ULTRASOUND PROTOCOLS

- Please use and scan in Exam Work Sheets. If exam is negative or there is only one finding, you may write in tech comments, otherwise please use sheet.

Abdomen

Aorta: Long –measure Proximal
    Mid
    Distal
    Trans- measure if abnormal caliber.
IVC: Long- with color- Annotate as IVC
Pancreas: Image head, body, and tail- 3 to 4 images
Liver: Long- Lt lobe lateral
    Lt lobe medial
    Lt lobe with caudate and IVC
    Rt lobe- several images to include dome of liver
    Rt lobe- measurement (picture to include Rt kidney)
    Trans- Lt lobe superior
    Lt lobe mid
    Lt lobe inferior
    Rt lobe-several images from sup (dome) to inferior
Portal Vein: Show flow
Rt. Kidney: Trans- Upper pole
    Mid with measurement
    Lower
    Long- Medial
    Mid with measurements
    Lateral
GB: Supine-Long- several images
    Trans- several images
    LLD-Long –few images
    Trans-few images
CBD: Long- image with and without measurements
Spleen: Long- 1 measurement
    Trans-2 measurements
Lt. Kidney- Trans- Upper pole
    Mid with measurement
    Lower
    Long- Medial
    Mid with measurements
    Lateral
- Measure and number all pathology transverse and longitudinal on consecutive pictures (first image long, next trans, or vice versa)
- Annotate ALL images

**Pelvic**

**Uterus:** Long  
Long (zoom) with long and AP measurement  
Long (zoom) endometrial measurement  
Transverse  
Transverse (zoom) trans measurement  
Long scan to Rt.  
Long scan to Lt  
Transverse- Vagina  
Cervix  
Body  
Fundus

**Rt Adnexa:** Long with several images to vessels  
Trans images thru adnexa

**Rt Ovary:** Transverse  
Transverse (zoom) with measurements  
Transverse (zoom) with color  
Long  
Long (zoom) with measurements  
Long (zoom) with color
- color image only needs to be trans or long, not both

**Lt Adnexa:** Long with several images to vessels  
Trans images thru adnexa

**Lt Ovary:** Transverse  
Transverse (zoom) with measurements  
Transverse (zoom) with color  
Long  
Long (zoom) with measurements  
Long (zoom) with color

- Measure and number all pathology transverse and longitudinal on consecutive pictures (first image long, next trans, or vice versa)
- If numerous, measure largest 2-3.
- Annotate ALL images
- All pelvic exams thru the ED may be done as TV.
- **ALL.** Outpatients must fill bladder
**TV**

Same images as Pelvic
Re-measure endometrium
Re-measure ovaries and uterus only if you feel you have better images

- Measure and number all pathology transverse and longitudinal on consecutive pictures (first image long, next trans, or vice versa)
- Annotate ALL images

**Thyroid**

**Rt Thyroid:** Trans- Several images from lower thru upper pole
  - Long- Lateral
  - Mid
  - Medial
  - Long-Mid with measurement
  - Trans-Mid with measurement

**LT Thyroid:** Trans- Several images from lower thru upper pole
  - Long- Lateral
  - Mid
  - Medial
  - Long-Mid with measurement
  - Trans-Mid with measurement

- Measure and number nodules
- Show color

  **Isthmus:** Midline transverse- Low
  - Mid with measurements
  - Upper

- Annotate ALL images
Renal

**Rt Kidney:** Long- Medial
   Mid
   Mid with measurements
   Lateral
   Trans- Upper
   Mid
   Mid with measurements
   Lower

**Lt Kidney:** Long- Media
   Mid
   Mid with measurements
   Lateral
   Trans- Upper
   Mid
   Mid with measurements
   Lower

**Bladder:** Long- Midline
   Rt
   Lt
   Trans- Low
   Mid
   Upper

- Measure prostate long and trans
- Measure and number cysts and stones
- If hydro is present, apply color
- If hydro is present, show bladder jets
- If hydro is present and patient is pregnant, do RI’s
- Annotate ALL images

Renal Artery Doppler

**Aorta:** Long- Proximal with measurements
   Mid with measurements
   Distal with measurements
   Proximal with color
   Proximal with PW and ratio measurements

   Trans- RRA proximal
   RRA proximal with color
RRA proximal with PW and velocity measurements

