

**UPMC**  
**CENTRAL PA**

**Department of Ultrasound**  
**Protocol Book**

# Table of Contents

Abdomen Complete Protocol.....	3-4
Abdomen Limited/RUQ Protocol.....	5-6
Aorta/Medicare Screening Protocol.....	7-8
Renal/Bladder Protocol .....	9-10
Transplant Renal Protocol.....	11
Transplant Liver Protocol.....	12
Liver Doppler for Portal Hypertension Protocol.....	13
TIPS Procedure Protocol.....	14
Renal Artery Doppler Protocol.....	15
Transabdominal/Endovaginal Pelvic Protocol.....	16-17
Follicular Maturation Study Protocol .....	18
1 <sup>st</sup> Trimester Obstetric Protocol.....	19-20
Detailed Anatomical Complete Obstetrical Protocol.....	21-23
2 <sup>nd</sup> /3 <sup>rd</sup> Trimester Growth Protocol & OB Fetal Followup.....	24
Limited Obstetrical Protocol & Biophysical Profile.....	25
Testicular Protocol.....	26
Thyroid Protocol.....	27
Breast Protocol .....	28
Pediatric (kidneys, spine, hips, pylorus, head) Protocol.....	29-32
Vascular (carotid, venous, arterial) Protocol.....	33-37
Executive Vascular Screening Protocol .....	38

**Procedure: Abdomen Complete**

**Pt. Prep:** NPO for at least **6** hours (**4** hours NPO for emergent pts if possible)

Diabetic pts/pts that need morning meds may have **CLEAR LIQUIDS ONLY**

**Required Images:**

**LIVER**

<b>Annotation</b>	<b>Image Description</b>
LONG LT LIVER	Lt lobe inferior and superior margins & aorta
LONG LT LIVER	Lt lobe/diaphragm & caudate lobe
LONG RT LIVER	Rt lobe/IVC where it passes through liver
LONG RT LIVER	Rt lobe to include porta hepatis
LONG RT LIVER	Rt lobe length in mid clavicular plane <b>with &amp; w/o measurement</b>
LONG RT LIVER	Rt lobe images medial to lateral to include part of the right kidney for parenchyma comparison
LONG RT LOBE	Rt lobe/dome & adjacent pleural space
TRV LT LIVER	Lt lobe/lateral margin with transverse images throughout left lobe including ligamentum teres
TRV RT LIVER	Rt lobe/dome & adjacent pleural space
TRV RT LIVER	Rt lobe/hepatic veins with transverse images throughout right liver including right and left branches of portal vein and main portal vein
TRV RT LIVER	Rt lobe image inferior

**AORTA**

<b>Annotation</b>	<b>Image Description</b>
LONG AO PROX	Longitudinal proximal aorta <b>with AP measurement (outer to outer wall)</b>
LONG AO MID	Longitudinal mid aorta <b>with AP measurement</b>
LONG AO DISTAL	Longitudinal distal aorta at the bifurcation <b>with AP measurement</b>
TRANS AO PROX, MID, DISTAL	Proximal, mid, distal and bifurcation

**INFERIOR VENA CAVA**

<b>Annotation</b>	<b>Image Description</b>
LONG IVC PROX	Inferior vena cava as passes through RT lobe of liver

## GALLBLADDER AND BILIARY TRACT

Annotation	Image Description
LONG GB SUPINE	Longitudinal image of gallbladder (evaluate for sonographic Murphy's sign)
TRV GB SUPINE	Transverse image of the gallbladder
LONG CD	Common hepatic/common bile duct <b>with</b> and <b>without</b> measurement

## GALLBLADDER AND BILIARY TRACT - SECOND POSITION/LEFT LATERAL DECUBITUS

Annotation	Image Description
LONG GB LLD	Longitudinal images of gallbladder to include neck, body and fundus
TRV GB LLD	Transverse images of neck, body and fundus of gallbladder
LONG CBD LLD	Longitudinal images of the common duct at level of PV & through the head of pancreas <b>with and without AP measurement</b>

## PANCREAS

Annotation	Image Description
TRV PANC	Transverse images of pancreas head (to include GDA/CBD relationship), uncinata, body, tail and pancreatic duct (abnormal duct if >2mm)
LONG PANC	Longitudinal images of the pancreatic head/distal common bile duct, body and tail

## KIDNEYS – RIGHT /LEFT KIDNEY

Annotation	Image Description
LONG RT/LT KID	Mid RT/LT Kidney <b>with and without long &amp; AP measurements</b> include liver or spleen for parenchyma comparison
LONG RT/LT KID LAT, MID & MED	Longitudinal images of RT/LT Kidney lateral to medial
TRV RT/LT KID SUP, MID & INF	Transverse RT/LT Kidney images superior to inferior
TRV RT/LT KID	Transverse RT/LT Kidney mid portion to include hilum <b>with and without transverse measurement</b>

## SPLEEN

Annotation	Image Description
LONG SPL	Longitudinal images including adjacent pleural space with <b>Max longitudinal (ML) spleen measurement and cranio-caudal length (CCL)</b>
TRV SPL	Transverse images both anterior & posterior margins with splenic hilum w/ <b>thickness and width measurement for volume calculation:</b> .524 x W x T x [(ML+CCL)/2] = .524 x width x thickness x [{avg. length}/2]

\*IF FREE FLUID IDENTIFIED... IMAGE ALL 4 QUADRANTS

**Procedure: Abdomen Limited/RUQ**

**Pt. Prep:** NPO for at least **6** hours for RUQ studies (**4** hours NPO for emergent pts if possible)  
 Diabetic pts or pts who need morning meds may have CLEAR LIQUIDS ONLY

**Required Images:  
 LIVER**

<b>Annotation</b>	<b>Image Description</b>
LONG LT LIVER	Lt lobe inferior and superior margins & aorta
LONG LT LIVER	Lt lobe/diaphragm & caudate lobe
LONG RT LIVER	Rt lobe/IVC where it passes through liver
LONG RT LIVER	Rt lobe to include porta hepatis
LONG RT LIVER	Rt lobe length in mid clavicular plane <b>with &amp; w/o measurement</b>
LONG RT LIVER	Rt lobe images medial to lateral to include part of the right kidney for parenchyma comparison
LONG RT LOBE	Rt lobe/dome & adjacent pleural space
TRV LT LIVER	Lt lobe/lateral margin with transverse images throughout left lobe including ligamentum teres
TRV RT LIVER	Rt lobe/dome & adjacent pleural space
TRV RT LIVER	Rt lobe/hepatic veins with transverse images throughout right liver including right and left branches of portal vein and main portal vein
TRV RT LIVER	Rt lobe image inferior

**PANCREAS**

<b>Annotation</b>	<b>Image Description</b>
TRV PANC	Transverse images of pancreas head (to include GDA/CBD relationship), uncinata, body, tail and pancreatic duct (abnormal duct if >2mm)
LONG PANC	Longitudinal images of the pancreatic head/distal common bile duct, body and tail

**GALLBLADDER AND BILIARY TRACT**

<b>Annotation</b>	<b>Image Description</b>
LONG GB SUPINE	Longitudinal image of gallbladder (evaluate for sonographic Murphy's sign)
TRV GB SUPINE	Transverse image of the gallbladder
LONG CD	Common hepatic/common bile duct <b>with</b> and <b>without</b> measurement

