

## 2.11 PAIN MANAGEMENT

### Introduction

Acute, chronic, and procedural pain are common conditions in the pediatric inpatient setting. They are most often associated with new-onset illness or infection, trauma, burns, post-surgical sequelae, or exacerbation of chronic disease. Chronic pain complicates effective control of acute pain and may be associated with central sensitization and neuropsychological changes that impact pain perception. Despite advances in understanding of the pathophysiology and management of pain in children, barriers to effective pain management still exist, such as fear of harmful side effects, difficulty in pain assessment in young and/or developmentally delayed pediatric patients, healthcare provider bias, and concerns of addiction and diversion of controlled medications. Pediatric hospitalists should enhance pain management services through the direct provision of effective care and lead development of a systematic approach to pain management in institutions and communities.

### Knowledge

Pediatric hospitalists should be able to:

- Describe the pathophysiology and developmental aspects of pain in infants, children, and adolescents.
- Explain how pain, anxiety, and fear interrelate and discuss strategies for addressing each.
- Understand central sensitization and its role in the development of chronic pain.
- Identify psychologic components that contribute to maintenance of chronic pain, including parental anxiety and catastrophizing.
- List the indications and contraindications for the main classes of drugs used for pain management, including nonsteroidal anti-inflammatory drugs, opioids, and topical and local anesthetics.
- Discuss the pharmacology of medications commonly used for analgesia, including route of administration, dosing range, and expected side effects.
- Discuss the pharmacology of medications used for anxiolysis, including route of administration, dosing range, and expected side effects.
- Describe the effect of age (including neonate, young child, and adolescent) on analgesia and on the pharmacology of medications used for analgesia and anxiolysis.
- Describe how diseases, such as obstructive sleep apnea, liver or kidney disease, and others, affect pharmacology of analgesic medications.
- Compare and contrast the risks and benefits of various modalities of drug delivery, attending to drug delivery, side effects, and invasiveness.
- Review the current state of the opioid crisis as it relates to pediatrics, including risks of opioid misuse, opioid abuse, opioid addiction, overdose, and opioid diversion in teens.
- Describe neonatal abstinence syndrome, including the current increased prevalence of this syndrome in infants.

- Describe risk factors for opioid misuse and abuse in the adolescent population.
- List appropriate monitoring techniques for patients receiving analgesics, anxiolytics, and other associated medications.
- List the appropriate monitoring requirements for patient-controlled analgesia (PCA) and nurse-controlled analgesia (NCA) delivery methods.
- Describe the pharmacology of and the indications for reversal agents for specific classes of drugs used for pain management.
- Describe the role of the pediatric pain consultant/pain management team and discuss barriers to local availability.
- Discuss how use of adjuvant medications, such as antidepressants, anticonvulsants, anxiolytics, and sleep medications, can be used most appropriately for pain management.
- Summarize common potential side effects and harms associated with pain treatments, attending to effects on the respiratory, renal, gastrointestinal, and neurologic systems.
- Discuss how complementary techniques, such as behavioral therapy, play therapy, physical therapy, bundling, glucose water pacifiers, presence of the family/caregivers, visual imagery, deep breathing, music, and others can be utilized to manage pain and anxiety.
- Describe nonpharmacologic, alternative therapies used for certain types of chronic pain as adjuncts to traditional therapies, such as acupuncture, massage therapy, hypnosis, and others.

### Skills

Pediatric hospitalists should be able to:

- Assess the presence and level of pain in children regardless of developmental level, utilizing history, physical examination, physiologic parameters, and validated pediatric pain scales.
- Create a pain management plan individualized to the patient that utilizes a tiered approach with nonpharmacologic treatments (such as distraction, comfort measures, and others) and both nonnarcotic and narcotic medications.
- Create a pain plan for patients undergoing procedures not requiring anesthesia/deep sedation (such as intravenous line placement, wound debridement, dressing changes, and others).
- Prescribe doses of analgesic medication that improve pain while minimizing side effects.
- Demonstrate proficiency in managing breakthrough pain utilizing both opioid and nonopioid pain medications
- Demonstrate competence in correctly ordering dosing of pain medications when changing from one route of delivery to another, or when switching from one pain medication type to another.
- Select and order pain and anxiety medications in safe and cost-effective manner.
- Create weaning strategies for pain and anxiolytic medication regimens that reduce the risk for withdrawal symptoms.
- Perform careful reassessments daily and as needed, note

changes in clinical status, pain, side effects, tolerance, and withdrawal, and respond with appropriate actions.

- Order appropriate blood testing and equipment monitoring in accordance with individualized needs and correctly interpret the data.
- Anticipate and identify potential side effects of analgesic and anxiolytic medications, including opioid hyperalgesia and nonsteroidal medication induced renal or gastrointestinal injury, and respond with appropriate actions.
- Identify patients at risk for development of chronic pain and involve appropriate consultants to assist with long-term management.
- Identify patients with neuropathic pain and develop a treatment plan with assistance from appropriate consultants.
- Identify discharge needs and create a comprehensive discharge plan, including appropriate medical equipment, required prescriptions and plan for refills, and follow-up appointments for specialty services.
- Effectively communicate with patients and the family/caregivers about risks and benefits of using opioid and non-opioid medications after discharge, including the need for proper storage and disposal of controlled pain medications.

### Attitudes

Pediatric hospitalists should be able to:

- Realize the importance of educating patients and the family/caregivers on various aspects of pain, including etiologies, management, and impact on the healing process.
- Appreciate the importance of involving the primary care provider in the therapeutic process early in the hospitalization.
- Recognize the impact that uncontrolled pain has on the emotional and physical well-being of patients and the family/caregivers.
- Reflect on the impact that race, ethnicity, and culture may have on pain management, medication responses, and side effects, including the occurrence of health disparities related to adequate pain control.

- Acknowledge the value of collaboration with subspecialists and the primary care provider to ensure coordinated longitudinal care for children receiving chronic pain management services.

### Systems Organization and Improvement

In order to improve efficiency and quality within their organizations, pediatric hospitalists should:

- Work with hospital administration, hospital staff, subspecialists, and others to implement a comprehensive, systematic approach to pain management across the continuum of care.
- Lead, coordinate, or participate in the development and implementation of cost-effective, safe, evidence-based care to standardize the evaluation and management for hospitalized children with pain, including standardization of pain protocols in the electronic medical record when available.
- Lead, coordinate, or participate in education of healthcare providers who work with children about pediatric pain assessment and safe medication use.
- Work in consultation with surgical staff to prioritize and improve the management of pain in pediatric surgical patients.
- Collaborate with hospital administration and others on efforts to mitigate patient opioid misuse and diversion risks within the hospital organization by advocating for opioid education among healthcare providers.
- Work with hospital informaticists to implement clear and safe ordering of pain medications and efficient access to data on pain medication usage and prescribing.

### References

1. Cravero JP, Agarwal R, Berde C, et al. The Society of Pediatric Anesthesia recommendations for the use of opioids in children during the preoperative period. *Pediatr Anesth*. 2019;29:547-571. <https://doi.org/10.1111/pan.13639>.
2. Fishman SM, Young HM, Arwood EL, et al. Core Competencies for pain management: results of an inter professional consensus summit. *Pain Med*. 2013;14(7):971-981. <https://doi.org/10.1111/pme.12107>.
3. McClain BC, Suresh S. *Handbook of Pediatric Chronic Pain: Current Science and Integrative Practice*. New York, NY: Springer Science + Business Media, LLC; 2011.