Chapter 7

Pain Assessment and Management in Children

PAIN ASSESSMENT

Pain Assessment: Influencing Factors

- Age
- Developmental level
- Cause and nature of the pain
- Ability to express the pain

Six Core Domains

- Intensity
- Satisfaction with treatment
- Symptoms and adverse events
- Physical recovery
- Emotional response
- Economic factors

Types of Pain

- Acute
- Chronic or recurrent

Pain Assessment Tools

- Behavioral
  - Infants to age 4 years
- Physiologic
- Self-report
  - Not valid for children younger than 4 years

Behavioral Pain Assessments

- Assessment of vocalization, facial expression, and body movements with specific tool
- Most reliable for short, sharp pain
- Most reliable for pain in infants
- Less reliable for recurrent or chronic pain
- Less reliable for pain in older children
  - May not correlate with child's self-report of pain

Behavioral Pain Assessment Tools

- FLACC
- CHEOPS
- TPPPS
- PPPRS

COMFORT Scale

- The only tool recommended for use with unconscious and ventilated infants, children, and adolescents.
- Eight indicators: Score each between 1 and 5.
  - Alertness
  - Calmness/agitation
  - Respiratory response
  - Physical movement
  - Blood pressure
  - Heart rate
  - Muscle tone
  - Facial tension
- Observe for 2 minutes and add the scores of each indicator.
- The total scores range from 8 to 40.
- Score of 17 to 26 = Adequate sedation and pain control.

Poker Chip Tool

- Set of four red plastic poker chips
- Each chip = a “piece of hurt”
- Scores 0 to 4
- Good psychometric testing

FACES Pain Scales

- Wong-Baker FACES Pain Scale: Six cartoon faces
  - Smiling face = “no pain”
  - Tearful face for “worst pain”
  - The child chooses a face that describes his or her pain
  - The WB FACES widely used in United States
- Bieri Faces Pain Scale–Revised: Six faces = 0 to 5
  - No smiling face at the “no pain” end
  - No tears face at the “most pain” end
  - Equivalent to a 0 to 10 metric system

Numeric Pain Ratings

- For 8 years and older
- 0 to 10 scale widely used
- Easy to use
- Little research for reliability and validity

Verbal Analog Scale (VAS)

- "No hurt" to "biggest hurt" are more appropriate than "least pain sensation to worst intense pain imaginable."
- Requires a higher degree of abstraction than the Numeric Rating Scale (NRS).
- Recommended because of the lack of supportive evidence through psychometric studies with the NRS in children and adolescents.

Adverse Events

- Signs, symptoms, laboratory findings, or diseases that occur after medications for pain are initiated
- Constipation
  - Most common
  - Need to screen

Multidimensional Assessments

- Adolescent Pediatric Pain Tool (APPT)
  - Assesses pain location, intensity, and quality
    - Anterior and posterior body outline on one side
    - 100-mm word-graphing rating scale with a pain descriptor
  - Facilitates assessments of pain quality + location

Pediatric Pain Questionnaire (PPQ)

- Assesses patient and parental perceptions of pain
- Cognitive and developmental considerations
- Eight areas of inquiry: pain history, pain language, the colors children associate with pain, emotions children experience, the worst pain experiences, the ways children cope with pain, the positive aspects of pain, and the location of the child's current pain
- Three components of the PPQ
  - VASs
  - Color-coded rating scales
  - Verbal descriptors
- The child, parent, and physician each complete the form separately

ASSESSMENT OF PAIN IN SPECIFIC POPULATIONS

Pain in Neonates

- Research in neonatal pain
- Response to pain may be behaviorally "blunted" or absent
  - Sleep states in preterm infants
  - Paralytic agents

CRIES Neonatal Pain Scale

- **C**rying
- **R**equiring increased oxygen
- **I**ncreased vital signs
- **E**xpression
- **S**leeplessness

Premature Infant Pain Profile (PIPP)

- Specifically developed for premature infants
- Gives higher pain score to infants with lower gestational age
- Gives higher pain score to blunted behavioral response

Neonatal Pain, Agitation, and Sedation Scale (NPASS)

- Used in neonates from 23 weeks of gestation up to 100 days of age

Children with Communication and Cognitive Impairment

- Difficult to measure pain
- High risk for inadequate treatment of pain
- NCCPC: Non-communicating Children's Pain Checklist
- PICIC: Pain Indicator for Communicatively Impaired Children

