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A Review on Pain, Types, Pathophysiology, and Management



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ABSTRACT

Pain is a subjective, unpleasant, emotional and, sensory experience associated with actual or potential tissue damage or described in terms of such damage. Pain acts as a protective mechanism in a body when responding to a harmful stimulus. Pain is one of the most common symptoms of disease, and it accompanies us from an early age. Pain can change a person's life, have an impact on the patient's family, and also reduce the quality of life of the patient. Management and prevention of pain is an important aspect of health care. Pain may be classified based on duration, location, intensity and, etiology. Both pharmacological and non-pharmacological treatments are necessary to minimize the patient's experience of pain. A scope of this review is to describe pain, different types of pain, pathophysiology, management of pain, and the role of a pharmacist in pain management.



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INTRODUCTION:

Pain is an unpleasant sensation that is caused by noxious stimulation of the sensory nerve endings. Pain is one of the most common symptoms of the disease. ⁽¹⁾ It acts as a protective mechanism in which the body responds to harmful stimuli. Pain has various etiologies such as chronic condition, pain as a symptom of disease, pain during an intervention, pain after surgery, and pain in response to an injury. ⁽²⁾ The prevalence of chronic pain reaches up to 30% worldwide and pain is one of the most challenging prevalent problems. ⁽³⁾ It is a perceptual and sensual phenomenon and leads to an emotional state connected with anxiety. Pain can change a person's life, have an impact on the patient's family, and also reduce the quality of life of the patient. Pain perception depends on the following factors such as arousal, attention, distraction, and expectation. As soon as we realize that something hurts, several physiological processes occur in the human body. Physiological factors play an important role in both pain onset and progression of pain disorder. The painful stimuli pass very quickly in milliseconds. ⁽⁴⁾ Pain is a major symptom of inflammation and is useful in the diagnosis of many diseases, disorders, and conditions. Pain may be mild, moderate or severe, acute or chronic, burning, dull or sharp, lancinating, precisely or poorly localized. Pain which is experienced is influenced by the following factors such as physical factors, biochemical factors, psychological factors, social factors, physiological factors, and also emotional factors. Pain is a major function of the nervous system in our body by providing us with a warning of actual or potential injury. Pain is a complex phenomenon that is caused by neuropathological mechanisms or noxious sensory stimuli. ⁽⁵⁾ Pain can occur in many situations but the injury is the major cause. The main function of the sensory system is to keep up pain homeostasis and protection of our body by identifying, localizing, and recognizing the tissue-damaging process. ⁽⁶⁾ The pain may be localized which affects a specific part of the body or pain may be generalized which affects overall pain in the body associated with flu-like symptoms. Some common causes of pain are headache, toothache, stomach ache, cuts, burns, bone fractures, muscle cramps, and many disorders or illnesses such as arthritis, fibromyalgia, flu, and endometriosis. This review aims to enlist a definition of pain, its various types, pathophysiology, pharmacological and non-pharmacological treatment of pain, and the role of the pharmacist in pain management. ⁽⁷⁾

Definition of pain:

1. International Association for the Study of Pain (IASP) defines pain as an unpleasant emotional and sensory experience and it is associated with actual or potential tissue damage referenced in terms of such damage. ⁽⁸⁾

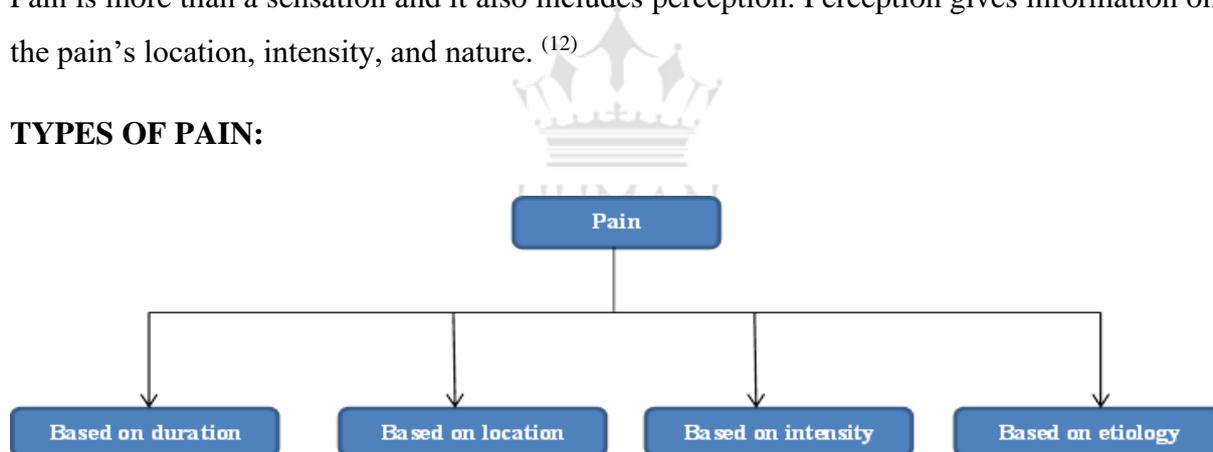
2. North American Nursing Diagnosis Association defines that pain as a state, in which individual experiences uncomfortable sensations and reports severe discomfort. ⁽⁹⁾

