


## Cancer Pain: A Comprehensive Approach for Improved Patient Care

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Cancer pain is a significant symptom that affects the majority of patients with cancer. 44% of cancer patients reported having pain overall, according to a recent systematic analysis that included research from 2014 to 2021. In a recent systematic review, 31% of individuals experienced moderate to severe pain and 55% of patients with advanced metastatic and terminal cancer reported experiencing pain<sup>1</sup>. Pain associated with cancer is complex, as it may result from tumor progression, treatment-related complications or damage to the nervous system. Nociceptive pain, caused by tissue damage or inflammation, is more common, while neuropathic pain arises from injury to the nerves and is often more difficult to treat. According to reports, up to 40% of cancer patients experience neuropathic cancer pain (NCP). Cancer itself was responsible for 64% of NCP, with therapies such as chemotherapy, radiation therapy and cancer surgery contributing to 20%<sup>2</sup>. The cornerstone of cancer pain management remains pharmacological treatment, primarily guided by the World Health Organization’s (WHO) pain ladder. This approach recommends a stepwise escalation from non-opioid medications like NSAIDs and acetaminophen for mild pain to stronger opioids such as morphine and fentanyl for severe pain<sup>3</sup>. Importantly, the pain ladder emphasizes

the combination of opioids with adjuvant therapies, such as antidepressants or anticonvulsants, especially for managing neuropathic pain. Despite the effectiveness of opioids, their use is not without challenges. Issues such as fear of dependence, regulatory barriers and side effects like constipation and sedation complicate their broader application. In addition to medications, non-pharmacological strategies play a vital role in managing cancer pain. These interventions often address the multidimensional nature of pain, which includes physical, emotional and psychological aspects. Techniques such as acupuncture, physical therapy and TENS (transcutaneous electrical nerve stimulation) have gained traction for their ability to provide relief with minimal side effects. Pain not only has a physical dimension but is also influenced by fear, anxiety and depression, which Cognitive Behavioral Therapy (CBT) can help alleviate. Recent advances in cancer pain management have focused on personalized medicine and emerging technologies. Neuromodulation techniques, such as spinal cord stimulation and intrathecal drug delivery systems, are being used to manage refractory cancer pain in advanced cases<sup>4</sup>. Research into molecular targets for pain management is advancing, focusing on pathways such as TRPV1 receptors, sodium channels and

inflammatory cytokines<sup>5</sup>. These novel approaches aim to address pain at its source, offering hope for safer and more effective therapies in the future. Machine learning and artificial intelligence are also emerging as powerful tools to predict and personalize pain management strategies based on individual patient profiles. Healthcare systems must focus on:

- 1. Improving Access to Medications:** Particularly in resource-limited settings by reducing regulatory barriers and training providers in appropriate opioid prescribing.
- 2. Expanding Multidisciplinary Care Models:** Integrating oncologists, palliative care specialists, physical therapists and mental health professionals to provide holistic care.
- 3. Advancing Research:** Supporting studies on innovative therapies, especially those addressing refractory pain or offering alternatives to opioid-based treatments.

### Conflicts of Interest

The Author declares that there is no conflicts of interest.

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