



Welcome to our Webinar Presentation

**An Introduction to Pediatric Pain
Assessment and Management**
Thursday, May 5th at 9:00am-11:00am

We will begin the presentation at 9:00am.
 Remember to check your volume levels for your speakers or headset.
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renison@ohsu.edu with your best phone number to call you, and she will call
 you back right away.

An Introduction to Pediatric Pain Assessment and Management

Helen N. Turner, DNP, RN-BC, PCNS-BC
 Clinical Nurse Specialist
 Pediatric Pain Management Center, Doernbecher Children's Hospital
 Anesthesiology and Perioperative Medicine, OHSU
 Portland, OR
turnerh@ohsu.edu

WHO ARE THE CHILDREN WE CARE FOR?



A Little History


- 1970's—only half of children treated post-operatively with analgesics.
- 1980's—only half of the doses of analgesics compared to adults with same operation
- 1990's—doing better with surgical but not medical pain and certainly not chronic pain.
- **Even Now**—Up to 40% of providers believe newborns don't experience pain.

What are the Barriers?

Patient/Family

Providers

Healthcare system



Barriers

- Attitudes/Beliefs
 - Life experiences
 - Culture/socialization
 - Fear, anxiety
 - Genetics--"hardware"
 - Previous treatment experience

Barriers

- Patient
 - Afraid treatment may be worse than pain
 - Don't want to upset parents
 - Telling a stranger about the pain
 - Anti-drug programs

Barriers

- Family
 - Measuring the pain
 - Afraid of "strong medicines"
 - Concerns about drug addiction
 - Need to be "good patient/family"

Barriers

- Provider
 - Personal bias/experience
 - Lack of knowledge
 - Concerns about agency monitoring
 - ✓DEA, Professional Boards

Barriers

- Healthcare system
 - Entrenched practices
 - ✓Personal and institutional
 - Lack of shared language
 - Multidisciplinary
 - ✓Different causes, different treatments
 - Cultural and political climate

Factors Affecting Pain Perception & Expression

- Sex
- Age
- Cognitive level
- Arousal/anxiety
- Cultural norms
- Expectations
- Consequences
- Exposure to others' pain
- Past pain experience
- Relevance of pain
- Attentional focus
- Perception of control
- Coping ability and style

Types of Pain

- Acute
- Incident/procedural
- "Chronic acute"
- Chronic nonmalignant
- Cancer
- End of Life



Chronic Pain Syndromes in Pediatrics

- Headaches
- Chronic Abdominal pain
- Myofascial Pain
- Neuropathic Pain
 - Complex Regional Pain Syndrome (RSD/RND)
 - Chemotherapy related neuropathies
- Chronic Pain Related to Medical Conditions
- Other

Incident/Procedural Pain

- Procedural pain - Immunizations, blood sampling, LP's etc.



Mechanisms of Pain

- Nociceptive
 - Somatic
 - Visceral
- Neuropathic

Effects of Poor Pain Control

- Hyperexcitability also called central sensitization
- Hyperalgesia and allodynia
- Neuro remodeling especially in infants
- Chronic pain

Effects of Poor Pain Control

- Agitation
- Depression/anxiety
- Loss of appetite—weight loss

Effects of Poor Pain Control

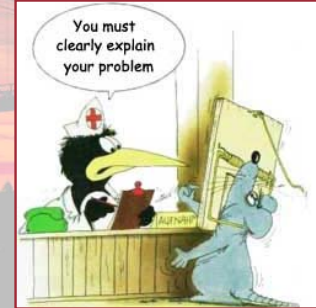
- Sleep disturbance
- Decreased quality of life
- Interruption in family life

Pain Across Childhood

- Premature Infant
- Infant
- Toddler/Preschooler
- School Age
- Adolescent



Assessment



Premature Infant/Neonate

- Motor
 - Restless, rigidity or flaccidity, ↓ or ↑ sleep, limb withdrawal, thrashing
- Communication
 - +/- crying, grunting
- Facial expression
 - Eyes squeezed shut, brow bulge, nasolabial furrow
- Other behaviors
 - Open lips, ↑ HR, ↓ Sats
- Pain Scale - N-PASS



