OBJECTIVES:

1. State barriers to pain management in the pediatric patient.
2. Describe the developmental characteristics of children’s responses to pain.
3. Identify anxiety in children and state treatment options.
4. Identify non-pharmacologic and behavioral treatments options for pain in children
5. Identify pharmacologic treatment of pain in children:
   a. Medication recommendations
   b. Dosages
   c. Nursing interventions

Definition of Pain

- The sensation of pain develops during the second and third trimester of fetal life and continues to mature during the first two years of life.
- Beyond the toddler years, perception of pain is identical to that of adults, although psychosocial and behavioral expressions of and response to pain change with growth and development.

QUESTT:

Q- Question the child
U- Use pain rating/tools
E- Evaluate behavior and physiologic changes
S- Secure parents involvement
T- Take cause of pain into account
T- Take action and evaluate result
PHYSIOLOGY OF PAIN

- Common responses to stimulation of the sympathetic nervous system that may be seen with all ages.
- Flushing of the skin.
- Elevated: heart rate, blood pressure, respiratory rate.
- Dilated pupils.

BARRIERS TO PAIN MANAGEMENT

Barriers to the treatment of pain in children include the following:

1. The myth that children, especially infants, do not feel pain the way adults do and if they do experience pain there is no untoward consequence.
2. Lack of assessment and reassessment for the presence of pain.
3. Misunderstanding of how to conceptualize and qualify a subjective experience.
5. The notion that addressing pain in children takes too much time and effort.
6. Fears of adverse effects of analgesic medications including; respiratory depression and addiction.
7. There is no evidence that pain management masks symptoms or clouds mental status, preventing adequate assessment and diagnosis. Appropriate medications such as acetaminophen, ibuprofen, or oral opiates can be given to these patients. Clinical experience suggests that the use of pain medication makes children more comfortable and the examination of the patient easier.
### BARRIERS TO REALITY: TREATMENT OF PAIN IN INFANTS AND CHILDREN

<table>
<thead>
<tr>
<th>The following MYTH: Children, especially infants, do not feel pain like adults. If infants and children do experience pain, there are no untoward consequences.</th>
<th>Infants and children do feel pain and do experience the physiologic and psychological consequences associated with pain.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of assessment and reassessment of pain in infants and children</td>
<td>The nursing policy on pain applies to human beings of all ages. Pain is to be assessed and reassessed on patients of all ages.</td>
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<tr>
<td>Misunderstanding of how to conceptualize, qualify and measure a subjective experience such as pain</td>
<td>There are excellent and evidence-based tools available at SJHC to measure pain in verbal, non-verbal, and cognitively impaired children. These tools are discussed later in the packet.</td>
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<tr>
<td>Lack of knowledge of pain treatment with the false belief that it is best to withhold pain medication until the pain is severe.</td>
<td>Pain should be treated early and with an adequate dose to relieve the pain. It is often best to administer pain medications around the clock.</td>
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<tr>
<td>The notion that addressing pain in children takes more time.</td>
<td>With use of pediatric specific pain assessment tools and knowledge of pain management strategies, the nurse will find it does not take too much time. In matter of fact, early and continuing pain assessment and interventions will prevent the need for additional interventions due to agitation in the child, stress and concern of the parent, prolonged healing and increased length of hospital stay.</td>
</tr>
<tr>
<td>Fear of adverse effects of narcotic analgesics such as respiratory depression.</td>
<td>The chance of complications such as respiratory depression is not any greater in children compared to adults. Pain management and considerations are reviewed in this packet.</td>
</tr>
<tr>
<td>Pain medication may make the child very drowsy or cloud the mental status, preventing an adequate assessment and exam.</td>
<td>There is no evidence that adequate pharmaceutical pain management impairs mental status, preventing an adequate exam. Adequate pain management makes children more comfortable, cooperative, and able to cope with procedures/interventions.</td>
</tr>
</tbody>
</table>
NURSING ALERT!
If children’s behaviors appear to differ from their rating of pain, believe their pain rating.