## GALLBLADDER AND BILIARY TRACT - SECOND POSITION / LEFT LATERAL DECUBITUS

Annotation	Image Description
LONG GB LLD	Longitudinal images of gallbladder to include neck, body and fundus
TRV GB LLD	Transverse images of neck, body and fundus of gallbladder
LONG CBD LLD	Longitudinal images of the common duct at level of PV & through the head of pancreas <b>with and without AP measurement</b>

\*IF FREE FLUID IDENTIFIED... IMAGE ALL 4 QUADRANTS

## ADDITIONAL ABDOMEN LIMITED EXAMS

### **PALPABLE MASS:**

Pertinent history required to be documented:

1. Pain
2. Trauma or anticoagulant therapy
3. How long present
4. Change in size

### **HERNIA:**

Include Valsalva maneuver evaluation with cine image

If positive, always scan contralateral side

### **APPENDIX:**

With and without graded compression RLQ

Diameter >6mm is abnormal

### **SPLEEN ONLY:**

Follow protocol for spleen listed under abdomen complete

**Procedure: Aorta complete – [Charged as Duplex scan of Aorta]**

**Pt. Prep:** NPO for at least 6 hours (4 hours NPO for emergent pts if possible)

Diabetic pts/pts that need morning meds may have CLEAR LIQUIDS ONLY

**Required Images:**

Annotation	Image Description
LONG AO PROX	Longitudinal image of proximal aorta (inferior to the diaphragm and superior to the celiac trunk) <b>with and without AP measurement (outer to outer wall)</b>
LONG AO PROX	Longitudinal image of proximal aorta <b>with color and spectral Doppler waveform</b> demonstrating blood flow and velocity.
LONG AO MID	Longitudinal image of mid aorta (inferior to the celiac truck and along the length of the SMA) <b>with and without measurement</b>
LONG AO MID	Longitudinal image of mid aorta <b>with color demonstrating blood flow and spectral Doppler waveform measuring velocity</b>
LONG AO DIST	Longitudinal image of distal aorta (inferior to SMA and superior to bifurcation) <b>with and without AP measurement.</b>
LONG AO DIST	Longitudinal image of distal aorta (inferior to SMA and superior to bifurcation) <b>with color Doppler and spectral waveform demonstrating blood flow and velocity.</b>
LONG AO RT & LT ILIACS	Longitudinal images of aortic bifurcation to include proximal common iliac arteries with AP measurement
TRV AO PROX	Proximal aorta (inferior to diaphragm and superior to the celiac trunk) <b>with and without measurement.</b>
TRV AO MID	Mid aorta (inferior to the celiac trunk at the level of the renal arteries) <b>with and without measurement.</b>
TRV AO DIST	Distal aorta (inferior to SMA and superior to bifurcation) <b>with and without measurement.</b>
TRV AO BIF	Bifurcation to include the proximal right and left iliac arteries with and without measurement of both iliac arteries

**Special Instructions:**

- **If an aneurysm is detected, obtain color Doppler images of the aneurysm in long and transverse planes.**
- **Demonstrate flow within the aneurysm with spectral waveform.**
- **Measure the AP and transverse dimensions of the aneurysm.**
- **Measure the thickness of the thrombus if detected.**
- **Measure residual lumen inside the aneurysm.**
- **Demonstrate relationship of renal arteries to level of aneurysm**

## Procedure: Aorta Screening

**Prep:** NPO for at least **6** hours (**4** hours NPO for emergent pts if possible)  
 Diabetic pts/pts that need morning meds may have **CLEAR LIQUIDS ONLY**

<b>Annotation</b>	<b>Image Description</b>
LONG AO Proximal Mid Distal	Longitudinal images <b>with and without AP measurements</b>
LONG RT/LT Iliacs	Longitudinal images of RT and LT iliac <b>with and without AP measurements</b>
TRAN AO Proximal Mid Distal	Transverse images <b>with and without transverse measurements</b>
TRANS RT/LT Iliacs	Transverse image of bifurcation
LONG Distal AO	Longitudinal image of distal aorta <b>with color Doppler</b>

### Special Instructions:

- **If an aneurysm is detected, obtain color Doppler images of the aneurysm in long and transverse planes.**
- **Demonstrate flow within the aneurysm with spectral waveform.**
- **Measure the AP and transverse dimensions of the aneurysm.**
- **Measure the thickness of the thrombus if detected.**
- **Measure residual lumen inside the aneurysm.**
- **Demonstrate relationship of renal arteries to level of aneurysm**



**Procedure: Retroperitoneal/Renal -complete**

**Pt. Prep:** 16 oz of water, 1 hour prior, DO NOT VOID prior to exam if possible

**Required Images:**

**RIGHT KIDNEY and LEFT KIDNEY**

<b>Annotation</b>	<b>Image Description</b>
LONG RT/LT KID	Mid RT/LT Kidney <b>with and without long &amp; AP measurements</b> include liver or spleen for parenchyma comparison
LONG RT/LT KID LAT, MID & MED	Longitudinal images of RT/LT Kidney lateral to medial
TRV RT/LT KID SUP, MID & INF	Transverse RT/LT Kidney images superior to inferior
TRV RT/LT KID	Transverse RT/LT Kidney mid portion to include hilum <b>with and without transverse measurement</b>

**BLADDER**

<b>Annotation</b>	<b>Image Description</b>
LONG BL-RT, ML, LT	Longitudinal images of urinary bladder including RT/LT sweeps
TRV BL-INF TO SUP	Transverse images of urinary bladder inferior to superior, with ureteral jets if seen

- **Patients with hydronephrosis, ureteral jets should be obtained as well as pre and post void renal images and a post void bladder image.**
- **PVR calculated if requested.**
- **Utilize color-Doppler and decubitus imaging when intraluminal bladder mass or debris is identified.**
- **If prostate is clearly seen, image and measure in 3 planes to obtain a *volume*.**

## Procedure: Urinary Bladder

**Pt. Prep:** 20oz. of fluid one hour prior to the exam. Patient should not void.

### Required Images:

#### Pre-void Bladder:

ANNOTATION	IMAGE DESCRIPTION
LONG BL ML	Image the bladder midline <b>with and without AP and longitudinal measurements (inner to inner wall).</b>
LONG BL RT	Longitudinal images of right lateral bladder.
LONG BL LT	Longitudinal images of the left lateral bladder.
TRV BL INF-SUP	Transverse images of the bladder inferior to superior.
TRV BL	Transverse image of the bladder at widest point <b>with and without transverse measurement</b>

#### Post-void Bladder:

ANNOTATION	IMAGE DESCRIPTION
TRV BL POST VOID	Image of the bladder at widest point <b>with and without transverse measurement</b>
LONG BL POST VOID	Image of the bladder midline <b>with and without AP and longitudinal measurements</b>

- **Utilize color-Doppler and decubitus imaging when intraluminal bladder mass or debris is identified.**
- **If prostate is clearly seen, image and measure in 3 planes to obtain a *volume*.**
- **Volume calculation should be used for pre and post void bladder measurements.**

