Pediatric Pain Management

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Pediatric Chronic Pain

25-40%

Musculoskeletal

Abdominal, Headache

Neuropathic

Disease-Related, Other

1/3 pain persists for years

Morbidity

- Long term depression and anxiety
- Reduced educational attainment
- Functional impairment/poor vocational functioning
- Decreased quality of life
- Societal cost in US of $19.5 billion annually

Substance Use Disorder

- Legitimate opioid prescription in youth associated with opioid misuse in young adulthood
- 1/1600 had subsequent opioid overdose
  - Mental health conditions, tramadol, and more dispensed tablets (>30)

Acute Pain

EMERGENCY ALARM

- Attention grabbing
- Negative emotional valence
- Physiological stressor

- Adaptive Response
  - Withdraw
  - Rest & Protect
  - Caregiver accommodation

Chronic Pain

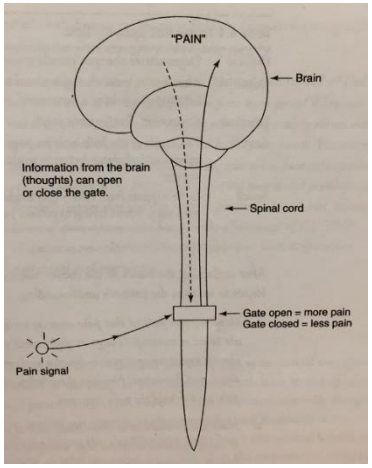
EMERGENCY ALARM

- Attention grabbing
- Negative emotional valence
- Physiological stressor

- False Alarm
- Normal response to pain is no longer adaptive

- Pain behaviors do habituate

Gate Control Theory



Melzack & Wall, 1965

Pro-nociceptive state predisposes development of chronic pain