3. Fields *et al.*, pain is an unpleasant sensation that is localized to a part of the body. It is described in terms of a penetrating or tissue-destructive process and a bodily or emotional reaction. ⁽¹⁰⁾

4. Mc Caffery *et al.*, Pain is whatever the experiencing person says it does. ⁽¹¹⁾

5. In the medical dictionary by Farlex, pain is an unpleasant feeling which is conveyed to the brain by sensory neurons, and the discomfort signals actual or potential injury to the body. Pain is more than a sensation and it also includes perception. Perception gives information on the pain's location, intensity, and nature. ⁽¹²⁾

TYPES OF PAIN:



Based on duration:

The pain is classified based on duration such as:

1.Acute pain:

Acute pain is defined as pain that has a sudden onset lasting for less than three months. ⁽¹³⁾ Acute Pain is usually the normal and temporary response that alerts the body to an injury. This type of pain has varied intensity and defined pathology and therefore the type of treatment for acute pain may be determined on an individual basis and can also resolve with the healing of the underlying injury. ⁽¹⁴⁾ Acute pain is complex and it is an unpleasant

experience with an identifiable cause. ⁽¹⁵⁾ Acute pain is associated with sympathetic nervous system activation and skeletal muscle spasm and is induced by a specific disease or injury. ⁽¹⁶⁾ Common causes of acute pain are cuts, burns, dental work, labor and childbirth, and minor surgery. ⁽¹⁷⁾

2. Chronic pain:

Chronic pain is defined as pain that lasts for more than six months which may or may not have an underlying pathology to define the suffering of the patient. ⁽¹⁸⁾ Chronic pain lasts for an undefined and longer period expected to be needed for the injury to heal. ⁽¹⁹⁾ Chronic pain is commonly associated with depression, sleep disturbance, mood, and anxiety disorders. ⁽²⁰⁾ Chronic pain can also disrupt daily activities such as living and sleep. ⁽²¹⁾ chronic pain is considered a disease state. It is pain that usually outlasts the normal time of healing if related to a disease or injury. Chronic pain causes affliction in the part of the body, such as an immobilized and unused limb. ⁽¹⁹⁾ Some common examples of chronic pain include arthritis pain, fibromyalgia, nerve damage pain, and low back pain. ^(22,28)

3. Breakthrough pain:

It is an episode of acute pain that usually occurs when taking medication to manage chronic pain, this type of pain relief for short period. ⁽²³⁾

Based on the location:

The pain is classified based on the site at which the pain is located such as:

- Back pain
- Joint pain
- Headache
- Cardiac pain
- Stomach pain

Based on intensity:

The pain is classified based on its intensity such as:

1. Mild pain:

On a pain scale, the reading which is from 1 to 3 is considered mild pain.

2. Moderate pain:

On a pain scale, the reading which is from 4 to 6 is considered moderate pain.

3. Severe pain:

On a pain scale, the reading which is from 7 to 10 is considered severe pain. ⁽²⁴⁾

Based on etiology:

The pain is classified based on the etiology such as:

1. Nociceptive pain:

Painful sensation as a result of localized stimulation of pain receptors such as nociceptors through mechanical, chemical, and thermal modalities is called nociceptive pain. ⁽²⁵⁾ Nociceptive pain is caused by the nociceptor's activation in the body by noxious or potentially harmful stimuli during inflammation, injury, or disease. These receptors which are activated leads to an action potential and the propagation of nervous messages to the brain and central nervous system. This type of pain acts as a normal response to potential harm and helps to protect from dangers that are encountered in the body. ^(26,28) This type of pain arises from an identifiable lesion causing tissue damage. ⁽²⁷⁾ The nociceptive pain can be further subdivided into somatic and visceral. ^(26, 27)

