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# The Mind – Body Connection

## PAIN MANAGEMENT

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# *Impact of Pain on Society*

- Pain is one of the most common complaints to primary care providers (*Gureje, Von Koff, Simon, & Gater, 1998; Otis, Reid, & Kerns, 2005*), and has significant implications for healthcare costs.
- The NIH identified chronic pain as the costliest medical problem in America, affecting nearly 100 million individuals (*Byrne & Hochwarter, 2006*).

# *Impact of Pain (cont'd)*

- One in four adults say they suffered from a day-long episode of pain in the past month, and one in ten reported pain lasting one year or more (*CDC, 2006*).
- Over 20% of all medical visits and 10% of all drug sales are pain-related (*Max, 2003*).

# *Impact in Occupational Contexts*

- Chronic pain is significant source of absenteeism and a major factor in reducing productivity while at work.
- Approximately half of all employees experience pain on the job, and individuals whose work involves repetitive movement or heavy lifting are affected in greater numbers (*Byrne & Hochwarter, 2006*).

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# *Occupational Impact (cont'd)*

- It has been estimated that pain results in \$79 billion annually in lost worker productivity (*Max, 2003*).
- A recent study estimated that the total healthcare expenditures for back pain alone reached over \$90.7 billion in 1998 (*Xuemei, Pietrebon, Sun, Liu, & Hey, 2004*).

# *iatrogenic Effects:Opioid Abuse*

- Abuse of prescription opioid analgesics has emerged as a major public health problem in the US (*Zacny et al., 2003*).
- Each year since 1999, more than 2 million adults started abusing prescription opioids in the US (*SAMHSA, 2006*).

# ***“The Decade of Pain Control and Research”***

- Overall, the total direct and indirect costs of chronic pain in the United States have been estimated to be between \$150 billion and \$260 billion annually (*Byrne & Hochwarter, 2006*).
- These statistics led the 108th Congress to formally declare the 10-year period beginning January 1, 2001, the “Decade of Pain Control and Research” (*CDC, 2006*).

# *Understanding Pain*

- Understanding of pain last 300 years dominated by the idea that human body is complex machine separate from the process of perception.
- Pain is an experience & cannot be separated from patient's mental state, environment and culture.
- These critical factors can actually cause the brain to trigger or abolish the experience of pain.
- Assessment must consider mental & environmental factors, (*The Richeimer Pain Update, 2000*).

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# *Definition of Pain*

- Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage, (*IASP, 1994*).

# *Feeling No pain*



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# *Classification*

- Acute pain is short-lived and resolves on its own over time, such as pain associated with a minor burn, cut, or broken bone.
- Chronic Pain persists for an extended period of time, that accompanies a disease process, or is associated with bodily injury that has not resolved over time, (*Classification of Chronic Pain, 1994*).

# Chronic Pain

- Chronic low back pain is the most common chronic pain condition, affecting 15% to 45% of adults annually and at least 70% of adults over a lifetime (*Anderson, 1997*).
- Headaches represent another large category of painful conditions. Tension headaches are the most common and affect 38% to 78% of people (*Rasmussen, Jensen, Schroll, & Olsen, 1991*).

# *Migraine Headaches*

- Migraine headaches affect 18% of women and 6% of men (*Lipon, Stewart, Diamond, Diamond, & Reed, 2001*).
  - Often preceded by sensory warning “aura,” flashes of light, blind spots, tingling in extremities.
  - May be accompanied by nausea, vomiting, light/sound sensitivity.
  - Unilateral and intensely painful.

# *Fibromyalgia Syndrome (FMS)*

- FMS consists of a set of unexplained physical symptoms with general pain & hypersensitivity to palpation at specific locations called “tender points.”
- Sufferers report a range of functional limitations & psychological dysfunction:

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■ Fatigue Sleep disturbance Stiffness headaches

# *Nociceptive Pain*

- Nociceptors are the nerves which sense and respond to parts of the body which suffer damage. They signal tissue irritation, impending or actual injury. When activated, they transmit pain signals to the brain via peripheral nerves as well as the spinal cord. The pain is typically localized, constant, and often with an aching or throbbing quality.

# *Examples of Nociceptive Pain*

- Examples of nociceptive pain:
  - Bumps, bruises
  - Burns
  - Bone fracture, sprains
  - Inflammation
  - Obstructions and myofascial pain.

# *Visceral*

- Visceral pain is the subtype of nociceptive pain that involves the internal organs. It tends to be episodic and poorly localized.
- Visceral pain is caused by activation of pain receptors resulting from infiltration, compression, extension, or stretching of the chest, abdominal, or pelvic viscera.
- Described as “pressure-like, deep-

# *Neuropathic Pain*

- Neuropathic pain is a neurological disorder resulting from damage to nerves that carry information about pain.
- Described as “shooting”, “electric”, “stabbing” or “burning.”
- May be felt traveling along a nerve path from the spine into the arms and hands or into the legs and buttocks.