Facilitation Processes

Noxious Input

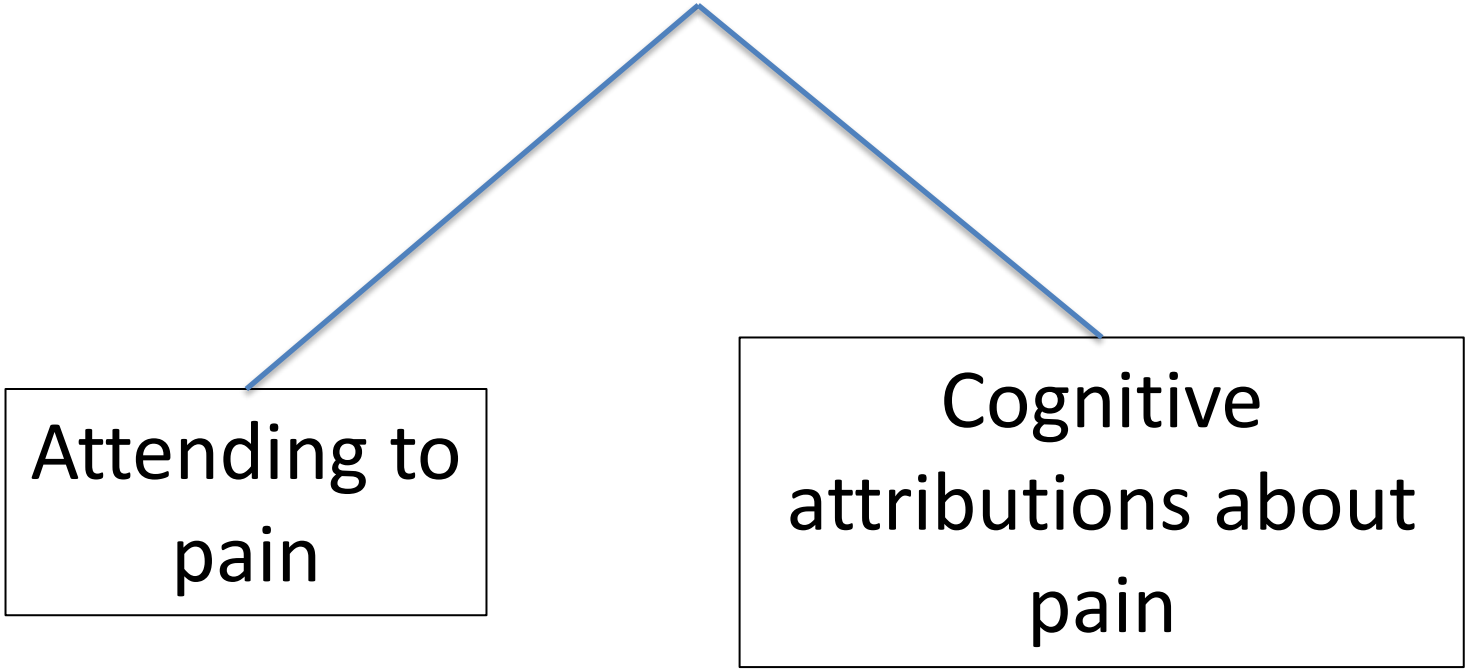
Inhibition Processes

Pain Sensation

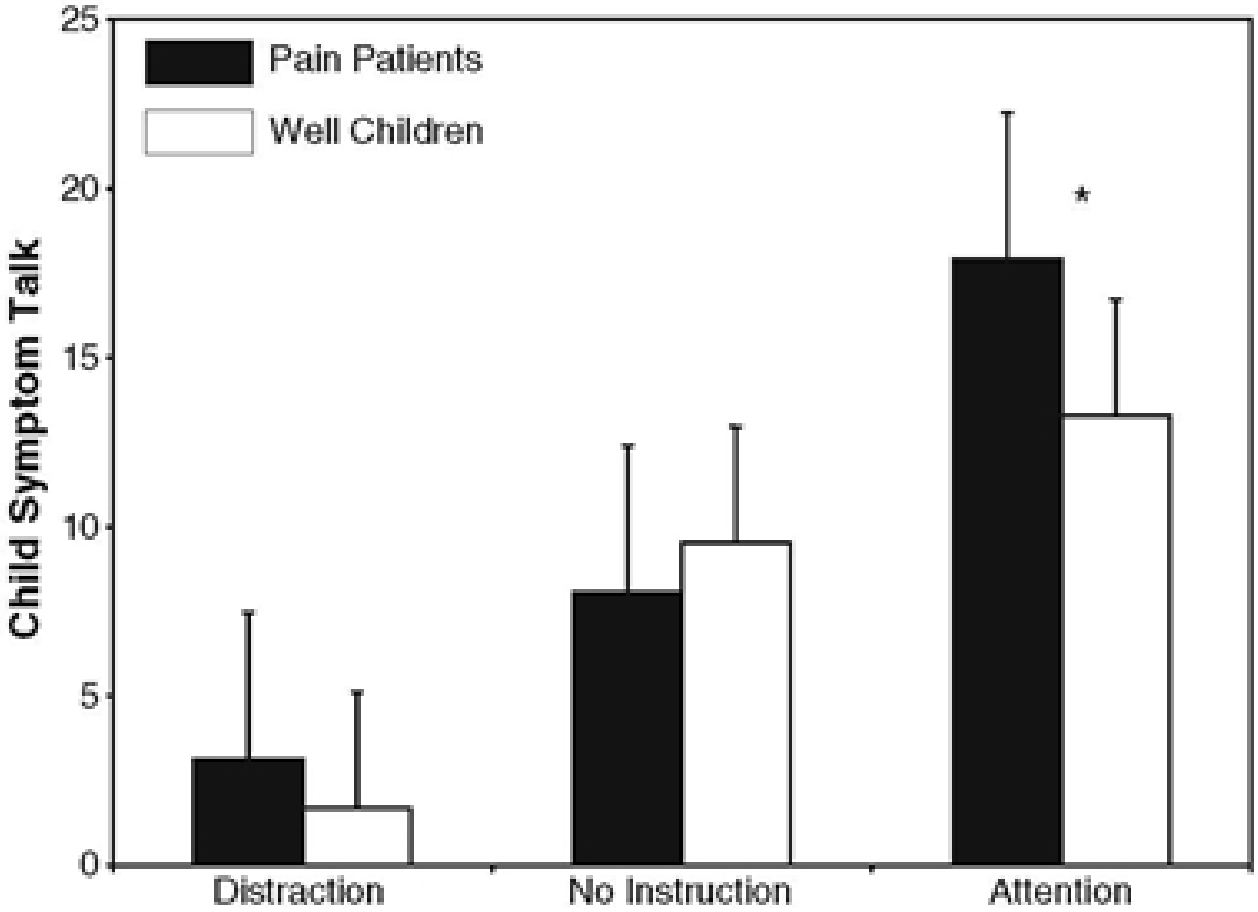
Attention and Thoughts

Emotions

Thoughts and Attention



Attending vs. Distracting



Distraction

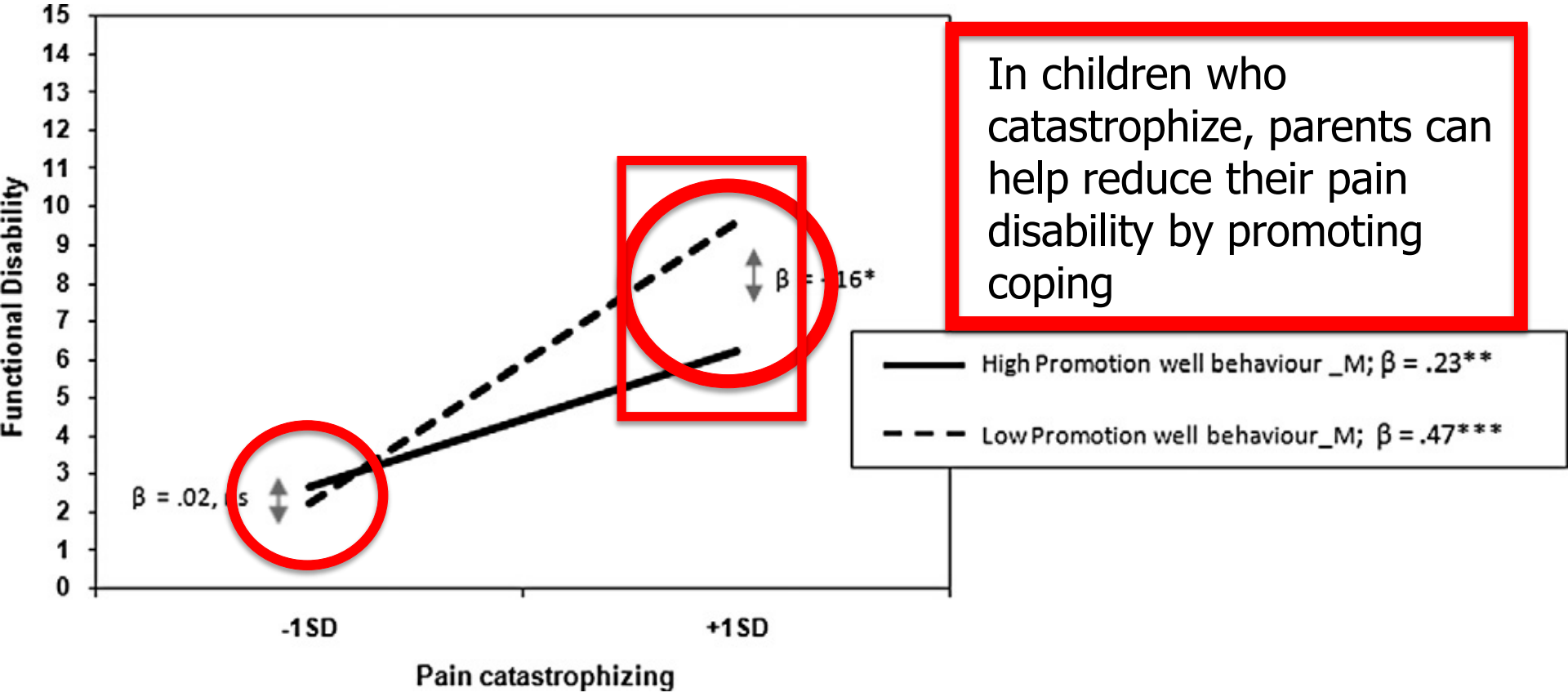
- repetitive, pleasant, engaging
- Anterior Cingulate Cortex

Walker, LS, Williams, SE, Smith, CA, Garber, J, Van Slyke, DA. (2006). Parent attention versus distraction: Impact on symptom complaints by children with and without chronic functional abdominal pain. *Pain*, 122(1-2), 43-52.