A). Somatic nociceptive pain:

This type of pain originates from pain receptors which are located on the body surface or in the musculoskeletal tissues. ⁽²⁶⁾ It is usually localized to a certain area of the body and relived by periods of rest. Somatic pain results from sensitization and excitation of nociceptors in tissues, such as bone, muscle, skin, joints. The pain is constant, intermittent, and describes as aching, stabbing, or throbbing. ^(25, 26)

B). Visceral nociceptive pain:

This type of pain originates from pain receptors located in the internal organs within a body cavity. ⁽²⁷⁾ It is usually described as a deep, pressure-like feeling that is not localized to a certain area in the body. ⁽²⁵⁾ Visceral pain usually arises from visceral organs. ⁽²⁶⁾ The visceral

pain involves organs such as the heart, liver, and stomach. Visceral pain is not always due to visceral injury where bladder stretching can also cause this pain. ^(29, 30)

2. Neuropathic pain:

Neuropathic pain is caused by dysfunction or damage of the nerves in the central and peripheral nervous system and is usually described as sharp, tingling, shooting, numbness, stabbing, and burning pain in the body. ⁽³⁰⁾ The causes are due to inflammation, trauma, infections, neurological disease, tumors, metabolic diseases, toxins, surgery, diabetes mellitus, chemotherapy, radiotherapy, ischemia, infection, or malignancy. ⁽³¹⁾ Neuropathic pain is majorly caused by a nerve injury that is involved in the propagation of the electrical signals that send messages of pain from the receptors to the brain. ⁽²⁷⁾ Neuropathic pain is of two types:

A). Central neuropathic pain: It is due to the damage of the central nervous system. Example: Spinal cord injury pain and post-stroke pain.

B). Peripheral neuropathic pain: It is due to the damage of the peripheral nervous system. Example: phantom limb pain

3. Psychogenic pain:

It is the occurrence of sensation of pain due to psychiatric disorder with the absence of injury or inflammation in the affected part of the body. Psychogenic pain is used to describe pain that is associated with some degree of psychological disturbance associated with anxiety, depression, and stress. ⁽²⁷⁾

PATHOPHYSIOLOGY OF PAIN:

Pain receptors are activated by a painful stimulus. After activation of pain receptors, they release chemicals called neurotransmitters. The glutamate or substance P is the neurotransmitter. This whole process of pain transmission is called nociception. Nociception pain receptors in the peripheral nerve fibers create afferent nerve conduction. These send information about stimuli to the brain and spinal cord. A-delta fibers and C sensory fibers are the two main types of afferent nociceptors in the tissues and they are myelinated nerves. These transmit pain impulses very quickly reaching the spinal cord and then send information to the brain stem, and specifically to the thalamus through the lateral spinothalamic tract, the information is processed in the ventral posterior nucleus of the thalamus and then the

stimulus is sent to the cerebral cortex in the brain from the thalamus and the body response to pain. (30, 32)