N-PASS

Assessment Criteria	N-PASS: Neonatal Pain, Agitation, & Sedation Scale				
	-2	-1	0	1	2
Crying Irritability	No cry with painful stimuli	Moans or cries minimally with painful stimuli	Appropriate crying Not irritable	Irritable or cries at intervals Consolable	High-pitched or silent/continuous cry Inconsolable
Behavior State	No arousal to any stimuli No spontaneous movement	Arouses minimally to stimuli Little spontaneous movement	Appropriate for gestational age	Restless, squirming Awakens frequently	Arching, kicking Consistently awake or Arouses minimally / no movement (not included)
Facial Expression	Mouth is lax No expression	Minimal expression with stimuli	Balanced Appropriate	Any pain expression interpreted	Any pain expression interpreted
Extremities Tone	No grasp reflex Flaccid tone	Weak grasp reflex ± muscle tone	Balanced hands and feet Normal tone	Intermittent clenched toes, fists or finger spiky Body is not tense	Continual clenched toes, fists, or finger spiky Body is tense
Vital Signs HR, RR, SpO₂	No variability with stimuli regimentation or apnea	± 20% variability from baseline	Within baseline or normal for gestational age	↑ 20-20% from baseline SpO ₂ ↓ 70-80% with stimulation - quick T	↑ 20% from baseline SpO ₂ ↓ 75% with stimulation - slow T Out of sync with vent

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Preterm Pain Assessment → + 3 if > 28 weeks gestation / corrected age
→ + 2 if 28-33 weeks gestation / corrected age
→ + 1 if 32-38 weeks gestation / corrected age

Infant

- Motor
 - Restless, rigidity, arching, ↓ or ↑ sleep
 - Increased frantic activity
- Communication
 - Intense crying, grunting
- Facial expression
 - Grimacing, brows lowered and drawn together
- Other behaviors
 - Loss of appetite, inconsolable, hypersensitive
- Pain Scale - FLACC



Toddler

- Motor
 - Clingy, restless, irritable
- Communication
 - Loud fearful cry
- Facial expression
 - Furrowed brow, tense
- Other behaviors
 - Regression, ↑ or ↓ sleep
- Pain Scale - FLACC, FPSR



Preschooler/Early School-age

- **Motor**
 - Clingy, restless, irritable, aggressive
- **Communication**
 - Verbal aggressiveness, loud fearful cry
- **Facial expression**
 - Furrowed brow, tense
- **Other behaviors**
 - Regression, ↑ or ↓ sleep
- **Pain Scale - FLACC, FPSR**



FLACC


F ace	0 No particular expression or smile.	1 Occasional grimace or frown, withdrawn disinterested.	2 Frequent to constant frown, clenched jaw, quivering chin.
L egs	0 Normal position or relaxed.	1 Uneasy, restless, tense.	2 Kicking, or legs drawn up.
A ctivity	0 Lying quietly, normal position, moves easily.	1 Squirming, shifting back and forth, tense.	2 Arched, rigid, or jerking.
C ry	0 No cry (awake or asleep).	1 Moans or whimpers; occasional complaint.	2 Cries steadily, screams, sobs, frequent complaints.
C onsolability	0 Content, relaxed.	1 Reassured by occasional touching, hugging or talking to; distractible.	2 Difficult to console or comfort.

