EARLY FIRST TRIMESTER OBSTETRICAL ULTRASOUND PROTOCOL

For up to 10w6d GA

BILLING CODES:
UOB1 – Singleton pregnancy
UOB1TWIN – Twin pregnancy

UOBFU (or UOBF1) to be used on follow up exams if a UOB1 has already been charged in this pregnancy.

UOBTV to be added when transvaginal exam performed. ***TV to be done on all pregnancies < 9 weeks gestational age, if abnormality suspected, or if otherwise indicated.***

*****If no definite intrauterine pregnancy is visualized, or ectopic pregnancy is questioned, evaluation following the ectopic protocol is necessary. Refer to Ectopic Pregnancy Evaluation requirements below.***

****See separate FETAL DEMISE PROTOCOL for contact information and imaging requirements.**
****If no evidence of intrauterine or extrauterine pregnancy, use the pelvic report on Viewpoint and include uterine measurements.**

DATING: As a routine, use the date provided by the clinician or patient's known LMP. Working EDD in EPIC should be used if more than one date is provided. Use AIUM and ACOG dating criteria if dating is unknown. Guidelines for redating based on ultrasound can be found here

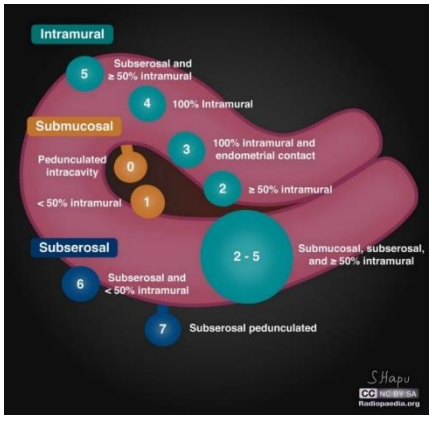
PATIENT PREP: Please have patient come with full bladder.

TRANSABDOMINAL IMAGES TO OBTAIN

MATERNAL STRUCTURES -

UTERUS/MYOMETRIUM:

- Sagittal image showing size, shape, and orientation of uterus.
- Sagittal cine sweep of uterus evaluating for contour changes, echogenicity, fibroids, and masses. *Depth and field of view should be set to visualize area superior to fundus and posterior cul de sac for pedunculated or other extra uterine anomalies.*
- Transverse/Coronal image size, shape, and orientation of uterus.
- Additional cine sweeps if abnormality seen.
- Document any abnormality and measure in three dimensions.



Measuring fibroids: ***See FIGO classification chart***

- Measure 2 largest fibroids and report location.
- Measure additional fibroids if they are submucosal or pedunculated.
  - If the indication for exam is bleeding, also measure any submucosal fibroids regardless of size.

ADNEXA:

- Transverse image of right and left adnexa.
- Cine clip in sagittal and transverse of right and left adnexa.

***** See ECTOPIC PREGNANCY evaluation section below for extra cines if suspected. *****

OVARIES:

- Sagittal image of right and left ovary with and without measurements in long and AP.
- Transverse image of right and left ovary with and without width measurement.
- Additional cine sweeps if abnormality seen.
- Document any abnormality and measure in three dimensions.
- Displacement cine clips - When it is unclear if a mass or cyst is paraovarian or ovarian in nature, apply pressure with the transvaginal probe to displace the structures. Watch for whether the ovary and area of concern move together or separate.

EMBRYO & STRUCTURES UP TO 10 WEEKS 6 DAYS

- **CRL** – Measured three times.
- **HEART RATE** -Establish presence or absence of fetal cardiac motion with M-mode. If no FHM is present, document slow cine clip sweeping through CRL and color image over CRL.
- **GESTATIONAL SAC** - document until 11 weeks
  - Measure the gestational sac in 3 dimensions.
  - Cine clip through the entire gestational sac to show the CRL and yolk sac.
- **YOLK SAC** - Measure AP diameter of yolk sac.
- **MUTLIPLES** -If there are multiples document number, location and chorionicty.
- **CINE CLIP** in sagittal and transverse if any abnormalities are seen.

