



APPROACHES TO CANCER PAIN MANAGEMENT

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ABSTRACT

Pain is a subjective experience and the perception of pain differs from individual to individual. Each and every individual experience some kind of pain in their life span. Pain is an unpleasant emotional experience usually initiated by noxious stimulus and transmitted over a specialized neural network to CNS where it is interpreted as such. Pain can be effectively controlled or managed by using advanced medical technology. Pain management is a multidisciplinary approach so nurse has to collaborate with other health care team members and also maintain good communication with team members for better quality patient care. Pain control can be achieved adequately by comprehensive assessment of pain and it helps in planning of best treatment for pain. All the health care providers should advance knowledge and skill of pain management to control pain, provide comfort and to improve quality of life. Nurses play an important role in pain management because nurses are in primary contact with the patient and family for 24/7. Nurses can use effective therapeutic communication techniques such as empathy, genuineness, warmth to gain confidentiality of patient and family members to identify difficulties in all the dimensions (physical, psychological, social and spiritual dimension) and to treat total pain.

KEY WORDS

Approach, Cancer, Pain, Management

I. INTRODUCTION

‘Freedom from pain is a human right’

– WHO, 1986

Pain is a subjective experience and the perception of pain differs from individual to individual. Each and every individual experience some kind of pain in their life span. Pain is crucial component in cancer patients because it is one of the most common symptoms of cancer, increases as disease progresses or at end-of-life care. Pain is inadequately identified or treated so it remains a global public health problem. Pain can be effectively controlled or managed by using advanced medical technology.

II. DEFINITION OF PAIN

- “An unpleasant sensory and emotional experience associated with or resembling that associated with, actual or potential tissue damage”

- International Association for the Study of Pain (IASP), 2020

- “Pain is what the patient says hurts”

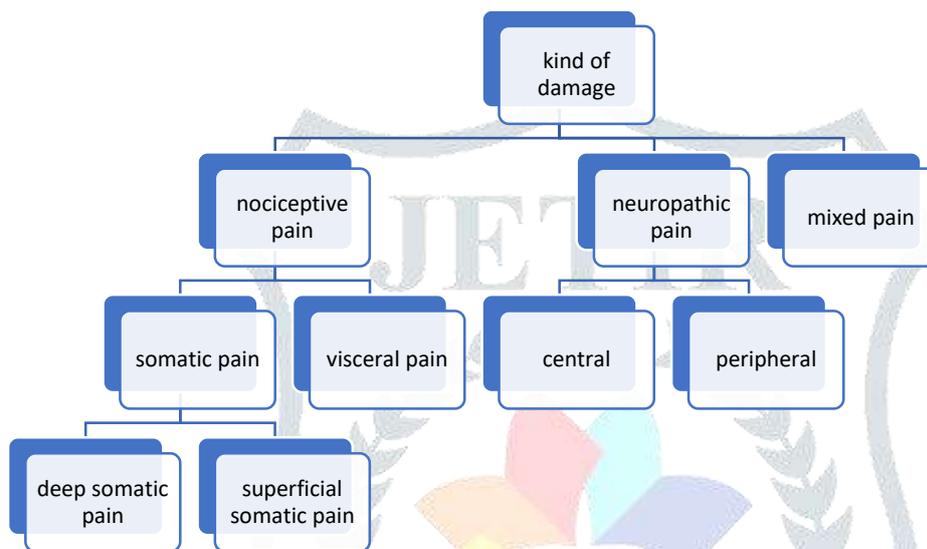
- Robert Twycross

- An unpleasant emotional experience usually initiated by noxious stimulus and transmitted over a specialized neural network to CNS where it is interpreted as such.

