PAIN MANAGEMENT FOR SURGERY AND ANESTHESIA

What is the Pain?

Medical Definition:

"Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage."

International Association for the Study of Pain, 1979

"An unpleasant sensation induced by noxious stimuli and generally received by specialized nerve endings."

CancerWEB, 2011

Operative Definition:

"Pain is whatever the experiencing person says it is, existing whenever he/she says it does."

Margo McCaffery, 1999

Epidemiology

Epidemiology

- 50 million people are partially or totally disabled due to pain

- 70 to 90% of patients with advanced disease from cancer have significant pain that requires the use of opioid drugs.

- Severe, unrelenting pain interferes with patients' quality of life, including their activities of daily living, their sleep, and their social interactions.

Epidemiology

- 80% of elderly patients have chronic pain.
- 66% have pain in the last month of life
- ~ ½ of *hospitalized* patients with pain are under-medicated.
- Up to 50% of patients who are taking pain medication do not experience adequate relief

Economics

- Chronic pain causes 700 million lost work days/year in the U.S.
- > $ 9 billion per year on OTC pain products.
- Estimated cost of pain is $150 billion per year

Physiologic Effects of Pain

- Immune System
- Developmental
- Future Pain
- Quality of Life
- Endocrine & Metabolic
- Musculoskeletal
- Cardiovascular
- GI/GU

Psychiatric Disorders in Chronic Pain

Types of Pain

1. Acute (<6 months)
2. Chronic (6 months <)

Acute pain:

- lasts less than 6 months, subsides once the healing process is accomplished.

Presentation of Pain

Acute

- Often obvious distress
- Can be sharp, dull, shock-like, tingling, shooting, radiation, fluctuating in intensity, and varying in location (occur in timely relationship to noxious stimuli)
- Comorbid conditions not usually present
- *May* see HTN, increased HR, diaphoresis, pallor…

Chronic

- Can appear to have no noticeable suffering
- Can be sharp, dull, shock-like, tingling, shooting, radiation, fluctuating in intensity, and varying in location (do NOT occur in timely relationship to noxious stimuli)
- Symptoms may change over time
- Usually NO obvious signs

Acute Pain (Nociceptive)

- Somatic
  - Superficial **(nociceptors of skin)**
  - Deep **[body wall (muscle, bone)]**
- Visceral **(sympathetic system; may refer to superficial structures of same spinal nerve)**

Chronic Pain

1. Malignant (cancer)
2. Nonmalignant
    - Neuropathic (nerve injury)
    - Inflammatory (musculoskeletal)
    - Mixed or unspecified
    - Psychogenic

Peripheral Nerve Fibers Involved in Pain Perception

- A-delta fibers–small, myelinated fibers that transmit sharp pain

- C-fibers–small unmyelinated nerve fibers that transmit dull or aching pain.

Chronic Pain

- Neuropathic:
  - Severe pain disorder that results from damage to the central and peripheral nervous systems.
    - Centrally generated
    - Peripherally generated
- Inflammatory:
  - Results from the effects of inflammatory mediators.

Chronic Pain Conditions

- Neuralgia
  - an extremely painful condition consisting of recurrent episodes of intense shooting or stabbing pain along the course of the nerve.
- Causalgia
  - recurrent episodes of severe burning pain.
- Phantom limb pain
  - feelings of pain in a limb that is no longer there and has no functioning nerves.

Major Categories of Pain

1. Nociceptive pain

   (stimuli from somatic and visceral structures)

2. Neuropathic pain

   (stimuli abnormally processed by the nervous system)

Nociceptive Pain

- Visceral Pain: Associated with internal organs.
  - Nature: Crampy, pressure, deep, dull to sharp, diffuse, referred.

