Management of Pediatric Chronic Pain: The Role of Pediatric Psychology

Ximena Celedon, Psy.D.

Kennedy Krieger Institute
Johns Hopkins Hospital
Discuss recent research and literature on pediatric chronic pain and functional disability

Discuss pain characteristics, profiles and outcomes

Operant / Behavioral conceptualization that may maintain chronic pain

Discuss biopsychosocial treatment model for chronic pain

Discuss pain management strategies and the role of a pediatric psychologist

Future directions
Pain that persist beyond 3 months and that does not remit with typical treatments for acute pain, such as rest, non-steroidal anti-inflammatory drugs, heat or ice, is considered chronic [1].

Chronic or recurrent pain
- Between 11% and 38% of children and adolescents [2, 3].

Severe chronic pain with high impairment
- 3% to 5% of children and adolescents
Pain Types

Pain types

- 60% to 30%
  - Headache
  - Abdominal pain
  - Limb pain
  - and back pain [6].

- Girls > Boys with prevalence rates increasing with age [2].
What if pain continues beyond what one would consider a typical trajectory of the original injury or trauma?
- Pain related hospital stay
  - 40%[7]
- Tertiary care
  - Nearly 30%
  - At least 4 physicians [8].

- Process of referrals and evaluations
  - extensive and costly [9].
  - will take, on average, 4 to 6 months; all the while, these patients have significant alterations in their quality of life and lifestyle [8].
Developmental health problem
Interfere significantly with daily functioning [2].
- quality of life,
- mood,
- sleep,
- relationships,
- academic performance,
- and social development
- may predispose the individual to the development of pain conditions later in life [10]
Term used in the pediatric pain literature to describe chronic pain conditions:

- Increased pain and disability resulting from a chronic pain condition
- with severe disruptions in functioning across domains
- lasting longer than 2 months*
- independent of etiology or location of pain

Based on biopsychosocial model: physical, social, behavioral, and emotional aspects of chronic pain
Across studies from the USA [13], Europe [5, 14] and Canada [15], approximately 3% of children and adolescents suffering from chronic pain demonstrate PADS.

30% will exhibit suffering, decreased school attendance, poor sleep, and limited participation in social and physical activities [28]
- Difficult to treat on an outpatient basis

Pain may be exacerbated through inappropriate treatment of self-medication [23].
Patterns develop:

- Fails to develop positive coping strategies
- Avoidance of stressful, effortful, or painful situations
- Increasing dependence on others
- Social withdrawal
- Avoidance of school and physical activity,
- Progression of functional disability

Numerous other variables contribute to a child’s pain-related disability:

- pain intensity,
- emotional factors (e.g., anxiety and depression),
- cognitive factors (e.g., pain catastrophizing, pain-related fear),
- behavioral factors (e.g., motivation, coping responses, self-management skills)
- social factors (e.g., context, parent response, peer influences).
- age,
- personality characteristics,
- ability to cope/mastery of coping skills (e.g., passive coping),
- activity level,
- low self-worth/ negative perception of self
- previous experiences with pain
Chronic pain and disability in the absence of an identifiable physical cause is most often attributed to psychological factors [12].

Psychological treatments are effective in reducing pain intensity and disability for children with chronic and recurrent pain [16].

Psychological distress has been identified as one of the risk factors for pain chronicity [25].

PADS develops when there is a physical trauma, illness or other life circumstance that becomes overwhelming to a vulnerable child who has poor coping skills and cannot regulate his or her emotions.
Family environment and parental distress.

Parental attention to pain is highly associated with more chronic disability. [23]
- Reinforcement of pain

Emphasis Sick role/Emphasis on medical
- Continual search for medical etiology, tests, and procedures [18]
Family Factors Impacting Patient Outcomes

- Poorer pain-related outcomes with patients:
  - Who have a parent or family member with current chronic pain [13].

- Parent coping style
  - Anxious parents tend to have anxious children
Downward spiral of increased disability and pain for which symptom-focused strategies did not lead to acceptable resolution

- Excused from normal activities and routines
- Reduced expectations and requirements for normative activities and responsibilities may be extended indefinitely.
- Thus, the physical symptoms may allow the child to avoid or escape the pain sensation, anticipation of pain or discomfort, and associated negative emotions.
Pain behavior influenced by:
- Social and environmental factors
- the actual tissue damage or irritation

Therefore, PB that first arose because of body damage or tissue irritation may come under control of consequences and conditioning that occur in the patient’s social environment.
Two general processes are involved in this type of operant conditioning:

1. **Positive reinforcement**
   - PB will increase, if followed by (+) Consequence
     - contingent social attention (attempts to comfort and console), efforts by others to soothe the pain, and providing contingent pain medication.

