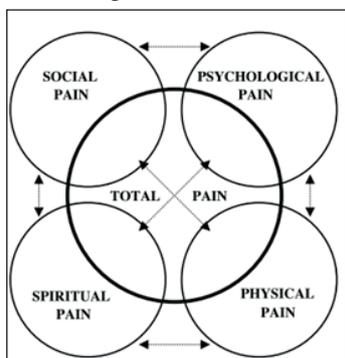


# Multidisciplinary Approach to Cancer Pain Management

by Grace Kettyle

## INTRODUCTION

Cancer is the leading cause of death worldwide, accounting for nearly 10 million deaths in 2020, with the global cancer burden expected to grow by 47% between 2020 and 2040<sup>1</sup>. Despite these statistics, cancer survivorship has increased to 70% in developed countries, primarily due to early detections<sup>1</sup> and advances in life-prolonging or curative treatments, subsequently resulting in the growing number of patients living with cancer. Pain is one of the commonest symptoms in cancer patients, occurring in as many as 90%<sup>3</sup>, the pain continuum often beginning with the diagnosis and remaining with the patient during treatment, post treatment, and right until the end of life<sup>4</sup>. Cancer pain is a multifactorial, complex phenomenon, not only affecting the patient physically but also impacting their psychological, cognitive, social, and spiritual domains leading to increased morbidity and poor quality of life<sup>5</sup>. It is estimated that 20-30% of cancer patients experience pain in the early stage of the disease<sup>5</sup>, with this figure rising to 70% and possibly beyond<sup>6</sup> in individuals in the advanced stages who report suffering moderate to severe pain (Numerical Rating Scale  $\geq 4$ )<sup>7</sup>. Cancer pain has long been acknowledged, with the World Health Organisation (WHO) first publishing the analgesic ladder in 1986 to provide guidelines on an international standard of care<sup>8</sup>. Although these guidelines are effective in controlling pain for approximately 70-80% of patients, it still leaves poor management in around 20-30% of cancer sufferers<sup>3</sup>. Recent research suggests that poor control of cancer pain is a major public health challenge worldwide<sup>9</sup>, often being suboptimal and secondary to other cancer-related treatments, leaving many patients undertreated<sup>10</sup> which is especially worrying as the presence of pain is associated with decreased survival rates<sup>11</sup>. Many barriers can lead to inadequate pain management, such predictors include patient characteristics, physician practice and type of treatment setting<sup>12</sup>. Despite these reasons, as already noted, cancer pain is not just physical pain but is a multifaceted symptom<sup>13</sup> that is individualised and specific to each patient, with Dame Cicely Saunders, coining the term ‘total pain’ to characterise its multidimensional and interdependent nature<sup>14</sup> (figure 1).



**Figure 1.** The ‘total pain’ experience: An interactive model (14)

This idea of ‘total pain’ and its management in relation to cancer is endorsed by the World Health Organisation<sup>15</sup> and has given rise to the concept of multidisciplinary management of cancer pain. An overview of pain and the multimodal approach of pharmacological and non-pharmacological interventions that may be utilised to manage pain in the oncology patient will ensue.

## PAIN

Pain is defined by the International Association for the Study of Pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage<sup>16</sup>. Pain is a subjective phenomenon – pain is what the patient says it is. The regular self-reporting of pain intensity with the help of validated assessment tools (figure 2) is the first step towards effective and individualised treatment. Pain can be either acute or chronic depending on its duration. The former usually resolving in less than 3 months while the latter prevailing for more than 3 months<sup>15</sup>. Furthermore, cancer pain can be classified as being nociceptive or neuropathic<sup>16</sup>. Nociceptive pain is caused by ongoing tissue damage, either somatic (such as bone pain) or visceral (such as gut or hepatic pain), and neuropathic pain is caused by damage or dysfunction in the nervous system, such as brachial plexopathy or in spinal cord compression by a tumour<sup>16</sup>. In cancer patients, the physical pain often gets compounded by associated psychological, social, and spiritual factors to contribute to the ‘total pain’ experience so it is essential that impeccable assessment and reassessment of the severity of pain, type of pain and cause of pain is done so that a multimodal management plan can be implemented accordingly to optimise relief. Cancer-associated pain is even more complex as it involves facing one’s own mortality and existential distress, again accentuating the requirement for a multidimensional approach for treatment<sup>17</sup>.