FLACCr

F ace	0 No particular expression or smile.	1 Occasional grimace or frown, withdrawn disinterested.	2 Frequent to constant frown, clenched jaw, quivering chin.	Individualized behavior
L egs	0 Normal position or relaxed.	1 Uneasy, restless, tense.	2 Kicking, or legs drawn up.	Individualized behavior
A ctivity	0 Lying quietly, normal position, moves easily.	1 Squirming, shifting back and forth, tense.	2 Arched, rigid, or jerking.	Individualized behavior
C ry	0 No cry (awake or asleep).	1 Moans or whimpers; occasional complaint.	2 Cries steadily, screams, sobs, frequent complaints.	Individualized behavior
C onsolability	0 Content, relaxed.	1 Reassured by occasional touching, hugging or talking to; distractible.	2 Difficult to console or comfort.	Individualized behavior


School Age

- **Motor**
 - Irritable, resist movement, localize pain
- **Communication**
 - Verbalizes pain, objective measurements
- **Facial expression**
 - May appear sad, tense
- **Other behaviors**
 - ↑ or ↓ sleep, nightmares
- **Pain Scale - FPSR, Numeric Scale**



Faces Pain Scale Revised

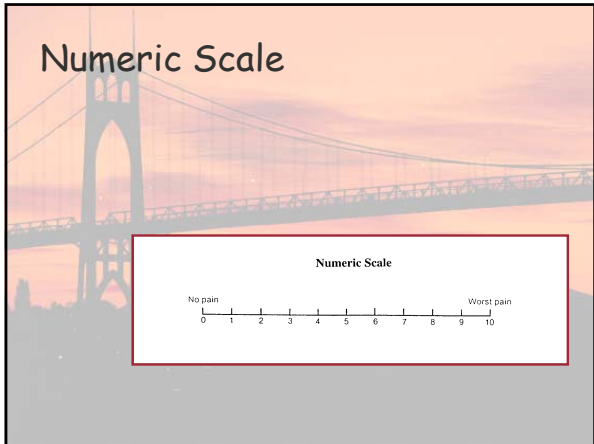
- **No tears, no happy face**



Adolescent

- **Motor**
 - ↑ muscle tension, flinches
- **Communication**
 - Very specific about pain qualities, may deny in front of peers
- **Facial expression**
 - Frown, grimace, may avoid eye contact
- **Other behaviors**
 - difficulty sleeping, anger, sadness
- **Pain Scale - Numeric scale**





- ### Challenges
- Motor Impairment
 - Cognitive Impairment
 - Language Difficulties
 - Chronic Pain

- ### Challenges
- Pain "Behavior"
 - Learning without awareness
 - Often reinforced albeit unintentionally
 - Don't medicate behavior

- ### Finding Help
- Clinical Resources
 - Refer to regional center
 - Refer to local services
 - Accessing Limited Resources
 - Few experienced providers
 - Expensive medications
 - Restricted services
 - ✓PT
 - ✓Psychology


- ### Interdisciplinary Approach
- Doernbecher Pediatric Pain Management Clinic—one afternoon a week
 - Physicians
 - Nurses
 - Psychologists
 - Physical Therapists

- ### Terminology
- Words ARE important!!!
 - What we say
 - How we say it

➤ Just say no to "Narcotic"

- Legal term
- No such drug class
- Pejorative
- Socially loaded
- Stigmatizing

Narcotic



Definitions

➤ Dependence

- Normal physiologic response
- State of adaptation that is manifested by a drug-class-specific withdrawal syndrome that can be produced by abrupt cessation, rapid dose reduction, decreasing blood level of the drug, and/or administration of an antagonist.

AAPM, APS, ASAM, 2001

- Management:

- ✓ Taper off medication. Do not abruptly stop

Definitions

➤ Tolerance

- Biologic adaptation
- May develop at different rates
- Exposure to drug induces changes that result in diminution of one or more of the drug's effects over time

AAPM, APS, ASAM, 2001

- This is NOT addiction
- Management:
 - ✓ Increased doses
 - ✓ Opioid rotation

Definitions

➤ Withdrawal

- Characteristic withdrawal syndrome for the substance
- Drug class specific

- Management:

- ✓ Appropriate weaning

Definitions

➤ Pseudoaddiction

- An iatrogenic misinterpretation caused by under treatment of pain that is misidentified by the clinician as inappropriate drug-seeking behavior
- Behavior ceases when adequate pain relief is provided - NOT addiction!
- Not a diagnosis, rather a description of a clinical interaction