- Monheim

III. CLASSIFICATION OF PAIN

1. **Based on duration:** it is divided into acute pain and chronic pain
 - **Acute pain:** acute pain is sudden in onset with limited duration (< 6 months). It occurs due to tissue damage such as injury to muscles, organs, bone etc. Acute pain is protective, positive, and adaptive in nature and has a purpose to serve. Acute pain subsides with treatment of underlying cause. E.g. post-surgical pain, head ache, trauma.
 - **Chronic pain:** it is a most common type of pain present in cancer patients. Chronic pain is progressive and persistent with longer duration (> 6months). It occurs due to tissue damage or nerve damage or both. Chronic pain is not protective, negative, and maladaptive in nature and has a no purpose to serve and is considered a disease to be treated. It is resistant to treatment. It is associated with long term diseases. Chronic pain is a multidimensional aspect of pain i.e. physical, psychological, social and cultural aspects (biopsychosocial) and affects Quality of life of patients, family and the society.
2. **Based on kind of damage:** it is classified into nociceptive pain, neuropathic pain and mixed pain.



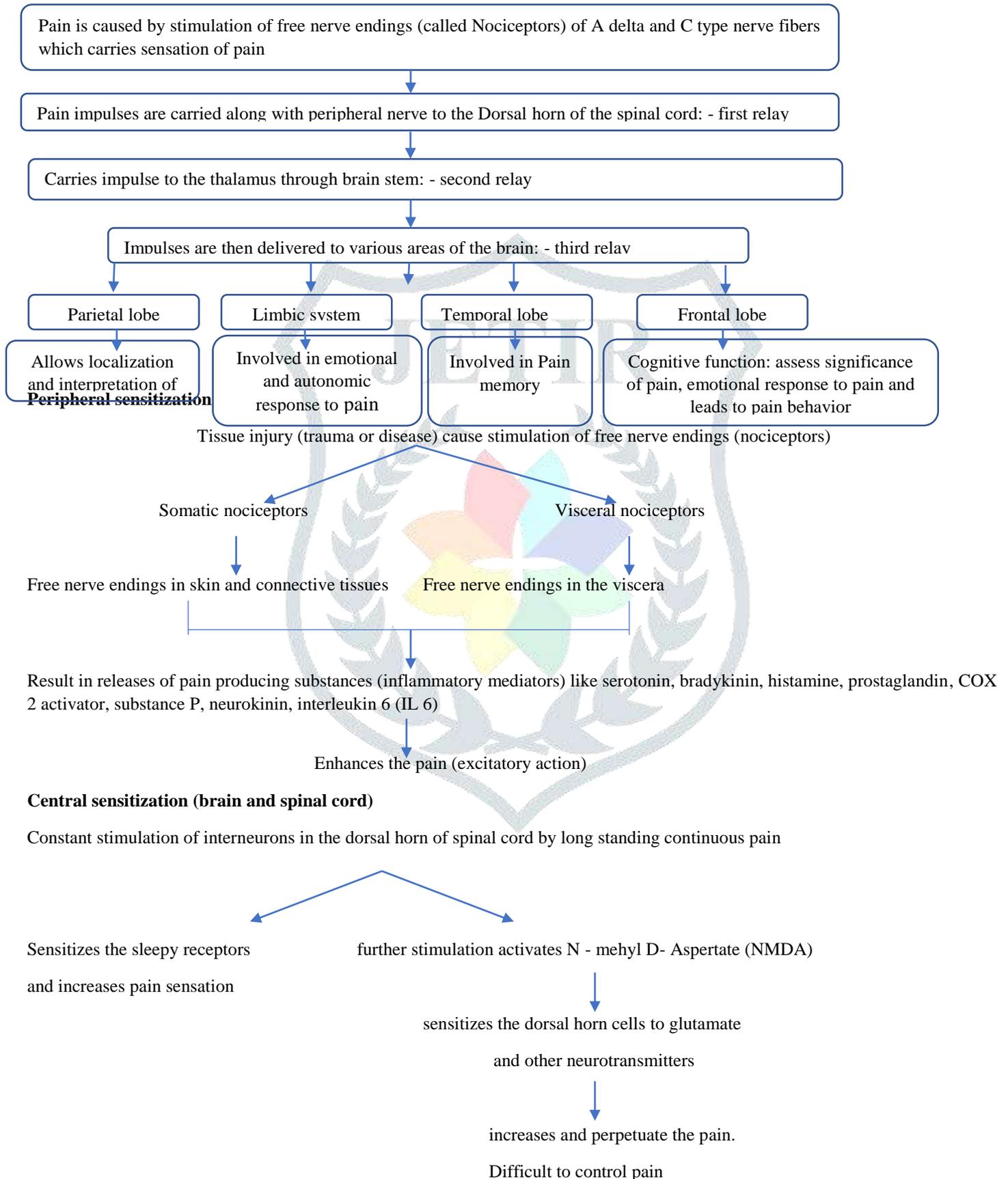
- **Nociceptive pain:** most common type of pain occurs due to tissue damages such as bones, organs, soft tissues. It may be acute pain or chronic pain. Nociceptive pain subdivided into somatic pain and visceral pain.
 - **Somatic pain:** it occurs due to damage or injury to skin, muscles, joints, bones and soft tissue. It is often difficult to identify exact location of the pain.
 - **Visceral pain:** it occurs due to damage or injury to an internal organ which includes chest, abdomen and pelvic organs such as liver, intestine, gallbladder, kidney, pancreas, etc. it is often easy to identify exact location of pain. Visceral pain has two types
 1. **Deep somatic pain** – sensed in joints, tendons, bones, and muscle.
 2. **Superficial somatic pain** – sensed in skin and mucus membranes.
 - **Neuropathic pain:** “Pain initiated or caused by a primary lesion, dysfunction or transitory perturbation of the peripheral or central nervous system” - *IASP 1994*
It occurs due to nerve damage or nerve compression. It causes abnormal pain signals.
 - **Mixed pain:** mixed pain is a combination of both nociceptive pain and neuropathic pain. This is the most common type of pain in cancer.
3. **Based on severity:** numerical rating scale (NRS) score is used to measure severity of pain
 - Mild: mild intensity, NRS 1-3
 - Moderate: moderate intensity, NRS 4-6
 - Severe: severe intensity, NRS 7-9
 - Worst pain or excruciating pain: very severe intensity, unbearable pain, NRS 10

