

DMS-1500: GYNECOLOGIC AND OBSTETRICAL SONOGRAPHY

Cuyahoga Community College

Viewing: DMS-1500 : Gynecologic and Obstetrical Sonography

Board of Trustees:

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Academic Term:

Fall 2020

Subject Code

DMS - Diagnostic Medical Sonography

Course Number:

1500

Title:

Gynecologic and Obstetrical Sonography

Catalog Description:

Study of normal anatomy and anatomic variants, physiology, pathology, and pathophysiology of female pelvis (non-pregnant, post-partum and postmenopausal) and female reproductive system as related to sonography. Includes monitoring infertile patient. Anatomy, physiology, anomalies, and pathology of maternal, embryo, and fetal anatomic structures during the first trimester studied. Delineates purpose and appropriateness of transabdominal versus transvaginal scanning approaches with associated patient and ethical issues. Doppler and color Doppler applications and biometrics of non-gravid uterus and ovaries discussed. Includes demonstration of transabdominal examination.

Credit Hour(s):

4

Lecture Hour(s):

4

Requisites

Prerequisite and Corequisite

Concurrent enrollment in DMS-1311 Initial Sonographic Scanning.

Outcomes

Course Outcome(s):

Identify indications for and provide a technical finding of a gynecologic ultrasound exam.

Objective(s):

1. Recognize and identify the sonographic appearance of normal anatomic structures of the female pelvis.
2. Recognize and identify the sonographic appearance of gynecologic disease, pathology, and pathophysiology.
3. Recognize and identify the sonographic appearance of intrauterine devices.
4. Describe the causes, treatment, and monitoring process of the infertile patient.
5. Identify normal values for dimensions of female pelvic organs and assess measured dimensions against normal values for age.
6. State the appropriate biometric values and define the purpose of Doppler and color Doppler applications of the female pelvic organs.
7. Assess and present technical findings to proposed gynecological clinical procedure scenarios for pertinent related medical data and image information.
8. Identify indications for and provide the technical findings for a first-trimester obstetric ultrasound exam.

Course Outcome(s):

Recognize and identify the sonographic appearance of normal maternal, embryo, and fetal anatomic structures during the first trimester.

Objective(s):

1. Describe the causes, treatment, and monitoring process of the first-trimester patient.
2. State the appropriate biometric values and define the purpose of Doppler and color Doppler applications in the first-trimester exam.

3. Assess and present technical findings to proposed gynecological clinical procedure scenarios for pertinent related medical data and image information.
 4. Recognize and identify the sonographic appearance of obstetric abnormalities, disease, pathology, and pathophysiology that occur during the first trimester to the patient and her fetus.
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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. First trimester cross-sectional anatomy of the female pelvis
 - b. First trimester cross-sectional fetal anatomy
 - c. Menstrual Cycle
 - d. Hormone cycle
 - e. Body habitus
 - f. Patient history
 - g. Reproduction
 - h. Fertility
 - i. Infertility
 - j. Patient preparation
 - k. Exam indications
 - l. Exam contraindications
 - m. Pathology/pathophysiology
 - n. Anomalies
 - o. Doppler
2. Skills
 - a. Recognizing sonographic appearance of the uterus and adnexal area.
 - b. Correlating medical data to technical findings present in a sonographic image of a female pelvic exam.
 - c. Describing probe disinfectant techniques.
 - d. Using critical thinking to analyze sonographic images.
 - e. Identifying disease and abnormalities present in a sonographic image of a female pelvic exam.
 - f. Describing indications/contraindications for a transvaginal pelvic exam and a first trimester obstetrical exam.
3. Issues
 - a. Medical ethics
 - b. Physician interaction
 - c. Legal
 - d. Standards of practice
 - e. Diversity
 - f. Standard precautions
 - g. Safety
 - h. Quality
 - i. Scope of practice
 - j. Practice
 - k. Body habitus
 - l. Retention of learned knowledge and skills
 - m. Doppler
 - n. Verbal and non-verbal communication limitations