Weissman & Haddock, 1989

Definitions

➤ Addiction

- A primary, chronic, neurobiologic disease with genetic, psychosocial and environmental factors.
- One or more of characteristic features
 - ✓ Impaired control over drug use
 - ✓ Compulsive use
 - ✓ Continued use despite harm
 - ✓ Craving

AAPM, APS, ASAM, 2001

Management Options

- Pharmacological
- Nonpharmacological
- Multimodal

By the Child



- Individualize to the child based on their level of pain, prior experience with opioids, and desired activity level
- Frequently assess pain level and adjust as necessary
- In pain crisis - rapid titration to comfort is imperative
- Goal is to stay ahead of pain as opposed to 'chasing' it



Non-Opioids

- First line
 - NSAIDS
 - acetaminophen
 - topical agents
- Second line
 - anticonvulsants
 - tricyclic antidepressants
- Third line
 - sedatives
 - anesthetic agents

Topical Anesthetics

- Buffered lidocaine
- EMLA[®] /Ela-Max[®]
- Lidoderm patches[®]
- Lidocaine iontophoresis
- Heat assist lidocaine

Topical Analgesics

- Bacteriostatic saline—benzyl alcohol
- Coolants/Ice
- Heat packs
- Capsaicin creams
- NSAIDs creams
- Compounded creams

Ibuprofen

- Advil[®], Motrin[®]
- Dose: 5 - 10 mg/kg Q6H
 - 24hr max 40mg/kg or 2400mg
- Preparations: suspension, tablets
- OTC and Rx

Ketorolac

- Toradol®
- Dose: 0.5 mg/kg (30mg max) IV Q6H
- PO Dose: 10 mg Q6H
- No more than 120 mg/day IV, 40 mg/day PO
- 5 days treatment maximum (IV & PO)

Acetaminophen

- Indications: mild - moderate pain
- Side effects: hepatotoxicity
- PO: 10 - 20 mg/kg Q4-6H
- PR: Initial dose PR should be 40mg/kg
 - Subsequent doses 20mg/kg Q6-8H
- Route: PO, PR, IV
- Often given in combination with opioid

Acetaminophen

- Watch the 24 hour limits
 - ✓ Kids 90-100mg/kg
 - ✓ Infants 80-90mg/kg
 - ✓ Neonates 60-75mg/kg
 - ✓ Preterms 45mg/kg
- OR**
- ✓ 75mg/kg/24 hours for ages 2-12 and <50 kg
 - ✓ 4000mg/24 hours for >50 kg

Additional Considerations

- Opioid use is often less when acetaminophen (or NSAID) is given concurrently
- Metabolized by the liver
- Can be given with NSAIDs and given at the same time—alternating works best for fever management NOT analgesia

Opioids

- Indications: moderate - severe pain
- Route: PO, PR, IV, transdermal, inhaled, SubQ, epidural, intrathecal
- No ceiling effect on analgesia
- Side effects: nausea, itching, urinary retention, respiratory depression, metabolite toxicity

Morphine

- Most commonly used opioid
- Dose:
 - 0.05 - 0.10 mg/kg (3 - 5 mg) IV Q2H
 - 0.3mg/kg PO Q3-4H
- Individual variation in requirements
- PO forms also available/immediate and sustained release

Hydromorphone

- Dilaudid®
- Dose:
 - 0.015 - 0.03 mg/kg (0.5 - 2 mg) IV Q2H
 - 0.02-0.1 mg/kg PO Q3-4 H
- 7 times more concentrated than morphine
- Also available in sustained release oral and PR

Fentanyl

- A semi-synthetic opioid
- Moderate-high potency
- Available IV/transdermal/transmucosal
- Short half life (if not given continuously)
- Dose: 0.5-2mcg/kg IV Q1H
 - 12, 25, 50, 75, 100 mcg/hour patches
 - 200, 400, 600, 800, 1200, 1600 mcg/lozenges