Catastrophizing

Children who catastrophize have more pain disability

In children who catastrophize, parents can help reduce their pain disability by promoting coping



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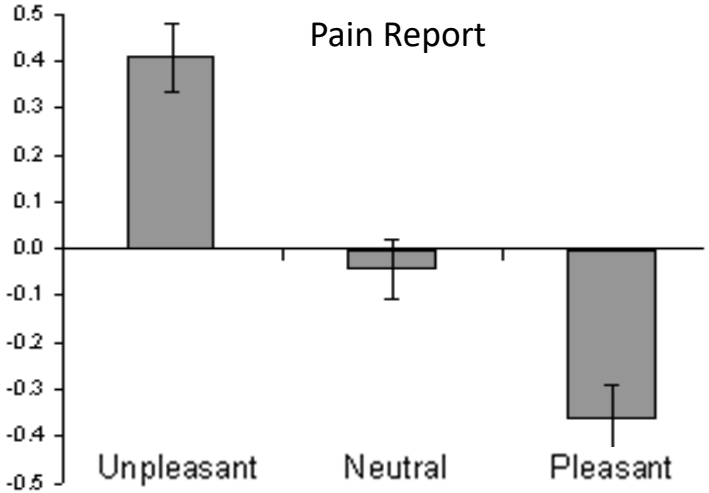
Emotions



International Affective Picture System (IAPS)

Williams, A.E., & Rhudy, J.L. (2009). Supraspinal modulation of trigeminal nociception and pain. *Headache,* 49(5), 704-720.

EXTERNAL AND SOCIAL FACTORS

Parental Empathy

- Responding with reassurance, apologies, and empathy actually *increases* the child's pain[4]
  - Focuses attention on pain
  - Tells child that parent is worried
  - Reinforces pain behavior by temporarily reducing distress
  - Gives child permission to express distress – which increases their experience of pain

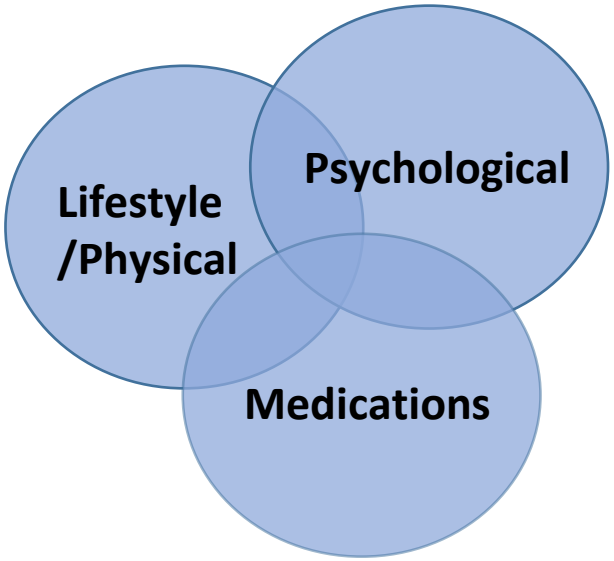
Operant Conditioning

Behavior	Consequence	Outcome
Pain Behavior	Positive Reinforcement • Social attention Negative Reinforcement (escape/avoidance conditioning) • Temporary reduction in pain or anxiety • Avoidance of dis-liked tasks or situations	Increased Pain and Pain Behaviors
Well Behavior	Positive Punishment • Increased pain • Social ridicule • Interpersonal stress Negative Punishment • Loss of social attention • Loss of resources (disability)	

INTERVENTIONS

Evidence Based Treatment Recommendations

- Multidisciplinary Care
  - physicians
  - nurses
  - mental health professionals (e.g., clinical psychologist, psychiatrist)
    - child life, music, art therapy
  - physical therapists



Psychological Interventions

- Cognitive Behavioral Therapy
  - Acceptance and Commitment Therapy
  - Mindfulness
  - Biofeedback
  - Hypnosis

Does CBT Really Help?

