

FIRST TRIMESTER DETAILED ANATOMY OB ULTRASOUND PROTOCOL (12w0d and 13w6d)

BILLING CODES:

UOBNTM1 – Singleton pregnancy

UOBNTTWIN – Twin pregnancy

UOBNTM1FU (or UOBNTTWNFU) 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. *Transvaginal imaging to be done if abnormality suspected or otherwise indicated.*

****See separate [FETAL DEMISE PROTOCOL](#) for contact information and imaging requirements.**

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.

PATIENT PREP: Please have patient come with full bladder.

TRANSABDOMINAL IMAGES TO OBTAIN

*****Transvaginal images to be included if abnormality suspected or if better visualization is required.***

MATERNAL STRUCTURES

CERVIX:

- Sagittal image of cervix.
- Transverse/Coronal image of cervix.
- Orientation and evaluation of cervical masses.

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 below.

- 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.

MATERNAL STRUCTURES continued...

PLACENTA:

- Sagittal and transverse image of placenta
- Sagittal and transverse umbilical cord origin and insertion into placenta

ADNEXA:

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

OVARIES:

- Sagittal image of right and left ovary without measurements.
- Sagittal measurement of the right and left ovary in long and AP.
- Transverse image of right and left ovary without measurements.
- Transverse width measurement of the right and left ovary.
- Additional cine sweeps if abnormality seen.
- Document any abnormality and measure in three dimensions.

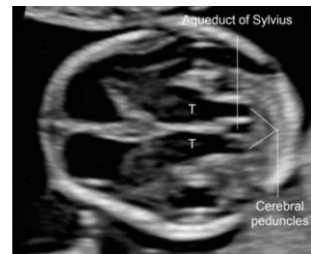
FETAL STRUCTURES

GENERAL IMAGES:

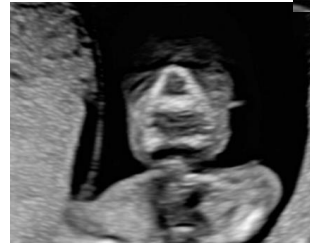
- **CRL** – Measured three times.
- **HEART RATE** -Establish presence or absence of fetal cardiac motion with M-mode. *If no FHM is present*, include images of a slow cine clip sweep through CRL and color image over CRL. Two observers are preferred to verify lack of FHM if available.
- **MUTLIPLS** -If there are multiples document number, location and chorionicty.
- **CINE CLIP** in sagittal and transverse if any abnormalities are seen.

HEAD ANATOMY:

- **CHOROID PLEXUS & CRANIUM**
- **TRANSVERSE CINE SWEEP OF CRANIAL STRUCTURES** to evaluate falx, thalami, cerebral peduncles, 3rd vent, aqueduct of Sylvius and posterior fossa
- **TRANSTHALAMIC VIEW** –thalami, cerebral peduncles, 3rd ventricle and aqueduct of sylvius (see image)
- **SAGITTAL MIDBRAIN**- 3 lines/spaces view showing the thalami, brainstem, posterior fossa and 4th ventricle/intracranial translucency. (see image)
- **SAGITTAL NECK**
- **PROFILE W/ NASAL BONE & MAXILLA**
- **RNT- RETRONASAL TRIANGLE**
- **MANDIBLE** in a coronal view



Profile w maxilla & NB



RNT

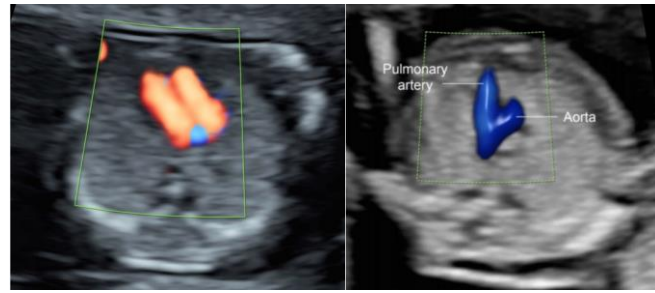


Coronal Mandible

FETAL STRUCTURES continued...