Cultural Influences on Pediatric Pain Scales

- Oucher Pain Scale
  - For 3- to 12-year-olds
  - Validated with African-American and Caucasian children
  - Hispanic version of APPT scale available for children/adolescents with cancer

Cultural Barriers to Pain Treatment

- Inadequate assessment of pain
- Concern about side effects and tolerance of analgesics
- Reluctance to report pain
- Reluctance to take pain medications
- Lack of adherence to treatment plan
- Use body outline diagram of the APPT for non–English speaking children and adolescents

Children with Chronic Illness and Complex Pain

- Difficult to isolate pain symptom from other symptoms
- Rating pain does not always accurately convey to others how they really feel

PAIN MANAGEMENT

Pain Assessment Components

- Onset of pain
- Pain duration/pattern
- Is current treatment effective?
- Factors that aggravate or relieve the pain
- Other symptoms and complications concurrently felt
- Interference with the child's mood, function, and interactions with family

Barriers to Pain Management

- Family issues and relationships
- Fears and concerns about addictions
- Lack of knowledge about pain
- Inappropriate use of pain medications
- Ineffective management of adverse effects from medications

Nonpharmacologic Pain Interventions

- Distraction
- Relaxation
- Guided imagery
- Cutaneous stimulation

Nonpharmacologic Pain Interventions for Infants

- Containment
- Positioning
- Nonnutritive sucking
- Kangaroo holding

Complementary and Alternative Medicine (CAM)

- Diverse practices and products
- Not considered part of conventional medicine
- Most have minimal scientific evidence
- Estimated use for pediatric CAM in United States = 31%-84%
- Includes herbal medicine, massage, megavitamins, self-help groups, folk remedies, energy healing, and homeopathy

Dosing of Analgesics

- First-pass effect
- Titration to desired effect
- Route of administration and effect on dosage

Patient-Controlled Analgesia (PCA) Mechanisms of Action

- Basal rate
  - Purpose
- Bolus doses
  - Patient-administered
  - Nurse- or parent-administered
    - Advantages
    - Disadvantages

Morphine

- Gold standard
- Drug of choice for PCA
- 1 mg/ml typical for PCA usage

Other Opiods

- Hydromorphone
- Fentanyl
- Meperidine
- Oxycodone
  - Available with and without acetaminophen
  - Total dose of acetaminophen considerations

Meperidine

- May increase the risk of seizures due to excitatory effects on the nervous system
- Recommended use for brief treatment of patients who have demonstrated its effectiveness or who have allergies or uncorrectable intolerances to other opioids
- Maximum usage: 48 hours or 600 mg/24 hours

Coanalgesics or Adjuvant Analgesics

- Used alone or with opioids to control pain symptoms and opioid side effects
- To enhance analgesics, not substitute for analgesics
- Anxiolitics, sedatives, amnesics
  - Diazepam (Valium) and midazolam (Versed)
- Tricyclic antidepressants and antiepileptics for neuropathic pain
- Stool softeners and laxatives for constipation
- Antiemetics for nausea and vomiting
- Diphenhydramine for itching
- Steroids for inflammation and bone pain
- Dextroamphetamine and caffeine for possible increased pain and sedation

Placebo

- Side effects similar to those of opioids
- May destroy trust
- Raises serious ethical and legal questions
- American Society of Pain Management Nursing position statement against the use of placebos

Epidural Anesthesia

- Opioid
  - Fentanyl or
  - Hydromorphone or
  - Preservative-free morphine
- + Local (bupivacaine or ropivacaine)
- Instilled via single or intermittent bolus, continuous infusion, or patient-controlled epidural analgesia (PCEA)

Nursing Care of Child with Epidural Anesthesia

- Careful monitoring for respiratory depression
- Skin care around catheter Insertion site
- Assessment of pain

Transmucosal and Transdermal Analgesia

- Oral transmucosal fentanyl (Oralet)
- Fentanyl transdermal patch (Duragesic)
- Anesthetic creams (EMLA, LMX)
- Refrigerant sprays (ethyl chloride and fluorimethane)
- Numby Stuff
- LidoSite activated patch

Local Anesthetics: Lidocaine

- Side effects: stinging and burning on injection
- Buffered lidocaine
  - Decreased or eliminated stinging
- Warming lidocaine to body temperature
  - Decreased or eliminated stinging