Topical Outline

1. Basic anatomy, physiology, and pathology of the female pelvis
 - a. Uterus
 - b. Cervix
 - c. Vagina

- d. Adnexa
 - e. Reproductive physiology and cyclic changes
 - i. Premenstrual stage
 - ii. Proliferative or preovulatory phase
 - iii. Ovulatory phase
 - iv. Secretory or postovulatory phase
 - v. Postmenopausal stage
 - f. Urinary bladder
 - g. Abdominal wall
 - h. Peritoneum
 - i. Retroperitoneum
 - j. Associated vascular, muscular, and lymphatic structures
 - k. Demonstration of transabdominal exam
2. In-depth anatomy, physiology, pathology, and pathophysiology of the uterus
- a. Imaging considerations for medical and surgical interventions that are often associated with specific populations
 - b. Congenital anomalies:
 - i. Number of organs
 - ii. Position, form, and orientation of organs
 - iii. Associated normal variants
 - c. Effects of trauma and complications of injury, disease, or pathology to include
 - i. Laceration or rupture
 - ii. Intrapelvic hemorrhage
 - iii. Hematoma
 - iv. Thrombosis
 - v. Leiomyoma
 - vi. Abscess
 - d. Inflammation and inflammatory conditions
 - e. Organ wall abnormalities or thickening
 - f. Neoplasm and neoplasm-like conditions to include:
 - i. Cystic, complex, or solid masses
 - ii. Primary or secondary neoplasm, and/or metastasis
 - g. Intrauterine contraceptive devices and other birth control methods
 - h. Hormonal replacement therapy
 - i. Pelvic vessel aneurysm
 - j. Pelvic intramural hematoma with dissection
 - k. Abnormal pelvic blood flow
3. In-depth anatomy, physiology, pathology, and pathophysiology of the ovaries
- a. Conditions specific to age, race, culture, social, geographical, and economic status
 - b. Congenital anomalies:
 - i. Locations of organs
 - ii. Associated normal variants
 - c. Effects of trauma and complications of injury, disease, or pathology to include
 - i. Laceration or rupture
 - ii. Hemorrhage
 - iii. Hematoma
 - iv. Thrombosis
 - v. Abscess
 - d. Inflammation and inflammatory conditions
 - e. Neoplasm and neoplasm-like conditions to include:
 - i. Cystic, complex, or solid masses
 - ii. Primary or secondary neoplasm, and/or metastasis
 - iii. Hyperstimulated ovaries (secondary to Clomid, Perganol, etc)
 - f. Hormonal replacement therapy
 - g. Abnormal blood flow
4. Etiology, treatment and the role of sonography in the management of infertility
- a. Conditions specific to the infertility patient
 - b. Techniques used with the infertility patient
 - c. Scanning approach and protocols

5. Anatomy, physiology, and pathology of the post-partum pelvis
6. Assessment of the post-menopausal pelvis
7. Tests and laboratory values related to gynecology
8. Scanning approach and ethics of transabdominal, transvaginal, and transperineal imaging
9. Doppler and color Doppler applications of the uterus and ovaries
 - a. Pathology
 - b. Ethics of the role of color Doppler in the first trimester pregnancy
10. Tests and laboratory values related to pregnancy
 - a. HGC levels
 - b. Quantitative vs Qualitative tests
11. Fertilization and embryology with abnormal outcomes
 - a. Ectopic
 - b. Abortion
 - c. Molar pregnancy
12. Fertilization and embryology with normal outcomes
13. Anatomy, physiology, maturation, pathology and pathophysiology of the placenta
 - a. Maturity/grading
 - b. Accreta
 - c. Previa
 - d. Abruption
 - e. Cysts, masses, lesions, calcification
 - f. Developmental changes
 - g. Increased or decreased placental thickness
 - h. Membranes and cord
14. Normal and abnormal fetal development of the first trimester
 - a. Presence or absence of fetal life
 - b. Fetal death:
 - i. Abortion
 - ii. Anembryonic gestation
 - c. Ectopic location
 - d. Embryo/fetal number
 - e. Fetal position or presentation
 - f. Fetal anatomy:
 - i. Stomach
 - ii. Liver
 - iii. Abdominal wall
 - iv. Bladder
 - v. Central nervous system:
 1. Intracranial structures
 2. Spinal column
 - vi. Skeletal system:
 1. Skull
 2. Extremities
 3. Spine
 - vii. Heart:
 1. Four-chambers
 2. Correct side
 3. Rate
 - g. Umbilical cord:
 - i. Number of vessels
 - ii. Insertion sites
 - h. Associated vascular and lymphatic structures
 - i. Amniotic fluid location and amount
 - i. Polyhydramnios
 - ii. Oligohydramnios
15. Fetal abnormalities:
 - a. Abdominal and thoracic
 - b. Cranial defects
 - c. Neural tube defects

- d. Genitourinary
 - e. Gastrointestinal
 - f. Skeletal
 - g. Cardiac
 - h. Fetal hydrops
 - i. Two vessel cord
16. Fetal biometry of the first trimester
 - a. Mean gestational sac diameter
 - b. Crown rump length
 - c. Biparietal diameter
 - d. Head circumference, lateral ventricular size, and cisterna magna size
 - e. Cephalic index
 - f. Occipitofrontal diameter
 17. Doppler and color Doppler applications of the first trimester pregnancy
 18. 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. Drug and nutritional disorders
 19. Familial and non-familial genetic disorders
 20. Coexisting conditions, neoplasm and neoplasm-like conditions to include:
 - a. Cystic, complex, or solid masses
 - b. Primary or secondary neoplasm, and/or metastasis
 - c. Intrauterine device
 - d. Intrauterine and ectopic pregnancy

Resources

Norton, Mary E. *Callen's Ultrasonography in Obstetrics and Gynecology*. 6th ed. Philadelphia: W. B. Saunders, 2016.

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

Hagen-Ansert, Sandra L. *Textbook of Diagnostic Ultrasonography*. 8th ed. 2 Volumes. St. Louis: Mosby, 2017.

Rumack, Carol M., Stephanie R. Wilson, and J. William Charboneau, eds. *Diagnostic Ultrasound*. 5th ed. 2 Volumes. St. Louis: Mosby, 2017.

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

Stephenson, Susan R. *DMS: Obstetrics & Gynecology*. 4th ed. Philadelphia: Lippincott Williams & Wilkins, 2017.

Sams Willis, Rebecca. *Quick Reference Guide for Ob/Gyn Sonography*. 1st ed. Create Space Independent Publishing Platform, 2013.

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