CHEST ANATOMY:

- 4CH VIEW
- 4CH VIEW WITH COLOR
- 3-VESSEL TRACHEA VIEW WITH COLOR
- LUNGS
- RIBS - demonstrated with normal shape and length
- DIAPHRAGM



ABDOMINAL ANATOMY:

- **STOMACH** - Document abdomen in cross section showing left sided stomach.
- **PORTAL VEIN** – shown coursing away from stomach
- **KIDNEYS** – coronal
- **RENAL ARTERIES** – coronal if kidneys not well seen
- **BLADDER** – Document area of fetal bladder. Report as not well seen if not distended.
- **3VC** – Color image at bladder showing presence of 3 umbilical cord vessels.
- **CORD INSERTION** -Note: *Physiologic Bowel in the 1st Trimester: >7mm in diameter. In normal embryos you will see an echogenic mass almost always 8.5-10.5 weeks, sometimes 10.5 –12.0 weeks. And virtually never in a >12.0 weeks. If there is an echogenic mass protruding prominently, measure it. If its >7mm, rescan at 13 weeks.*

BILATERAL EXTREMITIES:

- **UPPER EXTREMITIES** – show humerus, radius and ulna
- **LOWER EXTREMITIES** - show femur, tibia and fibula
- **HANDS**
- **FEET**

SPINE : SAGITTAL VERTEBRAL ELEMENTS AND SKIN EDGE

NUCHAL TRANSLUCENCY: Measured 3 times according to the technique and criteria listed below.

IF AN INCREASED NUCHAL TRANSLUCENCY IS SUSPECTED

Include the following images:

- Cine clip of the fetus in motion showing the nuchal area to prove it is not the amnion being measured.
- Transverse image of the cranium showing the nuchal area, looking for septations and cystic hygroma.
- Cine clip in sagittal through the entire fetus.
- Cine clip in transverse through the entire fetus.
- Perform transvaginal imaging if needed for better visualization.

****Transvaginal images to be included if abnormality suspected or if better visualization is required.**

NUCHAL TRANSLUCENCY MEASUREMENT TECHNIQUE

CRITERIA

- Sonographer must have active certification through FMF to perform and document official NT measurement.
- The gestational period must be 11 to 13 weeks and 6 days.
- CRL must be between 45-84mm. No exceptions.

FETAL POSITION

- Neutral position, with head in line with the spine. When the fetal neck is hyperextended, the measurement can be falsely increased and when the neck is flexed, the measurement can be falsely decreased
- A mid-sagittal view of the face should be obtained. This is defined by the presence of the echogenic tip of the nose and rectangular shape of the palate anteriorly, the translucent diencephalon in the center and the nuchal membrane posteriorly.
- Midline diencephalon and brain structures should be visible.
- Nasal bone and maxilla should be visible.
- Amnion should be distinguishable from fetal skin.
- Fetus must be horizontal on the screen.

IMAGE OPTIMIZATION

- C9-2 probe should be used when reasonable.
- Image should be zoomed to only include the fetal head and upper thorax.
- Image should be zoomed to maximum magnification and always such that any movement of the caliper produces only a 0.1 mm change in the measurement.
- In magnifying the image (pre or post freeze zoom) it is important to turn the gain down. This avoids the mistake of placing the caliper on the fuzzy edge of the line which causes an underestimate of the nuchal measurement.

MEASUREMENT OF NUCHAL TRANSLUCENCY

- Must be measured at least 3 times meeting all criteria.
- Measure at the widest part of the translucency.
- Measurements should be taken with the calipers placed on the white line and should not include any of the fuzz between the lines.
- The umbilical cord may be round the fetal neck in about 5% of cases and this finding may produce a falsely increased NT. In such cases:
 - Document cord with color doppler
 - Obtain a measurement above and below the cord using the same image criteria.
 - Report the average of the above and below measurements.

REPORTING FOR NUCHAL TRANSLUCENCY EXAM:

- **NT** - Always use the ***largest*** of your 3 best nuchal translucency measurements.
- **CRL** - Using the 3 best measurements, report the ***smallest*** CRL. Use whole numbers, no decimals.
- **NASAL BONE** - Report presence of absence of nasal bone
- **LR** - Calculate the Likelihood ratio from [NT charts here](#)
- **SONOGRAPHER** - include FMF certification number and performing sonographer's name.
- **An NT is defined as being abnormal when the LR ≥ 2.0 .** If an NT is abnormal, please call the MICC triage nurse at 8-2497 if on the Montlake campus. All other locations should contact the provider directly to relay the information.

