PAIN MANAGEMENT

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WE ARE GOING TO TALK ABOUT:

• Pain score

• Gate control theory

• Codeine

• Tramadol
PAIN SCORE

• measures a patient's pain intensity.

• Pain measurements help determine the severity, type, and duration of the pain, and are used to make an accurate diagnosis, determine a treatment plan, and evaluate the effectiveness of treatment.

• Pain assessments are often regarded as "the 5th Vital Sign".
PAIN SCORE

Wong-Baker FACES® Pain Rating Scale

0  2  4  6  8  10
No Hurt  Hurts Little Bit  Hurts Little More  Hurts Even More  Hurts Whole Lot  Hurts Worst
PAIN SCORE

• 0 = The patient has no pain.

• 2 = (Mild) Nagging, annoying but doesn’t interfere with most daily living activities
  - Example: like lightly pinching the fold of skin between the thumb and first finger with the other hand, using the fingernails

• 4 = (Moderate) Frustrating, patients notice the pain all the time and cannot completely adapt. Patient can still do most of the daily activities with rest.
  (e.g. The initial pain from a bee sting, or minor trauma)
PAIN SCORE

- 6 = (Moderate) Intense pain, interferes with some daily activities.

- 8 = (Severe) Horrible pain, patient can hardly think of anything else because of the pain. (e.g.: Acute pancreatitis)

- 10 = (Severe) Disabling pain, patient unable to function independently. (e.g. Pelvic fractures)
Gate control theory states that activation of nerves which do not transmit pain signals, called non-nociceptive fibers, can interfere with signals from pain fibers, thereby inhibiting pain.

Therefore, stimulation by non-noxious input is able to suppress pain.

Pain modulation occurs at the level of the dorsal horn.
GATE CONTROL THEORY

Inhibitory interneuron → Projection neuron → Aβ fiber

Inhibitory interneuron → Projection neuron

C fiber → Inhibitory interneuron

Aβ fiber → Projection neuron

C fiber
GATE CONTROL THEORY

• Large-diameter $A_{\beta}$ fibers are non-nociceptive (do not transmit pain stimuli) and inhibit the effects of firing by $A_{\delta}$ and C fibers.

• The inhibitory interneuron fires spontaneously. The C fiber's synapse would inhibit the inhibitory interneuron, **indirectly increasing** the projection neuron's chance of firing. The $A_{\beta}$ fiber, on the other hand, forms an **excitatory** connection with the inhibitory interneuron, thus **decreasing** the projection neuron's chance of firing.

• Thus, depending on the relative rates of firing of C and $A_{\beta}$ fibers, the firing of the non-nociceptive fiber may inhibit the firing of the projection neuron and the transmission of pain stimuli.
GATE CONTROL THEORY

- In **transcutaneous electrical nerve stimulation** (TENS), non-nociceptive fibers are selectively stimulated with electrodes in order to produce this effect and thereby lessen pain.
CODEINE

- Naturally occurring opioid that is a weak analgesic compared to morphine.
- It exerts its effect by acting on the μ opioid receptors on the membranes of certain cells in the CNS and other structures such as the GI and the urinary bladder.
- Used to decrease pain by increasing the threshold for pain without impairing consciousness or altering other sensory functions.
- Actions include: Analgesia, euphoria, reduction of intestinal motility and depression of cough reflex.
CODEINE

- The analgesic actions of codeine are derived from it’s conversion to morphine by the CYP450 2D6 enzyme.
- Some patients lack the necessary enzyme and therefore get no effect from codeine.
- It should be used only for mild to moderate pain.
- Codeine is commonly used in combination with acetaminophen for management of pain.
- The average duration of action is about 4 hours
• Codeine is either administered **orally**.

• Not recommended for use in the presence of **renal failure**

• **Adverse effects** include: Dysphoria (anxiety, depression), Constipation, Urinary retention, **Respiratory depression** and potential for addiction.
TRAMADOL

- It’s a **synthetic oral opioid** that binds to the $\mu$ receptor.
- In addition, it **weakly inhibits reuptake** of norepinephrine and serotonin.
- It’s used to manage **moderate to severe** pain.
- It is a usual go-to medication as it has **less potential for abuse and respiratory depression**.
- It has the **same efficacy** as the combination of codeine and acetaminophen.
TRAMADOL

- **Overdose** can be observed as a coma, constricted pupils, seizures, respiratory depression, bradycardia, hypotension, cardiac arrest, and death.

- Naloxone (opioid antagonist) can only **partially reverse** the analgesia produced by tramadol.

- **Anaphylactoid reactions** have been reported
THANK YOU!