**RRA:**
- Long-Mid
  - Mid with color
  - Mid with PW and velocity measurements
- Long-Distal
  - Distal with color
  - Distal with PW and velocity measurements

**Rt Kidney:** Long-Mid
- Lateral
- Medial
  - Mid with measurements
- Trans- Upper
  - Mid
  - Mid with measurements
- Lower
  - Trans- Lower arcuate RI
  - Mid arcuate RI
  - Upper arcuate RI

**Rt Renal Vein:** Long -Color

**Aorta:**
- trans- LRA Proximal
  - LRA Proximal with color
  - LRA Proximal with PW and velocity measurements

**LRA:**
- LRA Mid
  - LRA Mid with color
  - LRA Mid with PW and velocity measurements
  - LRA Distal
  - LRA Distal with color
  - LRA Distal with PW and velocity measurements

**Lt. Kidney:** Long-Mid
- Lateral
- Medial
  - Mid with measurements
- Trans- Upper
  - Mid
  - Mid with measurements
- Lower
  - Trans- Lower arcuate RI
  - Mid arcuate RI
  - Upper arcuate RI

**Lt Renal Vein:** Long- Color

Take pictures of all 3 report pages
Ratios, Velocities, and RI’s
- Make sure velocities are taken in longitudinal plane of vessel.
- Annotate ALL images
- If aorta is not visualized due to bowel gas, reschedule after patient has bowel prep
- If aorta is not visualized due to body habitus, cancel and

**Scrotal**

**Long:** Distal inguinal canal  
Epididymal head  
Testicle-Medial, Mid, Lateral  
Epididymal tail  
Measure length pole to pole

**Trans:** Measure transverse and AP  
Epididymal head  
Testicle-Upper, Mid, Lower  
Epididymal tail

- Color Doppler each testicle in longitudinal  
- Make sure to use same color gain throughout study  
- If any doubt that color pictures are convincing for flow, Spectral images are needed  
- Use color on all Epididyma  
- Enlarged Epididymis- check for Hyperemia with Color Doppler. Compare with contra lateral epididymis.  
- Normal size Epididymis with complaint of pain and tenderness- check with color Doppler for hyperemia  
- Measure all masses and cysts and large hydroceles in 3 dimensions  
- Suspected Varicoceles- use color and valsalva maneuver to show venous engorgement  
- Suspected Inguinal Hernia-Scan up into inguinal canal. Look for loops of bowel( peristalsis) or herniated knuckles of mesenteric fat  
- Valsalva may show hernia  
- Orchitis-Use color to demonstrate unilateral or bilateral Hyperemia  
- Undescended Testicles-Scan both hemiscrotum. If testicles are absent, scan inguinal canals up into pelvis.  
- Annotate ALL images

**Aorta**
**Proximal:** Longitudinal- with and without measurements
   Transverse- with and without measurements

**Mid:** Longitudinal- with and without measurements
   Transverse- with and without measurements

**Distal:** Longitudinal- with and without measurements
   Transverse- with and without measurements

**Bifurcation:** Transverse with measurements

**Common Iliacs:** Transverse with measurements

**Color images:** Proximal, Mid, Distal and Bifurcation
   - Annotate ALL images

**Soft Tissue**
   - Image area of interest in Longitudinal and Transverse with measurements if needed
   - Use body marker to show area of interest.
   - Annotate ALL images

**OB Less than 14 weeks**

**Pt must have full bladder.**

**Uterus:** Long
   Long (zoom) with long and AP measurement
   Long (zoom) endometrium
   Include- Gestation Sac – if applicable. Gestational sac must be measured in 3 planes. It is a mean sac diameter and requires 3
   Yolk Sac- if applicable
   Fetal Pole measurement( at least 2)
   Heart rate
   Transverse
Transverse (zoom) trans measurement
Long scan to Rt.
Long scan to Lt
Transverse- Vagina
   Cervix
   Body
   Fundus

**Rt Adnexa:** Long with several images to vessels
   Trans images thru adnexa

**Rt Ovary:** Transverse
   Transverse (zoom) with measurements
   Transverse (zoom) with color
   Long
   Long (zoom) with measurements
   Long (zoom) with color
   - color image only needs to be trans or long, not both

