

DMS-2500: OBSTETRICAL SONOGRAPHY

Cuyahoga Community College

Viewing: DMS-2500 : Obstetrical Sonography

Board of Trustees:

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Academic Term:

Fall 2020

Subject Code

DMS - Diagnostic Medical Sonography

Course Number:

2500

Title:

Obstetrical Sonography

Catalog Description:

Study of normal anatomy and anatomic variants, physiology, pathology and pathophysiology of the gravid pelvis and fetus during second and third trimesters as related to sonography. Focus on fetal biometry, fetal size and age assessment, fetal maturity of second and third trimester, conditions involving multiple gestations, fetal abnormalities, and effects of maternal disease on the pregnancy. Also includes sonographic procedures for amniocentesis, chorionic villus sampling, fetal therapy, Doppler and color Doppler applications of uterine artery, umbilical cord and fetal aorta. Ethical issues in obstetric sonography and support of parental-fetal bonding discussed.

Credit Hour(s):

4

Lecture Hour(s):

4

Requisites

Prerequisite and Corequisite

DMS-1500 Gynecologic and Obstetrical Sonography; and concurrent enrollment in DMS-2301 Intermediate Sonographic Scanning.

Outcomes

Course Outcome(s):

Assess the indications for necessity and provide the technical findings for a second-trimester and third-trimester obstetric ultrasound exams.

Objective(s):

1. Recognize and identify the sonographic appearance of normal maternal and fetal anatomic structures observed during the second and third trimester.
2. Recognize and identify the sonographic appearance of obstetric/fetal abnormalities, disease, pathology, and pathophysiology seen during the second and third trimester.
3. Explain the process for various ultrasound-guided procedures performed during the 2nd and 3rd trimester.
4. State the appropriate biometric values and define the purpose of Doppler and color Doppler applications of the gravid uterus, umbilical cord and fetal aorta.
5. Assess and present technical findings to proposed obstetrical clinical procedure scenarios for pertinent related medical data and image information.

Methods of Evaluation:

1. Written tests/quizzes
2. Midterm and final exam
3. Presentations

4. Homework assignments
5. Research paper/project

Course Content Outline:

1. Concepts
 - a. Exam protocols
 - b. Scope of Practice
 - c. Exam preparation
 - d. Cross-sectional anatomy
 - e. Hormone cycle
 - f. Patient history
 - g. Fertility
 - h. Fetal demise
 - i. Patient preparation
 - j. Exam indications
 - k. Exam contraindications
 - l. Pathology/pathophysiology
 - m. Fetal anomalies
 - n. Doppler
 - o. Fetal pathology
 - p. Maternal pathology/pathophysiology
 - q. Standards of practice
2. Skills
 - a. Defining the sonographic appearance of the gravid uterus and adnexal area.
 - b. Correlating medical data to technical findings present in a sonographic image of a gravid pelvic exam.
 - c. Identifying disease and abnormalities present in a sonographic image of a gravid pelvic exam.
 - d. Describing indications/contraindications for a transvaginal pelvic exam during the second and third trimester of pregnancy.
 - e. Differentiating between sonographic appearance of normal and abnormal maternal anatomic structures.
 - f. Differentiating between sonographic appearance of normal and abnormal fetal anatomic structures.
3. Issues
 - a. Medical ethics
 - b. Physician interaction
 - c. Patient interaction
 - d. Anomalies
 - e. Doppler
 - f. Legal
 - g. Standard precautions
 - h. Body habitus
 - i. Retention of learned knowledge and skills
 - j. Doppler
 - k. Standards of practice
 - l. Verbal and non-verbal communication limitations

Topical Outline

1. Maternal pelvic organs in second/third trimester of pregnancy
 - a. Uterus
 - b. Cervix
 - c. Vagina
 - d. Adnexa
2. Normal sonographic appearance of fetal structures in second/third trimester
 - a. Presence or absence of fetal life
 - b. Fetal presentation and orientation
 - c. Fetal age and measurement
 - i. Biparietal diameter
 - ii. Binocular diameter
 - iii. Head circumference, lateral ventricular size, and cisterna magna size
 - iv. Cephalic index
 - v. Occipito-frontal diameter
 - vi. Abdominal circumference and abdominal diameter