AGITATION- defined as a behavioral symptom of physical or emotional distress that includes any of the following behaviors alone or in combination; crying, restlessness, thrashing, verbal outbursts, kicking, and/or biting.

- Most acute pain experienced in medical settings can be prevented or substantially relieved.
- Comprehensive pediatric care considers all aspects of distress and also should address these aspects in a compassionate, effective, timely, and multidimensional manner.
- Effective pain management involves an interdisciplinary therapeutic approach with a combination of pharmacologic, cognitive-behavioral, psychological, and physical treatments.
- Data support the concept that morbidity and mortality can be reduced by good pain treatment.
- Posttraumatic stress disorder can occur after procedures or stressful medical experiences that are not accompanied by appropriate pain control and sedation.
- Plans for the postoperative pain management should be discussed with the family and generated before surgery or painful procedures.
- Educate the child about the pain, especially when explanation may lessen anxiety. “Pain may occur after surgery and does not mean something is wrong”. Reassure them they are not responsible for the pain.
For long-term pain control, give the child a doll, which represents “the patient”, and allow the child to do everything to the doll that is done to the child. Pain control can be emphasized through the doll saying, “Dolly feels better after the medicine”.

In the hospital, pain and response to treatment including adverse effects, should be monitored:
1. At least every 2 hours.
2. After any known pain-producing event.
3. With each report of new pain.
4. After each pain management intervention- any patient with a pain score >3 or who is receiving active pain therapy should have pain reassessed at least every hour while awake.

To treat pain adequately, ongoing assessment of the presence and severity of pain and the child’s response to treatment is essential.

The tools to be used are the Wong-Baker faces rating scale for patients 3 and older. The FLACC scale is used to assess pain behaviors in infants and children 0-3 years old, or in pediatric patients who are unable to verbally communicate pain.

Observation of behavior should be used to complement self-report. Listen to and consider a parent’s report of pain when a child is unwilling or unable to give a self-report.
DEVELOPMENTAL CHARACTERISTICS OF CHILDREN’S RESPONSES TO PAIN

YOUNG INFANTS

1. Generalized body response of rigidity, possibly with local reflex withdrawal of stimulated area.

2. Loud crying.

3. Facial expression of pain (brow lowered and drawn together, eyes tightly closed, etc.).

4. Demonstrates no association between approaching stimulus and subsequent pain.

OLDER INFANTS

1. Localized body response with deliberate withdrawal of stimulated area.

2. Loud crying.

3. Facial expression of pain and/or anger.

4. Physical resistance, especially pushing the stimulus away after it is applied.
YOUNG CHILDREN

1. Loud crying, screaming!
2. Verbal expressions of “Ow, Ouch, or it hurts!”
3. Thrashing of arms and legs.
4. Attempts to push stimulus away before applied.
5. Uncooperative- may need physical restraint.
6. Requests termination of procedure.
7. Clings to parent, nurse or other.
8. Requests emotional support such as hugs, or other forms of physical comfort.
9. May become restless and irritable with continuing pain.
10. All these behaviors may be seen in anticipation of actual painful procedures.

SCHOOL-AGE CHILDREN

1. May see all behaviors of young child, especially during painful procedures but less in the anticipatory period.
2. Stalling behavior, such as “Wait a minute,” or “I’m not ready!”
3. Muscular rigidity such as clenched fists, gritted teeth, contracted limbs, body stiffness, closed eyes etc.

