, risk of misuse, and scrutiny over prescribing practices. To address these challenges, the Centers for Disease Control and Prevention (CDC) released a comprehensive clinical practice guideline in 2022 focusing on the rational and responsible prescribing of opioids. The guideline emphasizes patient-centered care, advocating for individualized pain therapy, prudent opioid initiation and titration, and ongoing risk monitoring. It supports integrating non-opioid and non-pharmacologic therapies when feasible, aligning well with the principles of pharmacist-led opioid stewardship programs [13]. An earlier 2016 guideline by Dowell et al. laid the foundational principles for opioid safety, including patient selection criteria, dosage thresholds, and the need for continual risk-benefit assessment. These recommendations have guided many institutions in formulating opioid stewardship policies aimed at minimizing harm while preserving access to essential pain relief for those in need [21]. Further supporting this need, Chou et al. conducted a systematic review for the NIH, which concluded that long-term opioid therapy carries limited evidence for sustained efficacy and considerable evidence for harm, such as overdose risk, opioid use disorder, and endocrine dysfunctions [17]. These findings underscore the importance of involving clinical pharmacists in opioid stewardship initiatives. Their expertise allows them to identify at-risk patients through medication reviews, tailor opioid regimens based on pharmacokinetics, monitor therapy using validated tools, and flag potential drug interactions. Smith's comprehensive analysis of opioid metabolism further highlights the importance of individualized therapy; genetic polymorphisms in metabolizing enzymes like CYP2D6 and CYP3A4 can dramatically influence both the efficacy and toxicity of opioids. Pharmacists, equipped with knowledge in pharmacogenomics and drug metabolism, are uniquely qualified to adjust doses, prevent adverse effects, and ensure optimal therapeutic outcomes in cancer pain management [19].[Figure 2].

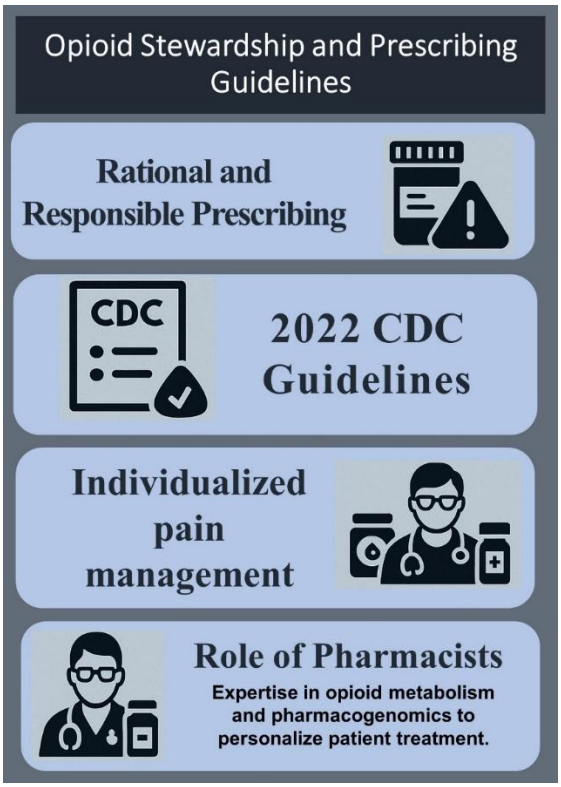


Figure 2 Opioid Stewardship and Prescribing Guidelines

4. PAIN ASSESSMENT AND WHO GUIDELINES:

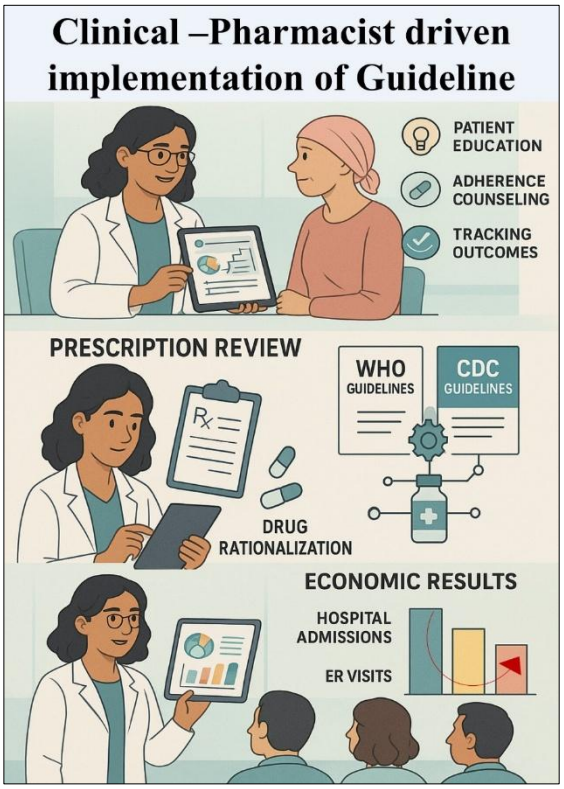
Effective pain management begins with accurate and consistent pain assessment. The WHO guidelines for the pharmacological and radiotherapeutic management of cancer pain underscore the importance of using validated pain assessment tools regularly and tailoring interventions to individual patient needs. Among these tools, the Visual Analogue Scale (VAS), the Numerical Rating Scale (NRS), and the Verbal Rating Scale (VRS) are widely used in clinical settings. The VAS, validated by Price et al., is particularly sensitive to subtle changes in pain intensity and generates ratio-level data, making it a valuable tool for clinical trials and therapeutic evaluations [14]. Caraceni et al. provided a detailed review of the methodologies and tools used in palliative care research, emphasizing that pain measurement must be reliable, easy to administer, and applicable across various clinical environments. Inadequate or inconsistent assessment practices, they noted, often result in suboptimal treatment strategies and increased patient dissatisfaction [16]. Paice and Ferrell offered a multidimensional framework for evaluating cancer pain, stressing that effective assessment should consider intensity, character, duration, and impact on functional capacity and daily living. They