## Procedure: Renal Transplant

Pt Prep: None

### Required Images:

Annotation	Image Description
LONG RLQ OR LLQ	Longitudinal images of pelvic side wall – evaluate and measure fluid collections
LONG RT/LT TX KID LAT/MID/MED	Longitudinal images of transplant kidney lateral, mid, and medial <b>with and without AP and longitudinal measurements</b>
TRAN TX KID SUP/MID/INF	Transverse images of transplant kidney superior, mid, and inferior <b>with and without mid measurements</b>
RT/LT ARC TX KID – SUP/MID/INF	Color duplex Doppler with resistive index measurements of superior, mid, and inferior arcuate arteries
RT/LT TX KID MRA @ PELVIS	Color duplex Doppler with resistive index, peak systolic, and end diastolic measurements of main renal artery within renal pelvis/hilum
RT/LT TX KID MRA @ MID	Color duplex Doppler with resistive index, peak systolic, and end diastolic measurements of mid main renal artery
RT/LT TX KID MRA @ ANASTAMOSIS	Color duplex Doppler with resistive index, peak systolic, and end diastolic measurements of anastomotic site
RT/LT TX KID MRV	Color duplex Doppler image of renal vein at pelvis/hilum
RT/LT ILIAC ART – PROX & DISTAL	Color duplex Doppler with peak systolic measurements of iliac artery proximal and distal to transplant
TRAN BLADDER	Transverse images of bladder inferior to superior – show relationship to transplant if possible
LONG BLADDER	Longitudinal images of bladder right to left
PRE & POST VOID BLADDER	<b>Longitudinal and transverse measurements</b> of bladder pre and post void if patient has hydronephrosis or if requested

**\*No Doppler evaluation on pre-biopsy scans**

## Procedure: Liver Transplant

**Pt Prep:** NPO for 6 hours prior to exam

### Required Images:

Annotation	Image Description
LONG RLQ, LLQ, RUQ, LUQ	Limited scanning of the four abdominal quadrants for the presence of ascites and perihepatic scanning for any fluid collection
LONG/TRV RT/LT TX LIVER	Longitudinal and transverse images of transplant LIVER to include: Caudate lobe anterior to IVC Left lateral/superior portion of liver Left lateral/inferior portion of liver Left medial/superior portion of liver Left medial/inferior portion of liver Right lower/anterior portion of liver at right kidney Right lower/posterior portion of liver Right upper/posterior portion of liver Right upper/anterior (dome of liver) Common duct with and without measurement
DOPPLER	Color Doppler and duplex: angle correct <b>&lt; 60 degrees</b> to demonstrate anastomosis, intrahepatic and extrahepatic vessels; if arterial anastomosis is visualized, it must be included in the Doppler study.
TX RPV/LPV/MPV	Color Doppler and duplex with <b>peak systolic and end diastolic</b> measurements of main (MPV), left (LPV), and right portal vein (RPV)
TX RHA/MHA/LHA	Color Doppler and duplex with <b>peak systolic and end diastolic</b> measurements, <b>RI</b> , and <b>acceleration time</b> of main hepatic artery (MHA), right hepatic artery (RHA) and left hepatic artery (LHA)
TX RHV/MHV/LHV	Color Doppler and duplex of middle, right, and left hepatic veins
	All abdominal varices seen must be documented with Color Doppler

## Procedure: Liver Doppler for Portal Hypertension

Required preliminary images: Perform standard RUQ ultrasound and splenic measurements in addition to the following:

**Pt prep:** NPO for 6 hours prior to exam

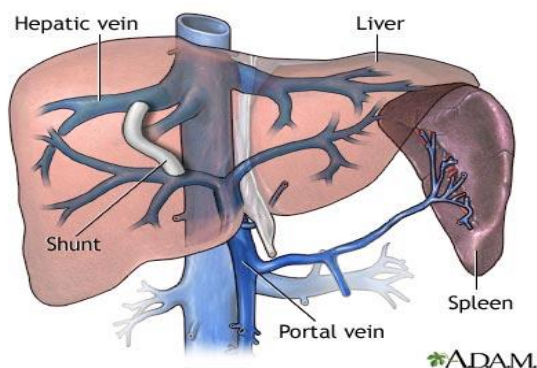
Annotation	Image Description
SPLENIC VEIN AT HILUM	Images of splenic vein at hilum <b>with</b> color duplex Doppler <b>(Normal venous flow towards liver)</b>
SPLENIC VEIN AT CONFLUENCE	Images of splenic vein at confluence <b>with</b> color duplex Doppler <b>(Normal venous flow towards liver)</b>
MAIN PORTAL VEIN	Image of main portal vein entering the liver <b>with</b> color duplex Doppler – should have hepatopedal flow with and without measurements – measure AP dimension
RT PORTAL VEIN	Image of right portal vein <b>with</b> color duplex Doppler
LT PORTAL VEIN	Image of left portal vein <b>with</b> color duplex Doppler
MAIN HEPATIC ARTERY	Image of main hepatic artery <b>with</b> color duplex Doppler and measurement- measure peak systolic and end diastolic
IVC NEAR LIVER	Image of IVC <b>with and without</b> color duplex Doppler ( <b>normal waveform similar to hepatic veins-flow toward heart</b> )
HEPATIC VEINS RT, MID AND LT	Right, mid and left hepatic veins <b>with and without</b> color duplex Doppler flow

## Procedure: TIPS (Transjugular Intrahepatic Portosystemic Shunt) Procedure

Pt prep: NPO for 6 hours prior to exam

Required preliminary images: Perform standard RUQ ultrasound and splenic measurements in addition to the following:

ANNOTATION	IMAGE DESCRIPTION
SPLENIC VEIN AT HILUM	Images of splenic vein at hilum <b>with</b> color duplex Doppler (Normal venous flow towards liver)
SPLENIC VEIN AT CONFLUENCE	Images of splenic vein at confluence <b>with</b> color duplex Doppler (Normal venous flow towards liver)
MAIN PORTAL VEIN	Image of main portal vein entering liver with color duplex Doppler <b>with and without</b> PSV measurement – <i>Document hepatofugal vs. hepatopedal flow</i>
LEFT/RIGHT PORTAL VEIN	Image of LEFT/RIGHT portal vein <b>with</b> color duplex Doppler and spectral waveform
PROXIMAL TIPS (NEAR PORTAL)	Image of TIPS at porta hepatis <b>with</b> color duplex Doppler <b>with and without</b> PSV measurement
MID TIPS	Image of mid TIPS <b>with</b> color duplex Doppler <b>with and without</b> PSV measurement
DISTAL TIPS (NEAR IVC/HEPATIC)	Image of distal TIPS near IVC <b>with</b> color duplex Doppler <b>with and without</b> PSV measurement.
IVC PROX	Image of IVC <b>with and without</b> color duplex Doppler
HEPATIC VEINS RT, MID AND LT	Right, mid and left hepatic veins <b>with and without</b> color duplex Doppler flow



- Velocities greater than 150 cm/sec are considered abnormal by Interventional Radiology.
- Velocities typically increase from the portal to hepatic end.
- Any velocity, which doubles over the course of the stent, is considered abnormal.