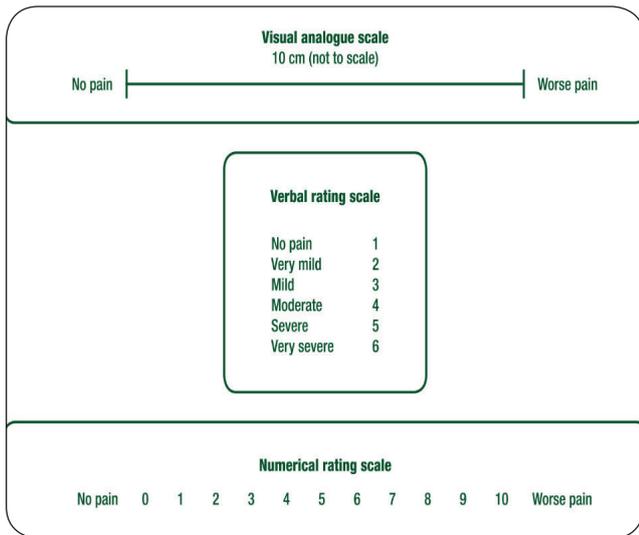
## PHARMACOLOGICAL INTERVENTIONS

### Pharmacological pain management

Since 1986 the prevailing pharmacological framework for managing cancer pain has been the WHO Analgesic Ladder (figure 3A), which has undergone several modifications. This universal strategy, based on expert opinion, was developed for use in the global context where access to medications may be limited.

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**Figure 2.** Validated and most frequently used pain assessment tools (16)

The original ladder consisted of a stepwise approach<sup>18</sup>:

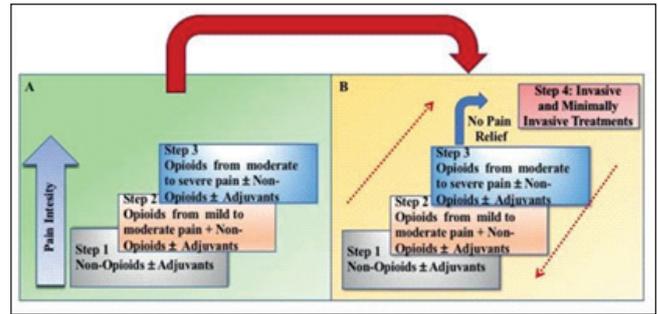
1. First step – Mild pain: non-opioid analgesics such as nonsteroidal anti-inflammatory drugs (NSAIDs) or paracetamol with or without adjuvants.
2. Second step – Moderate pain: weak opioids (hydrocodone, codeine, tramadol) with or without non-opioid analgesics, and with or without adjuvants.
3. Third step – Severe and persistent pain: potent opioids (morphine, oxycodone, hydromorphone, alfentanil, fentanyl, methadone) with or without non-opioid analgesics, and with or without adjuvants.

Adjuvants encompass a vast set of drugs such as antidepressants, anticonvulsants, corticosteroids, bisphosphonates and topical anaesthetics and are usually administered for indications other than pain, but they have a role, in combination with opioids, to manage nociceptive pain or as a sole agent for neuropathic pain<sup>19</sup>. Long-term opioid therapy has been associated with reduced immune function, addiction, opioid-induced androgen deficiency as well as predisposing to osteoporosis and reduced high density lipoprotein (HDL) levels<sup>20</sup>. However, the real limitation of the original ladder was the lack of opportunity to integrate non-pharmacological treatments into the therapy path.

## NON-PHARMACOLOGICAL INTERVENTIONS

### Interventional therapy for pain management

Recently, a fourth step was added to the WHO Analgesic Ladder (*figure 3B*) encompassing interventional and minimally invasive procedures such as, but not limited to, epidural or intrathecal analgesia, neuromodulation with or without a pump, nerve blocks or ablation procedures<sup>20</sup>. The updated ladder has removed the existing unidirectional approach to pain management and now permits a bidirectional system allowing for escalation and de-escalation of the pain



**Figure 3.** Transition from the original WHO three-step analgesic ladder (A) to the revised WHO fourth-step form (B). The additional step 4 is an ‘interventional’ step and includes invasive and minimally invasive techniques. The updated WHO ladder provides a bidirectional approach (21)

management strategy as the patient’s clinical condition dictates<sup>21</sup>.

### Oncological pain management

Radiotherapy, chemotherapy, hormones and bisphosphates are all used to treat and palliate cancers and, when used in combination with pharmacological and non-pharmacological methods can optimise pain relief<sup>20</sup>. However, it must be acknowledged that oncological treatments themselves can induce pain in some patients.

**Radiotherapy** is administered to over half of all cancer patients in the UK and is used as an integral component for palliation of symptoms including pain<sup>22</sup>. The success of radiotherapy in controlling symptoms is well supported in literature as evidence has shown pain relief in 73% of patients with bone metastases which was previously uncontrolled by analgesics<sup>22</sup>. Brief courses of pelvic radiotherapy have been shown to control severe pelvic pain in patients with gynaecologic and colorectal cancers, with the added advantage of minimal morbidity<sup>22</sup>. However, the time delay between delivery of radiation and symptom relief should be considered especially for a palliative patient<sup>19</sup>.