reinforced the importance of WHO's stepwise analgesic strategy while also advocating for the integration of non-pharmacological and adjuvant interventions in comprehensive pain care plans [15]. The WHO's three-step analgesic ladder serves as a foundational guideline for cancer pain management. It recommends starting with non-opioid analgesics like acetaminophen or NSAIDs for mild pain, escalating to weak opioids such as tramadol or codeine for moderate pain, and utilizing strong opioids like morphine or fentanyl for severe pain. The model promotes scheduled rather than as-needed dosing and supports the oral route of administration as the most convenient and preferred method. It also encourages the use of adjuvants at all steps to address neuropathic components or enhance analgesia [9].

5.PHARMACIST-DRIVEN IMPLEMENTATION OF PAIN GUIDELINES:

Clinical pharmacists play a critical role in ensuring the effective implementation of clinical guidelines in day-to-day practice. Their role extends beyond dispensing to encompass patient education, therapeutic drug monitoring, and quality assurance. Pereira et al. conducted a systematic review demonstrating that pharmacist-led interventions significantly improved adherence to antidepressant therapy—a finding that holds relevance for cancer pain management, where patient adherence to complex, long-term analgesic regimens often poses a challenge [18]. By tracking adherence, addressing barriers, and providing tailored counseling, pharmacists enhance treatment continuity and patient outcomes. Pharmacists are also instrumental in auditing prescription patterns, minimizing medication errors, and promoting rational drug use through formulary management and policy development. Their involvement ensures that WHO and CDC guidelines are not merely theoretical frameworks but are actively applied in clinical settings. Pharmacists also act as educators, equipping healthcare teams with up-to-date knowledge on evolving guidelines, evidence-based practices, and pharmacovigilance principles. Zhang et al.'s economic analysis provides strong evidence supporting the sustainability of pharmacist-driven models. The study showed that the integration of pharmacists into cancer pain management significantly reduced healthcare costs related to hospital admissions, emergency department visits, and management of medication-related complications, while simultaneously improving patient outcomes [20]. [Figure 3].

Figure 3 Pharmacist-Driven Implementation of Pain Guidelines



6. COMPARATIVE EVALUATION OF WHO RECOMMENDED PAIN ASSESSMENT SCALES:

The success of any pain management strategy is inherently dependent on the accuracy and reliability of the assessment tools employed. The WHO supports standardized tools such as the VAS, NRS, and VRS, each tailored to different clinical scenarios. The VAS, while highly sensitive and suitable for detecting subtle changes in pain levels, may be difficult for certain populations—including elderly patients or those with cognitive impairments—to comprehend and utilize effectively. The NRS is a more user-friendly alternative, allowing patients to rate their pain on a numerical scale from 0 to 10, but it may lack the statistical robustness of VAS. The VRS, which uses descriptors like “mild,” “moderate,” and “severe,” offers simplicity at the cost of quantitative precision. Caraceni et al. emphasized that the choice of assessment tool should be informed by patient characteristics, clinical context, and the specific goals of treatment. In this respect, clinical pharmacists can provide valuable guidance by

training healthcare professionals in the appropriate use of these tools, ensuring consistent implementation, and integrating assessments into electronic health records for ongoing monitoring and quality improvement [16]. Furthermore, pharmacists can contribute to the development and validation of novel pain assessment tools tailored to specific populations such as pediatric, geriatric, or palliative care patients. Their involvement ensures that tools are not only selected appropriately but are also administered correctly and interpreted accurately, leading to more effective pain control and enhanced patient care outcomes.

