Creating a Pediatric Chronic Pain Service: When the Impossible Becomes a Reality

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Conflict of Interest Disclosure

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- L. Brown No Conflict of Interest

The Long Haul
Chronic pain is a journey and a patient's successful journey depends on many factors.
Components of Pain-A Review

- Nociception
  - Sensation of pain
- Perception of pain
  - Triggered by a noxious stimulus
- Suffering
  - Negative response induced by pain, fear, anxiety, stress and other psychological states
- Pain behaviors
  - Results from pain and suffering and are things a person does or does not do that can be ascribed to the presence of tissue damage
  - Disruption of normal function, disability

Chronic Pain in Children

- Pain that lasts at least 3-6 months (contrast chronic from recurrent)
- Must be viewed within developmental, ecobiopsychosocial domains
- Present in 15-30% of all children at some point
- Objective signs may be absent, in contrast to acute pain

Identifiable Causes of Chronic Pain in Children

- Cancer
- Sickle cell disease
- HIV pancreatitis, tumor-related, neuropathies
- Cystic fibrosis
- Cerebral palsy
- Metabolic disorders
- Autoimmune disorders
Idiopathic Chronic Pain in Children

- Headaches, Migraine
- Recurrent Abdominal Pain (RAP)
- Musculoskeletal- back, neck, limb
- Primary Juvenile Fibromyalgia
- Neuropathic, CRPS

Classification

- Acute pain serves as a protective mechanism against impending tissue injury or death
- Chronic pain in contrast serves no such physiologic role and is itself not a symptom, but a disease state.

Acute vs. Chronic Pain

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Acute Pain</th>
<th>Chronic Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td>Generally known</td>
<td>Often unknown</td>
</tr>
<tr>
<td>Duration of pain</td>
<td>Short, well-characterized</td>
<td>Persists after healing, ≥3 months</td>
</tr>
<tr>
<td>Treatment approach</td>
<td>Resolution of underlying cause, usually self-limited</td>
<td>Underlying cause and pain disorder; outcome is often pain control, not cure</td>
</tr>
</tbody>
</table>
Nociceptive Pain

- **Nociceptive pain** is the perception of nociceptive input described in terms of tissue damage (i.e., postoperative pain)
  - **Somatic pain** - arises from damage to body tissues, well localized
  - **Visceral pain** - arises from the viscera mediated by stretch receptors. It is poorly localized, deep, dull, and cramping

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**Neuropathic Pain is Different from Muscle/skeletal Pain**

<table>
<thead>
<tr>
<th>Neuropathic Pain</th>
<th>Muscle/Skeletal Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic pain (months/years)</td>
<td>Acute pain (hours or days)</td>
</tr>
<tr>
<td>Caused by injury or disease to nerves</td>
<td>Caused by injury or inflammation that affects both the muscles and joints</td>
</tr>
<tr>
<td>Mild to excruciating pain that can last indefinitely</td>
<td>Moderate to severe pain that disappears when the injury heals</td>
</tr>
<tr>
<td>Causes extreme sensitivity to touch – simply wearing light clothing is painful</td>
<td>Causes sore, achy muscles</td>
</tr>
<tr>
<td>Sufferers can become depressed or socially withdrawn because they see no relief in sight and may experience sleep problems</td>
<td>Sufferers can become anxious and distressed but optimistic about relief from pain</td>
</tr>
</tbody>
</table>

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**Features of Neuropathic Pain**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>DESCRIPTORS</th>
<th>EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady, Dysesthetic</td>
<td>Burning, Tingling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Constant, Aching</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Squeezing, Itching</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Alldynia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hyperesthesia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Diabetic neuropathy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Post-herpetic neuropathy</td>
<td></td>
</tr>
<tr>
<td>Paroxysmal, Neuralgic</td>
<td>Stabbing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Shock like, electric</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Shooting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lancinating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Trigeminal neuralgia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• May be a component of any neuropathic pain</td>
<td></td>
</tr>
</tbody>
</table>
Physiology of Pain Perception

- Transduction
- Transmission
- Modulation
- Perception
- Interpretation
- Behavior