- vii. Fetal long bone
- viii. Head/body ratio
- ix. Estimated weight
- x. Femur length/abdominal circumference ratio
- d. Fetal anatomy
 - i. Gastrointestinal system
 - 1. Gall bladder
 - 2. Spleen
 - 3. Bowel
 - 4. Stomach
 - 5. Liver
 - 6. Abdominal wall
 - ii. Genitourinary system
 - 1. Bladder
 - 2. Kidneys
 - 3. Genitalia
 - iii. Central nervous system
 - 1. Intracranial structures
 - 2. Spinal column
 - iv. Skeletal system
 - 1. Skull
 - 2. Facial bones
 - 3. Extremities
 - 4. Spine/ossification centers
 - v. Cardiovascular system - heart
 - 1. Four-chambers
 - 2. Correct side
 - 3. Rate
 - 4. Outflow tracks
 - vi. Respiratory system (lungs)
- e. Placenta
- f. Umbilical cord
 - i. Size
 - ii. Number of vessels
 - iii. Insertion sites
- g. Associated vascular and lymphatic structures
- h. Amniotic fluid location and amount
- 3. Sonographic appearance and issues surrounding obstetric abnormalities, disease, pathology, and pathophysiology during the second and third trimester
 - a. Fetal number
 - b. Fetal position or presentation
 - c. Fetal viability
 - d. Placenta
 - i. Accreta
 - ii. Previa
 - iii. Abruption
 - iv. Cysts, masses, lesions, calcification
 - v. Developmental changes
 - vi. Increased or decreased placental thickness
 - vii. Membranes and cord
 - e. Fetal abnormalities
 - i. Abdominal and thoracic
 - ii. Cranial defects
 - iii. Neural tube defects
 - iv. Genitourinary
 - v. Gastrointestinal
 - vi. Skeletal
 - vii. Cardiac

- viii. Fetal hydrops
- ix. Umbilical cord
 - 1. Number of vessels
 - 2. Knots/masses
 - 3. Abnormal position
- 4. Sonographic changes associated with these maternal diseases
 - a. Pre- and post-conception infections and in utero infections
 - b. Diabetes mellitus
 - c. Rh sensitization and other hematologic disorders
 - d. Toxemia and hypertension
 - e. Metabolic and endocrine disorders
 - f. Drug and nutritional disorders
 - g. Familial and non-familial genetic disorders
 - h. Specific conditions/considerations
 - i. Age
 - ii. Race
 - iii. Cultural
 - iv. Social
 - v. Geographical
 - vi. Economic status
 - i. Amniotic fluid
 - i. Polyhydramnios
 - ii. Oligohydramnios
 - j. Coexisting conditions, neoplasm and neoplasm-like conditions to include
 - i. Cystic, complex, or solid masses
 - ii. Primary or secondary neoplasm, and/or metastasis
 - iii. Intrauterine device
 - iv. Intrauterine and ectopic pregnancy
 - k. Fetal death
- 5. Effects of maternal disease
 - a. Infection
 - b. Endocrine and metabolic disorders
 - c. Hematologic disorders
 - d. Drug use and nutritional disorders
- 6. Invasive ultrasound-guided procedures
 - a. Amniocentesis
 - b. Chorionic villus sampling
 - c. Percutaneous umbilical blood sampling
 - d. Fetal reduction
- 7. Doppler and color Doppler applications
 - a. Uterine artery
 - b. Umbilical cord
 - c. Fetal aorta
- 8. 3D and 4D imaging
- 9. Fetal Therapy
- 10. Controversies in obstetrical ultrasound
- 11. Support of parental-fetal bonding
- 12. Ethical issues in obstetrical ultrasound

Resources

Morton, Mary E. *Callen's Ultrasonography in Obstetrics and Gynecology*. 65th ed. Philadelphia: Saunders, 2016.

Bissett, R. A. L., A. N. Khan, and N. B. Thomas. *Differential Diagnosis in Obstetric and Gynecologic Ultrasound*. 3rd ed. Philadelphia: Saunders, 2013.

Sohn, Christof, Hans-Joachim Voigt and Klaus Vetter. *Doppler Ultrasound in Gynecology and Obstetrics*. 4th ed. New York: Thieme, 2004.

Doubilet, Peter M., and Carol B. Benson. *Atlas of Ultrasound in Obstetrics and Gynecology: A Multimedia Reference*. 2nd ed. Philadelphia: Lippincott Williams Wilkins, 2011.

Fleischer, Arthur C., et al., eds. *Fleischer's Sonography in Obstetrics and Gynecology: Principles and Practice*. 8th ed. New York: McGraw-Hill Professional, 2017.

Hogge, W. Allen, Isabelle Wilkins, et al. *Sanders' Structural Fetal Abnormalities*. 2nd ed. McGraw Hill, 2016.

Rumack, Carol M., Deborah Levine, eds. *Diagnostic Ultrasound*. 5th ed. St. Louis: Elsevier, 2017.

Stephenson, Susan R. *Diagnostic Medical Sonography: Obstetrics & Gynecology*. 3rd ed. Philadelphia: Lippincott Williams & Wilkins, 2016.

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