**Procedure: Renal Artery Doppler Only**

**Pt. Prep:** NPO for at least 6 hours prior to exam  
 Diabetic pts/pts that need morning meds may have CLEAR LIQUIDS ONLY

**If both a renal Doppler and renal ultrasound are ordered, use Renal/RAD combo code, complete renal exam with renal artery Doppler study, and use both worksheets.**

**Required images:**

<i>Annotation</i>	<i>Imaging Description</i>
LONG RT and LT KID	Longitudinal kidney images with and without longitudinal measurement
LONG AO LEVEL OF RENAL ARTERIES	Longitudinal aorta, at the level of the renal arteries with and without duplex Doppler ( <b>calculate peak systolic velocity with angle correction</b> )
LONG RT OR LT KID SEGMENTAL	Longitudinal kidney with color and duplex Doppler waveform of segmental arteries, (renal pelvis area); <b>calculate systolic &amp; diastolic peak velocities/RI, AT and AI of UPPER, MID AND LOWER POLES, &lt;20 degrees angle correction</b>
LONG RT OR LT RENAL ARTERIES-ORIGIN	Longitudinal or transverse renal arteries exiting the aorta with color and duplex Doppler waveform of renal arteries <b>immediately adjacent to aorta; calculate peak systolic and diastolic velocity with angle correction &lt;60 degrees</b>
LONG RT OR LT RENAL ARTERIES	Color and duplex Doppler waveform of renal arteries at <b>mid renal artery and at renal hilum; calculate peak systolic and diastolic velocity with angle correction &lt;60 degrees</b>
RENAL VEIN	Color and duplex Doppler waveform of renal vein at hilum

**\*Diagnostic Criteria\***

<b>Classification</b>	<b>AT</b> (Time = end of diastole to peak of systole)	<b>AI</b> (PSV-EDV)/AT	<b>RI</b> (PSV- EDV)/ PSV	<b>PSV</b> Peak Systolic Velocity	<b>RAR</b> (PSV <sub>renal</sub> /PSV <sub>aorta</sub> )
<b>&lt;60% stenosis</b>	<b>&lt;.07 s</b>	<b>&gt;300 cm/s<sup>2</sup></b>	<b>0.50 - 0.75</b>	<b>&lt;180 cm/s</b>	<b>&lt;3.5</b>
<b>&gt;60% stenosis</b>	<b>&gt;.07 s</b>	<b>&lt;300 cm/s<sup>2</sup></b>	<b>&gt;0.75</b>	<b>&gt;180 cm/s</b>	<b>&gt;3.5</b>

## Procedure: Transabdominal Pelvis - Complete

**Pt. Prep:** 32 oz. of fluids to be finished 1 hour prior to exam, may not void until after the exam is completed. Must have a full bladder if transvaginal exam not performed.

### Required Images:

#### UTERUS

Annotation	Image Description
LONG UT	Longitudinal images of ML uterus with and without uterine length and AP measurements.
LONG ENDO	Uterus at widest portion of endometrial stripe with and without AP measurement of the endometrial stripe.
LONG RT UT	Longitudinal images of right uterus.
LONG RT ADX	Longitudinal images of right adnexa including bladder and pelvic side wall
LONG LT UT	Longitudinal images of left uterus.
LONG LT ADX	Longitudinal images of left adnexa including bladder and pelvic side wall
LONG / TRV CDS	Longitudinal and transverse images of cul-de-sac
TRV CERVIX / UT	Transverse images of uterine cervix, body and fundus with measurements at widest part of body
TRV LT ADX	Transverse images of left adnexa including bladder and pelvic side wall
TRV RT ADX	Transverse images of right adnexa including bladder and pelvic side wall

#### RIGHT OVARY

Annotation	Image Description
LONG RT OV	Longitudinal images of RT ovary with and without measurement of length and AP dimension
TRV RT OV	Transverse images of RT ovary with and without transverse measurement. <i>Calculate volume.</i>

#### LEFT OVARY

Annotation	Image Description
LONG LT OV	Longitudinal images of LT ovary with and without measurement of length and AP dimension
TRV LT OV	Transverse images of LT ovary with and without transverse measurement. <i>Calculate volume.</i>

- **If transvaginal exam is performed, obtain survey images of uterus and ovaries with measurements obtained on the TV study only.**
- **Venous and arterial Color Doppler duplex to be performed on ovaries of ALL Emergency Department patients presenting with acute pelvic pain.**



## Procedure: Endovaginal Pelvis

Pt. Prep: None, empty bladder just prior to exam

- A female chaperone must be present if a male sonographer is performing the study.

### Required Images:

Annotation	Image Description
LONG ENDO	Longitudinal image of the uterus at the widest portion of the endometrial stripe with AP measurement of the endometrial stripe
LONG CDS	Longitudinal image of the cul-de-sac
LONG CERVIX	Longitudinal image of the cervix
LONG UT ML	Longitudinal ML image of the entire uterus to include the endometrial cavity with uterine length and AP measurements
LONG UT	Longitudinal images of the uterine fundus, body and cervix
LONG RT UT	Longitudinal images of right uterus
LONG RT ADX	Longitudinal image right adnexa
LONG LT UT	Longitudinal images left uterus
LONG LT ADX	Longitudinal image left adnexa
TRV CDS, CX & UT	Transverse images of the cul-de-sac, uterine cervix, body, and fundus with measurement at widest point
TRV RT ADX	Transverse image right adnexa
TRV RT OV	Transverse images of the right ovary measuring ovarian width with and without calipers
LONG RT OV	Longitudinal images of the right ovary measuring ovarian length and AP with and without calipers. <i>Calculate volume.</i>
TRV LT ADX	Transverse image of the left adnexa
TRV LT OV	Transverse images of left ovary measuring ovarian width with and without calipers
LONG LT OV	Longitudinal images of left ovary measuring ovarian length and AP with and without calipers. <i>Calculate volume.</i>

- **Complete uterus images before imaging the ovaries.**
- **Each fibroid should be measured in 3 dimensions before moving to the next fibroid.**
- **All masses and cystic structures must be evaluated and measured in 3 dimensions.**
- **DO NOT report simple follicles < 3.0 cm as cysts in pre-menopausal patients.**
- **Perform 3D imaging of the uterus IF a congenital anomaly is suspected or exam is ordered to evaluate IUD position.**

**Procedure: Follicular Maturation Study – FMS**

**Pt Prep:** None – void prior to transvaginal examination

- **As per referring physician’s script (TA pelvis limited w/TV if ordered)**
- **Serial studies should be a transvaginal only exam**
- **Measure all follicles > 1cm and calculate average diameter – TV only**
- **Count number of follicles per ovary: antral follicle count**

**Required Images: Transvaginal**

<b>Annotation</b>	<b>Image Description</b>
LONG UT RT & LT / TRAN	Longitudinal images of the uterus {ML, RT and LT} and transverse images of uterus {vagina – fundus}, with & without LONG, TRANS and AP measurements
LONG / TRANS ADX RT & LT	Longitudinal and transverse images of RT & LT adnexa
LONG / TRANS OV RT & LT	Longitudinal and transverse images of RT & LT ovaries with LONG, TRANS and AP measurements, <i>calculate volumes</i>
LONG/TRANS OV RT & LT	Longitudinal and transverse images of RT & LT ovarian follicles with LONG, TRANS & AP measurements of follicles with an average diameter of >1 cm. Measure and number follicles in all dimensions before moving to subsequent follicles.
LONG ENDO	Longitudinal images of endometrium with and without measurement
LONG/ TRANS CDS	Longitudinal and transverse image of the posterior cul-de-sac – document free fluid

