

Managing Cancer-Related Pain: A Combined Approach

In the United States, more than 1.6 million new cancer diagnoses and over half a million cancer deaths have been estimated for the year of 2016.¹ Given the prevalence of cancer in Western society, there is a constant effort being made to improve the quality of life of those affected. There have been significant advances in the screening, diagnosis, and management of cancer; however, cancer-related pain remains one of the most worrisome concerns for patients. The nature of cancer pain can be multifaceted, involving somatic, visceral, and neuropathic components. Although a localized tumor can be the direct source of a patient's pain, metastases, related surgeries, radiation therapy, chemotherapy, and concurrent illnesses must also be considered. Pain syndromes receive contributions from the inactivity, fatigue, and musculoskeletal issues that often accompany an oncologic diagnosis and vice versa.^{2,3} The neuropathophysiological pathways behind cancer pain and its pharmacologic management are well established, yet patients are still suffering from inadequate pain relief. A systemic review of the literature has shown that the prevalence of pain is 59% for patients on anticancer regimens, 64% in those with metastatic or advanced stage disease, and 33% after curative treatment.⁴ The fact that pain can persist even after curative treatment truly highlights the need for additional measures in providing relief for these patients. When cancer pain is not appropriately handled, it causes further deterioration of a patient's state.^{5,6} Alternative approaches to coping with cancer pain have been studied and a select few will be discussed here. This article will provide an overview of pain assessment and general guidelines for pain management, as well as review adjunctive techniques such as exercise and relaxation methods in hopes that they can be used to decrease cancer-related pain for patients today.

Pain Assessment

Whenever cancer patients are encountered in a clinical setting it is necessary to evaluate their pain. The traditional history and physical exam are the most helpful tools for an initial cancer patient assessment.⁷ Physical exam findings include basic vital signs, signs of muscle atrophy, strength testing, and identification of trigger points. Physical evidence of pain is not always obvious which is why taking a detailed history becomes important. To better understand the nature of the pain one can delve into the following: when the pain started, what provokes it, what palliates it, the quality of the pain (e.g. dull, achy, sharp), whether the pain radiates elsewhere, a subjective rating for the pain on a visual or numerical scale (Figure 1), and whether or not the pain is worse at any particular time of day. By using the acuity or chronicity of the pain, recognizing the factors that influence it, and knowing what resources are being used to manage the pain, care providers are left with a more holistic picture of the patient. If needed, an additional resource like The Biobehavioral Pain Profile⁸ may be used, which measures behavioral, physiological, and cognitive reactions to pain through a self-report questionnaire. Combining detailed interview questions with the associated symptomology of malignancy allows for the type and source of a patient's pain, the pathophysiology behind it, and the relationship of the pain to the disease process to be better explored.

Living with cancer comes with many emotional and psychological challenges.⁹ As such, it is necessary for an initial pain assessment to also include questions about a patient's life stresses beyond just the cancer. The patient's family relations, work issues, and existing support systems should be discussed through open dialogue and in a nonjudgmental atmosphere. There is

an interconnection between the emotions of anxiety, depression, fear, anger, helplessness, hopelessness and the feeling of pain itself.^{10,11} This correlation involves a vicious cycle: a patient is diagnosed with cancer, undergoes physical pain as a result of the cancer and/or treatment, develops negative emotions related to the cancer and its management, and then these emotions feedback to exacerbate the entire pain experience. Zaza and Baine¹² gathered evidence from the literature demonstrating that greater amounts of pain are associated with lower levels of social support. The inverse relationship between social well-being and pain makes investigating a social history worthwhile during an initial assessment. The collected information about a patient's medical history, social history, and physical exam findings serves as a guide in the selection of coping strategies for cancer-related pain.