TRANSVAGINAL IMAGES TO OBTAIN

To be done on all pregnancies < 9 weeks gestational age, if abnormality suspected, or if otherwise indicated.
Sterile or bacteriostatic gel packs and single use covers to be used for all transvaginal imaging

REPEAT ALL IMAGES LISTED ABOVE WITH TRANSVAGINAL IMAGING

ACUTE PAIN <6DAYS:

SPECTRAL DOPPLER IMAGING: To be used on the ovaries in cases of acute pain less than <6 days, not for cases of chronic pain greater than a week.

- Presence of arterial and venous blood flow
- Billing code to be added:

UORGDC if arterial and venous flow is seen.

UORGDL if only arterial OR venous flow is seen.

ECTOPIC PREGNANCY EVAULATION - If no definite intrauterine pregnancy is identified, or if ectopic pregnancy is suspected, evaluation following the ectopic protocol is required. Billing codes to be used **UOB1 and UOBTV.**

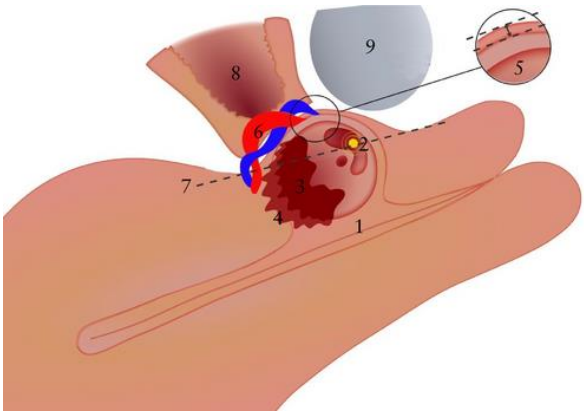
- At least 2 cine clips in sagittal and 2 in transverse of right and left adnexa.
- Cine clip using color flow sweeping slowly through right and left adnexa looking for hypervascular areas or ring of fire which is classically seen with ectopic pregnancies.
- Measure any mass or abnormality seen.
- Displacement cine clips - When it is unclear if a mass or cyst is paraovarian or ovarian in nature, apply pressure with the transvaginal probe to displace the structures. Watch for whether the ovary and area of concern move together or separate.
- Document free fluid and note if debris seen within.

INTERSTITIAL ECTOPIC EVALUATION:

- Perform 3D of the uterus if interstitial ectopic pregnancy is suspected and save 3D data and 3D sweep.

CESAREAN SCAR ECTOPIC EVALUATION:

- Location of the GS in relation to the uterine cavity line (1)
- Measure residual myometrial thickness (5)
- Color Doppler of area surrounding gestational sac (6)
- Location of the GS in relation to the serosal line (7)
- Perform sliding sign to assess movement between the uterus and bladder or bowel.



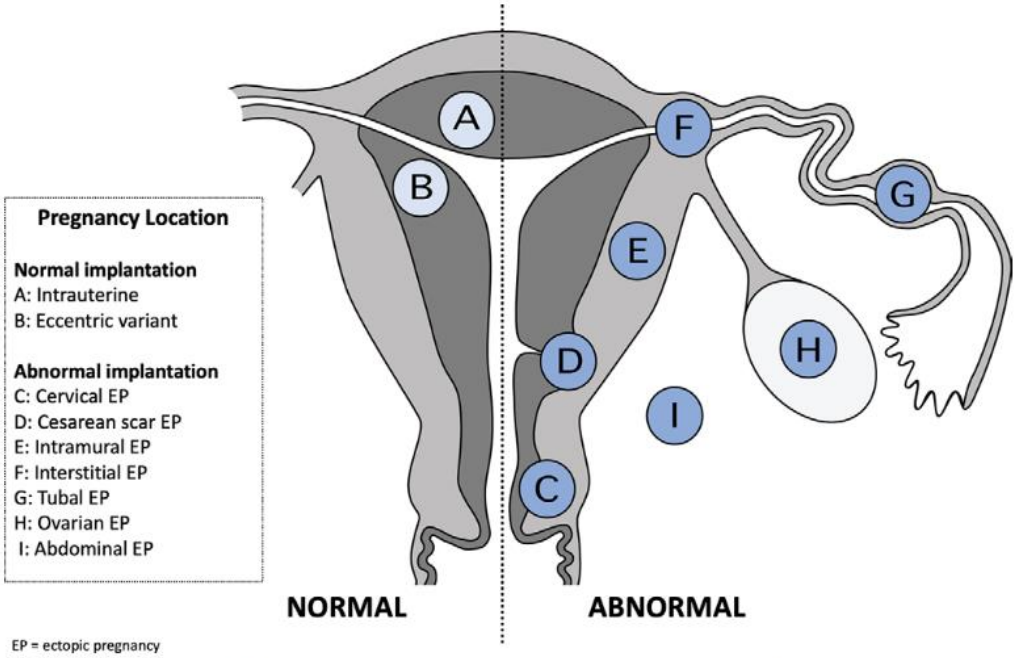
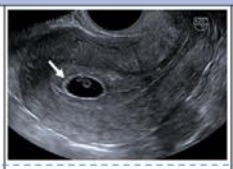
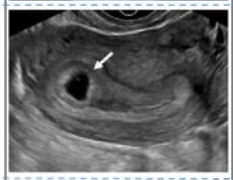
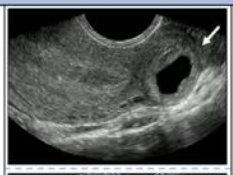
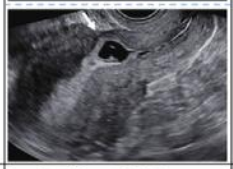
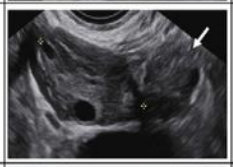
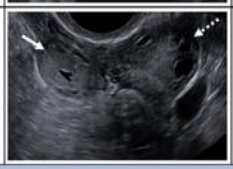
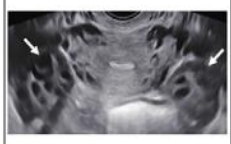


