

# The New OB/GYN Ultrasound Curriculum and the SonoSim® Ultrasound Training Solution

In 2015, the American Institute of Ultrasound in Medicine (AIUM) assembled a multisociety task force of experts in obstetrics & gynecology, radiology, and medical education to develop a consensus-based, standardized curriculum and competency evaluation process for obstetric & gynecologic ultrasound training in residency programs. In January 2018, [American Journal of Obstetrics & Gynecology](#), [Journal of Ultrasound in Medicine](#), and [Ultrasound in Obstetrics & Gynecology](#) officially published the recommendations.<sup>1,2,3,4</sup> The SonoSim Ultrasound Training Solution matches these new industry recommendations through its computer-based modules of didactic courses, knowledge assessments, and interactive SonoSimulator® scanning cases.

Year 1 Residency		
OB/GYN Essential Topic & Objective	SonoSim® Module & SonoSim® Lesson	Covered
<b>Basic Principles of Medical Ultrasound</b>	<b>Fundamentals of Ultrasound</b>	
Explain the basic principles of ultrasound physics	Basic Ultrasound Physics	✓
Compare the different types of ultrasound modes (B-mode, M-mode, Doppler, two-dimensional (2D) and three-dimensional (3D)).	Imaging Modes, Doppler Mode Imaging	✓
Describe the bioeffects of ultrasound (mechanical and thermal effects: ALARA Principle – As Low As Reasonably Achievable)	Infection Control & Biosafety	✓
Recognize and describe ultrasound artifacts	Imaging Artifacts	✓
Recognize relevant official statements from professional societies (AIUM, ACOG, ACOOG, ACR, ISUOG, SMFM, and SRU)	Infection Control & Biosafety First-Trimester Pregnancy: General Considerations Second- and Third-Trimester Pregnancy – Part I: General Considerations Fetal Biometry & Pregnancy Dating	✓
<b>Basic Characteristics of the Ultrasound Equipment (Knobology)</b>	<b>Fundamentals of Ultrasound</b>	
Ultrasound transducers: explain principles of sound generation; compare transducer characteristics and applications	Introduction, Transducer Basics	✓
Recognize and describe sound penetration and bioeffect with consideration related to acoustic power output	Infection Control & Biosafety	✓
Describe the effect of frequency on resolution and penetration	Transducer Basics	✓
Describe the effect of depth settings on the field of view and image size	Ultrasound System Operation	✓
Explain how to adjust gain settings for optimal image brightness with minimum power output	Ultrasound System Operation	✓
Explain how to adjust focal zone depths to achieve the best resolution of structures of interest	Ultrasound System Operation	✓
Explain how to adjust image persistence settings to reduce background noise	Imaging Artifacts	✓
Input patient information into ultrasound system before starting an ultrasound examination	Imaging Conventions	✓

## Year 1 Residency

OB/GYN Essential Topic & Objective	SonoSim® Module & SonoSim® Lesson	Covered
<b>Aspects of the Ultrasound Examination</b>	<b>Fundamentals of Ultrasound</b>	
Describe effective positioning of patients and application of coupling agents	Basic Ultrasound Physics, Imaging Conventions	✓
Describe ergonomic practices that minimize repetitive stress injuries (positioning of operator and equipment)	Imaging Conventions	✓
Explain correct transducer manipulation and image orientation	Imaging Conventions	✓
Explain ultrasound image labeling and storage	Imaging Conventions	✓
Describe appropriate communication of ultrasound findings to other health professionals	Imaging Conventions	✓
Describe the protocol for transducer cleaning and disinfection	Infection Control & Biosafety	✓
<b>Ultrasound in the First Trimester</b>	<b>First-Trimester Pregnancy</b>	
Describe steps for performance of first-trimester transvaginal ultrasound examination	Introduction, General Considerations	✓
Describe indications for a first-trimester ultrasound examination	Introduction, General Considerations, First-Trimester Pregnancy Ultrasound	✓
Describe gestational sac evaluation (intrauterine location, discriminatory human chorionic gonadotropin levels, and differentiation from endometrial fluid)	First-Trimester Pregnancy Ultrasound	✓
Recognize and describe the yolk sac	First-Trimester Pregnancy Ultrasound	✓
Recognize and describe the amnion	First-Trimester Pregnancy Ultrasound	✓
Recognize and describe the embryo/fetus (number)	Anatomy, First-Trimester Pregnancy Ultrasound, Special Scenarios	✓
Recognize embryo/fetus cardiac activity and know how to document with M-mode or movie clip	General Considerations, First-Trimester Pregnancy Ultrasound	✓
Describe criteria for definitive diagnosis of embryonic/fetal death in the first trimester	Detecting Pregnancy Failure	✓
Identify components of sonographic dating in the first trimester	Pregnancy Dating Using Ultrasound	✓
Recognize and describe ultrasound evaluation of ampullary tubal ectopic pregnancies	Pathologic Conditions	✓
Recognize and describe the sonographic appearance of subchorionic hematoma	Pathologic Conditions	✓
Recognize and describe features of a molar pregnancy	Pathologic Conditions, Special Scenarios	✓
Recognize and describe the association between thickened nuchal translucency and fetal chromosomal anomalies	Special Scenarios	✓

