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Accurate Education

Bedside Pain Modulation Testing

This handout explains how to participate in two simple pain tests: the **cold pressor test (CPT)** and the **Conditioned Pain Modulation (CPM) / Diffuse Noxious Inhibitory Control (DNIC)** test using a pressure algometer. These tests help measure your pain sensitivity and your body's ability to suppress pain signals.

Why are these tests important?

Chronic pain can change how your nervous system responds to pain, sometimes making you more sensitive to pain due to Opioid-Induced Hyperalgesia (**OIH**) and Central Sensitization (**CS**).

- **Opioid-induced hyperalgesia (OIH)** is a condition where your body becomes more sensitive to pain due to long-term opioid use. Instead of helping, opioids can sometimes make pain worse or cause new pain in different areas. The prevalence of OIH in patients on long-term opioid therapy likely occurs in 5% to 15% of patients.
- **Central Sensitization (CS)** is when your nervous system becomes extra-sensitive, making you feel pain more easily or more intensely (hyperalgesia), even from things that shouldn't hurt at all (allodynia). This is especially common in conditions like migraines, chronic back pain, neuropathy and fibromyalgia and it can be made worse by long-term opioid use. In studies of mixed chronic pain populations, central sensitization is present in 43% - 80% of patients.

What is the Cold Pressor Test (CPT)?

The CPT measures your pain tolerance by placing your hand in cold water for up to 2 minutes.

- You will be told to state when you first feel pain and then when you can no longer tolerate it.
- This test is safe and commonly used in pain research and clinics.

How is the CPT done?

1. You will sit comfortably at a table.
2. A container will be filled with ice cold water ((0° - 4°C or 34°F)).
3. Place your non-dominant hand (the one you use less) into the water, up to your wrist.
4. Tell us when you first feel pain (*measures **pain threshold***).
5. Keep your hand in the water as long as you can, up to 2 minutes, or until you need to remove it (*measures **pain tolerance***).
6. We will record the times and ask you to rate your pain on a scale from 0 (no pain) to 10 (worst pain ever).

What is Conditioned Pain Modulation (CPM)/DNIC?

- CPM/DNIC tests how well your body can suppress pain when another pain is happening elsewhere at the same time.
- A small device that applies increasing pressure to your skin (a pressure algometer) is used to measure the pressure at the point where it becomes painful (your Pressure Pain Threshold (**PPT**)).
- We measure your PPT before and during the cold pressor test to see if your PPT changes.

How is CPM/DNIC done?

1. First, we will apply the pressure algometer on a certain muscle (like your shoulder, lower back, thigh, or hand web) and press gently until you indicate it feels unpleasant or painful. This is your **baseline PPT**.
2. The pressure test will then be repeated, this time with the non-dominant hand immersed again in the cold water.
3. When your hand is in the cold water for 30 seconds, the pressure test will be repeated to measure your PPT again on the same muscle.
4. CPM effect = PPT during conditioning (immersion) – baseline PPT
5. We compare your first baseline PPT measured without cold water immersion to the PPT measured during the cold water immersion (CPM effect)
If your PPT goes up (i.e. you tolerate more pressure), your body is engaging its natural pain-blocking (endorphin) system effectively (normally). If your PPT goes down or stays the same, your natural pain-blocking endorphin system may be impaired.

What do the results mean?

- **Higher pain threshold during cold water:** Your body is effectively blocking pain (normal endorphin response).
- **Lower or unchanged pain threshold:** Your pain-blocking endorphin system may be impaired, which is common in chronic pain.
- **Treatment with naltrexone** may be indicated to restore your endorphin system.

What should I expect?

- The tests may cause temporary discomfort, but will not cause harm.
- You can stop the test at any time if you become too uncomfortable, just let staff know.

Tips for Most Accurate Results

- Try to relax and focus on the instructions.
- Tell us if you are feeling stressed, anxious or distracted, as these feelings can affect your results.

If you have any questions about these tests or what your results suggest, please ask our staff.