Figure 7: Specific normal and abnormal pregnancy location sites. Schematic illustration of normal pregnancy implantation sites on the left half of the uterine diagram and abnormal implantation sites on the right. Representative round icons indicate the implantation site with corresponding letters to lexicon terms in the box. Of note, it is optional to further describe a tubal ectopic pregnancy location as *isthmic*, *infundibular*, or *ampullary* when the precise location is clear at US.

PREGNANCY LOCATION TERMINOLOGY

SRU FIRST TRIMESTER ULTRASOUND LEXICON: PREGNANCY LOCATION

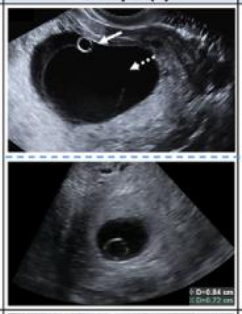
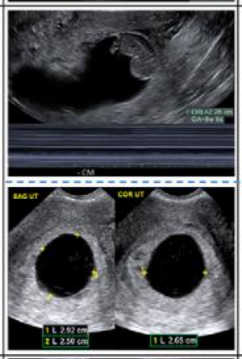
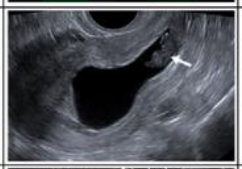
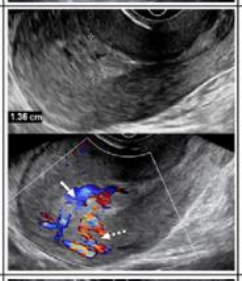
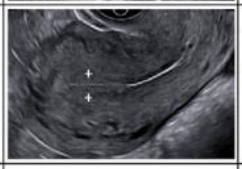
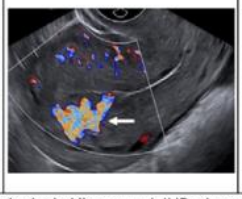
Term(s) *Alternate Term(s)*	Image Example(s)	Image Key	Definitions/ Applications	Term(s) to Avoid	Comments
NORMAL					
Intrauterine pregnancy (IUP) *Normally located pregnancy/IUP*		Arrow = IUP	Pregnancy implanted in a normal location		▪ In early pregnancy, GS normally located in upper 2/3 of uterus
Variants: - *Eccentrically located GS completely surrounded by endometrium*		Arrow = IUP (transverse plane)		'Angular pregnancy' 'Cornual pregnancy' 'Eccentric pregnancy'	▪ Conclude as IUP ▪ Optional to include description/term in report findings ▪ Short-interval follow-up or 3D TVUS may help differentiate from interstitial EP in uncertain cases
- Describe location of GS in uterus with Müllerian duct anomaly		Arrow = IUP in right horn of septate uterus (3D coronal reconstructed plane)		'Unicornuate pregnancy' 'Bicornuate' pregnancy'	▪ Reporting examples: o *GS within a unicornuate uterus* o *GS within right horn of a septate uterus*
ABNORMAL					
Ectopic pregnancy	 	Arrow = GS in left interstitial segment of tube (transverse plane) Arrow = CS scar	Pregnancy implanted in an abnormal location	'Cornual EP' 'Cesarean scar pregnancy' 'Cervical pregnancy' 'Live/living EP' 'Viable EP'	▪ Poses risk of maternal morbidity/mortality if untreated ▪ General term; report laterality (if applicable) and location as follows: o ***Tubal EP*** (includes *ampullary, isthmic,* & *fimbrial*) o ***Interstitial EP*** (intra-myometrial segment of tube) o ***Cesarean scar EP, cervical EP, ovarian EP, abdominal EP, intramural EP*** ▪ Report YS, embryo/fetus and cardiac activity when seen to assist with treatment planning o No YS or embryo/fetus = ***probable EP*** o With YS or embryo/fetus = ***definite EP*** o When in LUS/endocervix, must differentiate from EPL in progress; short-interval follow-up may help in uncertain cases ▪ With co-existing IUP = ***heterotopic pregnancy***
