**Objectives**

- Describe the changes that occur in the normal fetal and transitional neonatal circulatory processes in response to perinatal asphyxia
- Outline the alterations causing impaired gas exchange and the development of acidosis as a result of asphyxia and summarize the potential multiorgan system dysfunctions that commonly accompany perinatal asphyxial injury
- Identify the common locations of brain injury resulting from perinatal asphyxial events based on factors such as timing and duration of insult and impact of therapeutic interventions
- Using clinical trial findings, contrast the multiorgan system markers observed in infants receiving therapeutic hypothermia versus those who did not receive the therapy and explain the significance to overall outcome prognosis in infants following a perinatal asphyxial injury

**Content Outline**

1. Overview of Normal Fetal Circulation
2. Circulatory Changes during Labor, Birth & Neonatal Transition
3. Causes of Perinatal Asphyxia
4. Responses to Asphyxia
   4.1 Cardiovascular
   4.2 Respiratory including lung injury
   4.3 Liver injury & coagulopathy, thrombocytopenia
   4.4 Renal injury & electrolyte imbalances
   4.5 Gastrointestinal
5. Alterations in Gas Exchange & Development of Acidosis
6. Processes Leading to Neuronal Cell Death
7. Pathology of Brain Injury Resulting From Perinatal Asphyxia
   7.1 Locations
   7.2 Timing & duration of injury
8. Impact of Therapeutic Hypothermia on Multiorgan Failure

**Reading Material Resources**

*Module WB1916: Perinatal Asphyxia-Causes & Effect* is based on the resources listed below. A copy of each resource is included with the module.

Pathophysiology of Birth Asphyxia, Rainaldi MA and Perlman JM, *Clinics in Perinatology* 43 (3); Sept. 2016, pp. 409-422

Cardiovascular Alterations and Multiorgan Dysfunction after Birth Asphyxia, Polglase GR, Ong T and Hillman NH, *Clinics in Perinatology* 43 (3); Sept. 2016, pp. 469-483