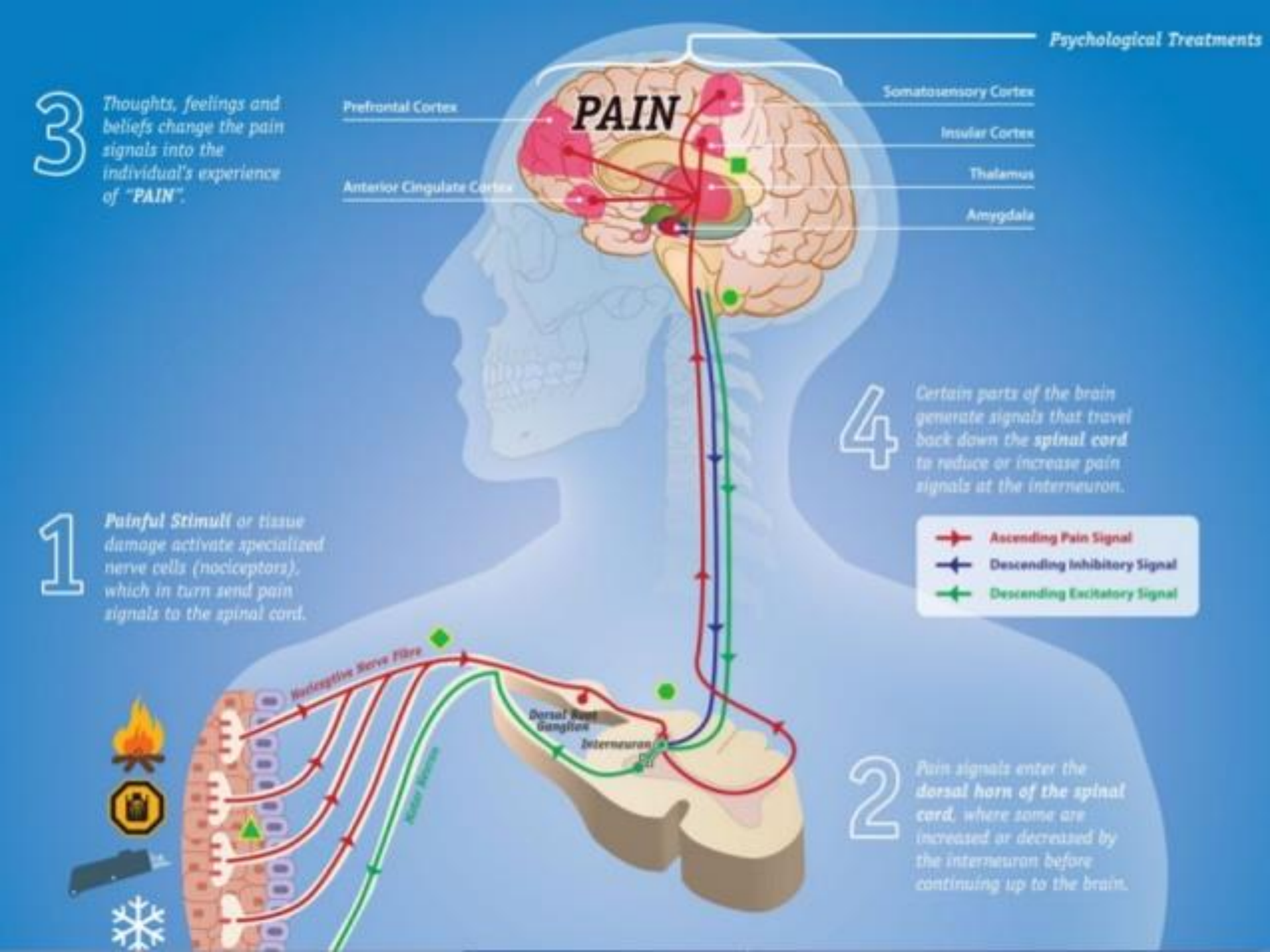
- Somatic pain : Soft tissues/ myalgic.
  - Nature: Dull to sharp, throbbing, achy, localized

Neuropathic Pain

- Abnormal neural processing by the peripheral or central nervous system.
- Signals are amplified or distorted; Synapse receptor numbers are altered; pathways not originally involved become involved
- Patient Description of Neuropathic Pain:
- Burning, electric, searing, tingling, and migrating or traveling.