Timing of Analgesia

- Around the clock (ATC) vs. as needed (PRN)
  - Continuous vs. as needed
    - Dosage difference and timing
    - Clock watching

Side Effects

- Respiratory depression
- Constipation
- Pruritus
- Nausea, vomiting
- Sedation
- Tolerance
- Physical dependence

Tolerance

- Dose must be increased to achieve the same effect
- May develop after 10 to 21 days
- Treatment
  - Increase dose
  - Decrease duration between doses

Treatment of Physical Dependence

- Gradually reduce dose
  - One half dose q 6 hours for first 2 days
  - Reduce by 25% q 2 days until total daily dose of 0.6 mg/kg/day of morphine (or equivalent) is reached
  - After 2 days on this dose, discontinue opioid
- May also switch to oral methadone, using one fourth of equianalgesic dose as initial weaning dose and proceeding as described above

Patient/Family Education

- Discuss educational needs surrounding use of opiates for analgesia in infants and children
  - Addiction/dependence
  - Cause and effect of psychologic dependence
  - Nursing statements to child/family and potential effects

Evaluation of Effectiveness of Pharmacologic and Nonpharmacologic Interventions

- When to evaluate?
  - q 15 to 30 minutes after intervention
- Document findings
- Ongoing assessments

Harmful Effects of Unrelieved Pain in Pediatric Clients

- Physiologic stress responses
- Chronic pain syndromes

Consequences of Unrelieved Pain in Neonates

- Physiologic changes
  - Increased ICP, HR, RR, BP
  - Decreased SaO_2
- Behavioral changes
  - Muscle rigidity, facial expression, crying, withdrawal, and sleeplessness

COMMON PAIN STATES IN CHILDREN

Sedation for Nonpainful Procedures

- Chloral hydrate, nembutal
- Careful monitoring during and after procedure
- Decrease stimuli after procedure
- “Nembutal rage”
  - Agitation during emergence

The “Windup Phenomenon”

- Studied in neonates
- Attributed to a decreased pain threshold + chronic pain
- After exposure to noxious stimuli, altered excitability at multiple levels of spinal cord
- Nonnoxious stimuli perceived as noxious
- Same physiologic response to stress
- Results in chronic pain
- Biologic and clinical consequences

Conscious Sedation (Minimal Level of Sedation)

- Protective reflexes are maintained
- Able to maintain a patent airway independently and continuously
- Patient responds to physical stimulation or verbal command (e.g., “Open your eyes”)
- Cognitive function may be impaired

Moderate Sedation

- Patient not easily aroused but responds purposefully to verbal commands, either alone or accompanied by light touch
- May retain partial or no protective reflexes
- Airway, spontaneous ventilation, and cardiovascular function may or may not be adequate without interventions (e.g., oxygen)

Deep Sedation/Anesthesia

- Patient cannot be easily aroused
- No protective reflexes
- Unable to maintain a patent airway; ventilatory and cardiovascular function independently may be impaired
- Continuous monitoring q 5 minutes

Emergency Equipment for Moderate and Deep Sedation

- Suction apparatus with catheters
- Oxygen source, oral and nasal airways, ETTs, laryngoscope/blades, Ambu bag/mask
- Medications for resuscitation and drug antagonism
- IV access
- Trained individual (MD, RN) whose sole responsibility is to monitor patient

Headaches in Children

- Causes
- Interventions

Recurrent Abdominal Pain (RAP)

- Incidence
- Causes
- Interventions

Pain in Children with Sickle Cell Disease

- Opioids are considered the major therapy and are started in early childhood and continued throughout adult life
- Nonpharmacologic interventions
- Goals of treatment of acute episodes

Pain Management for Childhood Cancers

- Sources/types of pain
- Interventions
- Obstacles to successful analgesia

Ketamine

- Often used for analgesia and sedation during procedures in children
- Subanesthetic doses uses + high dose opioids for uncontrolled cancer pain
  - Appeared to improve pain control and to have an opioid-sparing effect
  - Dosage range (0.1 to 1 mg/kg/hr) lower than that used for anesthetic purposes
  - Lorazepam (0.025 mg/kg/12 hr) concurrently during ketamine treatment
  - Continuous monitoring: HR, BP, RR, O_2 saturation
- Long-term use of ketamine for the treatment of neuropathic pain in children has not been systematically studied

Pain and Sedation at End of Life

- Goals of treatment
- Use of conscious sedation for control of pain