III. CHARACTERISTICS OF PAIN

Nociceptive pain	Neuropathic pain
<ul style="list-style-type: none"> • Visceral pain: <ul style="list-style-type: none"> ✓ Pressure ✓ Aching ✓ Ching ✓ Squeezing ✓ Cramping ✓ Symptoms such as nausea or vomiting, changes in body temperature, heart rate, or 	<ul style="list-style-type: none"> • Dull, throbbing • Sharp, shooting • Numbness • Altered sensation • Burning • Tingling • Freezing • Stabbing

blood pressure. • Somatic pain: ✓ Aching ✓ Dull/sharp ✓ Gnawing sensation	• Electric shocks
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IV. PATHOPHYSIOLOGY OF PAIN



Inhibition:

Presence of inhibitory neurons in the dorsal horn cells of spinal cord, block the transmission of pain impulses. This is stimulated by descending pathways from the brain and thalamus and helps to modulate degree of pain transmission at different levels of the pain pathways. This occurs by endogenous substances such as serotonin, noradrenaline, opiates, GABA, somatostatin. Final pain perception is the balance of these inputs.

V. CAUSES OF CANCER PAIN

1. Disease related causes (due to cancer)
 - Primary lesion or tumor
 - Soft tissue infiltration
 - Metastasis to bone or viscera
 - Tumor compression on other organs
 - Nerve compression
 - Nerve infiltration
 - Muscle spasm
 - Lymphedema
 - Raised intracranial pressure
2. Treatment related causes
 - Surgery: post-operative scars, adhesions
 - Radiotherapy: fibrosis, damage to tissues, scar formation
 - Chemotherapy: neuropathy
3. Debility related causes
 - Constipation
 - Pressure sores
 - Bladder spasm
 - Stiff joints
 - Post herpetic neuralgia
4. Co-morbidities
 - Low back pain
 - Arthritis
 - Angina
 - Trauma
 - Stroke
 - Diabetic neuropathy

VI. ASSESSMENT OF PAIN**Concept of total pain**

The world total pain was coined by Cicely Saunders (Dame Cicely Mary Strode Saunders) which includes physical, psychological, social and spiritual distress. Pain is not only caused by a physical problem but influenced by other factors such as emotional, social and spiritual factors. This concept is used for pain assessment to address all the aspects for effective pain relief.