Pain Pathways:

1. Painful Stimuli or tissue damage activate specialized nerve cells (nociceptors), which in turn send pain signals to the spinal cord.
2. Pain signals enter the dorsal horn of the spinal cord, where some are increased or decreased by the interneuron before continuing up to the brain.
3. Thoughts, feelings and beliefs change the pain signals into the individual's experience of "PAIN".
4. Certain parts of the brain generate signals that travel back down the spinal cord to reduce or increase pain signals at the interneuron.


Psychological Treatments
3
Thoughts, feelings and beliefs change the pain signals into the individual's experience of "PAIN".
Prefrontal Cortex
Anterior Cingulate Cortex
PAIN
Somatosensory Cortex
Insular Cortex
Thalamus
Amygdala
4
Certain parts of the brain generate signals that travel back down the spinal cord to reduce or increase pain signals at the interneuron.
Ascending Pain Signal
Descending Inhibitory Signal
Descending Excitatory Signal
1
Painful Stimuli or tissue damage activate specialized nerve cells (nociceptors), which in turn send pain signals to the spinal cord.
Nociceptive Nerve Fibre
Dorsal Root Ganglion
Interneuron
2
Pain signals enter the dorsal horn of the spinal cord, where some are increased or decreased by the interneuron before continuing up to the brain.

Pain Assessment and Management

Patient Pain History

- Site(s)
- Quality
- Severity
- Date of onset
- Duration
- What makes it better/worse
- Impact on sleep, mood, activity
- Effectiveness of previous medication

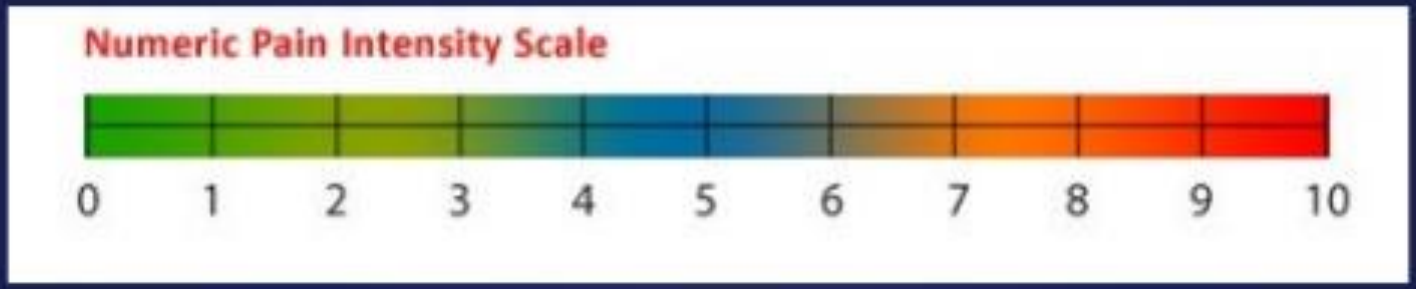
PQRST mnemonic:

- P: Precipitating and palliating factors
- Q: Quality
- R: Region and radiation
- S: Severity
- T: Time

Instruments

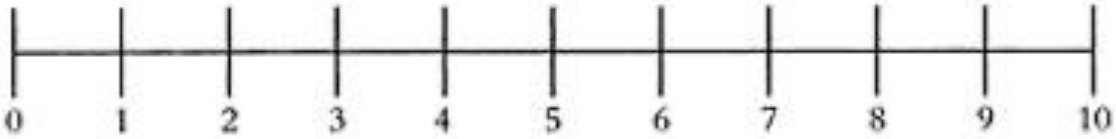
- Single-dimension
  - Visual analog scale
  - Verbal numerical scale
  - Verbal rating scale
- Multidimensional
  - Assesses the pain as well as the emotional and behavioral effects of the pain.