**Procedure: 1<sup>st</sup> Trimester Fetal [up to 13 weeks 6 days]****Pt prep:** Void prior to transvaginal examination**Required Images: Transabdominal and/or Transvaginal**

<b>Annotation</b>	<b>Image Description</b>
LONG CDS, CX	Longitudinal images of cervix and posterior cul-de-sac
LONG ML UT/ LONG UT RT/ LONG UT LT	Longitudinal images of the midline, right and left regions of the uterus to include the gestational sac contents and myometrium
LONG LT ADX /LONG RT ADX	Longitudinal images of the left and right adnexa
TRV CDS, CX, UT	Transverse images of the cul-de-sac, cervix, lower uterine segment, body, and fundus of the uterus
TRV RT ADX	Transverse images of the right adnexa
TRV RT OV	Transverse images of the right ovary with and without measurements
LONG RT OV	Longitudinal images right ovary with and without measurements
TRV LT ADX	Transverse image of the left adnexa
TRV LT OV	Transverse images of the left ovary with and without measurements
LONG LT OV	Longitudinal images left ovary with and without measurements
LONG GS	Longitudinal images of the gestational sac and endometrial cavity with and without longitudinal and AP sac measurements
TRV GS	Transverse images of the gestational sac and endometrial cavity with and without TRANS sac measurements
CRL	Image of the embryonic crown-rump length in the scan plane that demonstrates the entire length with and without measurements x 2
FHR	Images to include M-mode of Doppler tracing of the embryonic cardiac rhythm with rate calculated
YS	Images to include yolk sac with and without measurements
ACI	Images to include embryonic abdominal cord insertion when possible
BLADDER & STOM	Images to include embryonic bladder and stomach if visualized
ARMS/LEGS	Images of bilateral arms/legs documented at 10-14 weeks
HEAD	Images of the head documented at 10-14 weeks
PLACENTA/PCI	Images of long/transverse placenta to include placental cord insertion at 10-14 weeks

### **1<sup>st</sup> Trimester Fetal continued:**

- **Endovaginal scanning is always performed with 1<sup>st</sup> trimester imaging EXCEPT if patient declines or referrer requests it not be done.**
- **If demise, document color, M-mode, and pulsed Doppler.**
- **At 14 weeks 0 days all fetal biometric measurements should be performed for dating.**

**Procedure: OB Fetal Complete –Detailed Anatomical survey [ @ approx 20 weeks]  
WITH TRANSVAGINAL**

**Pt. Prep:** None

Fetal measurements for age determination

- a. **BPD** (biparietal diameter)-at the level of the thalamus and cavum septum pellucidum, measure BPD by placing one caliper at the outer edge of the anterior parietal bone and the other caliper at the inside of the most posterior parietal bone.
- b. **HC** (head circumference)-at the same level as the BPD measurement.
- c. **AC** (abdominal circumference)-a transverse section at the level of the stomach and the umbilical vein, measure around the fetal abdomen including skin.
- d. **FL** (femoral length)-measure the long axis of the fetal femur.

**Required Images:**

<b>Annotation</b>	<b>Image Description</b>
LONG CERVIX W/ TV	<b>TRANSVAGINAL</b> longitudinal images of the cervix and lower uterine segment. Measure the length of the cervix and placental relationship to cervix. Color Doppler image at internal os to evaluate for vasa previa
LONG ML FETAL LIE	Longitudinal images of the midline region of the uterus to include uterine contents and myometrium-lower uterine segment to fundus image to include fetal position
CHEST SITUS /W POSITION	Transverse image of fetal thorax with 4CH/axis of fetal heart must be 45 degrees to left ( <i>right and left side identified</i> )
ABD SITUS /W POSITION	Transverse image of the fetal abdomen with stomach ( <i>right and left side identified</i> )
LONG UT ML, RT AND LT	Longitudinal images of the uterus including ML, right, and left uterus
TRANS UT	Transverse uterus images from inferior to superior
TRANS AND LONG RT and LT OVARY	Transverse and longitudinal images with and without measurements of right and left ovaries
TRAN and LONG RT and LT ADNEXA	Transverse and longitudinal images of the right and left adnexa

<b>Annotation</b>	<b>Image Description</b>
LONG PLAC	Longitudinal images of the placenta location to include margins of the placenta
TRV PLAC	Transverse images of placenta
PCI	Image of placental cord insertion with and without color

LONG SP C LONG SP T LONG SP LS	Longitudinal images of the entire spine to include skin line and sacral region. (WITH SPINE ANTERIOR AND FREE FROM UTERINE WALL IF POSSIBLE)
TRV SP C TRV SP T TRV SP LS	Transverse images of the entire spine
TRV RENALS	Transverse images of the fetal kidneys with AP measurement of renal pelves when indicated
LONG RT KID and LT KID	Longitudinal image of the right and left fetal kidney
AC	Image of the fetal abdomen at the level of the portal sinus, the confluence of the umbilical vein with the portal vein with calculation for abdominal circumference.
ACI	Image of the fetal abdomen at the level of the umbilical cord insertion superior to bladder

<b>Annotation</b>	<b>Image Description</b>
3VC (or 2VC if only one umbilical artery is seen)	Image showing umbilical cord insertion and umbilical arteries coursing along the sides of the bladder using color Doppler & cross-section of cord
BLADDER	Image of the fetal pelvis documenting the urinary bladder
DIAPH	Image of the fetal chest/abdomen showing both hemi-diaphragms
4CH	Image of the fetal chest documenting 4-chamber heart (cine images if needed)
FHR	Measurement of fetal heart rate with M-mode.
LVOT & RVOT	Individual images of left ventricular outflow tract & right ventricular outflow tract in long axis with cine if needed – must show continuity of septum with anterior aortic wall
3VV/3VT	Image of the fetal chest defining pulmonary artery, aorta, and SVC Image of the fetal chest defining transverse aortic and ductal arches in relation to trachea
SAX	Short axis of the heart to show pulmonary outflow tracts
BPD	Diameter image at level of thalamus and CSP with and without measurement.
CP	Images of choroid plexus bilaterally.
LAT VENT	Image of posterior lateral ventricle with and without measurement
TCD/ CM	Image of cerebellum and cisterna magna with and without measurement of both
CSP	Image level with cavum septum pellucidum
ORBITS	Transverse image of fetal orbits to include fetal lens.
LIPS/NOSE	Coronal image of soft tissue fetal lips, nose, and chin.