- Extraovarian Mass *Adnexal mass*		Solid arrow = extraovarian mass Calipers = ovary	Adnexal mass, separate from ovary, of variable echogenicity and vascularity		▪ When no IUP, high likelihood of tubal EP ▪ *Adnexal mass* preferred when ovary not seen ▪ ***Sliding sign*** helpful to confirm separate from ovary or uterus
- Tubal ring *Adnexal ring* *Adnexal GS*		Solid arrow = tubal ring Dotted arrow = ovary	GS in adnexa separate from ovary, ± peripheral vascularity	'Bagel' sign 'Donut' sign	▪ When no IUP, high likelihood of tubal EP (even without YS or embryo) ▪ Important to differentiate from exophytic corpus luteum o Echogenicity, ovarian ***claw sign*** and ***sliding sign*** on TVUS may be helpful ▪ Color Doppler not useful as both may have a ring of peripheral vascularity
UNKNOWN					
Pregnancy of unknown location (PUL)		Arrows = ovaries (transverse plane)	No findings of probable or definite IUP or EP on TVUS		▪ Differential diagnosis = non-visualized early IUP, non-visualized EP and completed EPL; correlate with trending serum hCG values and follow-up US o Most IUPs seen with serum hCG ≥3000 mIU/ml ▪ Should NOT be used when TVUS shows: o ***Probable GS/IUP*** = any round/oval intrauterine fluid collection with a hyperechoic rim (even without YS or embryo) o ***Probable EP*** = no findings of IUP and extraovarian mass or tubal ring (even without YS or embryo)

SRU = Society of Radiologists in Ultrasound; GS = gestational sac; 3D = three dimensional; TVUS = transvaginal US; EP = ectopic pregnancy; CS = cesarean section; YS = yolk sac; LUS = lower uterine segment; EPL = early pregnancy loss; "±" = with or without; hCG = human chorionic gonadotropin

Figure 5: Pregnancy location. The location of a pregnancy is divided into normal, abnormal, and unknown. Lexicon terms are bolded and/or italicized, and terms to avoid are in single quotation marks. The essential word in the definition of intrauterine pregnancy and ectopic pregnancy (EP) is *implanted*, which helps differentiate pregnancies that are temporarily located in the lower uterine segment. This definition also further clarifies abnormal intrauterine implantation sites as EPs.

EARLY PREGNANCY LOSS (EPL) TERMINOLOGY

SRU FIRST TRIMESTER ULTRASOUND LEXICON: EARLY PREGNANCY LOSS (EPL)