2. **Avoidance learning (negative reinforcement).**
   - PB Increases after the Bx enabled the patient to escape or avoid aversive stimulation
     - pain behaviors such as limping, bracing, or activity avoidance become associated with decreased or no pain sensation.
Anticipation of pain sensation functions as a conditioned aversive stimulus.

Therefore,

- $AP = PB = No/reduced pain = maintained in the future (neg. reinforcement)$

Avoidance learning requires little ongoing reinforcement to maintain it.
The goal of operant treatment is to:

- prompt and positively reinforce normative physical activity
- and arrange the environment such that the patient attempts typical physical activity with minimal self-protective pain behaviors,
- and does not experience pain or experiences it at much lower intensity [18].
Biopsychosocial Approach (3 P’s for Pain Management)

- Pharmacological
  - Address medication management, diagnostic testing, referrals to different specialists, as appropriate
  - Complementary and Alternative Medicine

- Physical
  - Assess de-conditioning and tolerance for activities of daily living
  - Range of motion, strength, flexibility and endurance

- Psychological
  - Psychological stress exacerbates physiological responses including pain
Goal is intervene and disrupt the downward spiral of increased dependence and social withdrawal
- Which leads to depression, anxiety, increased pain, decreased functioning/deconditioning

Goal is to have them participate more fully in daily activities and to develop coping skills that help them successfully return to school, home, and community life.

Identifying pain triggers, teaching coping techniques and assessing and targeting cognitive styles
Psychosocial Assessment
- Pain coping strategies
  - Substance abuse history
  - Cognitive flexibility
- Mind-Body Connect
  - Psychological stress exacerbates sensation
- Interpersonal and peer stress
- Family functioning
  - Marital stress and sibling conflict
  - Parent/child enmeshment
  - Parental response to pain
- Academic and school functioning
  - Amount of missed school (avoidance)
- Sleep dysregulation
- Mental Health
  - Symptoms of anxiety and depression, SI, SIB
- Sources of secondary gain
  - Trauma, negative life events, and school or activity avoidance
Studies into the effectiveness of inpatient treatment are rare, but thought to be optimal treatment regimen

- Maynard et al., (2009)
- Hechler et al., (2009, 2014)
- Palermo and Scher (2001)
- Sherry et al., (1999)
- Simons et al. (2013)
- Logan (2012)
- Hirschfeld (2013)
Rehabilitation Models

- Only six programs in the country to our knowledge:

1. Kennedy Krieger Institute, Baltimore, MD
2. Children’s Hospital of Philadelphia, Philadelphia, PA
3. Children’s Hospital Cleveland Clinic, Shaker Campus, Cleveland, OH
4. Children’s Institute, Pittsburgh, PA
5. Mayo Institute, Rochester, MN
   - Only treats patients in an outpatient setting
6. Children’s Hospital of Boston, Waltham, MA
   - Only treats patients with neuropathic pain and in an outpatient setting
• Characteristics:
  ▪ Severe suffering and extensive pain-related disability
  ▪ And/or exhausted all medical interventions and outpatients services to date (e.g., physical therapy, occupational therapy and cognitive behavioral therapy) and the child or adolescent is still not functioning at a developmentally appropriate level across most areas of daily living
Less costly than inpatient, but intensive enough to benefit many of those children who fail to progress with traditional outpatient treatments [30].

Intensive day treatment may be recommended:
- Exhausted medical interventions and outpatient services, to date
- Short-term intensive rehabilitation
- Post-inpatient rehabilitation pain admission
Chronic pain and associated physical, emotional, social, educational and functional deficits can be difficult to treat on an outpatient basis. Cannot simply treat one to the exclusion of the others [21].