PROFILE	Image of fetal profile to include forehead, nasal bone, maxilla, and chin
RT ANKLE LT ANKLE	Images of bilateral feet and ankles at 90-degree angle
RT FOOT LT FOOT	Images of bilateral foot prints
RT T/F LT T/F	Images of bilateral lower extremities in long showing both tibia and fibula
RT FEMUR LT FEMUR	Images of bilateral femora in long
FEMUR	Long measurement of femur without bowing
RT HAND LT HAND	All fingers in extended position to visualize digits, if possible
RT THUMB LT THUMB	An image documenting both thumbs, if possible
RT HUMERUS LT HUMERUS	Images of bilateral upper arms in long
R R/U L R/U	Images of bilateral lower arms with radius and ulna in long
Male/Female	Image documenting gender, if seen
AFI RUQ	Image of the RUQ to evaluate AFI with AP measurement with color Doppler
AFI LUQ	Image of the LUQ to evaluate AFI with AP measurement with color Doppler
AFI LLQ	Image of the LLQ to evaluate AFI with AP measurement with color Doppler
AFI RLQ	Image of the RLQ to evaluate AFI with AP measurement with color Doppler

- ❖ **Endovaginal scanning is performed on ALL OB exams on one exam, usually with the anatomic survey, between 18-30 weeks to image and document cervical length and placenta relationship.**
- ❖ **Endovaginal scanning may be done at any point in the 2<sup>nd</sup>-3<sup>rd</sup> trimester for cervical evaluation if not previously documented with prior EV imaging.**
- ❖ **Endovaginal scanning is NOT performed if the patient declines or in the situation of PROM or fluid leakage.**

**Procedure: Fetal 2<sup>nd</sup> and 3<sup>rd</sup> Trimester w or w/o Transvaginal  
[13 –40 weeks for growth/size]**

**Pt. Prep:** None

Anatomy Evaluated: (use annotation from Fetal Detail Complete)

1. Cervical measurement with transvaginal technique 18-30 weeks documenting length, placenta location and closure of internal os. **Do not routinely check cervix by TV exam after 30 weeks, unless specifically ordered or otherwise indicated.**
2. Document fetal position.
3. Document placenta location with long and transverse images.
4. Document and measure fetal heart rate with M-mode.
5. Document AFI.
6. Document biometry [BPD, HC, AC, FL].
7. Document fetal bladder, stomach, kidneys, 4 chamber heart, CSP, cerebellum, cisterna magna, and lateral ventricles.

**Procedure: OB Follow-up  
Follow up undocumented anatomy from prior anatomic survey**

**Pt. Prep:** None

1. Document fetal position.
2. Document placenta with longitudinal and transverse images.
3. Document AFI.
4. Document and measure fetal heart rate with M-mode.
5. Document previous undocumented anatomy.



## Procedure: OB Fetal Limited (AFI, Position, Cervical evaluation, Placenta)

**Pt. Prep:** None

- 1) If specifically requested to document **AFI only**, perform AFI, fetal position, longitudinal and transverse placenta images, and document fetal heart rate by M-mode.
- 2) If specifically requested to document **cervical length only**, perform cervical evaluation with endovaginal to document cervical length and placental relationship to os - \*\*code as OB endovaginal only with NO transabdominal imaging performed.
- 3) If specifically requested to evaluate **placenta** (r/o previa or abruption), document placental position with endovaginal cervix image, longitudinal and transverse placenta images with and without color, fetal position, and document fetal heart rate by M-mode.

## Procedure: Biophysical Profile

**Pt Prep:** None

1. Document fetal position
2. Document placenta with longitudinal and transverse images.
3. Document AFI.
4. Document and measure fetal heart rate with M-mode.

<b>BPP Score</b>	<b>2 Points</b>	<b>0 Points</b>
Breathing	<b>30 sec/30min</b> – at least 1 episode	Absent
Trunk Movement	<b>3/30min</b> - torso, body, limbs	Absent
Limb Tone	<b>1/30min</b> {flex – ext} extremities/spine	Absent
Amniotic Fluid	> 2cm pocket- vertical axis	<2cm pocket

## Procedure: Scrotum w/ Doppler

Pt. Prep: None

### Required Images: Image RIGHT side first

Annotation	Image Description
TRV RT EPI	Transverse Rt epididymal head with and without transverse measurement.
LONG RT EPI	Longitudinal images of head of right epididymis with and without AP and length measurements AND AN IMAGE WITH COLOR DOPPLER
TRV RT SUP, MID INF	Transverse superior, mid and inferior images of right testis with measurement at the widest part
LONG RT LAT, MID, MED	Longitudinal images laterally, midline (with and without length and AP measurements) and medially of the right testis
LONG/TRV RT	Long/TRV right testis with color Doppler.
LONG/TRV RT	Long/TRV images of the right testis with color Doppler duplex <b>documenting venous and arterial flow</b>
TRV LT EPI	Transverse Lt epididymal head with and without transverse measurement.
LONG LT EPI	Longitudinal images of the head of left epididymis with and without AP and length measurements AND AN IMAGE WITH COLOR DOPPLER
TRV LT SUP, MID INF	Transverse superior, mid and inferior images of left testis with measurement at the widest part
LONG LT LAT, MID, MED	Longitudinal images lateral, midline (with and without length and AP measurements) and medially of left testis
LONG/TRV LT	Long/TRV left testis with color Doppler.
LONG LT	Long/TRV images of the left testis with color Doppler duplex <b>documenting venous and arterial flow</b>
TRV BILAT	Transverse bilateral testes on same image with and without color Doppler
TRV/LONG RT& LT	Evaluate for bilateral varicocele, labeled with and without Valsalva and color images.

## Procedure: Thyroid/Parathyroid

Pt. Prep: None

### Required Images:

Annotation	Image Description
TRV RT	Transverse superior, mid and inferior images of right lobe with appropriate labeling
TRV RT	Transverse mid portion of right lobe with measurement. Color Doppler.
LONG RT	Longitudinal lateral, mid and medial images of right lobe including carotid artery laterally
LONG RT MID	Longitudinal mid portion of right lobe with length and AP measurement.
LONG RT	Mid portion of right lobe with color Doppler
# 1, #2, etc.	Measure and label nodule #1 in all dimensions before continuing to nodule #2, etc.
TRV LT	Transverse superior, mid and inferior images of left lobe with appropriate labeling
TRV LT	Transverse mid portion of left lobe with measurement. Color doppler
LONG LT	Longitudinal lateral, mid and medial images of left lobe including carotid artery laterally
LONG LT MID	Longitudinal mid portion of left lobe with length and AP measurement.
LONG LT	Mid portion of left lobe with color Doppler
# 1, #2, etc.	Measure and label nodule #1 in all dimensions before continuing to nodule #2, etc.
TRV ML	Mid portion of both thyroid lobes.
TRV ISTHMUS	Transverse images of isthmus including right and left lobe with and without AP measurement
TRV ISTHMUS	Transverse image with color Doppler of both lobes
TRV RT/LT NECK SUP, MID, INF	Evaluate neck for adenopathy
LONG RT/LT NECK MED, MID, LAT	Evaluate neck for adenopathy

- **WHEN DOCUMENTING NODULES, NUMBER AND MEASURE EACH NODULE IN ALL DIMENSIONS BEFORE CONTINUING TO NEXT NODULE- color Doppler all nodules**

**Procedure: Breast****Pt Prep:** None**Scanning position:**

Patient is in supine position with arm raised above head.

**Scanning/ Procedure/Guidelines and Technique**

1. Review mammogram with Radiologist.
2. Determine area of interest in breast to ensure that sonographic lesion is concordant in size and position with the mammographic abnormality.
3. Use a high frequency linear transducer.
4. Image area radially and anti-radially, documenting centimeters from the nipple, RT or LT breast and RAD/ANTI-RAD.
5. Use color Doppler to show blood flow when necessary.
6. Breast body marker can be used for orientation, in addition to the annotation.
7. Show images to Radiologist.

