

## Objectives

- List the most common conditions causing cardiovascular instability in the neonatal period & the agents used to address the instability
- Identify the challenges faced to close the gaps in evidence-based knowledge related to use of cardiostatic drugs in neonates including issues created by lack of age-appropriate formulations for these drugs
- Describe the findings & conclusions from the Caffeine for Apnea of Prematurity (CAP) trial including the impact of those findings on current clinical practice
- Outline the physiologic and biologic mechanisms of action by which caffeine exerts its various effects
- Explain pharmacokinetics, metabolism & dosing of acetaminophen when used in preterm infants
- Summarize the evidence available from clinical trials, observational studies & pooled analyses assessing acetaminophen's efficacy & safety as compared to COX inhibitors when used as early & late therapy, prophylaxis & rescue therapy for patent ductus arteriosus (PDA) in preterm neonates

# Neonatal Drugs-Cardiostatics, Caffeine, Acetaminophen

## Content Outline

1. Cardiostatic Drug Use in Neonates
  - 1.1 Overview of specific inotropes/vasopressors/inodilators used in neonates
  - 1.2 Neonatal treatment categories with diagnostic, management approaches
    - 1.2.1 Preterm neonate with transitional low BP
    - 1.2.2 Persistent pulmonary hypertension of the newborn (PPHN)
    - 1.2.3 Septic shock
    - 1.2.4 Perinatal asphyxia
      - 1.2.4.1 Therapeutic hypothermia
  - 1.3 Issues impacting drug administration
2. The Use of Caffeine in the Neonatal Intensive Care Unit
  - 2.1 Historical overview of caffeine use in neonates including safety concerns
  - 2.2 Comparison of caffeine and theophylline
  - 2.3 Mechanisms and cellular/molecular modes of action
  - 2.4 Controversies & conclusions regarding caffeine use in clinical practice
    - 2.4.1 Caffeine for Apnea of Prematurity (CAP) trial conclusions
    - 2.4.2 Current practices regarding dosing, initiation & termination of therapy
3. Evidence-based Use of Acetaminophen for Hemodynamically Significant Ductus Arteriosus in Preterm Infants
  - 3.1 Pharmacologic aspects of acetaminophen in preterm infants
    - 3.1.1 Therapeutic mechanism of action in patent ductus arteriosus (PDA)
    - 3.1.2 Pharmacokinetics, metabolism and dosing
  - 3.2 Evidence from clinical trials & pooled analyses in preterm infants treated for PDA using early, late, prophylactic & rescue therapies

## Reading Material Resources- Next Page

## Reading Material Resources

**Module WB2108: Neonatal Drugs-Cardiotonics, Caffeine, Acetaminophen** is based on the resources listed below. A copy of each resource is included with the module.

The use of cardiotonic drugs in neonates. Dempsey E and Rabe H, *Clinics in Perinatology* (2019), 46, 273-290

Caffeine use in the neonatal intensive care unit. Abu-Shaweesh JM and Martin RJ, *Seminars in Fetal & Neonatal Medicine* (2017), 22, 342-347

Evidence-based use of acetaminophen for hemodynamically significant ductus arteriosus in preterm infants. Jasani B, Weisz DE and McNamara PJ, *Seminars in Perinatology* (2018), 42, 243-252