**Cytotoxic chemotherapy** drugs play a role in managing pain through reducing tumour growth and ultimately lessening compression on surrounding tissues, organs and bones, thereby reducing nociceptive pain<sup>23</sup>. The effectiveness of chemotherapy is difficult to assess as it is frequently used in combination with other treatments. However, in prostate cancer patients, the chemotherapeutic drug docetaxel administered along with a corticosteroid provided superior outcomes in managing pain than the use of the corticosteroid alone<sup>24</sup>. This analysis did not address questions of safety so this putative benefit must be weighed against potential side effects of the corticosteroid in the individual patient. Certain types of chemotherapy drugs are neurotoxic and can damage the nerves, resulting in chemotherapy-induced peripheral neuropathy (CIPN). Common offending agents are taxanes and platinum which are used to treat some of the most common cancers – breast, lung, gastrointestinal



and gynaecologic<sup>21</sup>. Adjuvants can be used to treat the neuropathic pain associated with CIPN but the oncologist should be vigilant to the onset of neurological symptoms and amend the treatment regimen accordingly.

**Hormone treatment** in the form of anti-androgen therapy has been shown to provide pain relief in over 90% of prostate cancer patients upon initial exposure<sup>20</sup>. The anti-oestrogen drug tamoxifen has been shown to reduce pain in those with metastatic breast cancer<sup>25</sup>.

**Bisphosphonates** are increasingly used to manage cancer-induced bone pain. A Cochrane review (2000) concluded, that despite methodological limitations, evidence suggested that bisphosphonates provide modest pain relief in patients with bony metastases where analgesics and/or radiotherapy were inadequate<sup>26</sup>.

### Psychological, social and spiritual pain management

The 'total pain' concept involving physical, psychological, social and spiritual aspects is clearly acknowledged in literature, yet the physical determinants of pain often remain a predominant focus in clinical practice<sup>14</sup>. However, the others are no less important as they contribute to a person's perception of pain and subsequently affects their response to it<sup>27</sup>.

In a study by Zaza and Baine (2002) a strong correlation was reported between increasing pain intensity and greater psychological distress, predominantly anxiety and depression<sup>28</sup>. This recognition of the importance of psychological factors has led to the development of psychosocial interventions based on cognitive behavioural approaches for managing pain which help to identify and change unhelpful thoughts, beliefs and behaviours<sup>29</sup>. Studies examining pain coping strategies indicated that catastrophising is associated with increased pain and anxiety<sup>28</sup>, again supporting the use of cognitive behaviour techniques.

Social support is another factor that should be considered when approaching cancer-related pain management as findings reported by Zaza and Blaine (2002) noted that in 7 out of the 8 studies reviewed there was a significant association between social support and cancer pain with higher levels in those with decreased social activities and lower levels of social support<sup>28</sup>.

Spirituality has been identified as an adaptive coping strategy as it impacts the perception of pain, however the assessment of spirituality in coping with pain is still incipient<sup>17</sup>. Oliveira et al. (2021) reported that as faith increased, pain decreased by 0.394 points on the Visual Analogue Scale reinforcing the role of spirituality in managing cancer-related pain<sup>17</sup>.

### Physical therapies in pain management

Physiotherapists and occupational therapists have an important role to play in the management of patients with cancer pain at various stages in their 'cancer journey.' A

common response to pain is the development of 'pain behaviours' where the patient may guard the painful area or develop an overly sedentary lifestyle; such inactivity resulting in deconditioning, increased muscle tension and increased attention to pain<sup>20</sup>. The aim is for the patient to achieve full functioning potential and become autonomous in managing the impact of pain on their daily life using many interventions including exercise, massage, heat and cold therapy<sup>20</sup>.

### Complementary and alternative medicine (CAM)

CAM may not be first-line treatment of cancer-related pain, but many cancer patients use the plethora of practices on offer<sup>30</sup>. An estimated 31% use acupuncture to complement cancer treatment but data is conflicting as the literature includes many types of pain (chronic, neuropathic, post-operative) and often has high risk of bias<sup>31</sup>. However, a 2022 study by Ge et al. put forward a strong recommendation for the use of acupuncture to relieve pain in patients with moderate to severe cancer pain and particularly for breast cancer patients to relieve their aromatase inhibitor-induced arthralgia<sup>6</sup>. Despite much conflicting evidence, CAM has the potential to increase wellbeing and thus influence pain, however, this is not an endorsement for its use given the lack of regulation and availability of robust evidence on its effectiveness specifically in cancer patients. Caution should be exercised before proceeding with CAM and it is imperative that, going forward, health care professionals work with their cancer patients to explore the potential beneficial therapies and work towards an integrated model of health-care provision<sup>32</sup>.

### CONCLUSION

In the 1960s, hospice movement founder Cicely Saunders coined the term "total pain" to illustrate the complexity and multidimensional nature of the pain experience in cancer patients. To this day, her simple yet profound holistic concept holds true. This concept underlies the need for personalised therapy and for clinicians to dynamically manage the pain by combining several pharmacologic and non-pharmacologic strategies according to the physiopathology of pain, pain features, complexity of symptoms, the presence of comorbidity and social context. Consequently, a wide range of non-pharmacological approaches such as yoga, acupuncture and psychotherapy are some of the tools available to the modern clinician. This new and expanded paradigm of treatment that incorporates novel ways of managing pain not only focuses on the nociception but also on the emotional and cognitive aspects of cancer pain in a comprehensive and patient-centred way.

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