## PEDIATRICS

### Procedure: Pediatric Renal

Pt.Prepare: None

#### Required images:

Annotations	Image Description
TRAN BLAD INF-SUP	Transverse images of the bladder – including jets if possible
LONG BLAD ML, RT, LT	Longitudinal images of bladder – right to left
LONG RT/LT KID LAT, MID & MED	Longitudinal images of lateral, mid, and medial kidneys with midline AP and longitudinal measurements – INCLUDE ADRENALS
LONG RT/LT KID	Longitudinal image with color Doppler
TRAN RT/LT KID SUP, MID & INF	Transverse images of superior, mid, and inferior kidneys with mid measurement – INCLUDE ADRENALS IN SUPERIOR POLE IMAGE
POST VOID TRAN BLAD	Transverse image of bladder post void with measurements – <b>IF PATIENT HAS HYDRONEPHROSIS</b>
POST VOID LONG BLAD	Longitudinal images of bladder post void with measurements – <b>IF PATIENT HAS HYDRONEPHROSIS</b>
POST VOID LONG RT/LT KID	Longitudinal image of bilateral kidneys post void – <b>IF PATIENT HAS HYDRONEPHROSIS</b>

- **If hydronephrosis, always do post-void images of bladder and kidneys.**
- **Include adrenal glands in newborns.**

## **Procedure: Pediatric Spine**

**Pt. Prep:** None – Radiologist must check images before patient leaves.  
Routinely performed up to 4 months corrected age.

Use a high frequency linear transducer.

### **Required Images:**

1. Panoramic imaging with labeled vertebrae from L1 through S5 must be performed.
2. Longitudinal images of lumbar and sacral vertebral bodies in relationship to conus with each vertebral body labeled.
3. Transverse images of lumbar and sacral vertebral bodies, labeled.
4. Long cine loop of conus and cauda equina for motion assessment.
5. Long and transverse image directly over sacral dimple if present.
6. Show images to Radiologist before releasing patient.

## **Procedure: Pediatric/Adult Hips for Effusion ONLY**

**Pt. Prep:** None – Done **only** for effusions of the hip joint. **Check with the Radiologist before scanning for needed views.**

## **Procedure: Infant Hips for DDH- Developmental Dysplasia of the Hip**

**Pt prep:** None – Done with radiologists performing stress on hips

Use a high frequency linear transducer (7-15Mhz)

### **Required Images:**

1. Longitudinal/coronal and transverse images of bilateral infant (**1 to 6 months of age**) hips, with leg slightly flexed or neutral position. (Angle measurements per Radiologist preference)
2. Show Radiologist images and accompany back to the infant to perform stress maneuvers, taking the appropriate images as directed.

- **Label with and without stress.**
- **Always a bilateral exam**
- **Age appropriateness for exam per interpreting Radiologist.**

## Procedure: Neonatal Head

Pt. Prep: None

Use a high frequency pediatric probe (8Mhz)

### Required Images:

All images acquired from the anterior fontanelle.

Annotation	Image Description
LT OR RT SIDE HEAD DOWN LONG ML	Longitudinal image of midline to include corpus callosum, brainstem, and cerebellum
LT OR RT SIDE HEAD DOWN  LONG ML-RT OR LT	Longitudinal images from midline laterally to include germinal matrix, caudothalamic groove, choroid plexus, and lateral ventricles, including surrounding white matter and Sylvian fissures. <b>INCLUDE 2 LONG CINE LOOPS (RT &amp; LT).</b>
LT OR RT SIDE HEAD DOWN CORONAL ANT TO POST	Coronal images of frontal lobe with anterior angulation to include orbits, frontal horns of lateral ventricles.
LT OR RT SIDE HEAD DOWN CORONAL ANT TO POST	Coronal images of 3 <sup>rd</sup> ventricle, parietal lobe, temporal lobe, basal ganglia, body of lateral ventricles with choroid, posterior portions of temporal lobes, occipital lobes, subtentorial area, posterior portions of lateral ventricles and posterior angulation to include peri-ventricular white matter. <b>INCLUDE TRV CINE LOOP FROM ANTERIOR TO POSTERIOR (SEPARATED INTO 2 SERIES IF NEEDED).</b>
LT OR RT SIDE HEAD DOWN CORONAL ANT TO POST	Coronal color Doppler images from anterior to posterior including Circle of Willis

- **Bilateral mastoid fontanelle views when requested or to better evaluate posterior fossa pathology.**
- **Routinely performed up to 6 months of age with age correction for premature infants.**

## **Procedure: Pylorus**

**Pt. Prep:** Baby should present with an empty stomach with exam to be done just before the next feeding is due.

After initial longitudinal and transverse images, Radiologist is present, if possible, as baby is fed Pedialyte through a bottle.

**Use a high frequency linear or pediatric probe.**

### **Required Images:**

<b>Annotation</b>	<b>Image Description</b>
LONG PYLORUS	Images of distal stomach to include pylorus with and without measurements.
TRAN PYLORUS	Images of transverse pylorus with and without measurements of pyloric muscle.
CINE	While feeding, to document peristalsis through pylorus.

- **Normal pyloric muscle less than or equal to 4 mm**
- **Normal pyloric channel length less than or equal to 14 mm**



**Procedure: Carotid Doppler****Pt. Prep:** None**Required Images:**

<b>Annotation</b>	<b>Image Description</b>
TRV RT CCA PROX TRV RT CCA MID TRV RT CCA DIS TRV RT CCA BULB	Transverse gray-scale images of the right common carotid artery proximal, mid, distal, bulb
TRV RT BIF	Color Doppler and gray-scale image of right ICA and ECA bifurcation
LONG RT CCA PROX	Longitudinal images of proximal right common carotid artery including gray scale, color Doppler and duplex with velocity measurements
LONG RT CCA MID	Longitudinal images of mid right common carotid artery including gray scale, color Doppler and duplex with velocity measurements
LONG RT CCA DIST	Longitudinal images of distal right common carotid artery including gray scale, color Doppler and duplex with velocity measurements
LONG RT BULB	Longitudinal image of right bulb including gray scale, color Doppler and duplex with velocity measurements
LONG RT ECA PROX	Longitudinal right external carotid proximal artery including gray scale, color Doppler and duplex with velocity measurements
LONG RT ICA PROX, MID AND DIST	Longitudinal images of proximal, mid, and distal right internal carotid artery including gray scale, color Doppler and duplex with velocity measurements
LONG RT VERT	Right vertebral artery color Doppler and duplex to assess direction of flow
LONG SUBCL	Right subclavian artery color Doppler and duplex to measure velocity

**Repeat above protocol for LEFT side.**

- **Document high bifurcations.**
- **Doppler before, within, and after a stenosis**
- **All velocity measurements should be obtained with a Doppler angle of 60 degrees or less.**