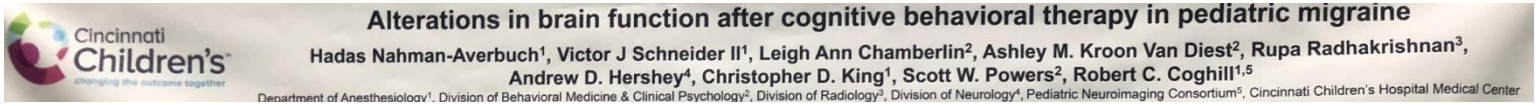
CBT in Adults with Chronic Pain

- Grey matter changes after CBT for chronic pain
  - Increased bilateral dorsolateral prefrontal, posterior parietal, subgenual anterior cingulate/orbitofrontal, and sensorimotor cortices, hippocampus,
  - Reduced supplementary motor area
- Decreased pain catastrophizing associated with
  - increased left dorsolateral prefrontal and ventrolateral prefrontal cortices, right posterior parietal cortex, somatosensory cortex, and pregenual anterior cingulate cortex

Seminowicz, D. A., Shpaner, M., Keaser, M. L., Krauthamer, G. M., Mantegna, J., Dumas, J. A., & ... Naylor, M. R. (2013). Cognitive-behavioral therapy increases prefrontal cortex gray matter in patients with chronic pain. *The Journal Of Pain*, *14*(12), 1573-1584.

CBT in Adolescents with Migraines (poster from World Congress on Pain, 2018)

- "Alterations in amygdalar connectivity with areas involved in nociceptive processing may underlie the therapeutic mechanism of CBT"
  - "left amygdala has an anti-nociceptive function and the right amygdala has a pro-nociceptive function. CBT effects may involve increased inhibitory input of the ventromedial prefrontal cortex (VMPFC) on the pronociceptive right amygdala."

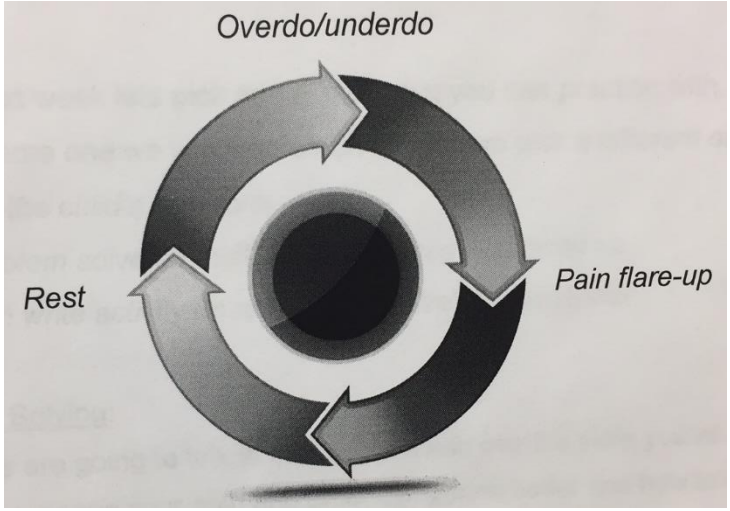


Components of CBT for Pain

- Education
  - Get them on board
- Coping Skills in response to pain
  - Behave differently
  - Think differently
  - Improve self-efficacy for pain reduction/coping
- Shift attention away from pain
- Modify environmental contingencies that promote pain/disability
  - Functional Rehabilitation
    - Reinforce functional gains
- Address family or individual psychosocial difficulties