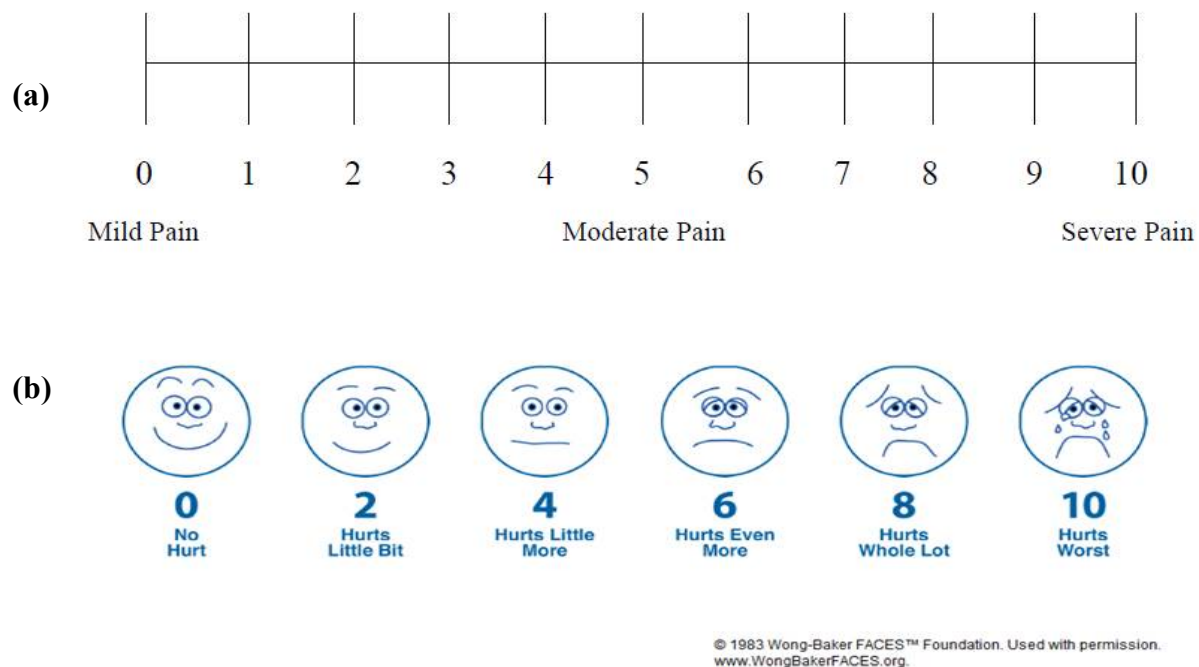


Figure 1: Pain scales for a patient assessment. **(a)** a standard numerical scale in which the numbers correlate with severity of pain. **(b)** The Wong-Baker Faces Pain Rating Scale graphically depicts a patient's level of discomfort. Visual scales are especially useful in pediatric and cognitively impaired patient populations.

Pain Relief Ladder

In modern medicine, pharmacologic management is considered first-line in the treatment of cancer-related pain. In 1986, the World Health Organization (WHO) established guidelines for pain relief in cancer patients that remains standard of care to this day. Understanding the fundamentals expected of health care providers for treating cancer pain is essential before alternative treatment approaches are explored. WHO outlined a three-step ladder, involving a progression from non-opioids (e.g. aspirin) to weak opioids (e.g. codeine) to strong opioids (e.g. morphine) until the patient is theoretically pain-free (Figure 2).^{13, 14} A patient enters the ladder based on the current severity of pain in relation to the stage of disease. These drugs are usually administered every 3-6 hours instead of on an "as needed" basis. Consequently, if a patient

reports inadequate pain relief, a provider can determine if the dosing and associated intervals are appropriate. Similarly, the intensity and frequency of pain can be correlated with the WHO ladder to see if the patient is being undertreated. The WHO recommendations are clear and have been implemented with quantifiable success in different clinical settings.^{15,16,17} When practiced appropriately the WHO guidelines provide a good foundation for pain relief. Ideal medical management of pain also involves tracking patient progress, assessing and reassessing the patient's pain, and monitoring side effects of different therapeutic modalities. If patients are experiencing neuropathic pain, an existing medication schedule can be supplemented with antidepressants (e.g. tricyclic antidepressants), anticonvulsants (e.g. gabapentin), and topical agents (e.g. lidocaine patch). Medication side effects, fear of addiction, and drug tolerance can weigh down on patients and make them noncompliant or aversive to the pharmacologic management of their pain. The search then begins for non-pharmacologic ways to cope with pain.