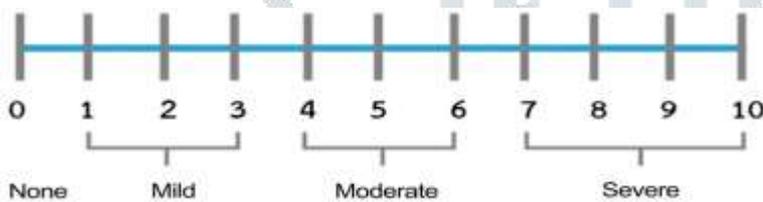
Total pain			
Physical	Psychological / emotional (affective)	Social	Spiritual
<ul style="list-style-type: none"> • Effects of cancer • Effects of cancer treatment • Unrelieved chronic pain • Other physical symptoms • Effects not related to cancer 	<ul style="list-style-type: none"> • Anger • Anxiety • Depression • Fear of pain • Fear of death • Sadness • Previous experience of illness 	<ul style="list-style-type: none"> • Financial worries • Loss of job • Loss of income • Loss of role in family/social status • Social isolation • Worries about future of family • Lack of family/social support 	<ul style="list-style-type: none"> • Regret • Guilt • Anger towards God • Finding meaning / purpose of life • Loss/struggle with faith

Mnemonics commonly used to assess the pain are OPQRSTV, SOCRATES, OLDCARTS

OPQRSTUV	SOCRATES	OLDCARTS
<ul style="list-style-type: none"> • O - Onset & Duration • P – Provocation and Palliation factors • Q - Quality • R - Region and Radiation • S - Severity • T – Time and treatment • U - Understanding / impact • V – Values 	<ul style="list-style-type: none"> • S- Site • O- Onset • C- Character • R- Radiation • A- Associations • T- Time course • E- Exacerbating / Relieving factors • S- severity 	<ul style="list-style-type: none"> • O- Onset • L- Location • D- Duration • C- character • A- Alleviating / aggravating factors • R- Radiation • T- Time • S- Severity

• **Pain assessment tools**

✓ **Numerical rating scales (NRS)**



✓ **Visual analogue scales (VAS):** commonly used to assess pain intensity



✓ **Wong baker faces pain scale**

Wong-Baker FACES Pain Rating Scale



✓ **FLACC behavioural scale:** used for assessment of pain in children between ages 2 months to 7 years or individuals who are unable to communicate their pain Scored on range of 0-10 with 0 representing no pain.

Criteria	Score 0	Score 1	Score 2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, uninterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting, back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

- ✓ McGill pain questionnaire (MPQ): it is a self-reporting measure of pain used to assess quality and intensity of pain and also effectiveness of intervention.
- ✓ Brief pain inventory (BPI): it quickly assesses severity of pain and its consequence on individual functioning.

VII. MANAGEMENT OF CANCER PAIN

GROUND RULES FOR PAIN MANAGEMENT

Ground Rule 1: Pain is present when the patient says she/he has pain

Ground Rule 2: Right drug for the right kind of pain

Ground Rule 3: Go by the ladder (WHO ladder)

Ground Rule 4: Pay attention to details of patient

Ground Rule 5: Patients receiving round the clock medications also experience pain

Ground Rule 6: Pseudo-addiction is much more common than real addiction

Ground Rule 7: Strong opioids seldom cause respiratory depression when optimal doses are used and titrated effectively.

Ground Rule 8: Pharmaco-economics should not be ignored

Ground Rule 9: Pain impacts Life. Life impacts Pain

Ground Rule 10: Pain management is always multimodal

Pharmacological interventions:

Nociceptive pain:

WHO analgesic ladder:

This strategy was proposed by the World Health Organization (WHO), in 1986, with the main aim to provide adequate pain relief for patients with cancer. It gives a structured and flexible approach to cancer pain management. It helps the physician to select analgesics based on patient intensity of pain rather than etiology of pain.