Other pain scales are just numeric



English

Please point to the number that best describes your pain.



No pain

Terrible pain

Single-dimension Instruments

Verbal rating scale

- No pain = **0**
- Mild pain = **1-3**
- Moderate pain = **4-6**
- Severe pain = **7-9**
- Worst ever = **10**

MODERATE

UNIVERSAL PAIN ASSESSMENT TOOL

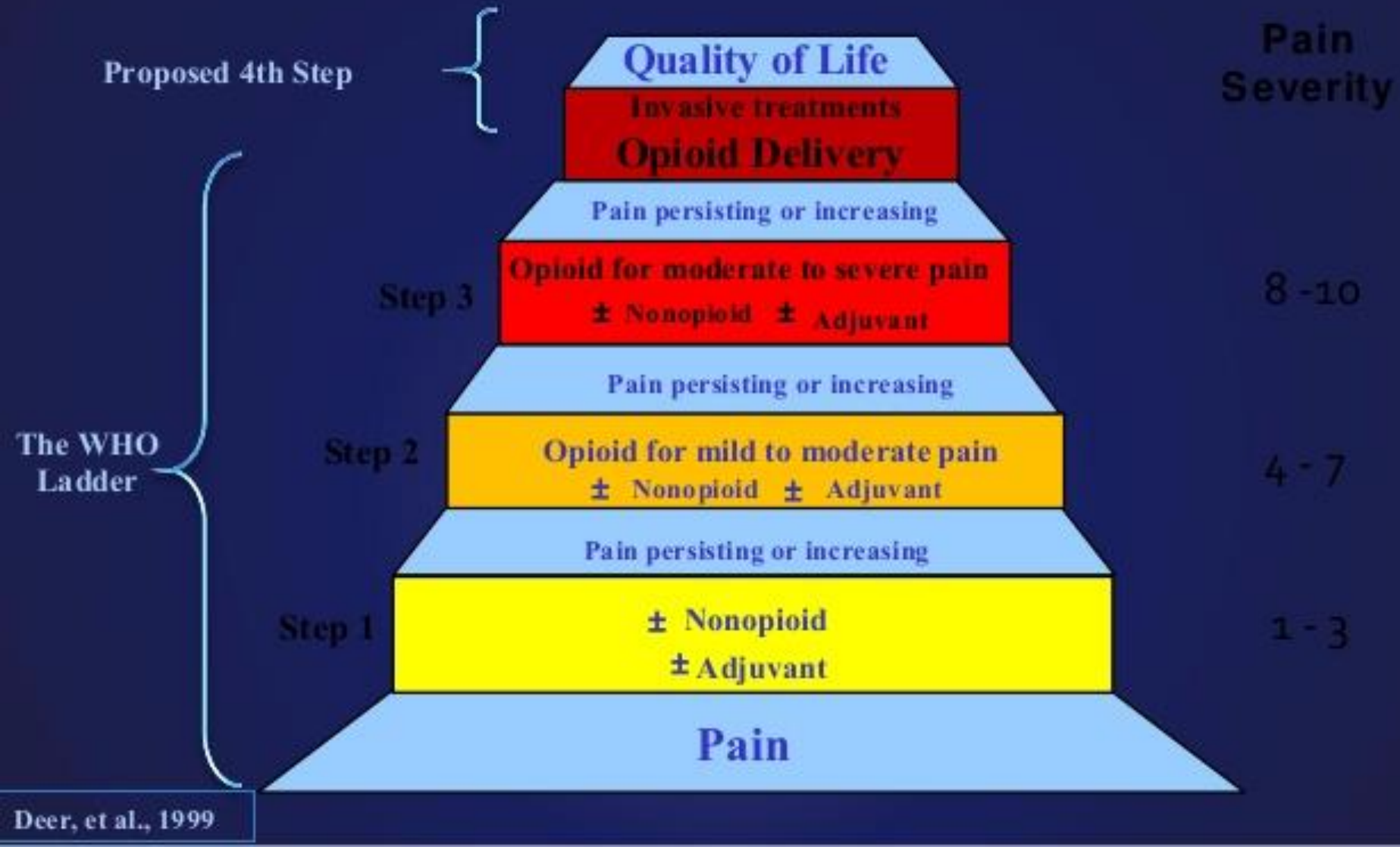
This pain assessment tool is intended to help patient care providers assess pain according to individual patient needs. Explain and use 0-10 Scale for patient self-assessment. Use the faces or behavioral observations to interpret expressed pain when patient cannot communicate his/her pain intensity.