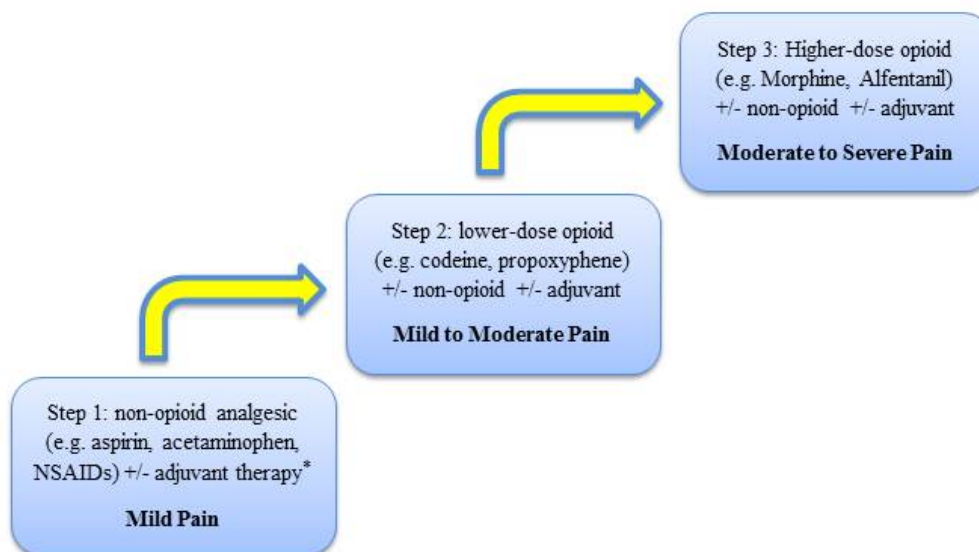


Figure 2: Three-step WHO analgesic ladder for cancer-related pain.

NSAIDs, nonsteroidal anti-inflammatory drugs

*adjuvant therapy includes psychotropic medications such as tricyclic antidepressants, selective serotonin reuptake inhibitors, benzodiazepines, and steroids. Adjuvant therapy is useful for additional pain reduction as well as for the associated symptoms of anxiety, insomnia, depression, and loss of appetite in cancer patients.

Palliative Treatment

If the cancer is potentially curable, surgery, radiation and/or systemic therapy can be used to durably alleviate cancer pain. A subset of patients with limited metastases have long-term survival following definitive treatment. More commonly, patients with distant metastases require supportive care and palliative treatment. Radiation therapy can be safely performed in 1 to 10 treatments, is 65 to 70% effective at relieving pain, and reduces the need for narcotic medications and subsequent risk for pathologic fractures.¹⁸ Painful metastases may respond to radiation, chemotherapy, hormonal therapy, and/or regional nerve blocks. Interestingly, pain is not necessarily associated with worse survival in patients with advanced cancer.¹⁹ Individuals with poor performance status, extensive disease, and inadequate nutrition generally have a worse prognosis and may be better candidates for supportive therapy alone. For this poor prognosis cohort, potential side effects of treatment may outweigh any palliative benefit.

Relaxation Techniques and Psychosocial Support

Interventions geared towards relaxation in cancer patients can also be used to reduce reactivity to pain. The relaxation techniques discussed here involve the use of deep breathing and imagery. On a basic level, consciously pairing muscle tension with inhalation and muscle relaxation with exhalation assist a patient in using breathing to control pain. More specifically, deep breathing is thought to help the patient concentrate better, soothe the nervous system, and balance the mind-body connection—this is especially true when used during activities like yoga, meditation, and tai chi.²⁰ Kabat-Zinn²¹ established the mindfulness-based stress reduction (MBSR) meditation technique that has been studied for its effect on psychological stress and pain in cancer patients. MBSR is an eight-week, structured program that includes sitting meditation, silent body scanning, and simple yoga postures. A recent study by Lengacher and colleagues²² in breast cancer survivors revealed improvements in physical functioning, pain, and emotional well-being in patients who regularly practiced the MBSR technique.

Imagery in the context of cancer is defined as having patients use positive visualizations to substitute the feeling of pain. Imagery and relaxation training have been found to decrease the intensity of cancer-related pain, possibly through an interruption in the pain-muscle-tension-anxiety cycle.^{23,24} Sloman and colleagues²⁵ studied the use of imagery and relaxation training in intermediate to advanced stage cancer patients and in addition to the above, they noted a decreased need for non-opioid analgesics in managing pain. The actual practice of using imagery involves asking a patient in a relaxed state to think of an image representing pain and then have the patient purposely change this image into a more positive one. This can be done by cognitively molding or replacing the painful, negative image with a peaceful, happy, or calm mental experience. By using such imagery training the patient focuses less on pain itself when it happens. Furthermore, the ability to use this technique at their own will gives patients a sense of power over their pain.²⁶ Relaxation techniques can even be used in combination with structured behavioral interventions like stimulus conditioning to extinguish the feelings of anxiety and fear in patients.²⁷ Health care providers must understand that patients' emotions contribute to the total pain experience, and this explains why relaxation behaviors provide pain relief. Using relaxation techniques as a form of distraction and/or as a means of controlling mental activity, patients lessen the sensation of pain and reduce its associated distress.