Table 2 Likelihood ratios for calculating trisomy 21 risk for various fetal crown-rump lengths and nuchal translucency (NT) thicknesses

NT (mm)	Crown-rump length (mm)										
	38	39	40	41	42	43	44	45	46	47	48
Median*	1.09	1.11	1.14	1.16	1.18	1.20	1.22	1.24	1.26	1.28	1.31
1.0	0.19	0.19	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17
1.1	0.23	0.22	0.21	0.21	0.20	0.18	0.19	0.18	0.18	0.17	0.17
1.2	0.30	0.28	0.27	0.25	0.24	0.23	0.22	0.21	0.20	0.19	0.18
1.3	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.26	0.25	0.23	0.22
1.4	0.53	0.50	0.47	0.44	0.42	0.39	0.37	0.35	0.33	0.31	0.29
1.5	0.74	0.69	0.62	0.57	0.53	0.48	0.45	0.42	0.39	0.37	0.35
1.6	1.05	0.97	0.86	0.77	0.71	0.64	0.59	0.55	0.51	0.48	0.45
1.7	1.50	1.36	1.23	1.09	0.97	0.80	0.67	0.58	0.52	0.47	0.43
1.8	2.26	1.92	1.70	1.56	1.39	1.23	1.09	1.01	0.90	0.83	0.77
1.9	3.30	2.79	2.46	2.17	1.92	1.70	1.56	1.39	1.28	1.13	1.05
2.0	4.83	4.07	3.59	3.16	2.79	2.46	2.17	1.92	1.70	1.56	1.39
2.1	7.1	6.0	5.3	4.63	3.91	3.44	3.03	2.67	2.36	2.08	1.92
2.2	10	8.8	7.7	6.5	5.7	4.83	4.25	3.74	3.30	2.93	2.56
2.3	15	13	11	9.6	8.1	7.1	6.0	5.3	4.63	4.07	3.59
2.4	23	20	16	14	12	10	8.8	7.4	6.5	5.7	5.0
2.5	35	28	24	20	17	14	12	10	9.2	8.1	6.8
2.6	51	41	35	29	25	21	18	15	13	11	9.6
2.7	75	61	51	41	35	29	25	21	18	15	13
2.8	85	85	85	85	85	85	85	85	85	85	85
2.9	85	85	85	85	85	85	85	85	85	85	85
3.0	85	85	85	85	85	85	85	85	85	85	85
3.1	85	85	85	85	85	85	85	85	85	85	85
3.2	85	85	85	85	85	85	85	85	85	85	85
3.3	85	85	85	85	85	85	85	85	85	85	85
3.4	85	85	85	85	85	85	85	85	85	85	85
3.5	85	85	85	85	85	85	85	85	85	85	85
3.6	85	85	85	85	85	85	85	85	85	85	85
3.7	85	85	85	85	85	85	85	85	85	85	85
3.8	85	85	85	85	85	85	85	85	85	85	85
3.9	85	85	85	85	85	85	85	85	85	85	85
4.0	85	85	85	85	85	85	85	85	85	85	85
4.1	85	85	85	85	85	85	85	85	85	85	85
4.2	85	85	85	85	85	85	85	85	85	85	85
4.3	85	85	85	85	85	85	85	85	85	85	85
4.4	85	85	85	85	85	85	85	85	85	85	85
4.5	85	85	85	85	85	85	85	85	85	85	85
4.6	85	85	85	85	85	85	85	85	85	85	85
4.7	85	85	85	85	85	85	85	85	85	85	85
4.8	85	85	85	85	85	85	85	85	85	85	85
4.9	85	85	85	85	85	85	85	85	85	85	85
5.0	85	85	85	85	85	85	85	85	85	85	85

Radial Down syndrome risk assay

Herman et al.

