

## Neonatal Pain & Sedation Pharmacology

### Objectives

- Recognize the influence that organ and system immaturity and developmental trajectory have on neonatal pain susceptibility and pain management
- Explain the potential impact of pharmacokinetics and pharmacogenetics on analgesic and sedative selection, route of administration and dosing in the neonate
- Describe the importance of neonatal pain assessment and the benefits of multimodal analgesic approaches in providing pain management to the neonate
- Outline non-pharmacological and pharmacological interventions commonly used to manage pain in the neonatal period

### Content Outline

1. Pharmacology of Analgesic and Sedative Drugs Commonly Used in the Neonatal Intensive Care Unit
  - 1.1 Drug uses, mechanism of action, metabolism, excretion & adverse effects
    - 1.1.1 Non-opiate analgesics- acetaminophen/paracetamol, NSAIDS
    - 1.1.2 Opiate analgesics-morphine, fentanyl, remifentanyl
    - 1.1.3 Sedatives-midazolam, clonidine, dexmedetomidine
  - 1.2 Multimodal analgesic approaches to neonatal pain control
  - 1.3 Pharmacogenetics & impact of developmental trajectories
    - 1.3.1 Clinical cautions regarding use of codeine, tramadol & ketamine
  - 1.4 Gaps in knowledge & current best practices
2. Developmentally Focused Acute Pain Management in the Neonate
  - 2.1 Pain mechanisms in the neonatal period
  - 2.2 Pain assessment & analgesic planning
  - 2.3 Non-pharmacological interventions
  - 2.4 Examples of clinically used neonatal analgesic dosing schedules
  - 2.5 Use of local anesthetics in the neonatal period

### Reading Material Resources

**Module WB2248: Neonatal Pain & Sedation Pharmacology** is based on the resources listed below. A copy of each resource is included with the module.

Pharmacology of Common Analgesic and Sedative Drugs Used in the Neonatal Intensive Care Unit, Donato JD, Rao K and Lewis T, *Clinics in Perinatology*, 46 (2019), 673-692

Acute pain management in the neonate, Carachi P and Williams G in *Anaesthesia and Intensive Care Medicine*, (2019), Elsevier, 99-104