## Procedure: Lower Extremity Venous Doppler

Pt. Prep: None

Required Images: RIGHT OR LEFT EXTREMITY IDENTIFIED

Annotation	Image Description
TRV CFV /W COMP	Gray-scale image (dual screen) common femoral vein with/without compression
TRV CFV/GSV /W COMP	Gray-scale image (dual screen) confluence of greater saphenous vein with/without compression.
TRV FV/PROF /W COMP	Gray-scale image (dual screen) common confluence of profunda femoris vein and femoral vein with/without compression
TRV FV P, M, D /W COMP	Gray-scale images (dual screen) femoral vein proximal, mid and distal with/without compression – labeling accordingly
TRV POP P,D /W COMP	Gray-scale images (dual screen) popliteal vein proximal and distal (at confluence of calf veins) with/without compression
LONG CFV/GSV	Right common femoral vein with greater saphenous confluence; gray-scale, color Doppler, assess flow
LONG CFV AUG & PHASIC	Common femoral vein: gray-scale, color Doppler and duplex, assess flow with labeling AUGMENTATION & PHASICITY
LONG FV/PROF	Confluence of profunda femoris vein and femoral vein: gray-scale, color Doppler, assess flow
LONG FV PROX AUG & PHASIC	Femoral vein proximal: gray-scale, color Doppler and duplex assess flow with labeling AUGMENTATION & PHASICITY
LONG FV MID AUG & PHASIC	Femoral vein mid: gray-scale, color Doppler and duplex, assess flow with labeling AUGMENTATION & PHASICITY
LONG FV DIST AUG & PHASIC	Femoral vein distal: gray-scale, color Doppler and duplex, assess flow with labeling AUGMENTATION & PHASICITY
LONG POP PROX AUG & PHASIC	Popliteal vein proximal: gray-scale, color Doppler and duplex, assess flow with labeling AUGMENTATION & PHASICITY
LONG POP DIST AUG & PHASIC	Popliteal vein distal (at level of confluence of calf veins): gray-scale, color Doppler and duplex, assess flow with labeling AUGMENTATION & PHASICITY
LONG /TRV CALF VEINS	Label and image with gray scale, compression, color Doppler and duplex all visualized calf veins, to include the posterior tibial, peroneal, gastrocs, and anterior tibial veins if seen
UNILATERAL EXAMS	Sag CFV with <b>color and spectral Doppler</b> of contralateral leg to compare phasicity. (obtain the sagittal CFV images back to back or split screen for comparison purposes)

- **All grayscale and compression imaging should be done prior to the performance of any augmentation**
- **DO NOT AUGMENT IF DVT IS PRESENT**
- **Follow CFV thrombus proximally until origin is documented (i.e. Iliac vein, IVC)**

**Procedure: Upper Extremity Venous Doppler****Pt. Prep:** None**Required Images:** RIGHT OR LEFT EXTREMITY IDENTIFIED

<b>Annotation</b>	<b>Image Description</b>
TRAN IJV	Transverse images of IJV with and without compression on split screen
LONG IJV	Longitudinal images of IJV with color Doppler and images with spectral Doppler
LONG SUBCLAV	Longitudinal images of SUBCLAVIAN VEIN with color Doppler and images with spectral Doppler
TRAN AXILLARY	Transverse images of AXILLARY VEIN with and without compression on split screen
TRAN BRACHIAL PROX, MID & DIST	Transverse images of both BRACHIAL VEINS – prox, mid and distal – with and without compression on split screen
TRAN BASILIC	Transverse images of BASILIC veins – prox, mid and distal- with and without compression on split screen
TRAN CEPHALIC	Transverse images of CEPHALIC VEINS – prox, mid and distal- with and without compression on split screen
TRAN ULNAR	Transverse image of ULNAR VEINS with and without compression on split screen
TRAN RADIAL	Transverse image of RADIAL VEINS with and without compression on split screen
LONG AXILLARY	Longitudinal images of AXILLARY VEIN with color Doppler and images with spectral Doppler
LONG BRACHIAL	Longitudinal images of BRACHIAL VEINS (DEEP VEINS) with color Doppler and images with spectral Doppler
UNILATERAL EXAMS	Sag subclavian vein with color and spectral Doppler of contralateral arm to compare phasicity. (obtain the sagittal subclavian vein images back to back or split screen for comparison purposes)

**Procedure: Upper Extremity Arterial Doppler**

**Pt. Prep:** None

**Required Images:** RIGHT OR LEFT EXTREMITY IDENTIFIED

Annotation	Image Description
LONG SUBCLAVIAN	Longitudinal images of SUBCLAVIAN ARTERY –proximal and distal- <b>with and without</b> color Doppler and spectral Doppler with velocity measured
LONG AXILLARY	Longitudinal images of AXILLARY ARTERY – <b>with and without</b> color Doppler and spectral Doppler with velocity measured
LONG BRACHIAL	Longitudinal images of BRACHIAL ARTERY – <b>with and without</b> color Doppler and spectral Doppler with velocity measured
LONG RADIAL	Longitudinal images of RADIAL ARTERY – <b>with and without</b> color Doppler and spectral Doppler with velocity measured
LONG ULNAR	Longitudinal images of ULNAR ARTERY – <b>with and without</b> color Doppler and spectral Doppler with velocity measured

**Procedure: Lower Extremity Arterial Doppler**

**Pt. Prep:** None

**Required Images:** RIGHT OR LEFT EXTREMITY IDENTIFIED

**Required Images:**

<b>Annotation</b>	<b>Image Description</b>
LONG RT OR LT CFA	Longitudinal images of CFA with/without color Doppler and duplex with velocity measurement
LONG RT OR LT SFA/PROF	Longitudinal image of SFA/PROFUNDA bifurcation with/without color Doppler and duplex with velocity measurement of the Prox Profunda
LONG RT OR LT SFA P	Longitudinal images of SFA origin with/without color Doppler and duplex with velocity measurement
LONG RT OR LT SFA M	Longitudinal images of mid SFA with/without color Doppler and duplex with velocity measurement
LONG RT OR LT SFA D	Longitudinal images of distal SFA with/without color Doppler and duplex with velocity measurement
LONG RT OR LT POP A Prox and Dist	Longitudinal images of popliteal artery Prox and Dist with/without color Doppler and duplex with velocity measurement
LONG RT OR LT ANT TIBIAL	Longitudinal images of anterior tibial artery with/without color Doppler and duplex with velocity measurement
LONG RT OR LT PTA D	Longitudinal images of distal posterior tibial artery (at the level of the ankle) with/without color Doppler and duplex with velocity measurement
LONG RT OR LT DPA	Longitudinal images of dorsalis pedis artery (at the level of the anterior ankle) with/without color Doppler and duplex with velocity measurement
LONG RT OR LT DPA AND PTA D	Longitudinal images of DPA AND PTA DISTAL arteries with systolic blood pressure measurement (using blood pressure cuff) documented by color duplex Doppler
LONG RT OR LT BRACHIAL	Longitudinal images of bilateral brachial arteries with systolic blood pressure measurement (using blood pressure cuff) documented by color duplex Doppler

**NOTE:  
ABI (ANKLE/BRACHIAL INDEX) IS CALCULATED USING HIGHEST BRACHIAL PRESSURE.**

## **EXECUTIVE SCREENING STUDIES**

### **Procedure: Vascular Screening of Carotid, ABI and Aorta**

Prep: None

#### **Carotid Screen – 4 images/ Right and Left**

1. 2D image of bulb showing plaque
2. Color Duplex Doppler of ICA proximal, mid and distal – measuring peak systolic velocity

#### **ABI – Ankle/Brachial Index – 3 images/Right and Left**

1. Duplex Doppler images of each brachial, DPA and PTA / Right and Left

#### **Aorta – minimal 5 images**

1. Longitudinal 2D images of aorta **with** AP measurements in proximal, mid, distal and bilateral iliacs.
2. **No** Doppler or transverse images obtained.

**Updated 08/23/23 CG**