7. CONCLUSION:

Cancer pain remains a significant burden on patients and healthcare systems alike. While global guidelines provide a robust framework for management, implementation gaps persist. Clinical pharmacist-led analgesic stewardship programs have demonstrated substantial benefits in optimizing pain control, improving adherence to guidelines, reducing opioid-related risks, and enhancing overall patient quality of life. Pharmacists contribute at every level—from drug selection and dose adjustment to patient education and policy development. Their integration into multidisciplinary care teams has shown to improve outcomes, reduce healthcare costs, and ensure safe and effective pain management practices. As the complexity of cancer care increases, so does the need for specialized roles like that of clinical pharmacists. Their expertise in pharmacotherapy, combined with patient-centered care principles, positions them uniquely to lead analgesic stewardship initiatives. Future research should focus on expanding these roles, developing standardized implementation frameworks, and evaluating long-term impacts on patient outcomes and healthcare resource utilization. In conclusion, clinical pharmacist-led analgesic stewardship represents a transformative approach in cancer pain management. By adhering to WHO-recommended pain assessment tools and incorporating evidence-based guidelines, these programs promise to set a new standard in oncologic care.

8. REFERENCES:

1. van den Beuken-van Everdingen MHJ, Hochstenbach LMJ, Joosten EA, Tjan-Heijnen VCG, Janssen DJA. Update on Prevalence of Pain in Patients With Cancer: Systematic Review and Meta-Analysis. J Pain Symptom Manage. 2016;51(6):1070-90.e9.
2. Mystakidou K, Tsilika E, Parpa E, Katsouda E, Vlahos L. Psychological distress of patients with advanced cancer: influence and impact on quality of life. Support Care Cancer. 2005;13(9):743–9.
3. Greco MT, Roberto A, Corli O, Deandrea S, Bandieri E, Cavuto S, et al. Quality of cancer pain management: an update of a systematic review of undertreatment of patients with cancer. J Clin Oncol. 2014;32(36):4149–54.
4. Breivik H, Cherny N, Collett B, de Conno F, Filbet M, Foubert AJ, et al. Cancer-related pain: a pan-European survey of prevalence, treatment, and patient attitudes. Ann Oncol. 2009;20(8):1420–33.
5. World Health Organization. Cancer Pain Relief: With a Guide to Opioid Availability. 2nd ed. Geneva: WHO; 1996.
6. Cleary J, Simha N, Panieri A. Integration of palliative care into oncology: evidence, global models, and challenges in low- and middle-income countries. Cancer. 2020;126(20):4641–52.
7. Wahab SMA, Alshehri AM, Alqahtani MA, et al. Role of clinical pharmacists in pain management in cancer patients: A review. Saudi Pharm J. 2021;29(2):97–106.
8. Kwon JH. Overcoming barriers in cancer pain management. J Clin Oncol. 2014;32(16):1727–33.
9. World Health Organization. WHO Guidelines for the Pharmacological and Radiotherapeutic Management of Cancer Pain in Adults and Adolescents. Geneva: WHO; 2018.
10. Fallon M, Giusti R, Aielli F, et al. Management of cancer pain in adult patients: ESMO Clinical Practice Guidelines. Ann Oncol. 2018;29(Suppl 4):iv166–iv191.
11. Caraceni A, Hanks G, Kaasa S, et al. Use of opioid analgesics in the treatment of cancer pain: evidence-based recommendations from the EAPC. Lancet Oncol. 2012;13(2):e58–68.
12. Li M, Zhang Y, Wang X, et al. Impact of a clinical pharmacist-led guidance team on

cancer pain management: a prospective, multicenter, randomized controlled study. Support Care Cancer. 2014;22(6):1583–9.
13. Centers for Disease Control and Prevention (CDC). CDC Clinical Practice Guideline for Prescribing Opioids for Pain—United States, 2022. MMWR Recomm Rep. 2022;71(3):1–95.
14. Price DD, McGrath PA, Rafii A, Buckingham B. The validation of visual analogue scales as ratio scale measures for chronic and experimental pain. Pain. 1983;17(1):45–56.
15. Paice JA, Ferrell B. The management of cancer pain. CA Cancer J Clin. 2011;61(3):157–82.
16. Caraceni A, Cherny N, Fainsinger R, et al. Pain measurement tools and methods in clinical research in palliative care: recommendations of an expert working group of the European Association of Palliative Care. J Pain Symptom Manage. 2002;23(3):239–55.
17. Chou R, Turner JA, Devine EB, et al. The effectiveness and risks of long-term opioid therapy for chronic pain: a systematic review for a National Institutes of Health Pathways to Prevention Workshop. Ann Intern Med. 2015;162(4):276–86.
18. Pereira L, Figueiredo I, Almeida A. Pharmacist interventions to improve adherence to antidepressant medication: a systematic review. Int J Clin Pharm. 2014;36(1):36–47.
19. Smith HS. Opioid metabolism. Mayo Clin Proc. 2009;84(7):613–24.
20. Zhang Y, Liu Y, Li X, et al. Therapy by physician–pharmacist combination and economic returns for cancer pain management in China: a cost-effectiveness analysis. Support Care Cancer. 2023;31(1):45–54.
21. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain—United States, 2016. JAMA. 2016;315(15):1624–45.
22. Koshy S, Carver A, McGuire TM. Integrating oncology pharmacists into multidisciplinary care teams for improved patient outcomes. Pharmacy (Basel). 2021;9(1):23.