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# *Neuropathic Pain (cont'd)*

- Neuropathic Pain has very different medication options.
- Opioids, (e.g., morphine) and nonsteroidal anti-inflammatory medications (NSAIDs) (e.g., ibuprofen) are not typically effective.
- Nerve block injections and similar interventions used for chronic pain are more effective.

# Examples of Neuropathic Pain

- Phantom pain
  - Phantom limb pain: perceptions that an individual experiences relating to a limb or an organ that is not physically part of the body either by congenital limb deficiency or limb removal (*Giummarra et al., 2007*).
  - Stump pain: located at the end of an amputated limb's stump, is due to damaged nerves that form neuromas.

# *History of Phantom Pain*

- The term, “phantom limb” was first coined by American neurologist Silas Weir Mitchell in 1871 (*Halligan, 2002*).
- He described that “thousands of spirit limbs were haunting as many good soldiers, every now and then tormenting them” (*Bittar et al., 2005*).

## *History (cont'd)*

- In 1551, French military surgeon Ambroise Pare' recorded the first documentation of phantom limb pain when he reported that, "For the patients, long after the amputation is made, say they still feel pain in the amputated part" (*Bittar, et al., 2005*).

# *Epidemiology*

- Phantom limb pain vs phantom sensations:
- Phantom sensation comes from congenital limb deficiency, spinal cord injury, and amputation.
- Phantom limb pain occurs almost exclusively from amputation (*Kooijman et al., 2000*).

# *Epidemiology (cont'd)*

- 90-98% of amputees report phantom sensations immediately following amputation.
- Nearly 75% experience the phantom as soon as anesthesia wears off, and the remaining 25% experience phantoms within days or weeks (*Ramachandran & Herstein, 1998*).

# *Non Surgical Treatment Options*

- Non surgical techniques:
  - Nerve blocks
  - Spinal cord stimulation
  - Hypnosis, biofeedback, relaxation techniques such as progressive muscle relaxation, guided imagery and CBT.
  - Mirror box therapy

# *Calm, Centered Canine*



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# Ramachandran's Mirror Box

- Mirror box therapy allows for illusions of movement and touch in a phantom limb by inducing somatosensory and motor pathway coupling between the phantom and real limb (*Giummarra et al., 2007*).
- Many patients experience pain as a result of a clenched phantom limb, and because phantom limbs are not under voluntary control, unclenching becomes impossible (*Ramachandran & Rogers-Ramachandran, 1996*).

# *Mirror Box Theory*

- The theory behind the mirror box is that the brain has become accustomed to the fact that a phantom limb is paralyzed because there is no feedback from phantom to brain to inform it otherwise. Ramachandran believed that if the brain received visual feedback that the limb had moved, then the phantom limb would become unparalyzed (*Ramachandran & Rogers Ramachandran, 1996*).

# *Mirror Box: Pioneer Study*

- In a study of ten patients with upper phantom limb paralysis, nine patients were able to move the phantom limb, and eight patients were able to move the phantom limb and had their pain alleviated (*Ramachandran & Rogers-Ramachandran, 1996*).

# *Supporting Research*

- Since Ramachandran's pioneer study, there have been multiple additional studies to support the mirror box findings for patients with upper limb phantom pain as well as successful studies for lower limb phantom treatments (*MacLachlan, McDonald, and Waloch, 2004*).

# *"Secrets of the Mind"*

- Vilayanur Ramachandran, MD, PhD is a neurologist known for his work in the fields of behavioral neurology and psychophysics.
- Director for the Center for Brain and Cognition
- Professor in the Psychology Department and Neurosciences Program at the University of California, San Diego, and Adjunct Professor of Biology at the Salk Institute for Biological Studies.

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# *Goal of CBT for Pain*

- To promote active problem solving approach to challenges of chronic pain.
- Adopt perspective of personal responsibility, self control and confidence vs. Helplessness.
- Understand that people don't become inactive due to pain but become adjusted to the idea of being disabled.
- CBT for pain involves challenging those beliefs and safely reintroduce enjoyable activities into their lives.

# *Key Components to CBT for Pain*

- Cognitive Restructuring
- Relaxation Training
- Time-based activity pacing
- Graded homework assignments designed to decrease patient's avoidance of activity and reintroduce a more healthy, active lifestyle.

# *Empirical Support*

- In a frequently cited meta-analysis of 25 randomized controlled trials of CBT for pain management, Morley, Eccleston, and Williams (1999) concluded that CBT is effective, as it resulted in significantly greater changes for the domains of the pain experience, cognitive coping and appraisal (positive coping measures), and reduced behavioral expression of pain when compared with alternative active treatments.

# *The Pain Interview*

- Pain History/Cycles
- Pain Triggers
- Date of Redefinition/Onset
- Coping Strategies
- Disruption/Bending?
- Pain Rating Goals
- Pain Medication Effectiveness
- Previous Treatments
- Affective Status

# *Patient Education*

- Review Assessment Results
- Discuss the Impact of Pain
- Explain the Pain Cycle
- Present General Treatment Goals
- Set Overall Behavioral Goals for Treatment

# *The Pain Cycle*

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# *Happiness is a lap full of Poms*



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# *Theories of Pain*

- The ***SPECIFICITY THEORY*** of pain suggests that the amount of pain felt is directly related to the amount of tissue damaged. According to this theory, pain should stop when the tissue has healed.