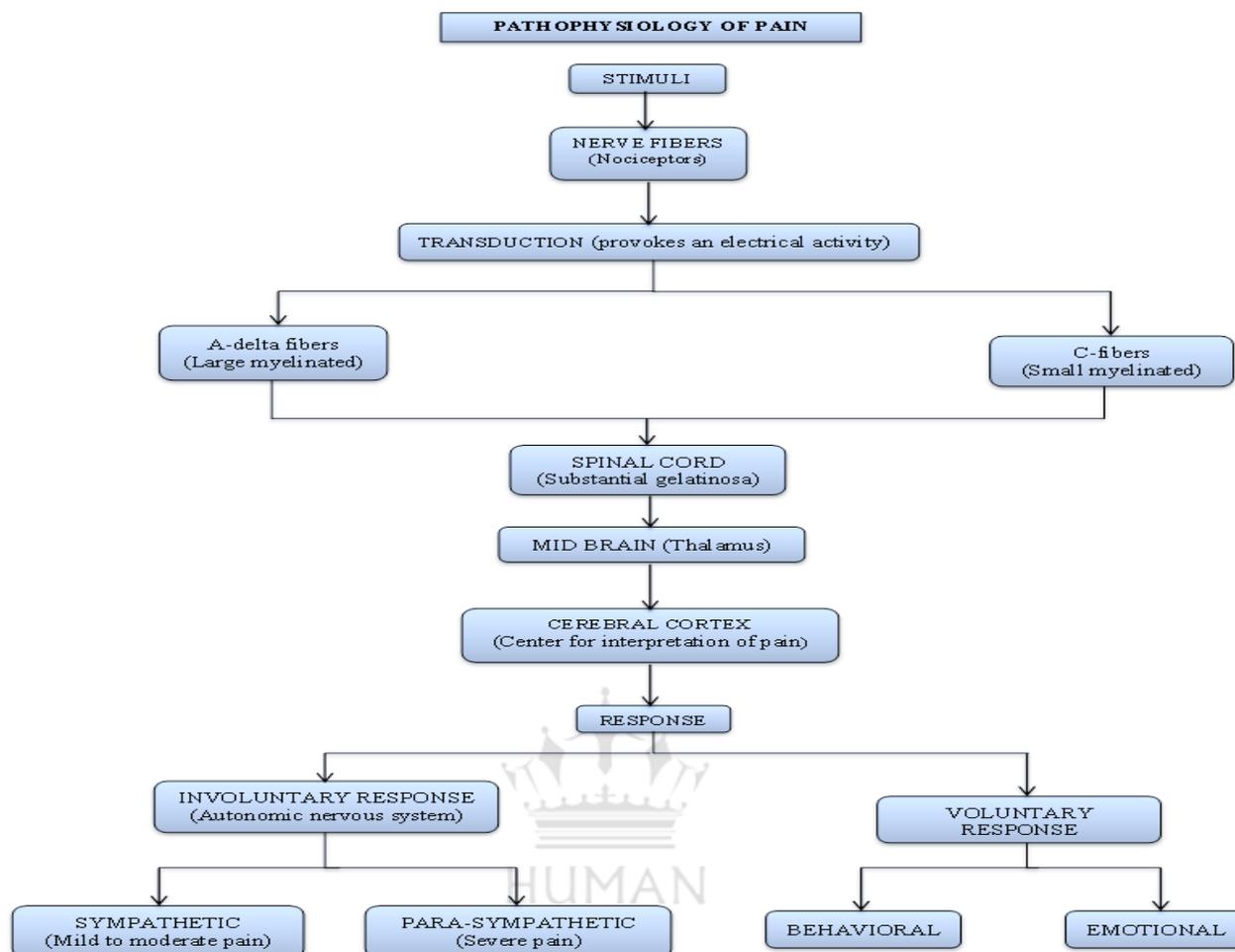


Figure No 1: Pathophysiology of Pain

PAIN MANAGEMENT:

The management of pain is a multidisciplinary task. (35, 36, 37) Pain management refers to the appropriate interventions and treatment which are developed for the pain assessment. It should be developed in collaboration with the patient and family. The strategies for pain management are developed based on effective and non-effective treatments in past experiences and also helps to meet the patient's goal by reduction of pain. Pain management includes the following consideration such as type of pain, disease processes, risks, and benefits of treatment modalities. (33) Goals of treatment are to minimize pain, improve functioning, provide reasonable comfort and provide quality of life at the lowest effective analgesic dose. (34) The management and control of pain are based on pharmacological therapy and non-pharmacological therapy, or a combination of these two therapies. (35, 36, 37)

Pharmacological treatment of Pain:

The pain which affects a patient's physical function or their quality of life should be recognized as a major problem. The ideal candidates for pharmacological therapy are the elderly, cancer, post-operative, and traumatic patients with functional impairment or with diminished quality of life. The use of medication for the treatment of pain can be complex. ^(35, 36, 37) Multiple factors are considered for pharmacological management such as age, current medications, patient medical and medication history, types of pain. Pharmacological treatments include:

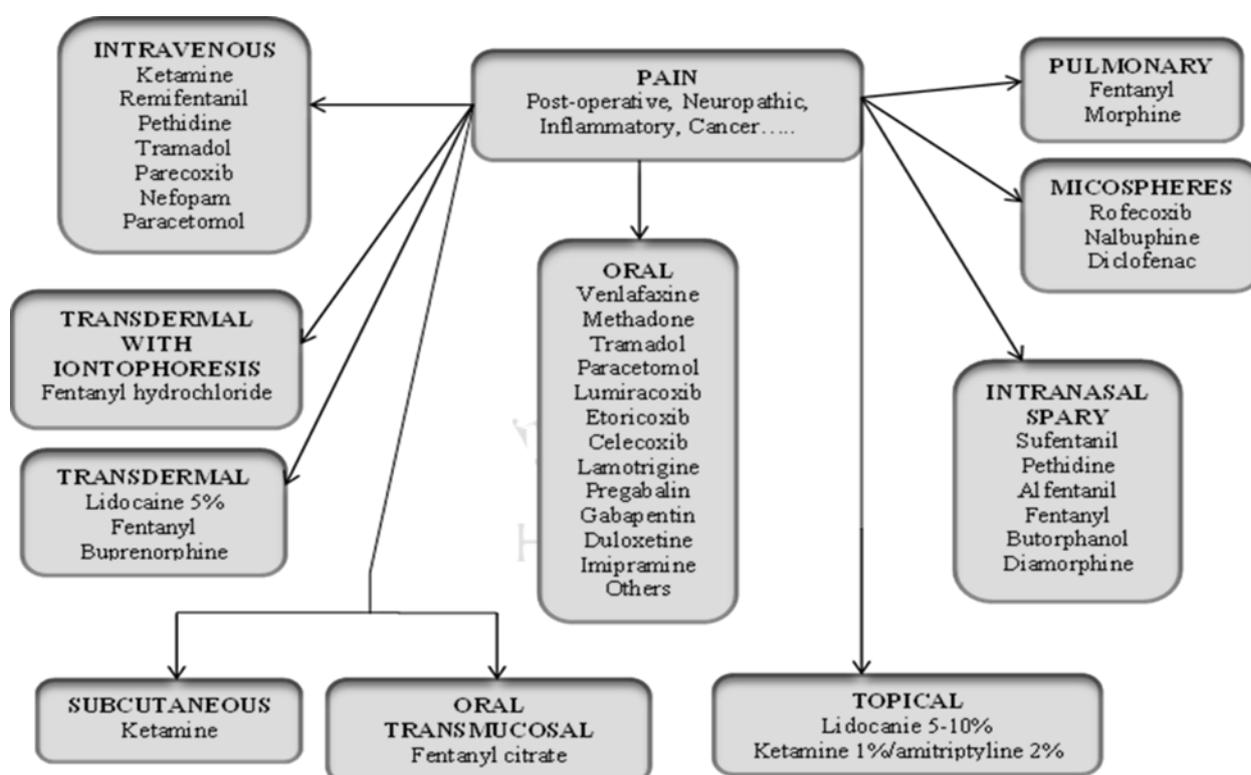


Figure No. 2: Classification of pharmacological treatment of pain based on the route of administration.

1. Nonsteroidal anti-inflammatory drugs (NSAIDs):

NSAIDs are used for mild to moderate pain, reduction of fever, pain associated with inflammation but NSAIDs have no evidence for the management of neuropathic pain. There are more than 20 different NSAIDs available commercially. ⁽³⁸⁾ Some of the commonly known NSAIDs are diclofenac, ibuprofen, naproxen, celecoxib, ketoprofen, ketorolac, acetaminophen. ⁽³⁴⁾ The mechanism of action of NSAIDs is the inhibition of the cyclooxygenase (COX) enzyme, thereby inhibiting prostaglandins synthesis and thereby

decreasing the number of pain impulses received by the CNS. ^(34, 39) There are two cyclooxygenase isoenzymes namely cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2). Cyclooxygenase-1 plays a role in maintaining gastrointestinal mucosal lining, kidney function by maintaining renal blood flow, glomerular filtration rate, and platelet aggregation. Cyclooxygenase-2 is inducibly expressed during an inflammatory response. The cyclooxygenase enzyme is required to convert arachidonic acid into prostaglandins, thromboxane, and prostacyclin. The thromboxane helps in platelet adhesion and prostaglandins cause vasodilation and inflammation. NSAIDs inhibit both COX-1 and COX-2 and therefore produce analgesic and anti-inflammatory properties. NSAIDs are particularly used for mild to moderate pain, chronic low back pain, and cancer-related bone pain. ^(38, 39)

2. Opioid agents:

Opioids are originally derived from the resin of the opium poppy, *Papaver somniferum*. These opioids agents as the most widely used drugs in treating severe pain. ⁽³⁸⁾ The commonly used opioids are morphine, hydromorphone, fentanyl, oxycodone, methadone, codeine, oxycodone, hydrocodone, pentazocine, naloxone, nalbuphine, buprenorphine, levorphanol, meperidine, tramadol. ⁽³⁴⁾ The mechanism of action is opioids act primarily at the mu receptors. Opioids may also act on other receptors such as kappa, delta, and sigma. All opioid receptors are G-protein coupled receptors. Based on receptor activation, different physiologic effects occur. Opioids act on both postsynaptic neurons and presynaptic neurons. Opioids block calcium channels on nociceptive afferent nerves presynaptically and substance P and glutamate neurotransmitters release is inhibited. Opioids enhance the activity of potassium channels postsynaptically. Therefore, hyperpolarizing cell membranes and increasing nociceptive neurotransmission. Thereby opioids produce analgesic effects. ⁽⁴⁰⁾