Exercise

A scientific framework exists behind using exercise for pain relief in cancer patients, where both physiological and psychological benefits have been reported. The main objective for using exercise to relieve cancer-related pain is to resolve the physical inactivity that often accompanies the diagnosis. The limitations in a cancer patient's physical abilities may lead to a loss of function which further intensifies the way in which one experiences pain. With immobility comes muscle wasting and weakness, changes in affect, decreased self-reliance, and reduced coping skills.²⁸ It is important for a patient with a confirmed diagnosis of cancer to undergo necessary health and fitness assessments before being prescribed an exercise regimen. This includes a review of recent EKGs, imaging studies, cardiovascular exam, feeding habits, current medications, and baseline laboratory results. Detailed exercise programs for cancer patients have been developed; they are designed to improve cardiorespiratory endurance (e.g. walking, jogging, cycling, swimming), muscular strength (e.g. free weights and resistance-gear devices), body composition (e.g. aerobic exercise), flexibility (e.g. stretching), and neuromuscular tension/stress (e.g. movement to music).²⁹ Generating temporary muscle tension through exercise prevents muscle atrophy and increases muscle mass. On a similar note, techniques from osteopathic manipulative medicine (OMM) such as soft-tissue mobilization, myofascial release, connective tissue stretches, and joint articulation can be used to manage pain.³⁰ Exercise and OMM treats pain in muscles, nerves, joints, and bones but attention must always be given to a patient's comfort level throughout the period of activity. The mode, frequency, intensity, and duration of the exercises should be adjusted over time based on the health status, needs, and goals of the individual patient.

A patient can begin exercise therapy under the supervision of many practitioners, including cancer pain specialists, personal trainers, physical therapists, nurses, and primary care providers. By better understanding the type and stage of cancer, the current treatment being received, and the patient's capabilities, a customized, consistent program of physical activity can be established to help reduce pain symptoms. Exercise results in increased endurance, improved functional capacity, enhanced well-being and body image, and decreased emotional distress caused by anxiety, depression and fatigue—all of these factors effectively contribute to the reduction in pain.^{31, 32, 33} As an added benefit, physical activity has been shown to reduce the risk of development of certain malignancies, prevent recurrence, and even increase survival in the oncologic population.³⁴ The habit of exercise makes cancer-related pain more bearable by helping patients improve their strength and concept of self-efficacy.

Summary and Conclusion

Pain continues to be the most important undertreated symptom in end-stage cancer patients, with 50 to 90% of patients experiencing cancer-related pain.^{7, 35} The pain associated with cancer can be caused directly by the malignancy, its related treatments, and/or the patient's psychological responses. Proper pain management has the power to decrease patient suffering and increase quality of life. Being able to effectively assess a patient's pain and knowing different ways to control it is essential not only for healthcare providers but for all those involved in the care of a cancer patient.

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Analgesic therapy as outlined by the WHO ladder has always been viewed as the best management for the treatment of cancer pain. Additionally, providers have resorted to surgery, radiation, or systemic therapies to provide pain relief. Given the prevalence of under treatment and lack of adequate pain control for patients on medical management, there is still room for adjunctive measures. Using exercise and methods of relaxation such as imagery, distraction, and meditation have been shown to be effective in controlling cancer-related discomfort. In clinical practice, it is not a decision between medical versus psychosocial management, but rather providers and patients alike must learn to take advantage of the full array of therapeutic options available to them. The picture of a patient's cancer pain entails a biomedical and psychological perspective, where treatments can be catered to nervous system or muscle activity as well as to emotions like depression, anxiety and stress that can heighten the feelings of pain. Using a combination of therapeutic activities to manage cancer pain not only improves any physical barriers patients experience but also elevates their overall emotional well-being.³⁶

The fight against cancer-related pain should be a multidisciplinary team approach. Physicians, counselors, therapists, mental health professionals, trainers, families, and of course patients themselves should all work together to create an ideal pain management plan. Cancer patients with uncontrolled pain have a greater risk for suicide, which emphasizes the importance of timely intervention.³⁷ The more a patient is educated about their cancer diagnosis and the options for relieving any associated pain, the more likely it is that feelings of helplessness will be diminished and a patient's sense of control over his health will be increased. Cancer affects millions of individuals and their families in American society. The hope of the authors of this article is to increase awareness about different ways to cope with cancer-related pain, whether this is through medications or complementary interventions. Ultimately, the goal is to help cancer patients feel like they once again have a life worth living.

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