

## Exploring Neonatal Analgesia and Sedation Concerns

### Objectives

- Recall that nonpharmacologic interventions form the foundation for approaches to mitigate neonatal pain & agitation during mild-moderate painful procedures as well as in the setting of therapeutic hypothermia (TH)
- List the optimal analgesic and/or sedative options to address neonatal procedural pain and/or prolonged stress & describe the risks & benefits related to each drug based on existing evidence & gestational age
- Discuss the specific pathophysiology related to the stress of therapeutic hypothermia (TH) for neonatal encephalopathy (NE) & identify the challenges of identifying pain & stress using traditional subjective markers in this setting
- Describe the impact of multi-organ injury or failure related to neonatal encephalopathy (NE) as well as the specific alterations in pharmacokinetics that accompany intervention with therapeutic hypothermia (TH)
- Summarize the clinical care points & clinical research needs as outlined by McPherson & colleagues addressing issues of pharmacokinetics, drug efficacy, safety & long-term outcomes in regard to care of critically ill neonates

### Content Outline

1. Neonatal Pharmacologic Analgesia & Sedation
  - 1.1 Impact created by mild painful procedures
    - 1.1.1 Nonpharmacologic interventions
    - 1.1.2 Pharmacologic interventions
      - 1.1.2.1 Use of oral sweet-tasting solutions
  - 1.2 Moderately painful procedures used in neonates
    - 1.2.1 Optimal analgesics for procedural pain
    - 1.2.2 Premedication use of anesthetic doses of hypnotic agents
  - 1.3 Prolonged stress in both preterm & term neonates
    - 1.3.1 Sedative & analgesic use by gestational age
    - 1.3.2 Research recommendations, clinical care points & best practices
2. Managing Comfort & Sedation During Therapeutic Hypothermia (TH) for Neonates
  - 2.1 Pathophysiology of the stress occurring during therapeutic hypothermia
  - 2.2 Providing comfort through non-pharmacologic approaches
  - 2.3 Potential impact of pharmacologic sedatives on the neonatal brain
  - 2.4 Impact of therapeutic hypothermia on pharmacokinetics
  - 2.5 Clinical data regarding the use of opioids during therapeutic hypothermia
  - 2.6 Preclinical & clinical data regarding dexmedetomidine use
  - 2.7 Approaches to clinical practice, research recommendations, practice points

### Reading Material Resources

**Module WB2438: Exploring Neonatal Analgesia and Sedation Concerns** is based on the resources listed below. A copy of each resource is included with the module.

Pharmacologic Analgesia and Sedation in Neonates, McPherson C and Grunau RE, *Clinics in Perinatology* 49(2022), 243-265

Management of comfort and sedation in neonates with neonatal encephalopathy treated with therapeutic hypothermia, McPherson C et al., *Seminars in Fetal and Neonatal Medicine* 26(2021), 101264, 1-7