## Year 1 Residency

OB/GYN Essential Topic & Objective	SonoSim® Module & SonoSim® Lesson	Covered
<b>Ultrasound in the Second and Third Trimesters</b>	<b>Second- and Third-Trimester Pregnancy – Part I and II</b>	
Describe components of the basic second- and third-trimester ultrasound examinations	Introduction, General Considerations, Basic Fetal Anatomy	✓
Identify and describe the components of fetal biometry in sonographic dating in second and third trimesters	Basic Fetal Anatomy, Fetal Biometry & Pregnancy Dating	✓
Recognize and explain predisposing factors for fetal macrosomia and fetal growth restriction in the third trimester	Fetal Weight, Intrauterine Growth Restriction, & Fetal Macrosomia	✓
Describe imaging parameters for placental localization	Assessment of Extrafetal Anatomy, Twin Gestation	✓
Recognize and describe risks and indications for genetic amniocentesis	Basic Fetal Anatomy	✓
<b>Ultrasound Evaluation of Twin Gestations</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Role of ultrasound in diagnosis of twins	Twin Gestation	✓
Chorionicity and amnionicity in multifetal pregnancies	Twin Gestation	✓
<b>Placental Abnormalities</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Recognize and explain risk factors and sonographic diagnosis of placenta previa and low-lying placenta	Placental Evaluation	✓
Recognize and describe risk factors of placenta accreta	Placental Evaluation	✓
<b>Amniotic Fluid Assessment</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Describe methods for diagnosing oligohydramnios	Amniotic Fluid Assessment	✓
Describe methods for diagnosing polyhydramnios	Amniotic Fluid Assessment	✓
<b>Ultrasound Examination of the Non-Pregnant Uterus</b>	<b>GYN Ultrasound of Nonpregnant Normal Uterus</b>	
Recognize and describe indications for pelvic sonography	Introduction	✓
Recognize and describe sonographic features of the normal uterus in relations to the menstrual cycle	Introduction, Normal Anatomy, Female Pelvis Anatomy, Sonographic Imaging, Transabdominal Sonographic Technique, Transvaginal Sonographic Technique, Case Studies	✓
<b>Ultrasound Examination of Adnexa</b>	<b>GYN Ultrasound Normal Adnexa</b>	
Recognize and describe sonographic features of the normal ovary in relations to the menstrual cycle	Introduction, Adnexal Anatomy, Female Pelvis Physiology, Sonographic Anatomy, Sonographic Examination, Case Studies	✓
Recognize and describe characteristics of a simple cyst	Introduction, Adnexal Anatomy, Female Pelvis Physiology, Sonographic Anatomy, Sonographic Examination, Case Studies	✓