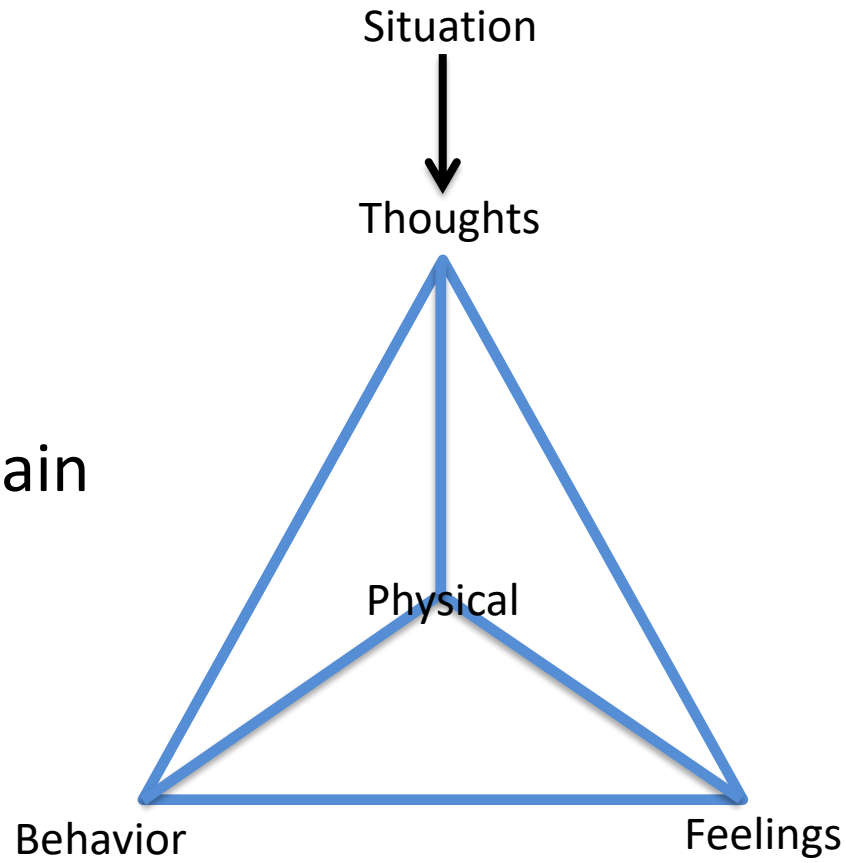
Behavioral Interventions

- Relaxation Training
  - Deep breathing
  - Muscle relaxation
  - Imagery
  - Biofeedback
  - Hypnosis
- Activity Pacing
- Exposure to feared situations or pain triggers
- Progressive increase in functioning
- Improving Sleep



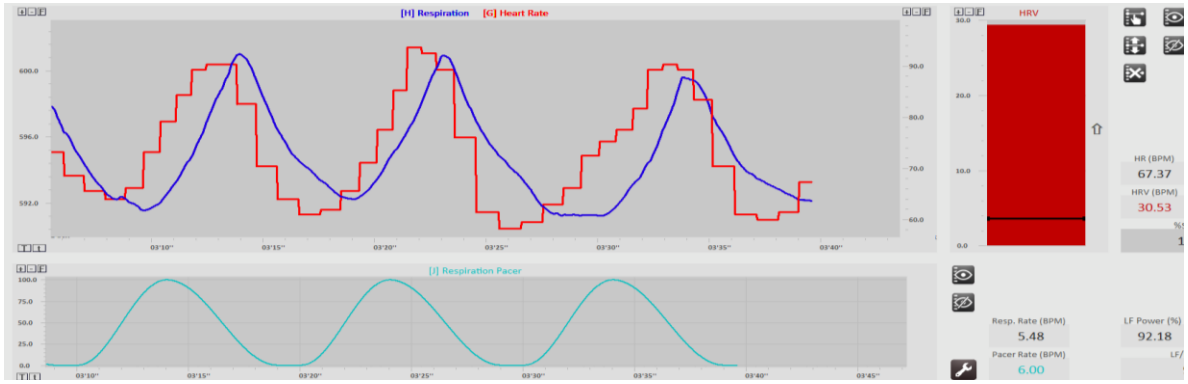
Cognitive Interventions

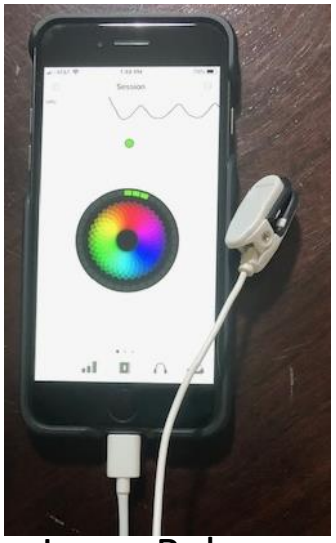
- Cognitive Restructuring
  - Active (rather than passive) coping
  - Threat, Loss, or Challenge interpretations of pain
- Reducing Reinforcement of pain
  - Secondary gain
  - Empathy
- Reduce attention to pain
  - Shift focus to functioning
- Facilitate positive emotions