3. Antidepressant medications:

Selective serotonin and norepinephrine reuptake inhibitors (SNRIs) 'duloxetine' and tricyclic antidepressants (TCAs) 'amitriptyline' are recommended as the first-line treatment and show a demonstrated efficacy in neuropathic pain conditions. The mechanism of action of both tricyclic antidepressants (TCAs) and selective serotonin and norepinephrine reuptake inhibitors (SNRIs) inhibits the reuptake of two important neurotransmitters such as serotonin and noradrenaline and this inhibition leads to increases in the descending inhibitory pathways of the central nervous system related to pain. In the tricyclic antidepressants, and selective

serotonin and norepinephrine reuptake inhibitors, amitriptyline, and duloxetine have good analgesic effects. ⁽³⁸⁾

4. Anti-epileptic medications:

Several antiepileptic drugs through their mechanism of action lowering neurotransmitter release or neuronal firing, they are also having their analgesic properties. The most common antiepileptic used as an analgesic for pain treatment is Gabapentin and Pregabalin. ⁽³⁴⁾ The mechanism of action of both Gabapentin and Pregabalin reduces the calcium-dependent release of excitatory neurotransmitters. And therefore, these drugs decrease neuronal excitability. Gabapentin is used for postherpetic neuralgia in adults and neuropathic pain. Pregabalin is used for neuropathic pain associated with diabetic peripheral neuropathy or spinal cord injury, postherpetic neuralgia, and fibromyalgia. Oxycarbamazepine and carbamazepine are used for trigeminal or glossopharyngeal neuralgia. ⁽³⁸⁾

5. Local anesthetic:

The local anesthetics produce an anesthetic effect or produce loss of sensation by blocking conduction in peripheral nerves or by inhibiting the excitation of nerve endings. ⁽⁴¹⁾ The most common local anesthetics are lidocaine, bupivacaine, chlorprocaine. Lidocaine is the most commonly used medication for postherpetic neuralgia and peripheral neuropathic pain. The mechanism of action of Lidocaine is it inhibits sodium ion channels on the internal surface of nerve cell membranes and the pain conduction through nerve impulses becomes impaired at the site of action and it stabilizes the neuronal membrane and therefore contributes to the absence of systemic effects. Lidocaine is available as topical solutions, creams, gels, ointment, lotions, and transdermal patches. ⁽³⁸⁾

Table No. 1: Clinical Pharmacology of drugs used in the treatment of pain. (T. Dipiro, Cecily V. Dipiro, *et al.*, Textbook of Pharmacotherapy)

DRUG CLASS	INDICATION	ROUTE OF ADMINISTRATION	CONTRAINDICATION	ADVERSE EFFECTS
NSAIDs	Analgesic and anti-inflammatory agents, mild and moderate pain	Oral, intravenous, intramuscular, rectal, topical, transdermal, epidural administration	Patients with Gastrointestinal disturbances, renal complications, hypersensitivity, cardiovascular disease, and cerebrovascular disease.	Dyspepsia, nausea, anorexia, abdominal pain, gastro-duodenal ulcers, GI bleeding, perforation, hypertension, congestive heart failure, myocardial infarction, stroke, and thrombotic events, nephrotoxicity, edema, nephrotic syndrome, acute interstitial nephritis, renal papillary necrosis, chronic kidney disease, hepatotoxicity
Opioids	Moderate to severe pain, Acute pain, chronic pain, postoperative pain, neuropathic pain,	Oral, intramuscular, intravenous, subcutaneous, sublingual spray, oral transmucosal, transdermal, rectal, vaginal, intranasal spray	Patients with severe hepatic dysfunction, cardiovascular disease, respiratory depression, CNS depression. Screen patients for alcohol and drug abuse	Nausea and vomiting, constipation, sedation, respiratory depression, euphoria, physical dependence, tolerance, dizziness,

