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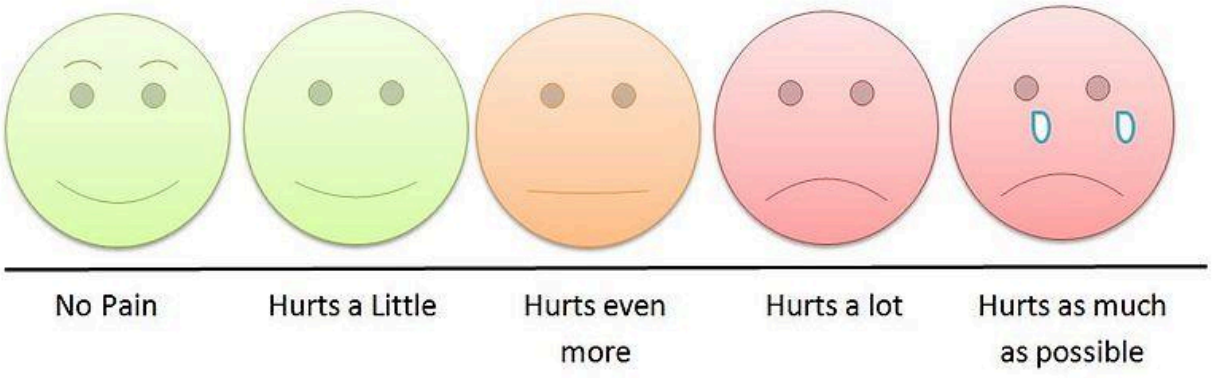
Introduction to Pain and Pain Assessments

Consider this quote from the International Association for the Study of Pain:

"Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage."

Pain includes an unpleasant sensory component that is influenced by previous experience, emotions, gender, and culture, as well as physical, cognitive, and spiritual factors. Pain is subjective and is uniquely experienced by each individual.

Because of its subjective nature, pain is very difficult to measure. Traditionally, a variety of **pain scales** have been adopted to try and help measure changes in pain. Common scales to measure pain are a **numeric scale** from 1-10 or a **visual analog scale** that has a gradient of facial expressions that people can visually associate with pain. A tool called a dolorimeter may also help determine pain levels. It delivers a steady amount of pressure, heat, or electrical stimulation to some area and then individuals grade the pain they feel on a pain scale. Medical professionals may use the dolorimeter after a treatment to get an idea of how much the treatment helped the pain. An assessment for pain should include information about what the patient looks like (during the pain) and the patient's past pain history. Previously experiencing pain such as natural childbirth may affect a patient's perception of the amount of pain they are experiencing because they have something so extreme to compare it to.



Visual Analog Scale *File:Children's pain scale.JPG; Robert Weis; https://commons.wikimedia.org/wiki/File:Children%27s_pain_scale.JPG; This file is licensed under the Creative Commons Attribution-Share Alike 4.0 International license.*

Pain threshold is the point at which a stimulus is perceived as pain. **Pain tolerance** is the duration of time or the intensity of pain that a person will endure before removal from the stimulus. Pain tolerance varies greatly between individuals. Cultural, familial, psychological, and environmental factors all have a significant impact on how much pain

an individual is willing to tolerate. The **cold pressor test** is a test that attempts to quantify pain threshold and pain tolerance. In this test, the hand is immersed into a container of ice water and the participant reports when pain is first felt (threshold). When the pain is no longer bearable the participant removes their hand and the pain tolerance is recorded (total time minus threshold).

Nociceptors are pain receptors with free nerve endings that are capable of responding to several different noxious stimuli including chemical, mechanical, and thermal energy. Their ability to respond to several types of stimuli makes them **polymodal**. Nociceptors are distributed throughout the body in places such as the skin, gastrointestinal tract, heart, skeletal muscle, and joints. They aren't located in the brain tissue itself, but they are located in the meninges, arteries, and sinuses. Nociceptors are also absent from bone, but they are located in the periosteum.

There are four main phases of nociception that occur in the following order:

1. **Transduction** occurs when a painful stimulus is turned into an action potential.
2. **Transmission** occurs when the electrical signal is transmitted to areas of the brain and CNS.
3. **Perception** occurs when the individual becomes consciously aware that they are in pain.
4. **Modulation** occurs when the person's body attempts to modulate the symptoms of pain. For example: when adrenaline is high, individuals will often feel very little pain compared to later when the sympathetic nervous system calms down.