Methadone

- Dolophine® /Methadose®
- Long half life
- Delay to steady state
- 0.05-0.1 mg IV/PO Q4-24H
- Clinically challenging to use
- Lower doses if patient has been on high doses of other opioids

Hydrocodone

- Lortab® /Vicodin® /Norco®
- Moderate potency
- Always in combination
 - typically with APAP 325 or 500mg
- PO Only
- Dose: 0.05-0.15 mg/kg Q4H of hydrocodone (watch the acetaminophen!)
 - Elixir: 7.5mg hydrocodone & 500mg APAP/15ml
 - Dose: 0.2ml/kg**

Oxycodone

- Percocet® /OxyCONTIN®
- Moderate potency
- PO Only
- Dose: 0.1 - 0.2 mg/kg PO
 - often given with acetaminophen
 - suspension and tablets

Codeine

- Tylenol #3®
- Weak analgesic
- PO Only
- Dose: 0.5 - 1.0 mg/kg PO q4h
 - often given with acetaminophen
 - suspension and tablets
- Constipation, nausea/vomiting common

Meperidine

- Demerol®
- Normeperidine metabolite causes CNS irritability
- Direct cardiac depressant
- Marked variability in IM absorption
- Restricted formulary use

Opioid Rotation

- Used when titration of opioid is ineffective or causing intolerable side-effects
- No clear guidelines for when to rotate due to ineffective pain control
- Cross-tolerance between opioids not always complete
 - Use equianalgesic conversion, decrease dose by 25%

Side Effect Management

- Nausea
- Itching
- Urinary retention
- Constipation
- Respiratory depression
- Metabolite toxicity

Nonpharmacological Options

- Used in isolation or combination with pharmacological options
- Can minimize need for medications
- Have fewer side effects

Nonpharmacological Options

- Give patient a sense of control
- Give family sense of involvement
- Use very little time and resources

Nonpharmacological

- Infants
 - 24% oral sucrose
 - Positioning—midline, hand to mouth, proper flexion, side lying; facilitated tucking for heel sticks
 - Containment--swaddling
 - Kangaroo Care
 - Nonnutritive Sucking


Nonpharmacological

- Distraction



Nonpharmacological

- Guided Imagery/Hypnosis/Virtual Reality
 - Imagery has the ability to directly influence the autonomic nervous system



Nonpharmacological

- Biofeedback



Nonpharmacological

- Acupuncture



Nonpharmacological

- Relaxation



Multimodal Therapy

- Medications from different classes used together—not multiple drugs from same class

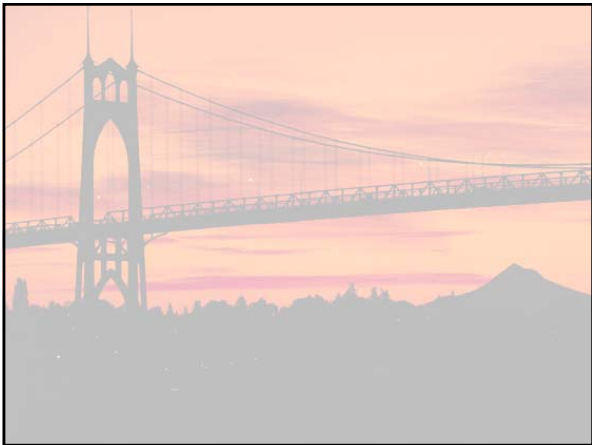

PLUS

- Nonpharmacological
 - Age appropriate

Resources

- For you—
 - American Society for Pain Management Nursing
 - American Pain Society
 - Pain Society of Oregon
- For patients
 - Camp Pain Retreat, good for 8-12 year old kids (abdominal pain/headache info for parents)
 - Painretreat.net

DISCUSSION



Thank you for your participation!

Please complete the evaluation by visiting this link:

<http://www.surveymonkey.com/s/Y8QG3RM>

We will send this link via email. We ask that everyone participate in the evaluation so we may gain valuable feedback for future webinars. Thank you!