Recommended when:
- further medical evaluations are warranted,
- when physical therapy or cognitive behavioral therapy services have not yet been initiated or attempted,
- and/or when the child or adolescent is engaging in a relatively high level of overall functioning (i.e., attending school, participating in some extracurricular activities, etc.).
Behavioral Interdisciplinary Pain Protocol

- Emphasizes recovery, pain coping, and shaping healthy functional behavior using both cognitive-behavioral and behavioral techniques

- Emphasis on breaking pain cycle and making functional gains

- Psycho-education on mind-body relationship
Behavioral Interdisciplinary Pain Protocol

Children and adolescents and their families are encouraged to

• Accept pain as a symptom that they can learn to manage.
• Children and their families are encouraged to shift their focus away from total elimination of pain and emphasize reinforcing more independent functioning in age-appropriate activities of daily living, academics, social and physical activities.
Pediatric Psychology Services

- Daily schedule
- Reinforcement program
- Teach, model, rehearse, and reinforce pain management strategies in session
- Psycho-education on mind-body relationship
- Assess patterns and triggers to the pain (antecedent management)
- Conduct functional analysis surrounding pain behaviors
- Assess cognitions surrounding pain
- Co-treatment with rehabilitation therapists
  - Coach, model, and prompt coping skills
- Individual CBT
- Parent training
- Sleep hygiene strategies
- Community and school re-entry planning
Little variability in their pain rating
- High ratings, despite showing positive affect during active participation in therapy and leisure activities.
PedIMMPACT Recommendations

Pediatric Initiative on Methods, Measurement and Pain Assessment in Clinical Trials

- Guidelines were established for assessment of core outcomes in clinical trials. These include:
  - Pain intensity
  - Global judgment of satisfaction with treatment
  - Symptoms and adverse events
  - Physical functioning
  - Emotional functioning
  - Role functioning
  - Sleep
  - Economic factors

McGrath et al., (2008)
PedIMMPACT
Structured Interview
- Child and Parent
- Primary for assessing historical and contextual variables contributing to pain

Daily Pain Diaries
- Prospective monitoring of recurrent pain symptoms
- Format varies – frequency vs. fixed intervals, ABC data

Standardized Measures
- Frequency, intensity, duration, bother associated with pain, and location of pain
  - Functional Disability Inventory (FDI)
  - Numeric Rating Scale (NRS)

Behavioral Observations
- Role of attentional and emotional variables that may influence child’s experience and ability to cope with pain
Cognitive Behavioral Therapy (CBT)

- Identification of cognitive processes that underlie maladaptive behaviors or negative emotions
- Assessment of beliefs (schemas), feelings, experiences, and ideas about behavior
- Aim is to learn how thoughts, feelings, and subsequent behaviors interact
Child Pain Coping Skills
- Stress identification and management
- Diaphragmatic breathing
- Relaxation training (PMR)
- Guided imagery
- Active Distraction
- Biofeedback
- Journaling
- Activity pacing
- Utilization of time-limited, planned breaks
- Time management
- Assertiveness skills

Parent training
- Reinforce healthy and functional behavior
- Reinforce return to school and other activities
- Neutrally acknowledge pain behavior and then redirect to functional activity
- Avoid “doctor shopping” or modeling sick role
Treat not only pain symptoms but also modifying behavioral and psychological variables that have previously served to maintain chronic pain and disability.

Ideal for implementing systematic behavioral intervention to shape functional behavior and reinforce its generalization across settings and situations.
Prospective randomized controlled clinical trials involving multiple centers utilizing the same protocol

Prospective studies that focus on long-term maintenance of gains

Studies that examine the cost-benefit ratio for chronic pain

Studies that look at individual difference in response to treatment

Movement in getting patients with chronic pain more readily admitted to inpatient rehabilitation centers
References


Questions?
Utilize alternative ways of thinking and responding to previous behaviors

Techniques include:

- Thought stopping
- Cognitive restructuring of distorted thoughts
- Reframing (change of perspective)
- Target negative and catastrophizing thoughts and replace them with encouraging Positive Self-Statements
  - “be brave” “hang in there” “you can do it”
- Acceptance and Mindfulness
Catastrophizing and Pain

- Tendency to magnify negative experiences, expectations about the future, and worry about negative events.

- Associated with reduced ability to cope with pain, increased focus on pain, report of more intense and disabling pain.