0 1 2 3 4 5 6 7 8 9 10

Verbal Descriptor Scale	NO PAIN	MILD PAIN	MODERATE PAIN	MODERATE PAIN	SEVERE PAIN	WORST PAIN POSSIBLE
WONG-BAKER FACIAL GRIMACE SCALE	 Alert Smiling	 No humor serious flat	 Furrowed brow pursed lips breath holding	 Wrinkled nose raised upper lips rapid breathing	 Slow blink open mouth	 Eyes closed moaning crying
ACTIVITY TOLERANCE SCALE	NO PAIN	CAN BE IGNORED	INTERFERES WITH TASKS	INTERFERES WITH CONCENTRATION	INTERFERES WITH BASIC NEEDS	BEDREST REQUIRED
SPANISH	NADA DE DOLOR	UNPOQUITO DE DOLOR	UN DOLOR LEVE	DOLOR FUERTE	DOLOR DEMASIADO FUERTE	UN DOLOR INSOPORTABLE
TAGALOG	Walang Sakit	Konting Sakit	Katamtamang Sakit	Matinding Sakit	Pinaka-Matinding Sakit	Pinaka-Malalang Sakit
CHINESE	不痛	輕微	中度	嚴重	非常嚴重	最嚴重
KOREAN	통증 없음	약한 통증	보통 통증	심한 통증	아주 심한 통증	최악의 통증
PERSIAN (FARSI)	بدون درد	درد ملایم	درد معتدل	درد شدید	درد بسیار شدید	بدترین درد ممکن
VIETNAMESE	Không Đau	Đau Nhẹ	Đau Vừa Phải	Đau Nặng	Đau Thật Nặng	Đau Đớn Tận Cùng
JAPANESE	痛みがない	少し痛い	いくらか痛い	かなり痛い	ひどく痛い	ものすごく痛い

Pharmacological management:

Modified WHO 3- Step Analgesic Ladder



Deer, et al., 1999

- **Step 1:** non-opioid analgesics
  - (COX-2, Aspirin, Acetaminophen, Diclofenac, Ibuprofen, Tenoxicam, Panadeine, Nurofen. Pain rating 1-2-3)

- **Step 2:** mild opioid is added (not substituted) to step 1
  - (Codeine, Propoxyphene, Tramadol, Sevredol, DHC Continus, Dihydrocodeine tartate. Pain rating: 4-5-6)

- **Step 3:** Opioid for moderate to severe pain is used and titrated to effect
  - Oxycodone, Morphine, Fentanyl, Pethidine, Ketamine Pain rating 7-10

Pharmacological management:

- Selection of appropriate drug, dose, route and interval
- Aggressive titration of drug dose
- Prevention of pain and relief of breakthrough pain
- Use of coanalgesic medications
- Prevention and management of side effects

Pharmacology of Nociception

Four Steps:

1. Transduction
    - NSAIDs, Local Anesthetics & Anticonvulsants
2. Transmission
    - Opioids, NMDA Antagonists
3. Perception
    - Distraction, Relaxation, Imagery
4. Modulation
    - Tricyclic Antidepressants, Opioids, GABA Agonists