	inflammatory pain, cancer pain			cognitive dysfunction
Antidepressants	Chronic pain, psychogenic pain, Neuropathic pain, fibromyalgia, chronic Musculoskeletal pain.	Oral	Patients with cardiovascular disease, liver disease, early stages of pregnancy, breastfeeding women, glaucoma, taking monoamine oxidase inhibitors, hypersensitivity, bipolar disorder, schizophrenia, kidney disease, diabetes mellitus. Screen patients for alcohol and drug abuse	Diarrhea or constipation, sedation, dry mouth, ataxia, nausea, anorexia, drowsiness, insomnia, orthostatic hypotension, weight gain, headache, abdominal pain, tremor
Antiepileptic drugs	Neuropathic pain associated with diabetic peripheral neuropathy, fibromyalgia, trigeminal neuralgia, postherpetic neuralgia, migraine.	Oral	Patients with pregnancy, breastfeeding, drug allergy, kidney disease, liver disease. Screen patients for alcohol and drug abuse	Fatigue, sedation, dizziness, nausea, vomiting, weight gain, tremor, ataxia, diplopia, headache, blurred vision, insomnia, somnolence, confusion
Cannabinoids	Chronic pain, neuropathic pain, visceral pain	Oral, inhalation, oromucosal, sublingual administration	Patients with psychosis, schizophrenia, hypertension and	Nausea, Vomiting, breathing problems, tachycardia, high blood pressure,

			ischemic heart disease, pregnancy, breastfeeding, drug allergy, substance abuse	euphoria, memory impairment
Local anesthetics	Local anesthetic nerve block (blocking evoked pain), post-herpetic pain, peripheral neuropathic pain.	Local or regional or topical anesthesia, topical administration (gel, cream, oil, ointment, spray), transdermal (patch), epidural administration, intravenous	Patients with previous allergic reactions to local anesthetics, local infection, malignant hyperthermia, severe hepatic disease, seizures, coagulation disorders	Rash, itching, dizziness, syncope, pruritis, hyperventilation, headaches, blurred vision, coma, convulsion, skin erythema

Non-Pharmacological Treatment of Pain:

Non-pharmacological treatments are defined as therapies that do not require administration of medication or any other active substances and it makes pain tolerable and gives patient relief over the situation of the pain. ⁽⁴²⁾ Non-pharmacological treatments are also an important adjunct treatment for patients with pain. ⁽⁴³⁾ For mild pain, non-pharmacological methods may be used independently without pharmacological treatment. For moderate to severe pain, a non-pharmacological method can be used along with pharmacological therapy as a complementary option. ^(44, 45) The non-pharmacological treatments are divided into the following categories. ^(46, 47)

- a) Cognitive-behavioral therapy,
- b) Emotional support,
- c) Physical technique,
- d) Creating a comfortable environment,
- e) Helping with activities of daily living,

f) Invasive methods.

1. Cognitive-behavioral therapy:

Cognitive-behavioral therapy helps in focuses on the interactions between mind, behavior, brain, and body. ^(46, 48) It helps the patient with pain to change their unhealthy ways of feeling, thinking, and behaving. It is a psycho-social intervention ^(51, 52) that helps to improve the patient's mental health and quality of life. ⁽⁵³⁾

- Cognitive-behavioral music therapy is by using music, it helps to a change in behavior, feeling, thinking, or physiology.
- Simple guided imagery helps in the imagination to achieve relaxation and also direct attention away from undesirable pain sensations.
- Simple relaxation therapy includes deep breathing to achieve relaxation to relieve the pain sensations.
- Meditation facilitation helps in focusing specifically on an image or thought and it helps to achieve relaxation.
- Distraction helps in the focus of attention away from undesirable pain sensations and makes relaxation.
- Aromatherapy is an application of essential oils by massaging, inhalation, showers, ointments, lotions, baths and helps to relieve pain by a clam or soothe effects and enhance relaxation and comfort.
- Hypnosis helps to assist a patient to induce an altered state of consciousness to create relaxation and an acute awareness and direct away from pain sensation and achieve relaxation.
- Procedure/treatment helps in the preparation of a patient to understand the prescribed procedure or treatment and get mentally prepared and also assisting the patient to understand the disease process. ^(49,50)

2. Emotional support:

Emotional support is a sensitive, caring, and understanding approach. ⁽⁴⁸⁾ It helps to overcome anxiety, stress, or fears and provides reassurance, acceptance, and encouragement. It helps in

the management of difficulties by active listening to patient's verbal and non-verbal messages. It helps in providing information and makes decisions regarding health care.