Biofeedback

- Measure and display physiological variable
  - Learn to alter in desired direction

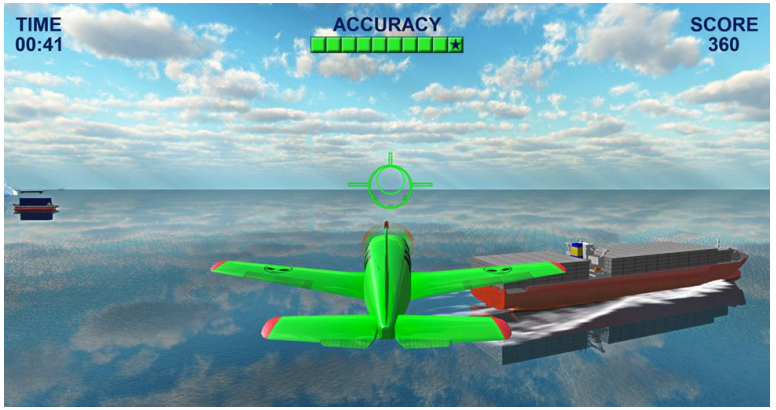




Inner Balance

CBT-Oriented Biofeedback Goals

- Increase insight and awareness of physiological variability and mind-body interactions
- Acquire Self-regulation skills
  - Reduce physiological arousal – promote and generalize relaxation skills
  - Practice mindfulness – learn to let go, or not try to force it
- Instill self-efficacy or internal locus of control
- Train new patterns of physiological response



Hypnosis

- Hypnotic suggestions
  - Selectively alter pain experience (intensity and unpleasantness)
  - Selectively alter cortical activity in areas related to pain experience (sensory cortices vs. ACC)
  - More effective after hypnotic induction
    - Focusing attention, increasing expectations, suggestion for use of imagination
  - More effective than no treatment or standard care
    - As effective or more effective than other treatments

STRATEGIES WITHIN THE MEDICAL OFFICE

Acknowledge Symptoms and Promote Coping

- Some empathy is good
  - Reflect the patients concerns
    - “Sounds like this has been really difficult for you.”
    - “Your pain is really interfering with school lately.”
- Switch to focus on functioning
  - “let’s work on developing a plan so you can get back to enjoying your life.”
  - “Sounds like you would like to be able to play tennis again. I would like to help you with that goal.”

Manage Reassurance-Seeking

- Excessive reassurance can increase symptoms
  - Have regular scheduled visits rather than frequent emergency calls/visits/hospitalization
  - Avoid un-necessary tests
  - Provide an explanation for symptoms
    - Negative test results rule out specific conditions and point us towards a functional problem rather than a structural problem
  - Recognize catastrophizing and somatization and help them reframe
    - Or refer for psychotherapy

Focus on Functioning

- Minimize your inquiries about pain
  - Instead inquire about functioning
- Help caregivers to reduce inquiries about pain
- Promote rehabilitation model
  - Functioning is not a direct result of pain level
  - Pain tends to get better after your functioning improves
  - If we wait until our pain gets better to function we usually only get worse
- Set functional goals
  - “After last session you were able to walk for 10 minutes each day. I recommend we increase that a little this week. How many minutes do you think we should set as your goal this week?”