Injury

Descending Pathway

Peripheral Nerve

Dorsal Root

Ganglion

C-Fiber

A-beta Fiber

A-delta Fiber

Ascending Pathways

Dorsal Horn

Spinal Cord

Changes in Central Nervous System

- Central sensitization – formation of spontaneous impulses with lowered thresholds
- Wind-up -- ↑ in magnitude of response to C fiber activity by dorsal horn neurons
- Long-term potentiation – cellular “memory” for pain may lead to ↑ responses to nociceptor stimuli
- Facilitation -- ↓ impulse threshold and ↑ intensity of response
- Neuronal sprouting -- ↑ nerve endings into adjacent layers of the dorsal horn

Nociceptive vs. Neuropathic Pain

<table>
<thead>
<tr>
<th>Nociceptive Pain</th>
<th>Mixed Type (Caused by a combination of both primary injury and secondary effects)</th>
<th>Neuropathic Pain (Initiated or caused by primary lesion or dysfunction in the nervous system)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postoperative pain</td>
<td>Activi.s</td>
<td>Post herpetic neuralgia</td>
</tr>
<tr>
<td>Mechanical low back pain</td>
<td>Sickle cell crisis</td>
<td>Neuropathic low back pain</td>
</tr>
<tr>
<td>Sports/exercise injuries</td>
<td></td>
<td>Distal polyneuropathy</td>
</tr>
</tbody>
</table>

Adapted with permission from WebMD Scientific American® Medicine.
Symptoms of Neuropathic Pain Characterized Differently

**Neuropathic Pain**
- Stabbing
- Burning
- Electric-shock-like
- Tingling

**Muscle/Skeletal Pain**
- Faintness
- Aching
- Stiffness
- Pain

What are the symptoms?
- Frequently results in a burning, tingling and shock-like sensation
- Experience of pain to things that are often non-painful, such as to bed sheets or socks
- Pain can persist even after the cause has been removed
- Abnormal sensations that are described as "pins and needles"
- The symptoms can be mild to incapacitating and are often progressive
- Symptoms often worse at night

Idiopathic CS Syndromes "Family"
- Fibromyalgia syndromes (FMS)
- Chronic headaches
- Irritable bowel syndrome (IBS)
- Chronic fatigue syndromes (CFS)
- Orthostatic Intolerance (OI)
- Myofascial pain syndromes (MPS)
- Posttraumatic stress disorder (PTSD)
- Depression
- Neuropathic, central pain
- Noncardiac chest pain
- Restless legs syndromes (RLS)
- Periodic limb movement disorder (PLMD)
- Temporomandibular disorder (TMD)
- Multiple chemical sensitivity (MC3)
- Female urethral syndromes (FUS)
- Interstitial cystitis
- Primary dysmenorrhea (PD), pelvic pain, vulvodynia
- Daniel Lacey, MD
CSS Symptoms That Overlap

Neurology sees chronic headache; Gastroenterology sees IBS; the dentist sees TMD; Cardiology sees chest pain/syncope; Rheumatology sees fibromyalgia; Gynecology sees pelvic pain; etc.....

Domains of Chronic Pain-The Goals of a Chronic Pain Service

Quality of Life
- Physical functioning
- Ability to perform activities of daily living
- Work
- Recreation

Psychological Morbidity
- Depression
- Anxiety, anger
- Sleep disturbances
- Loss of self-esteem

Social Consequences
- Marital/family relations
- Intimacy/sexual activity
- Social isolation

Socioeconomic Consequences
- Healthcare costs
- Disability
- Lost workdays

Redefining Success in Chronic Pain

The Establishment of a Chronic Pain Service
### Chronic Pain Service Process

- Evaluate numbers of referrals
- Identify rationale
- Establish resources that are required
- Confirm resources that are available

- Identify Operational Details
- Establish referral process for inpatient service
- Engage Administrative support

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### Chronic Pain Service Process

- Organize Chronic Pain Team Meeting
- Confirm Commitment of Members
- Maximize Use of Electronic Medical Record Technology

- Construct List of Community Resources
- Identify appropriate Patient/Family Educational Tools and Create new Tools as needed

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### Chronic Pain Service Process

- Schedule Regular Meetings of the Chronic Pain Team
- Review EMR Data and Establish Continual Quality Improvement of Service

- Goals for the Future-
  - Continued funding of Complementary Therapy
  - Establishment of a Support Group or Social Media Support Site
Treatment Goals for Chronic Pain

- Minimize physical pain and discomfort
- Alleviate anxiety
- Prevent potentially deleterious physiologic responses due to pain
- PREVENT PADS!!!!!