Steps:

The original ladder was consisted of three steps and it was unidirectional approach

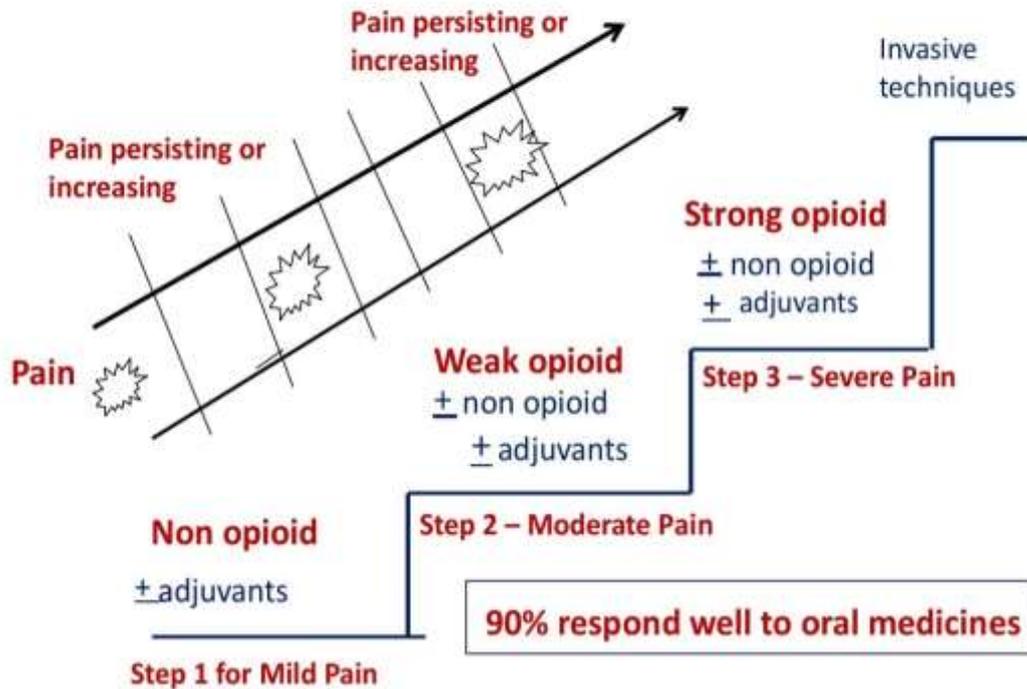
1. Step 1: Mild pain - non-opioid analgesics with or without adjuvants. Move on to step 2 for inadequate pain relief.
2. Step 2: Moderate pain - weak opioids + step 1. Move on to step 3 for inadequate pain relief.
3. Step 3: Severe and persistent pain – potent (Strong) opioids + step 1

Revised WHO analgesic steps: it consists of four steps and it is a bidirectional approach.