**Lt Adnexa:** Long with several images to vessels
   Trans images thru adnexa

**Lt Ovary:** Transverse
   Transverse (zoom) with measurements
   Transverse (zoom) with color
   Long
   Long (zoom) with measurements
   Long (zoom) with color
   - **Identify and annotate any visible fetal anatomy**
   - **Measure and number all pathology transverse and longitudinal on consecutive pictures** (first image long, next trans, or vice versa)
   - **If numerous, measure largest 2-3.
   - All OB exams thru the ED may be done as TV.
   - **ALL Outpatients must fill bladder**
   - **Annotate ALL images**

**OB Complete**

**Pt must have full bladder**

**Cervix:** Long with measurements

**Uterus:** Long- Midline
   Right
   Left

**Transverse- Cervix**
   Body
   Fundus

(These images are to show the lie of the fetus)
**Placenta:** a few images  
Placenta in relationship to cervix

**Measure fluid** AFI

**2 measurements each:** Head circumference  
BPD

**Spine:** Lumbar- Long and Trans  
Thoracic- Long and Trans  
Cervical-Long and Trans  
Sacral-Long and Trans

**Lower Extremity:** Femur and Tib-Fib, Both Legs  
**Femur Length:** 2 measurements

**Bladder**

**Cord insertion into abdomen and placenta**

**3 Vessel Cord**

**Kidneys**

**Stomach:** Annotate fetal position to verify on correct side

**Heart:** Annotate fetal position to verify on correct side  
Do Clip store to show real time HR  
HR trace and measurement

**Abdominal Circumference:** 2 measurements

**Face:** Image lips and nose if possible  
Profile

**Gender:** If possible

- Annotate ALL images

**Carotid Doppler**

**Transverse:** CCA- Proximal to Bifurcation  
ICA and ECA- Bifurcation to highest visible point

**Longitudinal:** CCA- Proximal to Bifurcation  
ICA and ECA- Bifurcation to highest visible point  
Color Doppler with PW Spectral wave form on split screen  
Must use 60 degree angle or less

**Vertebral:** Image in 2D and color with PW

**Measurements:** CCA- within 2 cm of bifurcation  
ICA-Proximal, Mid, and Distal  
ECA- Proximal  
Vertebrals

- Measure Peak Systolic and End Diastolic Velocities of CCA’s and ICA’s  
- Measure Peak Systolic Velocities of ECA’s and Vertebral’s  
- Indicate any plaque or other abnormality seen  
- Survey any stenotic areas for highest velocities
Do not take CCA velocity for ratios at area of plaque
Annotate all Images
Include Image of Report page on completion of all measurement.

Venous Doppler-Leg

CFV/GSV: Trans- Clip store showing compression
GSV: Survey to knee
   Long with flow (PW)
   Long with inhalation (PW)
   Long with augmentation (PW)
CFV: Long with flow (PW)
   Long with inhalation (PW)
   Long with augmentation (PW)
SFV/Profunda: Long with flow (color only)
SFV Upper: Long with flow (PW)
   Long with inhalation (PW)
   Long with augmentation (PW)
Profunda: Long with flow (PW)
   Long with inhalation (PW)
   Long with augmentation (PW)
SFV/Profunda: Transverse- Clip store showing compression
   Transverse- do compression down to Mid SFV
SFV Mid: Transverse- Clip store showing compression
   Long with flow (color only)
   Long with flow (PW)
   Long with inhalation (PW)
   Long with augmentation (PW)
   Transverse- Do compression down to Distal SFV
SFV Lower: Transverse- Clip store showing compression
   Long with flow (color only)
   Long with flow (PW)
   Long with inhalation (PW)
   Long with augmentation (PW)
   Turn Patient on side or prone

Popliteal: Transverse- Clip store showing compression
   Long with flow (color only)
   Long with flow (PW)
   Long with inhalation (PW)
   Long with augmentation (PW)

PTV: Compression down to ankle
   Transverse- Clip store showing compression
   Long with flow (color only)
   Long with flow (PW)
Long with augmentation (PW)

- Survey calf for GSV, peroneals and LSV
- Annotate all Images

**Venous Doppler Arm**

**Jugular:** Long
  - Long with color
  - Long with PW
  - Trans with compression

**Subclavian:** Medial-Long
  - Long with color
  - Long with PW
  - Mid-Long
    - Long with color
    - Long with PW
  - Lateral-Long
    - Long with color
    - Long with PW

