

General Ultrasound Obstetrical Exam

PURPOSE:

1. To determine the presence or absence of disease.
2. To identify and quantitate pathology, which may be present by evaluating organs and anatomic regions in the fetus and female pelvis, for focal or diffuse abnormalities.
3. To improve patient outcome by identifying abnormalities and disease, categorizing severity and planning for intervention and/or medical correction.
4. To evaluate fetal growth and development

PROCEDURE:

1. The complete study may/may not include M-mode, Real time, Doppler or Color Interrogation.
 - a) The complete obstetric first trimester exam includes the uterus, adnexa, cul de sac, gestational sac, yolk sac, and embryo.
 - b) A complete second or third trimester exam includes the uterus, adnexa, cul de sac, amniotic sac and fetus.
2. Patient preparation is required for these tests.
 - a) A transabdominal 1st trimester exam requires a full bladder. (Drinking 24-48 ounces of water, one hour prior to exam is helpful)
 - b) A transabdominal 2nd and 3rd trimester exam doesn't requires a full bladder.
 - c) A transvaginal exam requires the patient to empty their bladder.
3. At conclusion of test sonographer will complete:
 - a) Appropriate technologist worksheet with findings
 - b) Log patient data into appropriate billing information
4. Call preliminary report as indicated.

STATEMENT OF INDICATIONS: One or more of the following indications must be present

1. First trimester obstetrical exam
 - a) To confirm the presence of an intrauterine pregnancy
 - b) To evaluate a suspected ectopic pregnancy
 - c) To define the cause of vaginal bleeding of undetermined etiology
 - d) To estimate gestational age
 - e) To confirm suspected multiple gestations
 - f) To confirm embryonic life
 - g) As an adjunct to chorionic villus sampling, amniocentesis, embryo transfer, and IUD localization and removal
 - h) To evaluate pelvic masses, ovaries, and adnexa
 - i) To detect uterine abnormalities
 - j) Additional indications may be used following ICD guidelines
2. Second and third trimester obstetrical exam
 - a) Estimation of gestational age for patients with uncertain clinical dates or verification of gestational age for patients scheduled to undergo elective cesarean section, induction of labor, or termination of pregnancy.
 - b) Evaluation of uterine size and clinical dates discrepancies
 - c) Evaluation of fetal growth
 - d) Estimation of fetal weight

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- e) Determination of fetal presentation
- f) Evaluation of fetal life in either a single or multiple gestations
- g) As an adjunct to an amniocentesis, percutaneous umbilical blood sampling procedure, or cerclage placement
- h) Evaluation of a suspected uterine abnormality such as a leiomyoma or uterus didelphis
- i) Evaluation of abnormal maternal serum alpha-fetoprotein values
- j) Evaluation of suspected polyhydramnios or oligohydramnios
- k) Evaluation of suspected abnormalities of the placenta, including placental abruption, placenta previa, or placenta accreta
- l) Evaluation of vaginal bleeding or suspected amniotic fluid leakage
- m) Evaluation and follow-up of suspected fetal anomalies
- n) Evaluation of patients with a history of prior congenital anomalies
- o) Biophysical evaluation of fetal well being, including the assessment of amniotic fluid volume, fetal tone and body movements, fetal breathing, and heart rate patterns
- p) Additional indications may be used following ICD guidelines

EQUIPMENT:

1. Real time scanner using;
 - a) Sector narrow near field
 - b) Linear (curved) transducers wide near field
 - c) Endovaginal transducer (5 MHz or higher)
 - d) Doppler
 - e) Color Doppler
 - f) Ultrasound acoustic gel
 - g) Appropriate patient drape
 - h) Towels
 - i) Probe cover for endovaginal transducer
 - j) Appropriate cleaning solution for transducer

PROCEDURE FOR FIRST TRIMESTER TRANSABDOMINAL OBSTETRICAL EXAM:

1. Obtain complete patient history, including last menstrual period, current and past symptoms, recent laboratory and other test results, and relevant risk factors. Enter patient data into real-time scanner
2. Place patient in a supine position.
3. Apply ultrasound gel to patient's lower abdomen region.
4. Begin by placing transducer just above the patient's symphysis pubis and midline.
5. In sagittal, image the uterus including the fundus, body, and cervix. Take an AP measurement and a long measurement from the fundus to the cervix.
6. Image the lower uterine segment with optimal demonstration of the cervix, vagina, and posterior cul-de-sac.
7. In transverse, and midline, angle slightly above the symphysis pubis, image the fundus. Angle posteriorly and image the cervix. Measure the width of the uterus at mid-corpus.

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8. In sagittal, locate gestational sac. A maximum measurement of the gestational sac should be documented with transverse measurements to obtain mean sac diameter.
9. In transverse, measure gestational sac orthogonally (AP and transverse)
 - a) Locate fetal pole. Measure from crown to rump (crown-rump length) and yolk sac.
 - b) Document presence or absence of fetal heart motion. If positive, measure fetal heart rate.
10. In sagittal, angle to the right of the uterus to image the right ovary and measure the dimension.
11. Rotate the transducer to transverse and image the long-axis of the right ovary with measurement (long-axis and AP).
12. Move the transducer back to midline and in sagittal, angle left to image the left ovary and measure.
13. Rotate the transducer to transverse and image the long-axis of the left ovary with measurement (long-axis and AP).
14. If follicles exceed 10mm in size, measure the diameter of the largest follicle.
15. While scanning the ovaries, survey the adnexal region for abnormalities. If an adnexal mass is identified, measure the mass, and document if cystic, solid or mixed, as well as its location in relationship to the ovaries and uterus.
16. If no fetal pole was located in the uterus, check adnexa carefully to rule out ectopic pregnancy.
17. Scan the cul-de-sac and bowel area posterior to the uterus for the presence of free fluid or a mass. If a mass is identified, measure the mass, and document if cystic, solid or mixed, as well as its relationship to the ovaries and uterus.
 - a) Identification of peristalsis can help distinguish a loop of bowel from a pelvic mass.
18. Placental location should be recorded and its relationship to the internal cervical os. Image entire placenta, paying special attention to the margins.

PROCEDURE FOR FIRST TRIMESTER TRANSVAGINAL OBSTETRICAL EXAM:

1. Proceed with introductions, explanations and patient comfort.
2. Obtain complete patient history, including last menstrual period, current and past symptoms, recent laboratory and other test results, and relevant risk factors. Enter patient data into real-time scanner.
3. Select obstetric set up or other appropriate machine settings.
4. Place patient in supine position with feet in stir-ups, or with a pillow under the patient's lower back and knees bent.
5. Cover the transducer with a probe cover. Use a lubricant such as K-Y jelly or saline on the outside of the probe cover.
6. Instruct the patient to insert the transducer into their vagina about 3 to 4 inches.
7. Proceed with #7 through #20 of previous section: Procedure for first trimester transabdominal obstetrical exam.

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PROCEDURE FOR SECOND AND THIRD TRIMESTER OBSTETRICAL EXAM:

1. Proceed with introductions, explanations and patient comfort.
2. Obtain complete patient history, including last menstrual period, current and past symptoms, recent laboratory and other test results, and relevant risk factors. Begin by placing transducer just above the patient's symphysis pubis and midline.
3. In sagittal, image the lower uterine segment with optimal demonstration of the cervix, vagina, and posterior cul de sac. Document placenta location in relation to the cervix. Scan throughout placenta in sagittal and transverse.
 - a) Use of translabial technique can be used in place of transvaginal transducer to document placenta previa in late 3rd trimester.
4. Measure amniotic fluid amount in four quadrants.
5. Document fetal position and orientation.
6. Obtain fetal age by following measurements:
 - a) Biparietal diameter - outer parietal bone to inner parietal bone
 - b) Head circumference - frontal bone to occipital protuberance, then area around skull
 - c) Abdominal circumference - level of hepatic vein in liver, stomach
 - d) Femur length - solid bone
7. Obtain images of the central nervous system
 - a) Spinal column in sagittal and transverse (c-spine, t-spine, l-spine and sacrum)
 - b) Lateral ventricular size
 - c) Cisterna Magna size
 - d) Cerebellar hemispheres
8. Obtain images of the skeletal system
 - a) Skull
 - b) In sagittal or transverse, image radius and ulna in both arms
 - c) In sagittal or transverse, image tibia and fibula in both legs
9. Obtain images of the cardiovascular system
 - a) Four-chamber heart
 - b) Document position of heart in chest cavity - apex of heart toward left
 - c) Heart rate and rhythm
10. Obtain images of umbilical cord
 - a) Size
 - b) Number of vessels
 - c) Insertion site - fetus and placental
11. Obtain images of the genitourinary system
 - a) In sagittal or transverse, image the kidneys
 - b) In sagittal or transverse, image the bladder
 - c) Genitalia
12. Obtain images of the stomach. Document position in abdominal cavity
 - a) Images of stomach on left side - correlate with apex of heart
13. Obtain images of diaphragm
 - a) Sagittal views to include bladder, stomach and heart in appropriate body cavities

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EVALUATION AND DIAGNOSTIC CRITERIA:

Real -time evaluation and documentation should include but not be limited to:

1. FETUS
 - a) Correlate gestational age with menstrual age
 - b) Appearance of all organs
 - c) Lesion (Cystic, Solid, or Complex)
 - i) Margins
 - ii) Shape
 - iii) Size
 - iv) Location and Origin
 - v) Septations
 - vi) Enhanced through transmission
 - vii) Posterior attenuation
 - d) Fluid Collection
2. UTERUS, OVARIES AND ADNEXAL REGION
 - a) Size and Shape
 - b) Echogenicity
 - c) Echo-texture
 - d) Lesion (Cystic, Solid or Complex)
 - i) Margins
 - ii) Shape
 - iii) Size
 - iv) Location and Origin
 - v) Septations
 - vi) Mural nodules
 - vii) Enhanced through transmission
 - viii) Posterior attenuation
 - ix) Distended fusiform tubular structures
 - e) Fluid collection
 - f) Doppler/Color Doppler
 - i) To evaluate vascularity of the uterus and adnexal region and that of localized masses.
3. PLACENTA
 - a) Location
 - b) Relationship to the internal cervical os
 - c) Margins - All low-lying placental observations need to be addressed with a preliminary report.

SPECIAL STATEMENT REGARDING DIAGNOSTIC CRITERIA:

It is recognized that individual patients and disease presentations will differ. For this reason this document is meant to be a statement of standard. This document is not meant to supersede the qualified interpreting physician's prerogative to add or adjust the interpretation according to his/her best judgment.

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GUIDELINES FOR CALLING PRELIMINARY REPORTS:

1. Reporting preliminary or technical findings is both desirable and necessary in clinical practice.
2. The sonographer may/may not make the preliminary nature of the report known to the referring or interpreting physician.
3. The technical findings must be interpreted within the above stated pre-established diagnostic criteria guidelines.
4. When to call the referring or interpreting physician with a preliminary report:
 - a) Ectopic pregnancy
 - b) Fetal demise
 - c) Any anomaly of the fetus or placenta
 - d) Abnormal amount of amniotic fluid
 - e) Adnexal mass
 - f) Free fluid or mass in the cul-de-sac
 - g) Abnormal biophysical profile or abnormal antepartum testing

REFERENCES

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2. AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices
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5. Sauerbrei, Eric E., Nguyen, Khanh T., Nolan, Robert L. A Practical Guide to Ultrasound in Obstetrics and Gynecology. Raven Press. 1987
6. Moore, Keith L. Before We are Born. W.B. Saunders Company. 1989, third edition