## Year 2 Residency

OB/GYN Essential Topic & Objective	SonoSim® Module & SonoSim® Lesson	Covered
<b>Ultrasound in the First Trimester</b>	<b>First-Trimester Pregnancy</b>	
Recognize and describe the sonographic appearance of major fetal malformations in early gestation	Pathological Conditions, Special Scenarios	✓
Describe atypical locations of ectopic pregnancies including interstitial, ovarian, cervical, abdominal and Cesarean scar implantations	Pathological Conditions	✓
Review workup of pregnancy of unknown location	Detecting Pregnancy Failure	✓
<b>Ultrasound Evaluation of Twin Gestations</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Describe methods of determining twin placentation by ultrasound	Twin Gestation	✓
Explain the role of ultrasound in follow-up of twin gestations	Twin Gestation	✓
Explain the role of ultrasound in serial evaluation of discordant twins	Twin Gestation	✓
Recognize and describe the sonographic findings with monochorionic monoamniotic twins	Twin Gestation	✓
<b>Placental Abnormalities</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Explain risk factors and recognize sonographic diagnosis of vasa previa	Placental Evaluation	✓
Explain risk factors and recognize sonographic findings of placenta accreta	Placental Evaluation	✓
Recognize and describe the role of ultrasound assessment of placental abruption	Placental Evaluation	✓
<b>Amniotic Fluid Assessment</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Recognize and explain ultrasound estimation of amniotic fluid volume in twin gestations	Amniotic Fluid Assessment	✓
<b>Cervix</b>	<b>Second- and Third-Trimester Pregnancy – Part I</b>	
Ultrasound measurement of cervical length in second and third trimesters of pregnancy	Cervical Length	✓
<b>Abnormalities of the Non-Pregnant Uterus</b>	<b>GYN Ultrasound of Nonpregnant Abnormal Uterus – Part I</b>	
Recognize and describe ultrasound evaluation of anatomic locations of leiomyomas (anatomic locations)	Leiomyomas	✓
<b>Abnormalities of the Non-Pregnant Uterus</b>	<b>GYN Ultrasound of Nonpregnant Abnormal Uterus – Part II</b>	
Recognize and describe endometrial abnormalities (myoma, etc.)	Evaluating the Endometrium, Endometrial Polyps & Submucosal Leiomyomas, Endometrial Adhesions, Retained Products of Conception, Arteriovenous Malformation, Subinvolution of the Placental Site, Endometrial Cancer & Endometrial Hyperplasia, Tamoxifen Effect on Endometrium	✓

## Year 2 Residency

OB/GYN Essential Topic & Objective	SonoSim® Module & SonoSim® Lesson	Covered
<b>Ultrasound Evaluation of Adnexa</b>	<b>GYN Ultrasound Nonmalignant Adnexal Conditions</b>	
Recognize and describe sonographic characteristics of hemorrhagic cysts and their evolution (grayscale and color Doppler)	Ovarian Cysts	✓
Recognize and describe sonographic characteristics of endometriomas (grayscale and color Doppler)	Ovarian Cysts	✓
Recognize and describe sonographic characteristics of mature teratomas (gray scale and color Doppler)	Ovarian Cysts	✓
Recognize and describe sonographic characteristics of pedunculated leiomyomas and ovarian fibromas	Ovarian Cysts, Pedunculated Leiomyoma	✓
Recognize and describe sonographic characteristics of hydrosalpinges	Hydrosalpinx	✓
Recognize and describe sonographic characteristics of tubo-ovarian inflammatory process (tubo-ovarian complex/abscesses)	Tubo-Ovarian Abscess	✓
Recognize and describe sonographic characteristics of peritoneal inclusion cysts	Peritoneal Inclusion Cyst & Paraovarian Cyst	✓
Recognize and describe sonographic characteristics of polycystic ovaries	Ovarian Cysts	✓
Recognize and describe sonographic characteristics of adnexal torsion	Adnexal Torsion	✓
<b>Ultrasound Evaluation of the Adnexa</b>	<b>GYN Ultrasound Malignant Adnexal Conditions</b>	
Recognize and describe sonographic characteristics of malignant adnexal masses	Adnexal Anatomy, Evaluation of Adnexal Masses, Sonographic Technique, Sonographic Characterization of Adnexal Masses, Borderline Tumors, Ovarian Cancer, Ovarian Cancer Screening	✓