Ultrasound in Obstetrics and Gynecology

471

Table 2 Continued

NT (mm)	Crown-rump length (mm)										
	54	55	56	57	58	59	60	61	62	63	64
Median*	1.43	1.46	1.48	1.50	1.52	1.54	1.56	1.58	1.60	1.62	1.64
1.0	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.1	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.2	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.3	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17
1.4	0.22	0.21	0.20	0.20	0.19	0.19	0.19	0.18	0.18	0.18	0.17
1.5	0.26	0.25	0.24	0.23	0.22	0.21	0.21	0.20	0.19	0.19	0.18
1.6	0.32	0.30	0.28	0.27	0.26	0.25	0.23	0.23	0.22	0.21	0.20
1.7	0.38	0.37	0.35	0.33	0.32	0.30	0.29	0.28	0.27	0.26	0.25
1.8	0.48	0.46	0.43	0.41	0.38	0.37	0.35	0.34	0.32	0.31	0.30
1.9	0.62	0.57	0.53	0.51	0.48	0.45	0.43	0.41	0.39	0.37	0.36
2.0	0.80	0.74	0.69	0.64	0.62	0.57	0.53	0.50	0.48	0.45	0.43
2.1	1.05	0.97	0.90	0.83	0.77	0.71	0.69	0.64	0.59	0.55	0.53
2.2	1.39	1.28	1.18	1.09	1.01	0.93	0.86	0.80	0.74	0.71	0.66
2.3	1.84	1.70	1.56	1.44	1.28	1.18	1.09	1.01	0.97	0.90	0.83
2.4	2.46	2.26	2.00	1.84	1.70	1.56	1.44	1.33	1.23	1.13	1.05
2.5	3.30	3.03	2.67	2.46	2.26	2.00	1.84	1.70	1.56	1.44	1.33
2.6	4.44	4.07	3.59	3.30	2.93	2.67	2.46	2.17	2.00	1.84	1.70
2.7	6.0	5.3	4.63	4.25	3.91	3.44	3.16	2.91	2.67	2.36	2.17
2.8	8.1	7.1	6.5	5.7	5.0	4.63	4.07	3.74	3.44	3.16	2.91
2.9	11	9.6	8.4	7.7	6.8	6.0	5.3	4.63	4.07	3.74	3.44
3.0	15	13	11	10	8.8	8.1	7.1	6.5	5.7	5.0	4.63
3.1	20	17	15	14	12	10	9.6	8.4	7.7	6.8	6.0
3.2	27	24	21	18	16	14	12	11	10	8.8	8.1
3.3	36	32	27	24	21	18	16	15	13	11	10
3.4	49	43	36	32	28	25	22	19	17	15	14
3.5	66	56	49	43	36	32	28	25	23	20	19
3.6	85	75	66	56	49	43	36	32	29	26	23
3.7	85	85	85	85	85	85	85	85	85	85	85
3.8	85	85	85	85	85	85	85	85	85	85	85
3.9	85	85	85	85	85	85	85	85	85	85	85
4.0	85	85	85	85	85	85	85	85	85	85	85
4.1	85	85	85	85	85	85	85	85	85	85	85
4.2	85	85	85	85	85	85	85	85	85	85	85
4.3	85	85	85	85	85	85	85	85	85	85	85
4.4	85	85	85	85	85	85	85	85	85	85	85
4.5	85	85	85	85	85	85	85	85	85	85	85
4.6	85	85	85	85	85	85	85	85	85	85	85
4.7	85	85	85	85	85	85	85	85	85	85	85
4.8	85	85	85	85	85	85	85	85	85	85	85
4.9	85	85	85	85	85	85	85	85	85	85	85
5.0	85	85	85	85	85	85	85	85	85	85	85

Radial Down syndrome risk assay

Herman et al.