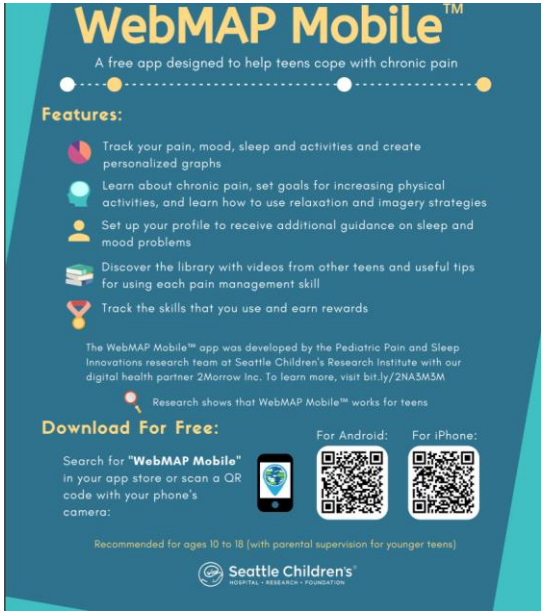
Promote Healthy Daily Routines

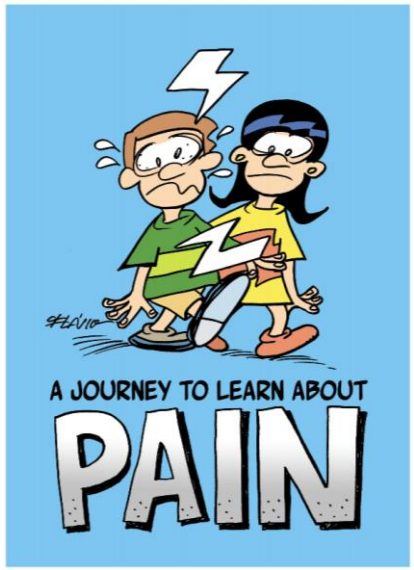
- Sleep hygiene
- Attendance at school/work
  - Extracurricular activities
- Regular physical activity
- Healthy meals/hydration

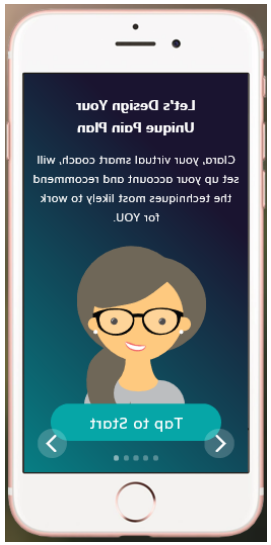
Provide Resources

- Pain Bytes
- Chronic Pain is Like...

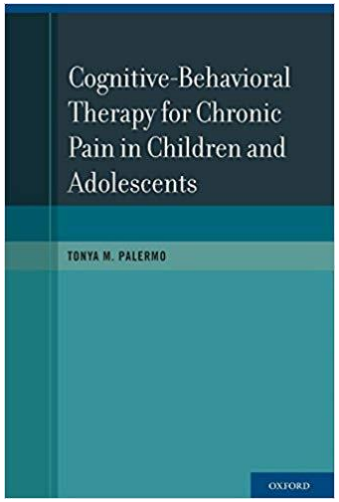
- Videos
  - Lorimer Moseley - Why Things Hurt
  - Understanding pain - and what's to be done about it - in 10 minutes

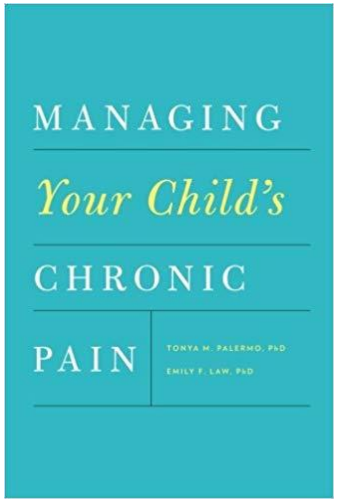






Curable





Refer for Multidisciplinary Treatment

Riley Pain Clinic
317-944-2353

- Anesthesia
  - James Tolley, MD – Medical Director
- Nursing
  - Marti Michel, DNP, CPNP
- Physical therapy
  - Sarah Johnson, DPT
- Psychology
  - Amy Williams, PHD – Clinical Director
  - Pediatric Pain Psychology Fellow

Consulting Teams

- Functional Neurosurgery
- Physical Medicine & Rehabilitation
- Addiction Psychiatry
- Neurology/Headache Clinic
- Social Work

How to Refer:

- Cerner "Pain Clinic Consult"

AND

- Fax referral to 317-944-2390

or

- Cerner message to "RPP Pain Clinical"

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