# Cancer Pain in Children

Pain is one of the most common symptoms in children with cancer. Pain in children with cancer is usually well controlled using the World Health Organization's guidelines. Cancer pain should be approached with an understanding of the individual child and family and with an open mind about interpatient variability in analgesic response. Multidisciplinary management may be needed, with a team including social workers, physiotherapists, play therapists, and music therapists. Cancer pain should always be measured using validated pain assessment tools.

**Epidemiology**
Pediatric cancer-related pain is usually secondary to treatment (e.g., procedure-related, mucositis, or infection). Tumor-related pain predominates at diagnosis, particularly when diagnosis has been delayed, in early treatment, and with advanced disease. Intractable cancer pain is rare, but in the setting of terminal disease it may be seen in children with solid tumors metastatic to the central or peripheral nervous system. Chronic pain conditions secondary to cancer treatment are rare in long-term survivors.

**Nonpharmacological Pain Management Modalities**
Nonpharmacological strategies may be beneficial in isolation or in tandem with pharmacological agents. They include physical techniques (e.g., massage, acupuncture, or transcutaneous electrical nerve stimulation [TENS]), behavioral techniques (e.g., relaxation or music therapy), and cognitive techniques (e.g., imagery, hypnosis, or music therapy).

**Pharmacological Pain Management Modalities**
Prescription of analgesics should follow the World Health Organization's analgesic ladder, which recommends non-opioids for mild pain and opioids for moderate to severe pain. Combining opioid and non-opioid therapies may improve analgesia, as may the addition of adjuvant agents. Chemotherapeutic agents and radiotherapy may produce potent analgesia in pediatric cancer pain by reducing tumor load.

Analgesia should be given to children by the simplest, most effective, and least painful route. Oral analgesia is usually the first choice. Intravenous (i.v.) administration has its advantages (e.g., rapid onset, bioavailability, and easier titration), particularly in pediatric patients who have long-term i.v. access. Patient-controlled analgesia (PCA) may be used in appropriate children over 6–7 years old. Using this technology, children self-administer intermittent opioid boluses, catering for individual variation in pain and drug pharmacology, and allowing patients to balance their own analgesia and side effects. Subcutaneous administration is an alternative if i.v. access is not feasible. Intramuscular analgesia is painful, and rectal administration is discouraged due to infection risk in cancer patients.

Unless pain is truly unpredictable, opioids should be given regularly, with "as needed" doses prescribed to treat breakthrough pain.

*Non-Opioid Analgesics*
Acetaminophen (paracetamol) is the most commonly used non-opioid analgesic, and i.v. administration (where available) is effective in similar doses, when oral administration is not possible. Nonsteroidal anti-inflammatory drugs impair platelet function and are often contraindicated in pediatric oncology patients who are at risk of thrombocytopenia and bleeding.

*Opioid Analgesics*

- Oral codeine may be used for moderate cancer pain, but it has limitations due to variable conversion to morphine, its active metabolite.
- Morphine is one of the most commonly used opioids for moderate to severe pediatric cancer pain and is generally the first-line opioid agent. Sustained-release oral morphine preparations are available.
- Oxycodone is commonly used to treat moderate to severe cancer pain; it has a relatively high oral bioavailability.
- Hydromorphone and fentanyl are alternative opioids to morphine when dose-limiting side effects arise. Fentanyl has a rapid onset due to its high lipid solubility and shorter half-life.
- Methadone has a long and highly variable half life, so there is a risk of accumulation and delayed sedation and toxicity with its use.

Opioid switching often changes the balance between analgesia and side effects. It is useful in managing dose-limiting side effects or tolerance to opioids, which is a less common problem in pediatric cancer pain.

All opioids can potentially cause the same range of side effects, which must specifically be asked about and managed. Although tolerance develops to most side effects, e.g., sedation, nausea, and pruritis, as with adults, children do not develop tolerance to constipation, so regular laxatives should be given.

Though a common parental concern, iatrogenic opioid addiction is exceedingly rare in pediatric patients. To prevent withdrawal symptoms following prolonged opioid use, opioids should be slowly weaned.

*Adjuvant Agents*

Adjuvant analgesics may be added to improve analgesia or allow dose reduction of opioids to minimize side effects. Classes of adjuvant drugs include antidepressants, anticonvulsants, local anesthetics, and corticosteroids.

Anesthetic approaches to cancer pain, e.g., nerve blocks, are usually confined to children with regional pain unresponsive to other analgesics.

**Summary**

Pediatric cancer pain can usually be adequately managed using the contemporary techniques mentioned, but in the uncommon setting of intractable pain and especially in the palliative care setting, relatively high opioid doses are generally well tolerated and often required.

**References**


1. Collins JJ, Management of symptoms associated with cancer: pain management. In: Carroll WL, Finlay JL, editors. Cancer in children and adolescents. Sudbury, MA: Jones and Bartlett; 2009
2. World Health Organization. Cancer pain relief and palliative care in children. Geneva: World Health Organization; 1998.