Addiction

- Acceleration of abuse patterns onto a primary illness.
- Characteristics:
  - Psychological dependence
  - Compulsive use
  - Loss of control over amount and frequency of use
  - Loss of interest in pleasurable activities
  - Continued use of drugs in spite of harm

Chronic Pain Medical Issues

- Physical Exam
- History documenting prescribing rationale
- Pain assessment documentation

Nonpharmacological Management

Non-pharmacologic Pain Management

- Neurostimulation
- TENS
- Acupuncture
- Anesthesiology
- Nerve block
- Surgery
- Physical therapy
- Exercise
- Heat/cold
- Psychological approaches
- Cognitive therapies (relaxation, imagery, hypnosis)
- Biofeedback
- Behavior therapy
- Psychotherapy
- Complementary tx
- Massage therapy
- Art therapy
- Music therapy
- Aroma therapy

Non-Pharmacologic

- Meditation: Yes, 'A', Cochrane
  - Strong evidence for the use of relaxation & hypnosis in reducing pain in a variety of medical conditions
- Music Therapy: Yes, 'A', Cochrane

Non-Pharmacologic

- Pre-Op counseling: Yes, 'B', Cochrane
- Ice: Yes, "B", Cochrane
- Chiropractic: No, 'B', Cochrane
- Massage: Yes for cancer, low back & OA pain, 'B', Cochrane
- Exercise : Yes; 'B', Cochrane

APA offers the following tips on coping with chronic pain:

- **Manage your stress.**
- **Talk to yourself constructively.**
- **Become active and engaged.**
- **Find support.**
- **Consult a professional.**

Manage your stress.

- Emotional and physical pain are closely related, and persistent pain can lead to increased levels of stress. Learning how to deal with your stress in healthy ways can position you to cope more effectively with your chronic pain. Eating well, getting plenty of sleep and engaging in approved physical activity are all positive ways for you to handle your stress and pain.

Talk to yourself constructively.

- Positive thinking is a powerful tool. By focusing on the improvements you are making (i.e., the pain is less today than yesterday or you feel better than you did a week ago) you can make a difference in your perceived comfort level. For example, instead of considering yourself powerless and thinking that you absolutely cannot deal with the pain, remind yourself that you are uncomfortable, but that you are working toward finding a healthy way to deal with it and living a productive and fulfilling life.

Become active and engaged.

- Distracting yourself from your pain by engaging in activities you enjoy will help you highlight the positive aspects of your life. Isolating yourself from others fosters a negative attitude and may increase your perception of your pain. Consider finding a hobby or a pastime that makes you feel good and helps you connect with family, friends or other people via your local community groups or the Internet.

Consult a professional.

- If you continue to feel overwhelmed by chronic pain at a level that keeps you from performing your daily routine, you may want to talk with a mental health professional, such as a psychologist, who can help you handle the physical and psychological repercussions of your condition.

Using psychological factors in clinical practice

Vigilance to pain

- Patients are distorted by the pain and are urged to react. Pain patients will have impaired concentration as they are being interrupted constantly by an aversive stimulus. Keep all communications clear and brief. Repeat key points often. Expect patients to talk about the pain often, as it is being brought repeatedly into attentional focus for them. This is not a sign of a somatization disorder or hypochondria.

Anger

- Patients with pain may shout at you, abuse you and generally be hostile to you. If they are hostile to you they have probably been hostile to everyone. Most often this will have nothing to do with you. and you will need to understand that anger normally means extreme frustration, distress and possibly depression. Anger functions to push people away and isolate a person. The angry pain patient is therefore less likely to have received or heard any information about their problems and be more confused than the non-angry patient.

Make sense of the pain

- Always ask the patient what they know and fear about the cause of the pain, the meaning of the pain and the time course of the pain. Expect the unexpected. What makes sense to one person is nonsense to another. What matters is that it is their understanding, not yours, that will inform their behaviour. Uncertain diagnoses or unknown diagnoses will lead to increased vigilance to pain and increased symptom reporting.

THANK YOU