Term(s) *Alternate Term(s)*	Image Example(s)	Image Key	Definitions/ Applications	Term(s) to Avoid	Comments
Concerning for EPL *Concerning for miscarriage* *Concerning for spontaneous abortion (SAB)* *IUP of unknown prognosis*		Solid arrow = YS Dotted arrow = amnion Calipers = YS (YS = 8 mm)	Normally located GS with findings that suggest a pregnancy may not progress	'Failure' 'IUP of uncertain viability'	▪ Criteria* on TVUS are as follows: ○ Embryonic CRL <7 mm and no cardiac activity ○ MSD 16-24 mm and no embryo ○ Absence of embryo with cardiac activity 7-13 days following visualized GS and no YS ○ Absence of embryo with cardiac activity 7-10 days following visualized GS with YS ○ Empty amnion sign ○ Enlarged YS (>7 mm) ○ Small GS relative to embryo (typically subjective; optional formula: MSD - CRL = <5) ○ Absent embryo ≥6 weeks after LMP ▪ Refer to literature for other poor prognosticators
Diagnostic of EPL *Diagnostic of miscarriage* *Diagnostic of SAB* Special scenarios: *Embryonic/fetal demise* *Anembryonic pregnancy*		Calipers = embryo (CRL = 23 mm; No cardiac motion) Calipers = MSD (MSD = 27 mm)	Normally located GS with findings definitive for a pregnancy that will not progress	'Failure' 'Blighted ovum' 'Nonviable' 'Nonviability'	▪ Criteria* on TVUS are as follows: ○ CRL ≥7 mm and no cardiac activity ○ MSD ≥25 mm and no embryo ○ Absence of embryo with cardiac activity ≥14 days after visualization of GS and no YS ○ Absence of embryo with cardiac activity ≥11 days after visualization of GS with YS ▪ Optional terms for special scenarios: ○ ***Embryonic/fetal demise*** = CRL ≥7 mm and no cardiac activity (*fetal* when GA ≥11 weeks 0 days) ○ ***Anembryonic pregnancy*** = no embryo and 1 of the following: ▪ MSD ≥25 mm ▪ ≥14 days since US showing GS and no YS ▪ ≥11 days since US showing GS with YS
EPL in progress *Miscarriage in progress* *SAB in progress*		Arrow = embryo in LUS/upper cervix (No CM)	GS located in cavity of lower uterine segment or endocervical canal in process of expulsion		▪ If cardiac activity present, consider cervical or cesarean scar ectopic pregnancy ▪ Color Doppler, ***sliding sign*** on TVUS or short-interval follow-up US may be helpful in uncertain cases
Incomplete EPL *Retained (or residual) products of conception (RPOC)* *Incomplete Miscarriage/SAB* Description of findings in lieu of term		Calipers = endometrial thickness (ET = 14 mm) Solid arrow = RPOC Dotted arrow = EMV	Residual intracavitary tissue or thickened endometrium following EPL, typically with internal vascularity; ± persistent GS	'Embryonic tissue' 'Fetal tissue'	▪ Option to substitute *residual* for *retained* as tissue may spontaneously expel and retained may imply tissue is fixed prompting unnecessary intervention; treatment is based on clinical factors or persistent GS ○ If GS in lower uterine segment/endocervix, see EPL in progress above ▪ Vascular flow in endometrial cavity confirms tissue ▪ Endometrium <10 mm without vascular flow is unlikely to represent incomplete EPL ▪ Enhanced myometrial vascularity (EMV) typically seen
Completed EPL *Completed miscarriage* *Completed SAB*		Calipers = endometrial thickness (ET = 7 mm)	No intracavitary tissue or persistent GS following EPL		▪ Used in following scenarios: ○ Prior visualized GS that is no longer seen and no residual intracavitary tissue ○ In differential diagnosis of pregnancy of unknown location (PUL)
- Enhanced myometrial vascularity (EMV)		Arrow = EMV	Focal myometrial vascularity deep to prior pregnancy implantation site		▪ Transient/expected finding following EPL (incomplete or completed); typically, resolves spontaneously ▪ Should NOT be confused with: ○ Arterio-venous fistula (AVF): rare; most commonly due to sharp curettage ○ Arterio-venous malformation (AVM): rare; congenital anomaly ○ Subinvolution of the placental site (SIPS): pathologic diagnosis

SRU= Society of Radiologist in Ultrasound; IUP = intrauterine pregnancy; cm = centimeters; YS = yolk sac; GS = gestational sac; *Doubilet et.al. NEJM 2013, PMID 24106937, DOI 10.1056/NEJMra1302417; TVUS = transvaginal US; MSD = mean sac diameter; CRL = crown-rump length; LMP = last menstrual period; GA = gestational age; CM = cardiac motion; SAG =sagittal; COR = coronal; "±" = with or without; ET = endometrial thickness

Figure 15: Early pregnancy loss (EPL). There are five main categories of EPL: concerning for, diagnostic of, in progress, incomplete, and completed. Enhanced myometrial vascularity (EMV) is included in the lexicon since increased myometrial vascularity deep to a prior implantation site is commonly confused with other rare entities, such as an arteriovenous fistula and arteriovenous malformation, which may lead to unnecessary work-up.