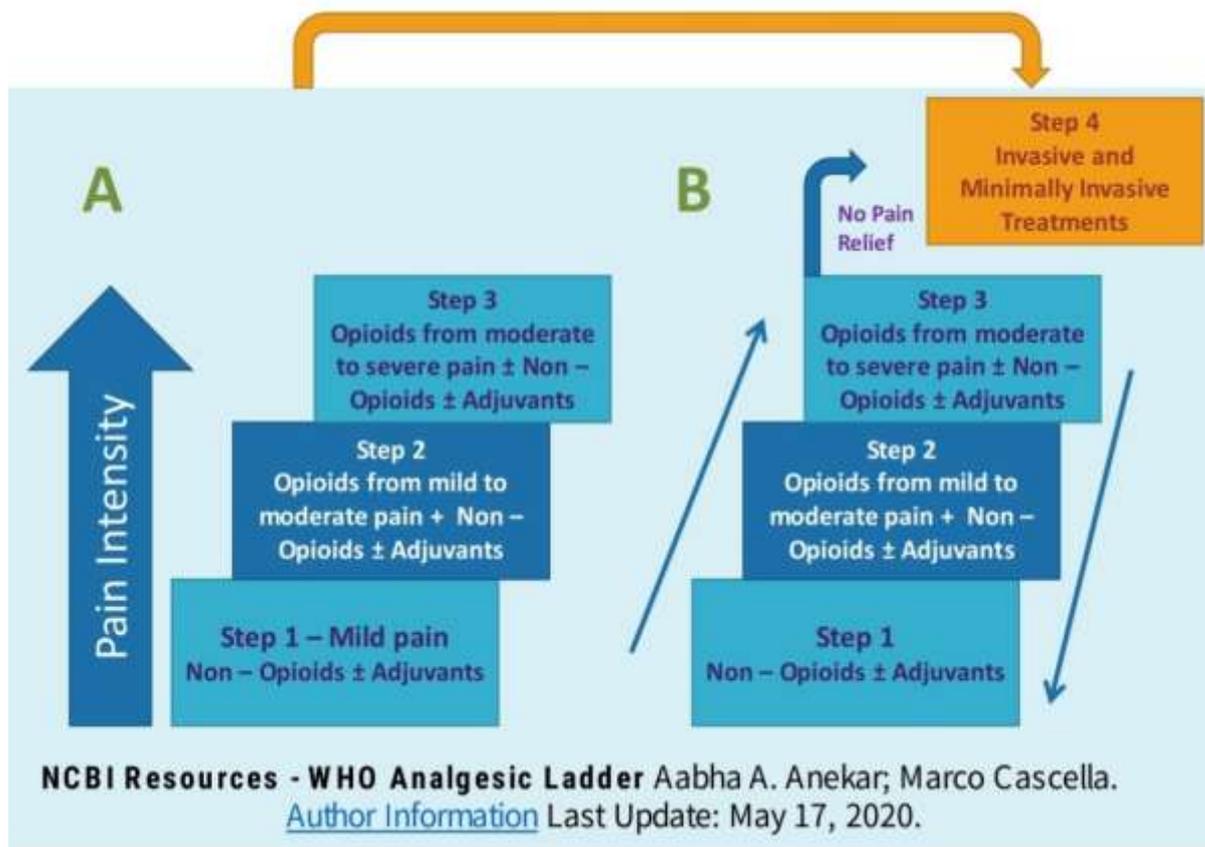
1. **Step 1:** Mild pain - non-opioid analgesics with or without adjuvants

2. **Step 2:** Moderate pain - weak opioids + step 1
3. **Step 3:** Severe and persistent pain – potent (strong) opioids + step 1
4. **Step 4:** Interventional step, no pain relief – invasive and minimally invasive treatments