## Year 3 Residency

OB/GYN Essential Topic & Objective	SonoSim® Module & SonoSim® Lesson	Covered
<b>Ultrasound in the Second and Third Trimesters</b>	<b>Second- and Third-Trimester Pregnancy – Part I and II</b>	
Recognize and describe normal fetal head anatomy and common malformations	Basic Fetal Anatomy	✓
Recognize and describe normal fetal facial anatomy and common malformations	Basic Fetal Anatomy	✓
Recognize and describe normal fetal thoracic anatomy and common malformations	Basic Fetal Anatomy	✓
Recognize and describe normal fetal heart anatomy and common malformations	Basic Fetal Anatomy	✓
Recognize and describe normal fetal abdominal anatomy and common malformations	Basic Fetal Anatomy	✓
Recognize and describe normal fetal pelvic anatomy and common malformations	Basic Fetal Anatomy	✓
Recognize and describe normal fetal skeletal anatomy and common malformations	Basic Fetal Anatomy	✓
Explain the use of umbilical artery Doppler studies in the evaluation of fetal growth restriction	Fetal Weight, Intrauterine Growth Restriction, & Fetal Macrosomia	✓
Recognize and describe ultrasound diagnosis of hydrops	Basic Fetal Anatomy	✓
<b>Ultrasound Evaluation of Twin Gestations</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Explain and recognize the role of ultrasound in diagnosis & management of twin-twin transfusion syndrome	Twin Gestation	✓
Explain the role of ultrasound in the evaluation of twin anemia-polycythemia sequence and selective intrauterine growth restriction in monochorionic twins	Twin Gestation	✓
Explain the use of umbilical artery Doppler studies in the evaluation of fetal twin-twin transfusion syndrome	Twin Gestation	✓
<b>Ultrasound Evaluation of the Non-Pregnant Uterus</b>	<b>GYN Ultrasound of Nonpregnant Abnormal Uterus – Part I</b>	
Recognize and describe sonographic features of adenomyosis	Adenomyosis	✓
Explain classification of congenital uterine malformations (2D and 3D ultrasound)	Sonographic Imaging, Congenital Uterine Malformations	✓
Recognize and describe intrauterine contraceptive devices (2D and 3D localization)	Sonographic Imaging, Localization of Intrauterine Devices	✓
<b>Evaluation of the Adnexa</b>	<b>GYN Ultrasound of Malignant Adnexal Conditions</b>	
Recognize and describe the role of color Doppler in the evaluation of adnexal masses	Adnexal Anatomy, Evaluation of Adnexal Masses, Sonographic Technique, Sonographic Characterization of Adnexal Masses, Ovarian Cancer	✓
Explain and compare prediction models of ovarian cancer	Ovarian Cancer, Ovarian Cancer Screening	✓
Recognize and describe the International Ovarian Tumor Analysis (IOTA) simple rules for classification of adnexal masses	Evaluation of Adnexal Masses	✓
<b>Evaluation of the Adnexa</b>	<b>GYN Ultrasound of Nonmalignant Adnexal Conditions</b>	
Recognize and describe sonographic features of endometriosis	Ovarian Cysts	✓

## Year 4 Residency

OB/GYN Essential Topic & Objective	SonoSim® Module & SonoSim® Lesson	Covered
<b>Ultrasound in the Second and Third Trimesters</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Recognize and describe the role of middle cerebral artery peak systolic velocity in screening for fetal anemia	Fetal Weight, Intrauterine Growth Restriction, & Fetal Macrosomia	✓
<b>Ultrasound Evaluation of Twin Gestations</b>	<b>Second- and Third-Trimester Pregnancy – Part II</b>	
Recognize and describe sonographic features of conjoined twins	Twin Gestation	✓
Recognize and describe the role of ultrasound in the diagnosis and evaluation of twin reversed arterial perfusion	Twin Gestation	✓

<sup>i</sup>Abuhamad A, Minton KK, Benson CB, et al. Obstetric and gynecologic ultrasound curriculum and competency assessment in residency training programs: consensus report. Am J Obstet Gynecol. 2018 Jan;218(1):29-67.

<sup>ii</sup>Abuhamad A, Minton KK, Benson CB, et al. Obstetric and gynecologic ultrasound curriculum and competency assessment in residency training programs: consensus report. J Ultrasound Med. 2018 Jan;37(1):19-50.

<sup>iii</sup>Abuhamad A, Minton KK, Benson CB, et al. Obstetric and gynecologic ultrasound curriculum and competency assessment in residency training programs: consensus report. Ultrasound Obstet Gynecol. 2018 Jan;51(1):150-155.