- In adults, associated with worse pain outcomes in several populations, controlling for effects of depression (Haythornthwaite et al., 2003; Edwards et al., 2006).
Parent training
- Acceptance of rehabilitation approach
- Reinforce healthy and functional behavior
  - Eliminating status checks
  - Guidance regarding interacting with their child
  - Recognizing the child, not the medical condition
- Reinforce return to school and other activities
- Neutrally acknowledge pain behavior and then redirect to functional activity
- Avoid “doctor shopping” or modeling sick role
Pain, functional disability, and coping measures

- Bath Adolescent Pain Questionnaire (BAPQ)
- Functional Disability Inventory (FDI)
- Pain Catastrophizing Scale for Children (PCS-C)
- Brief COPE Inventory
- Children’s Depression Inventory (CDI)
- Revised Childrens Manifest Anxiety Scale (RCMAS-2)
Interdisciplinary Behavioral Rehabilitation of Pediatric Pain-Associated Disability: Retrospective Review of an Inpatient Treatment Protocol

Cynthia S. Maynard, PsyD, Adrianna Amari, PsyD, Beth Wieczorek, RN CRNP, James R. Christensen, MD, and Keith J. Silber, PsyD

The Kennedy Krieger Institute and Johns Hopkins University School of Medicine

Objective. A biopsychosocial model was used to treat pain-associated disability in children and adolescents. We assessed the clinical outcomes of children and adolescents (8–21 years of age) with pain-associated disability who were treated in an interdisciplinary inpatient rehabilitation program which included physical, occupational, and recreational therapy, medicine, nursing, pediatric psychology, neuropsychology, psychiatry, social work, and education. Psychological treatment emphasized cognitive-behavioral intervention for pain and anxiety management, and behavioral shaping to increase functioning. Methods. We conducted a retrospective chart review of 41 consecutive patients. School attendance, sleep, and medication usage were assessed at admission and discharge; functional disability and physical mobility were assessed at admission, discharge, and 3-month follow-up. Results. As a group, significant improvements were observed in school status, sleep, functional ability, physical mobility, and medication usage. Conclusion. Findings support the efficacy of an inpatient interdisciplinary behavioral rehabilitation approach to the treatment of pain-associated disability in pediatric patients.

Key words. pediatric; chronic pain; functional disability; interdisciplinary rehabilitation; pain-associated disability.

Introduction

Epidemiological studies have determined that more than 30% of children and adolescents experience chronic or recurrent pain significant enough to cause suffering, school avoidance, limited participation in social activities, and disruption of sleep and appetite (Paley, 2000; Perquin et al., 2000). Some of these individuals are very difficult to treat and develop chronic functional disability. In many medical settings, chronic or recurrent pain and disability in the absence of an identified physical cause is attributed to psychological factors. Interventions that are based on psychological conceptualizations are often poorly received by families and typically do not lead to significant improvement. Families often seek the opinions of numerous healthcare providers in search of medical etiology and treatment of pain. As a result, specialists in the field of chronic pain treatment and research have adopted a biopsychosocial conceptualization of chronic pain. This has called for a conceptual shift away from attempting to differentiate physical from mental pain and acknowledges the multidimensional nature of pain in which biological, psychological, social, and environmental variables interact in the development, maintenance, and subjective experience of pain and disability (Bursch, Joseph & Zeltzer, 2003; Zeltzer, Bursch, & Walco, 1998; Zeltzer, Tsao, Bursch, & Myers, 2006). The biopsychosocial model has been recommended with patients who meet the criteria for Pain-Associated Disability Syndrome (PADS). Severe disability that continues for two months or greater has been adopted as one of the criteria used to define PADS (Bursch et al., 2003). PADS has been used to describe a chronic pain condition with frequent and severe difficulties in functioning, regardless of the location or cause of the pain (Bursch, Walco, & Zeltzer, 1998).
PADS - Retrospective Data Review

- 41 patients

- Demographics

- Clinical Outcomes
  - School attendance, sleep, medication usage, and pain assessed at admission and discharge
  - Functional disability and physical mobility assessed at admission, discharge, and 3-month f/u

- Significant improvements found in school status, sleep, functional ability, physical mobility and medication usage
Future Directions

- Prospective randomized controlled clinical trials involving multiple centers utilizing the same protocol
- Studies that incorporate PedIMMPACT core outcome domains
- Prospective studies that focus on long-term maintenance of gains
- Studies that examine the cost-benefit ratio for chronic pain
- Studies that look at individual difference in response to treatment
- Movement in getting patients with chronic pain more readily admitted to inpatient rehabilitation centers
References

Questions?