# *Problems with Specificity Theory*

- People with similar amounts of tissue damage experience different levels of pain, suggesting something unique about each person's experience of pain.
- Some people with very little tissue damage feel a considerable amount of pain while others with a great deal of tissue damage experience little pain.
- Doesn't explain phantom pain.

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# *Gate Control Theory*

- The Gate Control Theory (*Melzack and Wall, 1965*).
  - Developed in 1960's by Ronald Melzack & Patrick Wall to account for the mind-body experience in pain perception.
  - Significant impact because it recognized the importance of psychological factors in pain perception.

# *Gate Control Theory(cont'd)*

- The Gate Control Theory suggests:
  - A type of gate mechanism in dorsal horn of spinal cord modulates pain signal.
  - The gate opens & closes depending on feedback from other nerve fibers in the body including descending neural impulses from the brain related to an individual's thoughts or mood.
  - The opening & closing of the gate determines how much pain signal gets through from the injured area.

# *Things that open the Gate*

- Physical: Degenerative changes, muscle tension, drug abuse.
- Cognitive: Attention to pain, thoughts about uncontrollability of pain, beliefs about pain as mysterious and terrible.
- Emotions: Depression, fear/anxiety, anger.

# *Things that Open the gate*

## *(cont'd)*

- Activity: Too much or too little activity, poor diet and other health behaviors, imbalance between work, recreation and social activity.
- Social: Little support from family & friends, others focusing on your pain, others trying to protect you too much.

# *Things that Close the Gate*

- Physical: Drugs, surgery, reduced muscular tension.
- Cognitive: Distraction/external focus of attention, thoughts of control over pain, beliefs about pain as predictable and manageable.
- Emotions: Emotional stability, relaxation, calm, positive mood.

# *Things that Close the Gate*

## *(cont'd)*

- Activity: Appropriate pacing of activity, positive health habits, balance between work, recreation, rest, and social activity.
- Social: Support from others, reasonable support from family & friends, encouragement from others to maintain moderate activity.

*Are we having fun yet?*



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# *Relaxation Techniques*

- Diaphragmatic Breathing
- Progressive Muscle Relaxation
- Visual Imagery

# *Pleasant Activity Scheduling*



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# *Automatic Thoughts & pain*

- Explain Automatic Thoughts
- Discuss how thoughts lead to emotions
- Explore Relationship between emotions and Pain
- Review common cognitive errors
- Introduce the ABC Model:
  - Activating Event- Belief/Thought- Consequences/Emotional, Physical, Behavioral

# *Cognitive Restructuring*

- Review connection between negative thoughts and pain
- Teach Cognitive restructuring:
  - Situation-Emotion-Automatic Thought-Evidence For-Evidence Against-Positive Coping Thought-Emotion

# *Stress Management*

- Define Stress
- Explain “fight-or-flight” response
- Review common stressors
- Help patient ID personal stressors
- Discuss Relationship between stress & Pain
- Examine ways to decrease stress

# *Time-Based Pacing*

- Time-based Pacing
  - ID Activity task
  - Estimate length of time performing without creating a “flare-up”
  - Estimate “rest- time” needed
  - Document “active” and “rest” times using the Activity Pacing Worksheet

# *ModerateActivity*



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# *Anger Management*

- Define Anger
- Discuss Relationship between anger and pain
- Teach Anger Management:
  - Develop awareness
  - Modify internal responses
  - Respond Assertively
  - Teach Assertive Communication guidelines

# *Sleep Hygiene*

- Explain effects of sleep deprivation
  - Increased emotional distress and irritability
  - Increased clumsiness and incoordination
  - Decreased work performance & memory lapses
  - Increased risk of auto accidents
  - Difficulty concentrating

Teach ways to improve sleep

# *Relapse Prevention and Flare-Up Planning*

- How to manage a flare-up
  - Preparation
  - Confrontation
  - Critical moments
  - Reflection and planning

# *Family Support*



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# *Treatment Resources*

- Managing Chronic Pain: A Cognitive-Behavioral Therapy Approach; Therapist Guide;(Treatments *That Work* Series).
- Managing Chronic Pain: A Cognitive-Behavioral Therapy Approach; Workbook; (Treatments *That Work* Series).
- The Ease of Being: Guided Meditations for Centering and Healing; Mary Maddux and Richard Maddux; **CD**
- Relaxation & Wellness ; (*Health Journeys*); Belleruth Naparstek; **CD**

# *Selected Quotes*

***"The greatest evil is physical pain"***

-Saint Augustine

***"There is no real evil in life, except great pain;  
all the rest is imaginary, and depends on the  
light in which we view things"***

-Marie de Sevigne