The WHO 3-step Analgesic Ladder Guidelines : 1986



Revised WHO Analgesic Ladder

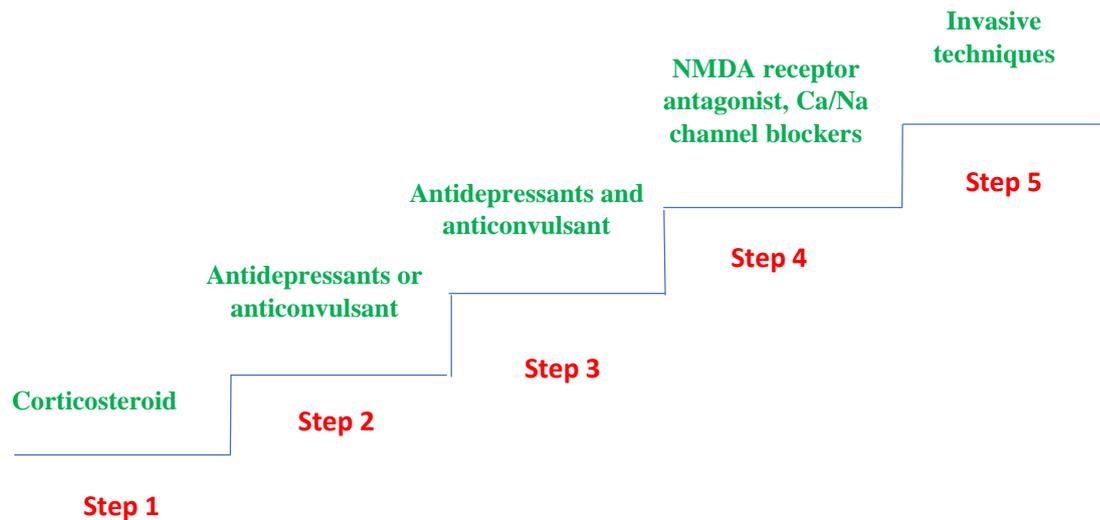


Drugs in WHO ladder

Non opioids	<ul style="list-style-type: none"> • Paracetamol • NSAIDS (ibuprofen, naproxen, diclofenac, celecoxib, mefenamic acid, ketorolac, etoricoxib, indomethacin, high dose aspirin)
Weak opioids	<ul style="list-style-type: none"> • Tramadol (most commonly used) • Hydrocodone • Codeine
Potent (Strong) opioids	<ul style="list-style-type: none"> • Morphine (most commonly used) • Methadone • Fentanyl (most commonly used) • Oxycodone • Buprenorphine • Tapentadol • Hydromorphone • Oxymorphone
Adjuvants (co analgesics)	<ul style="list-style-type: none"> • Antidepressants: <ul style="list-style-type: none"> ✓ Tricyclic antidepressants (TCAs) - amitriptyline, imipramine and nortriptyline ✓ Serotonin-norepinephrine reuptake inhibitors (SNRIs) - duloxetine and venlafaxine • Anticonvulsants - gabapentin and pregabalin, carbamazepine, valproate, clonazepam • Topical anesthetics (e.g., lidocaine patch, sublingual ketamine) • Anxiolytics • Corticosteroids – pain caused by edema. Hydrocortisone, dexamethasone, prednisolone. • Bisphosphonates – pamidronate, zoledronate, clodronate, alendronate and ibandronate • Cannabinoids. • Antiemetics • Muscle relaxants – muscle cramps • Antispasmodics – bowel colic • Antitussives • Psychotropic medications • Antibiotics – infection related pain

Neuropathic pain:

- Opioids are tried first- Neuropathic pain commonly co-exists with nociceptive pain.
- **Step 1:** corticosteroid for nerve compression
- **Step 2:** tricyclic antidepressant or anticonvulsant
- **Step 3:** tricyclic antidepressant and anticonvulsant
- **Step 4:** NMDA (N-Methyl-d-aspartate) receptor antagonist and Ca/Na- channel blocker.
 - ✓ NMDA receptor antagonist - Ketamine (commonly used), Dextromethorphan, Amantadine, Magnesium, Phencyclidine, methoxetamine, nitrous oxide.
 - ✓ Ca/Na channel blockers - Lidocaine, mexiletine
- **Step 5:** invasive techniques: indicated when analgesic administration does not work or when side effects are intolerable. commonly used invasive techniques for pain management are
 - ✓ Radiofrequency ablation
 - ✓ Surgical: Peripheral and central neural tissues may be divided surgically (e.g midline myelotomy)
 - ✓ Non-destructive techniques: Local anesthetic with or without steroid may be deposited or infused around nerves to cause reversible conduction block and pain relief
 - ✓ Peripheral blocks: Peripheral nerves and plexus can be blocked e.g brachial and lumbar plexus block, paravertebral block, Intercostal blocks, Thoracic splanchnic block, coeliac block, hypogastric plexus block, and ganglion impar blocks. Drugs used: local anesthetics and steroids
 - ✓ Central blocks - Intrathecal neurolysis. This provides long lasting analgesia by producing permanent chemical destruction of pain nerves. Drugs used: Phenol or alcohol
 - ✓ Intrathecal Analgesia - Intrathecal/epidural catheters – local anesthetics and steroids are commonly used, Intrathecal Implant
 - ✓ Percutaneous vertebroplasty

Start with opioids**Non pharmacological interventions:**

- TENS (transcutaneous electrical nerve stimulation)
- SCS (spinal cord stimulation)
- Massage
- Acupuncture
- Heat or cold application
- Splinting of fractured limb
- Joint mobility – active and passive
- Distraction therapy
- Psychotherapy
- Imaginary
- Music therapy
- Art therapy
- Therapeutic touch
- Hypnosis
- Support groups
- Aromatherapy
- Biofeedback
- Reassurance