- Hope instillation helps in the facilitation of the development of positive thinking in a given patient's situation.
- The calming technique helps in reducing anxiety in a patient.
- Family involvement promotion is the facilitation of the participation of family members in the emotional and physical care of the patient.
- Animal-assisted therapy helps to provide emotional support, distraction, and relaxation by the use of animals. ^(49,50)

3. Physical technique:

Physical therapy and rehabilitation are supporting methods used in the management of pain. ⁽⁵⁵⁾ The physical technique helps to focus on the parts of the body, including the joints, bones, soft tissues, circulatory and lymphatic systems. ⁽⁴⁸⁾ These techniques include thermotherapy (heat), cryotherapy (cold), laser therapy, electrotherapy, kinesitherapy, manual technics, medicinal extracts, positioning, massage, and therapeutic touch. These methods may improve the life and mobility of some patients. ⁽⁵⁴⁾

- Physical massage helps to decrease pain, produce relaxation and improve circulation in the body.
- Reflexology is a system of massage applied to specific reflex points of the hands, feet, or ears that relieves tension and treat illness.
- Acupressure is the sustained pressure to specific reflex points of the body and provides relaxation and helps to decrease pain.
- Positioning is the placement of the body part of the patient to promote physiological and psychological well-being such as the use of cushions or pillows.
- Exercise therapy is doing daily activity and it helps to prevent fatigue, muscle stiffness, or injury.
- Heat or cold application helps to relieve pain, muscle spasms, and inflammation. ^(49,50)

4. Creating a comfortable environment:

It helps in the reduction of stress and making a comfortable environment as much as possible.
(46)

- Sleep enhancement is the facilitation of regular sleep/wake cycles.
- Environmental management helps in the promotion of optimal comfort to the patient.
- The use of a cushion helps in the stabilization, immobilization, and protection of an injured body part and provides relaxation. (49,50)

5. Helping with activities of daily living:

The assistant helping the daily living of the patient with pain by doing these activities such as bathing, eating, walking for relaxation, maintain hygiene, and promotes healing. (46)

6. Invasive methods:

Invasive methods are implemented and it is enforced by experienced specialists for pain management. (54) It includes injection, prolotherapy, radiofrequency radio ablation, surgically implanted electrotherapy devices, implantable opioid infusion pumps, neurosurgery, etc.

Neuromodulation- Neuromodulation helps in the management of pain by activating the pain inhibitory mechanisms and therapy reduces pain and improves the quality of life of the patient with chronic pain. Several Neuromodulation methods are used for the management of pain such as percutaneous electrical nerve stimulation (PENS), transcutaneous electrical nerve stimulation (TENS), and acupuncture. (54)

ROLE OF THE PHARMACIST IN PAIN MANAGEMENT:

The role of the pharmacist in the management of pain should incorporate the following:

1. Compounding and dispensing:

The pharmacist ensures that the patients have prompt access to drugs in analgesic pain and control of symptoms.

2. Clinician's education:

The pharmacist plays a role in educating personnel such as other pharmacists about the pharmacotherapy of analgesia which includes drug administration, interactions, compatibilities, treatment of adverse effects, individualizing therapy, a menu of analgesics, adjuvant analgesics, and equianalgesic dosage conversion. The pharmacist also helps in the assessment of pain and evaluation of the effectiveness of pain management, and differences among addiction, dependence, and tolerance.

3. Patient education:

The pharmacist provides patient education by taking medical and medication histories and providing education to patients and their families, and ensuring that it is understandable by patients.

4. Continuity of care:

The pharmacist provides continuity of care by ensuring the drug therapy before and after discharge and that the patients can afford the treatment and ensure that the provided therapy is medication adherence.

5. Formulary management:

The pharmacist plays role in formulary management by implementing cost-effective, safe, and appropriate analgesic formularies.

6. Research:

The pharmacist participates in research by evaluating the patient outcomes and new drug treatments are provided to ensure progression in pain management. ⁽⁵⁵⁾

CONCLUSION:

This review focuses on pain, various types, pathophysiology, and different pain management techniques that are used in clinical settings including pharmacological treatment and non-pharmacological treatment, and the role of the pharmacist in the management of pain. The unrelieved pain should be identified and treated promptly by the health care professionals to minimize the adverse physiological and psychological effects and the patient should also have an active role in managing their pain. Pain management is a complex and vital role in providing patient care and it is important to individualize for each patient to provide a proper

plan of care. Pharmacological and non-pharmacological interventions both play a major role in the management of pain.

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