**Axillary:** Long
  - Long with color
  - Long with PW
  - Trans with compression

**Brachial:** Superior-Long
  - Long with color
  - Long with PW
  - Trans with compression
  - Mid-Long
    - Long with color
    - Long with PW
    - Trans with compression

**Inferior:** Long
  - Long with color
  - Long with PW
  - Trans with compression

**Cephalic:** Long
  - Long with color
  - Trans with compression (proximal, Mid, Distal)

**Basilic:** Long
  - Long with color
  - Trans with compression (proximal, Mid, Distal)

- Annotate all Images
Deep Abdominal Doppler

Tips

- Locate Portal and Hepatic Vein ends of Shunt
- Use color and PW of Proximal, Mid and Distal Shunt
- Measure velocities in Proximal, Mid and Distal Shunt
- Image IVC, Use Color and PW
- Image Splenic and Portal Vein, Use Color and PW
- Image Hepatic Veins entering IVC
- Document with color Doppler flow direction
- Image Hepatic Artery
- Annotate all Images

Deep Abdominal Doppler

Patient must be NPO

Aorta: Long-Proximal Color, PW, and Velocity
  Mid- Color, PW, and Velocity
  Distal- Color, PW, and Velocity

Celiac Artery: Long- Color, PW, and Velocity

SMA: Long-Proximal Color, PW, and Velocity
  Mid- Color, PW, and Velocity
  Distal- Color, PW, and Velocity

IMA: (if seen) Long-Proximal Color, PW, and Velocity
  Mid- Color, PW, and Velocity
  Distal- Color, PW, and Velocity

- Annotate all Images

Segmental Pressures

Pressures

Put Patient in 2 gowns-Remove pants, shoes, and socks.
Patient is supine

Wrap: 1 Above ankles with #10 cuff
  2 Below knees with #10 cuff
  3 Above knees with #12 cuff
  4 High thigh with #12 cuff

Attach inflator module to appropriate cuff

Follow instructions as to which cuff to inflate for segmental pressure setting

Brachial Pressure: Locate artery with probe at wrist or elbow.
  Inflated cuff until artery is occluded
  Press button to store when first pulse returns
  Repeat in other arm

Leg Pressures: Locate artery with probe in post tib or on top of foot
Start with cuff 1
Inflate cuff until artery is occluded
Press button to store when first pulse returns
Repeat for all cuffs, both legs
Store settings when all pressures are recorded

**Pneumo Waveforms**

**Leg Waveforms:**
- Start with cuff 1
- Inflate to between 65-70 mHg.
- Record at least 3 waveforms
- Repeat through all cuffs, both legs
- If patient is Diabetic perform toe pressures and waveforms on great toe.
- If patient can walk, walk patient for 5 minutes or until patient tires
- Do post exercise ABI’s until resting pressure is reached

**Thyroid or Neck FNA**

**Supplies**
- Sterile gloves
- Sterile towels
- Chloraprep
- 5 25g needles (pink)
- 1 18g needle (w/safety)
- 1 25g needle (s/safety)
- 6 12cc syringes
- Sterile gauze
- Sterile gel
- Alcohol
- Probe Cover

**Before Radiologist enters room:**
- Get consent signed
- Survey and image area of interest
- Have pathology request ready (for lab)
  - Give lab advanced notice of procedure
  - Call lab as soon as Radiologist enters room

**ALL MATERIALS EXCEPT ALCOHOL AND PROBE COVER SHOULD BE OPENED USING STERILE TECHNIQUE AND PLACED ON STERILE TOWELS PRIOR TO RADIOLOGIST ENTERING THE ROOM. DO NOT LEAVE UNATTENDED**

**Paracentesis/Thoracentesis**
Supplies:
- Sterile gloves
- Biopsy pack
- Chloraprep
- Lidocaine
- Sodium Bicarbonate (optional per Radiologist)
- 4F or 5F 7cm One Step Cath (Occasionally may use 10cm)
- Thoracentesis tubing
- Three-way stopcock
- 60cc Syringe (optional per Radiologist)
- Vacuum Bottles

Before Radiologist enters room:
- Check labs
- Get consent signed
- Survey and image area of interest

Have all supplies ready and unopened

Once Radiologist is sterile, may open these materials and drop onto tray.
**WITHOUT BREAKING THE STERILE FIELD**