DOMAINS OF ASSESSMENT

- PAIN & PAIN HISTORY
- OTHER PHYSICAL SYMPTOMS
- PHYSICAL FUNCTIONING
- SOCIAL FUNCTIONING
- ACADEMIC FUNCTIONING
- FAMILY FUNCTIONING

DOMAINS OF ASSESSMENT

- EMOTIONAL & COGNITIVE FUNCTIONING
- COPING STYLE & PROBLEM-SOLVING CAPACITY
- PERCEIVED STRESSORS
- MAJOR LIFE EVENTS
- PAIN CONSEQUENCES
“MEDICALIZATION”
THE CONTINUED SEARCH FOR
THE “CAUSE”

- Adds psychological stress (can contribute to development of PTSD)
- Painful procedures contribute to more sensitivity in the neural pain signals
- The more tests that come out “negative,” the more likely children feel that no one believes them

TREATMENT MODALITIES

- EDUCATION
- PHARMACOLOGICAL
- PHYSICAL
- BEHAVIORAL
- PSYCHOLOGICAL
- COMPLEMENTARY THERAPIES

EDUCATION

- Reassurance: pain is real and biological
- Reason for pain: dysregulation in pain neural signaling system
- Reason for failure of medical tests: looking in the wrong places
- Avoid mind-body split
- Review how other factors influence pain: anxiety, depression, beliefs, attention, memory; hyper vigilance, catastrophizing
PHYSICAL THERAPY

- Especially for patients who have
  - chronic musculoskeletal pain
  - complex regional pain syndrome
  - become deconditioned due to inactivity
- Requires specific expertise by PT
- Exercise has specific benefits related to muscle strengthening/ functioning & posture, and generalized benefits related to improved body image, body mechanics, somatic self-efficacy, sleep, and mood

PSYCHOLOGICAL INTERVENTIONS

- Cognitive-Behavioral Therapy (CBT)
- Social Skills Training
- Psychotherapy: child or family or both
- Academic interventions
- Treatment aimed at PTSD or unresolved grief or trauma

FAMILY THERAPY

- To observe and alter family contributors to pain perception
- To participate in development & implementation of behavioral plan (e.g. how to get child to go to school)
- To address family stress & problems
- To improve family communication
- To provide support & improve family coping
**CAM and OTHER PAIN TREATMENTS**

- Acupuncture
- Distraction
- Muscle Relaxation/Breathing
- Meditation
- Hypnotherapy
- Iyengar Yoga
- Biofeedback
- Massage Therapy
- Art Therapy

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**PAIN-ASSOCIATED DISABILITY SYNDROME “PADS”**

DOWNWARD SPIRAL OF INCREASING SYMPTOMS AND DISABILITY

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Pain-Associated Disability Syndrome (PADS)

- Described in 1998 as “a spiral of increasing pain-related disruption of function” in children
- Seen in all types of pediatric chronic pain disorders, head, visceral, musculoskeletal, etc.
- Preventing or addressing this should be the primary goal of the chronic pediatric pain service


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**PADS Prevention**

- Must assess **functional** limitations at home, school, etc., not just focus on pain as the only dimension
- Sole treatment focus on medications often does not result in **functional** restoration
- Best treatment program is multimodal with emphasis on non-medical therapies, including cognitive behavioral
- **Functional** improvement always precedes pain reduction!!

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**Stories that Inspire**

- What are your experiences with patients and chronic long term pain?
- Innovative Treatment Plans and Processes
- Success Stories

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**References**

- In addition to those listed throughout the slide presentation-
Questions

- Lucinda Brown MSN, RN, CNS
- Dayton Children's Hospital
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Thank you!