ADOLESCENTS

1. Less vocal protest.
2. Less motor activity.
3. More verbal expressions, such as “It hurts,” or “You’re hurting me!”
4. Increased muscle tension and body control.
5. Silent tears.
General Strategies

- Use for mild pain and pain that is reasonably well controlled with analgesics.
- Form a trusting relationship with the child and family.
- Express concern regarding their reports of pain and intervene appropriately.
- Take an active role in seeking effective pain management strategies.
- Stay with the child during painful procedures.
- Allow parents to stay with the child if child and parent desire.
- Prepare child before potentially painful procedure, but avoid “planting” the idea of pain. For example, instead of saying, “This is going to hurt,” say, “Sometimes this feels like pushing, sticking or pinching, and sometimes it doesn’t bother some people”. “Tell me what it feels like to you.” Use “non-pain” descriptors when possible, “It feels like heat,” rather than “burning pain”.
- Avoid evaluative statements or descriptions such as, “This is a terrible procedure,” or “It will really hurt”.
- Involve parents in learning specific nonpharmacologic strategies and assisting the child in their use.
- Cognitive behavioral strategies that involve the use of imagery, relaxation, and self-regulation can provide pain relief independently or in conjunction with other pain management approaches.
- Other treatments include, massage, heat or cold, distraction, relaxation, cutaneous stimulation, thought stopping etc. may be beneficial.
Analgesic treatment should include proper dosing according to body weight, physiologic development, and the medical situation.

The goal is to control the pain as rapidly as possible, therefore the starting dose should be optimal and further doses should be titrated depending on patient response.

Administration of multiple, small ineffective doses of analgesic may result in the prolongation of pain, exacerbation of anxiety, and even severe adverse effects of the analgesic, such as respiratory depression.

Early effective treatment is safer and more efficacious than delayed treatment, results in improved patient comfort, and possibly less total analgesic administered.

Except in extenuating circumstances medication should not be given IM, because it is painful and absorption can be variable.

Oral administration is preferred for mild to moderate pain. For immediate pain relief, IV administration is recommended.

For moderate or severe pain expected to persist, continuous dosing or around the clock dosing at fixed intervals is recommended.

The use of IV PCA has expanded to use in adolescents and even children. Children who are able to push a button and who can understand the concept of “pushing the button” to obtain pain relief, usually > 5 years old, can use PCA.

Addressing the adverse effects of opioid use, such as nausea, vomiting, and pruritis, is important.

Combining non-opioids with opioids attacks pain on two levels; non-opioids primarily at the peripheral nervous system and opioids primarily at the central nervous system. This approach provides increased analgesia without increased side effects.
CONTROLLING PAIN RELATED TO MINOR PROCEDURES

Topical anesthetics can be placed proactively as described previously to control the pain associated with minor procedures.

**EMLA** is a euteric mixture of local anesthetics (lidocaine 2.5% and prilocaine 2.5%).

Uses;
- IV line placement or venipuncture- should be placed in at least 2 sites over veins amenable to placement of an IV line.
- Abscess drainage
- Joint aspiration Lumbar puncture- consult with physician for placement.

**LET** is a tropical anesthetic/vasoconstrictor with lidocaine, epinephrine, and tetracaine, which the pharmacy can prepare in a liquid or gel form. LET provides excellent wound anesthesia in 20 or 30 min.

Uses:
- Simple laceration repair < 5 cm in length.

Do NOT use if:
- The patient is allergic to amide anesthetics.
- There is gross contamination of the wound.
- The wound is > 5 cm.
- There is involvement of the mucous membranes, digits, genitalia, ear or nose.

Discussion with parents should bring up these issues:
- Topical anesthetics do not provide complete pain relief.
- Some patients may require a procedure before the topical anesthetic can be effective.
- Should not come into contact with mucous membranes.
- Dose should be lower for patients <12 mo. old or weighing < 10 kg.

Contraindications:
- Emergent need for IV access
- Allergy to amide anesthetics
- Non-intact skin
Recent sulfonamide antibiotic use –
Congenital or idiopathic methemoglobinemia use EMLA only.

NON-OPIOID ANALGESICS

NSAIDS may be used alone for mild pain or in combination with opioid analgesics for moderate to severe pain. All NSAIDS except for acetaminophen have significant anti-inflammatory, antipyretic, and analgesic actions.