472

Table 2 Continued

Table 2. Continued														
		Crown-rump-length (mm)												
NT (mm)	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Median*	1.76	1.78	1.79	1.81	1.83	1.85	1.86	1.88	1.90	1.91	1.93	1.94	1.96	1.97
1.0	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.1	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.2	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.3	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.4	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.5	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
1.6	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.17	0.17	0.17
1.7	0.21	0.21	0.21	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.18
1.8	0.24	0.23	0.23	0.22	0.22	0.21	0.21	0.21	0.21	0.20	0.20	0.19	0.19	0.19
1.9	0.28	0.27	0.27	0.26	0.25	0.25	0.24	0.23	0.23	0.22	0.22	0.22	0.21	0.21
2.0	0.34	0.33	0.31	0.30	0.29	0.28	0.27	0.27	0.26	0.26	0.25	0.25	0.24	0.24
2.1	0.39	0.38	0.37	0.36	0.35	0.34	0.33	0.32	0.31	0.30	0.29	0.28	0.27	0.27
2.2	0.48	0.46	0.45	0.42	0.41	0.39	0.38	0.37	0.36	0.35	0.34	0.33	0.32	0.32
2.3	0.59	0.57	0.55	0.51	0.50	0.48	0.45	0.43	0.42	0.41	0.39	0.38	0.38	0.38
2.4	0.74	0.69	0.66	0.62	0.59	0.57	0.55	0.53	0.51	0.50	0.48	0.46	0.45	0.45
2.5	0.90	0.86	0.80	0.77	0.74	0.69	0.66	0.64	0.62	0.59	0.57	0.55	0.53	0.53
2.6	1.13	1.05	1.01	0.97	0.90	0.86	0.83	0.77	0.74	0.71	0.69	0.66	0.64	0.62
2.7	1.44	1.33	1.23	1.18	1.13	1.05	1.01	0.97	0.90	0.86	0.83	0.80	0.77	0.75
2.8	1.77	1.70	1.56	1.50	1.39	1.33	1.23	1.18	1.13	1.05	1.01	0.97	0.90	0.86
2.9	2.26	2.08	2.00	1.84	1.77	1.63	1.56	1.44	1.39	1.33	1.23	1.18	1.13	1.09
3.0	2.91	2.69	2.46	2.36	2.17	2.00	1.92	1.84	1.70	1.63	1.56	1.44	1.39	1.33
3.1	3.59	3.44	3.16	2.91	2.67	2.46	2.26	2.17	2.00	1.92	1.84	1.70	1.63	1.56
3.2	4.63	4.25	3.91	3.74	3.44	3.16	3.03	2.79	2.67	2.46	2.36	2.26	2.17	2.09
3.3	6.0	5.5	5.0	4.63	4.25	4.07	3.74	3.59	3.30	3.16	2.91	2.79	2.67	2.64
3.4	7.4	6.8	6.3	6.0	5.5	5.0	4.63	4.40	4.07	4.25	3.59	3.44	3.30	3.16
3.5	9.6	8.8	8.1	8.1	7.4	6.5	6.5	6.6	6.8	8.1	7.1	6.8	6.2	6.0
3.6	12	11	10	9.6	8.8	8.1	7.4	7.1	6.5	6.0	5.7	5.3	5.0	4.8
3.7	13	14	13	12	11	10	9.6	8.8	8.1	7.4	6.8	6.2	6.0	5.6
3.8	20	18	17	15	14	13	12	11	10	9.6	8.8	8.4	7.7	7.4
3.9	26	24	22	19	17	16	15	14	13	12	11	10	9.6	9.2
4.0	35	29	27	23	21	21	21	19	18	16	14	13	12	11
4.1	41	38	35	31	28	26	24	22	20	19	17	16	15	14
4.2	43	41	38	43	40	37	34	32	29	28	26	24	23	22
4.3	61	61	56	49	45	41	38	35	32	29	27	25	24	22
4.4	78	78	69	63	57	53	49	45	42	36	33	32	27	27
4.5	85	85	85	78	72	66	61	53	49	45	43	40	36	33
4.6	85	85	85	85	85	82	75	63	58	53	53	49	45	41
4.7	85	85	85	85	85	85	85	78	85	66	78	66	66	66
4.8	85	85	85	85	85	85	85	85	85	85	85	82	75	66
4.9	85	85	85	85	85	85	85	85	85	85	85	85	85	82
5.0	85	85	85	85	85	85	85	85	85	85	85	85	85	85

FIRST TRIMESTER DETAILED ANATOMY IMAGE LIST 12w-13wk 6d

IMAGE	MODE
MATERNAL	TRANSABD
Cervix Sag	2D
Cervix Trans	2D
UT Sag Mid	2D
UT Sag R-L Cine	Cine
UT Trans Mid	2D
<i>Fibroids (measure largest 2 and any submucosal or pedunculated)</i>	2D +
Placenta Sag	2D
Placenta Trans	2D
Cord Origin	
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 +
FETAL	
CRL x3 (must be 45-84mm)	2D +
Heart Rate	Mmode
<i>Multiples – number, chronicity, and location</i>	Cine / 2D
<i>Cine clip of any abnormalities</i>	
HEAD	
Choroid plexus & cranium	2D
Trans cine sweep of brain	Cine
Transthalamic view	2D
Sagittal midbrain	2D
Sagittal neck	2D
Profile with NB and maxilla	2D
RNT	2D
Mandible in coronal	2D

IMAGE	MODE
CHEST	
4CH	2D
4CH w color	Color
3vt w color	Color
Lungs	2D
Ribs	2D
Diaphragm	2D
ABDOMEN	
Stomach	2D
Portal vein	2D
Kidneys coronal	2D
<i>Renal arteries if kidneys not well seen</i>	Color
Bladder	2D
3VC	Color
Cord Insertion	2D
BILATERAL EXTREMITIES	
Upper Extremities – Hum, Rad, Ulna	2D
Lower Extremities – Fem, Tib, Fib	2D
Hands	2D
Feet	2D
Spine sagittal	2D
Nuchal Translucency x3	2D+
REPEAT W TRANSVAGINAL IF NEEDED	TRANSVAG

REFERENCES:

https://www.aium.org/docs/default-source/resources/image-libraries/detailed_1st.pdf

FIRST TRIMESTER DETAILED ANATOMY PROTOCOL HISTORY

	Date	Changes made	By whom
Created	10/20/2024		Renee Betit Fitzgerald
Reviewed & Approved	1/23/2025	Added: All long bones of extremities	Protocol meeting attendees 1/23/25 E Cheng, M Dighe, K Ma, M Richley, S Swati, C Cheng, S Bornemeier, B Marion, R Betit Fitzgerald, P Thompson