TERMS TO AVOID

SUMMARY OF MAJOR LEXICON CHANGES: TERMS TO AVOID

Terms to Avoid	Lexicon Terms
Embryonic 'pole' or fetal 'pole'	***Embryo*** or ***fetus***
'Heart', 'heartbeat', 'heart motion', etc.	***Cardiac activity*** OR *cardiac motion*
'Live', 'living', 'viable'	***Cardiac activity*** OR *cardiac motion*
'Viability' scan	***First trimester US exam***
'IUP of uncertain viability'	***IUP of uncertain prognosis*** OR ***concerning for EPL***
'Failure'	***Early pregnancy loss (EPL)***
'Blighted ovum'	***Anembryonic pregnancy*** OR ***diagnostic of EPL***
'Pseudogestational sac', 'pseudosac'	***Intracavitary fluid*** OR *endometrial cavity fluid*
'Cesarean scar pregnancy'	***Cesarean scar ectopic pregnancy***
'Cervical pregnancy'	***Cervical ectopic pregnancy***
'Angular pregnancy', 'cornual pregnancy', 'eccentric pregnancy'	***IUP*** OR if describing, use: *eccentrically located GS completely surrounded by endometrium* (and conclude as IUP)
'Cornual ectopic pregnancy'	***Interstitial ectopic pregnancy***
'Unicornuate pregnancy', 'bicornuate pregnancy'	Describe GS relative to uterine MDA (e.g., *GS in right horn of septate uterus*)

US = ultrasound; IUP = intrauterine pregnancy; EPL = early pregnancy loss; GS = gestational sac; MDA = Müllerian duct anomaly

Figure 18: Summary of major lexicon changes highlights terms to avoid. Equally important as terms to use are those terms that are best avoided since they are obsolete or confusing (single quotation marks). This is accompanied by recommended lexicon terms (bold and italicized) to use instead.

TERMS TO USE

SUMMARY OF MAJOR LEXICON CHANGES: TERMS TO USE

Terms to Use	Comments
Early Pregnancy Loss (EPL)	▪ General term endorsed by OB-Gyn communities and societies to describe a pregnancy that may or will not progress, is in the process of expulsion, or has incompletely or completely passed; replaces 'failure' ▪ Modifiers to differentiate above scenarios are as follows: o ***Concerning for*** = GS normally located but with findings that it may not progress o ***Diagnostic of*** = GS normally located but with findings that it will not progress o ***In progress*** = GS located in cavity of LUS or endocervical canal in process of expulsion o ***Incomplete*** = Intracavitary tissue, thickened endometrium or persistent GS following EPL ▪ Alternate terms: • *Retained* (or *residual*) *products of conception (RPOC)* • Description of findings in lieu of a term (e.g., *intracavitary vascularized tissue*, etc.) o ***Completed*** = No persistent GS or intracavitary tissue following EPL ▪ Alternate terms for EPL to be used along with above modifiers: o *Miscarriage* ▪ Preferred by patients in one survey o *Spontaneous abortion in progress (SAB)* ▪ If using, consider reporting as synonymous with miscarriage for patient clarity
Cardiac activity	▪ Term for embryonic/fetal rhythmic pulsations; replaces 'heart', 'heart motion', 'heartbeat', etc. ▪ Alternate term: *cardiac motion* ▪ Avoid the terms 'live', 'living' and 'viable' in the 1st trimester
Ectopic Pregnancy	▪ Defined as a pregnancy implanted in an abnormal location, whether extrauterine or intrauterine o Clarifies cervical and Cesarean scar sites as ectopic pregnancies ▪ Use ***probable*** if no YS or embryo seen ▪ Use ***definite*** if YS or embryo seen

OB-Gyn = Obstetrical and Gynecologic; GS = gestational sac; LUS = lower uterine segment; YS = yolk sac; 1st = first

Figure 17: Summary of major lexicon changes highlighting terms to use. The major changes from currently used terminology to describe sonographic findings in the first trimester are *(a) early pregnancy loss* in lieu of 'failure'; *(b) cardiac activity* in lieu of 'heart motion'; and *(c)* defining *ectopic pregnancy* as an abnormal implantation site. The terms 'live,' 'living,' and 'viable' are commonly used terms to describe cardiac activity. However, as these terms may be misleading, they are best avoided in the first trimester.