ACETAMINOPHEN
Acetaminophen, Tylenol, is the most commonly used mild analgesic for pediatric patients. For young children, the initial dose is often administered rectally (up to 45 mg/kg) before awakening from anesthesia. Supplemental doses can be given orally (10-15 mg/kg) or rectally (20 mg/kg) every 4-6 hrs. (not prn) to maintain adequate blood levels and effective analgesia. Acetaminophen dose not to exceed 5 doses in 24 hrs. or 75mg/kg/day orally.

IBUPROFEN- Children’s Motrin or Advil
Children 6 mo. and older; 5-10 mg/kg/dose every 6-8 hrs. not to exceed 40 mg/kg/day.
Available in numerous preparations and in suspension of 100mg/5ml and drops 100mg./2.5ml.

NAPROXEN- Naprosyn
Children over 2 years.; 10mg/kg/day in 2 divided doses.
Available in suspension 125mg/5ml and several different dosages for tablets.

Side effects of ibuprofen and naproxen include;
- Nausea, vomiting, diarrhea, constipation
- Gastric ulceration
- Bleeding nephritis
- Fluid retention
- Should NOT be given to patients with allergic reactions to salicylates.
- Use cautiously in patients with renal impairment.

KETOROLAC- Toradol
Toradol has been proven effective in relieving postoperative pain following a range of operations in children. Ketorolac is the only IV form of NSAID available in the U.S. Using ketorolac used intraoperatively may reduce the incidence of opioid-related
adverse effects such as respiratory depression, nausea and vomiting in children. The addition of Ketoralac to an opioid has been shown to decrease the morphine requirements and the opioid-related adverse effects. Ketorolac seems to be able to suppress bladder contractions and increase bladder capacity.

Dose is 0.5 mg/kg.

Side effects include:
- Decreased bone repair after osteotomy
- Bronchospasm
- Acute renal failure
- Possibly increased surgical bleeding secondary to altered platelet function.

Nursing Alert
Acetylsalicylic acid (aspirin) is not recommended for children because of its possible association with Reye syndrome.

OPIOID ANALGESICS

**GENERAL INFORMATION RELATED TO OPIOID ANALGESICS.**

- Parenteral and oral dosages of opioids are not the same.
- Because of the *first-pass effect*, an oral opioid is rapidly absorbed from the gastrointestinal tract and in the liver is partially metabolized before reaching the central circulation. Therefore oral dosages must be larger to compensate for the partial loss of analgesic potency to achieve *equianalgesia*, (equal analgesic effect).

- **SIDE EFFECTS INCLUDE:**
  1. constipation
  2. respiratory depression
  3. sedation
  4. N/V
  5. agitation, euphoria
  6. hallucinations
  7. orthostatic hypotension
  8. pruritis/urticaria
  9. sweating
  10. miosis- may be a sign of toxicity
  11. anaphylaxis- rare
MORPHINE
Most commonly used opioid is morphine. Which has a reasonably long duration of action and mild sedative effect.

FENTANYL
Fentanyl is also a frequently used opioid in children. It has a faster onset and shorter duration than morphine. When children are expected to have constant pain, a background infusion usually is required. In situations of intermittent severe pain of short duration, fentanyl boluses are effective.

HYDROMORPHONE, (Dilaudid)
Hydromorphone, (Dilaudid) is a hydrogenated ketone of morphine, and has a potency of 7-10 times that of morphine. It is frequently used as an alternative to morphine. It frequently is well tolerated by children who have difficulty tolerating morphine.

NURSING ALERT!
Meperidine (Demerol) is not recommended as a first line analgesic for the management of any type of pain.

Midazolam is used rarely for anxiety and only after nonpharmacologic treatments have been attempted.

Refer to resource attachments:

Combinations of opioid and non-opioid oral analgesics.

OPIOID EQUIANALGESIC for morphine, fentanyl, codeine, Dilaudid, Lortab and oxycodone dosing.

Routes and methods of analgesic administration

Integration of other therapies to complement opioid and non-opioid analgesics.
BIBLIOGRAPHY

1. Wong’s Nursing Care of Infants and Children