Disease modifying therapies for Pain relief:

This is used if the tumour is the cause of pain-control of disease/ decreased tumour burden will lead to better pain control

- **Radiotherapy:** Relief of bone pain, Uncomplicated painful bone metastases Treating spinal cord and nerve compression, prevents pain and paraplegia/ neurological deficit if done early, Metastases in spinal bones
- **Chemotherapy:** In chemo-sensitive tumours, treatment with chemotherapy can decrease tumour size and relieve pain. Eg. breast cancer with liver metastasis/ chest wall metastasis, ovarian cancer with ascites, lymphoma
- **Surgery:** By removing the source of tumour pain e.g Bypass/ stoma creation in cancer causing intestinal obstruction, amputation in malignant melanoma, osteosarcoma and Spinal decompression in epidural/ vertebral metastasis
- **Bisphosphonates:** used to prevent bone loss and for bone pain relief.
- **RANK ligand inhibitors:** therapeutic targeting of RANKL is a rational approach to treat or to prevent the process of bone metastases. It resulting in complete absence of osteoclasts in the treated bones. Drug used: Denosumab
- **Hormonal therapy:** used mainly for Breast cancer (ER +) and ovarian cancer to decrease effect of oestrogen on cancer cells thereby decreases tumour size. It is also used for prostate cancer
 - ✓ Aromatase inhibitors: letrozole, anastrozole, exemestane
 - ✓ Estrogen receptor antagonist: fulvestrant

- ✓ Selective estrogen receptor modulators (SERMs): tamoxifen
- ✓ LHRH agonists (sometimes called *GnRH agonists*) used for ovarian cancer and prostate cancer. E.g goserelin and leuprolide

VIII. ROLE OF NURSE IN CANCER PAIN MANAGEMENT

- Pain assessment: Assess the patient pain by using concept of total pain (biopsychosocial assessment) and assess the pain characterises by using mnemonics. Document the pain assessment in nurse's record
- Communicate patient pain status to the treating doctor.
- Administer medication as per doctor's order
- Monitor the patient for side effects of opioids. tramadol, morphine and fentanyl are commonly used. The more common side effects of opioids are dizziness, drowsiness, lightheadedness, nausea and vomiting, constipation, lack of energy, sweating and dry mouth.
- Explain common side effects of opioids to patient and patient relatives
- Inform the patients that do not stop medication due to the side effects. Explain to the patient that these side effects are temporary and will subside in future. Ensure the patient that side effects of medications can be managed by simple nursing measures and medications
- Monitor LFT and RFT
- Maintain therapeutic communication and good rapport with the patient and family
- Give distraction techniques and other non-pharmacological therapies to reduce pain
- Inform duty doctor if the patient has persistent pain or increase in pain intensity or severe side effects
- Provide adequate and balanced nutrition (high fibre)
- Advise the patient to increase water intake
- Instruct the patient to get up slowly when rising from a sitting or lying position to prevent dizziness.
- Inform the patient and relatives that morphine will not cause any addiction or respiratory depression
- Ask the patient to take T. morphine from hospital as these medications are not available outside
- Explain the patient that dosage of morphine may be increased over a period time
- Prepare the patient for invasive procedures
- Pain management is a multidisciplinary approach so nurse has to collaborate with other health care team members and also maintain good communication with team members for better quality patient care.

IX. CONCLUSION

Pain control can be achieved adequately by comprehensive assessment of pain and it helps in planning of best treatment for pain. All the health care providers should advance knowledge and skill of pain management to control pain, provide comfort and to improve quality of life. Nurses play an important role in pain management because nurses are in primary contact with the patient and family for 24/7. Nurses can use effective therapeutic communication techniques such as empathy, genuineness, warmth to gain confidentiality of patient and family members to identify difficulties in all the dimensions (physical, psychological, social and spiritual dimension) and to treat total pain. Once the pain is managed, patient should be monitored and evaluated regularly.

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