Miami Dade College

Course Description

SON2151C | Neurosonography | 2.00 credits

A comprehensive course designed to examine sonographic imaging of the neonatal and infant brain, with an introduction to ultra-operative brain and spinal cord imaging. Emphasis is placed on normal brain anatomy, congenital and malformations and acquired pathologic conditions. Prerequisites: SON1113L, 1141C.

Course Competencies

Competency 1: The student will demonstrate knowledge about the advantages of Neurosonography by:

1. Listing the advantages and disadvantages of real-time scanning
2. Listing and comparing the advantages and disadvantages of ultrasound and CT
3. Describing the role ultrasound currently plays as a diagnostic tool
4. Identifying and describing the advantages and disadvantages of the various transducers and frequencies used for Neurosonography

Competency 2: The student will demonstrate knowledge and comprehension of the scanning protocol in Neurosonography by:

1. Listing patient preparation and positioning
2. Outlining a basic protocol and significant landmarks of each section
3. Identify the various forms of hard copy image storage and describe the advantages and disadvantages of each
4. Describe proper patient care for both full-term and premature infants
5. Discussing the unique requirements of premature infants
6. Discussing infant positioning
7. Identifying the monitors and special equipment of neonates
8. Discussing proper methods of infection control and equipment cleaning
9. Describe the necessary precautions for diseases and infections unique to infants

Competency 3: The student will demonstrate knowledge and comprehension of the normal brain anatomy findings by:

1. Discuss the difference between the central, peripheral, somatic, and autonomic nervous systems
2. Describing the bones and sutures of the skull and vertebral column
3. Identifying the meninges of the brain and spinal cord
4. Describe the three major reflections of the dura mater and what they divide
5. Describing the formation of venous sinuses and cisterns
6. Describing the macro and microscopic anatomy of the spinal cord
7. Understanding the configuration of the white and gray matter of the brain and spine and what it is composed of
8. Listing the significant functions of the spinal cord
9. Identifying the six major divisions of the brain and the primary functions of each
10. Identifying the difference between sulci and gyri and identifying some of the major ones
11. Identifying the five lobes of the cerebrum, which fissures separate them, and their major functions
12. Describing the limbic system
13. Identifying the basal ganglia and the three types of axon tracts of the brain
14. Identifying the structures seen on a mid-sagittal section of the brain
15. Describing the ventricular system
16. Discuss the cerebrospinal fluid's composition, formation, flow, and reabsorption
17. Labeling a diagram of the cranial vascular system, arterial and venous
18. Listing the structures seen on each standard cross-sectional anatomical section
19. Identifying modified coronal (transverse), sagittal (longitudinal), axial, and posterior fossa views
20. Identifying normal anatomy on all standard images

Competency 4: Demonstrate knowledge, comprehension, and application of brain pathologies diagnosed with Neurosonography by:

1. Discussing and identifying the various types of intracranial hemorrhages, their causes, location, and sequelae
2. Describing and identifying cerebral infarcts and ischemia
3. Describe and identify hydrocephalus, its causes, sequelae, and treatment
4. Describing and identifying holoprosencephaly
5. Describing and identifying hydranencephaly
6. Describing and identifying Dandy-Walker Syndrome
7. Describing and identifying meningeal hematomas and grading of bleeds
8. Describe and identify effusions and normal extra-axial fluid
9. Describe and identify Chiari malformations, especially Chiari II- Arnold Chiari
10. Describe and identify A-V malformations- exceedingly vein of Galen aneurysms and their cause and treatment
11. Describing and identifying agenesis of the corpus callosum
12. Describe and identify brain cysts, including porencephalic, periventricular leukomalacia, encephalomalacia, and quadrigeminal and arachnoid cysts
13. Describe the neonatal infections affecting the brain and their sonographic manifestation
14. Describing and identifying cerebral abscesses and empyema
15. Describing and identifying congenital and acquired brain tumors
16. Describing and identifying spinal tumors and cysts
17. Describing and identifying spinal trauma and intraoperative sonographic foreign body localization
18. Describe intraoperative sonography's role in disk herniation and vertebral dislocation

Learning Outcomes:

- Communicate effectively using listening, speaking, reading, and writing skills
- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information