EARLY FIRST TRIMESTER PROTOCOL IMAGE LIST
>10wks 6d GA

IMAGE	MODE
TRANSABDOMINAL	**TRANSABD**
UT Sag Mid	2D
UT Sag R-L Cine	Cine
UT Trans Mid	2D
Fibroids (measure largest 2 and any submucosal or pedunculated)	*2D +*
Rt Adnexa Trans	2D
Rt Adnexa Trans S-I Cine	Cine
Rt Adnexa Sag M-L Cine	Cine
Rt Ov Sag	2D
Rt Ov Sag w/ length and height measurements	2D ++
Rt Ov Trans	2D
Rt Ov Trans w/ width measurement	2D +
Lt Adnexa Trans	2D
Lt Adnexa Trans S-I Cine	Cine
Lt Adnexa Trans M-L Cine	Cine
Lt Ov Sag	2D
Lt Ov Sag w/ length and height measurements	2D ++
Lt Ov Trans	2D
Lt Ov Trans w/ width measurement	2D +
CRL x3	2D +
Heart Rate	Mmode
Gestational Sac Sag w/ measurements	2D +
Gestational Sac Trv w/ measurements	2D +
Gestational Sac Sag cine clip	Cine
Yolk Sac w/ AP measurement	2D +
Multiples – number, chronicity, and location	*Cine / 2D*
Cine clip of any abnormalities	
TRANSVAGINAL	**TRANSVAG**
Repeat above images if <9wks, abnormality suspected or otherwise indicated	

REFERENCES:

A Lexicon for First-Trimester US: Society of Radiologists in Ultrasound Consensus Conference Recommendations. S. Rodgers, M. Horrow, et al. Radiology 2024; 312(2):e240122 • https://doi.org/10.1148/radiol.240122

How to perform standardized sonographic examination of Cesarean scar pregnancy in the first trimester C. Verberkt, I. P. M. Jordans, et al. Ultrasound in OB & Gyn, 3 February 2024. https://doi.org/10.1002/uog.27604

EARLY FIRST TRIMESTER ULTRASOUND PROTOCOL HISTORY

	Date	Changes made	By whom
Updated	11/20/2020		Becky Marion
Updated	5/1/2022	Format change Ectopic Pregnancy sweeps added	Renee Betit Fitzgerald
Updated	10/15/2022	Removed 3D for cervical and c-section scar ectopic, still need 3D for cornual ectopic	Renee Betit Fitzgerald
Updated		Added FIGO charts. Removed 3D for cervical and c-section preg	
Reviewed		-Added Nasal bone for 11-15weeks -Added use pelvic report if no evidence of IUP or extrauterine pregnancy seen. UT measurements to be included. -Added incidental increased NT requirements -Added to do ovarian dopplers for ectopic eval if pain <6 days -Added displacement clips for paraovarian mass/cyst	Protocol Meeting 3/23 Attendees: Manjiri Dighe Ken Linnau Shaun Bornemeier Dalene Edden Katie Toth Becky Marion Renee Betit Fitz
Added	5/23/2023	If no definite intrauterine pregnancy is visualized, *or ectopic pregnancy is questioned*, evaluation following the ectopic protocol is necessary	Renee Betit Fitzgerald
Reviewed	1/25/2024	-Separated >11wks and <10w6d protocols -Changed Fetus to Embryo per SRU Consensus & SMFM definitions -No image additions -Changed: Measure 2 largest fibroids (from 3) -Removed duplication of image description in -TV section and stated “Repeat of all transabdominal images listed above” instead -Added image list	Protocol Meeting Attendees: Manjiri Dighe Edith Cheng Kim Ma, Jane Hitti, Michael Richley, Shaun Bornemeier, Dalene Edden, Becky Marion, Renee Betit Fitzgerald
Added	3/12/2025	-First Trimester SRU Consensus Information -Cesarean Scar Ectopic section	Renee Betit Fitzgerald