Skagit RADIOLOGY INCORPORATED PROFESSIONAL SERVICES	**US Abdomen**(includes abdominal Doppler protocols)		
	Reviewed:	Date: 4/5/2022	
	Revised:	Date: 4/5/2022	

PURPOSE

Practice parameter for the performance of diagnostic ultrasound of the abdomen.

SUPPORTIVE DATA

- Obtain a written, verbal, or electronic order from provider
- Verify that written orders are scanned into Epic
- Previous relevant imaging procedures

INDICATIONS

Indication for an abdominal ultrasound include but are not limited to:

- Abdominal pain.
- Signs or symptoms that may be referred from the abdominal region, such as jaundice
- Palpable abnormalities such as abdominal mass or organomegaly
- Abnormal laboratory values or abnormal findings on other imaging exams suggestive abdominal pathology
- Follow up of known or suspected abnormalities in the abdomen
- Search for metastatic disease or occult primary neoplasm
- Evaluation of suspected congenital abnormalities
- Abdominal trauma
- Pretransplantation of post transplantation evaluation
- Planning for and guiding an invasive procedure
- Search for the presence of free or loculated peritoneal and/or retroperitoneal fluid
- Evaluation of suspected hypertrophic pyloric stenosis or intussusception

CONTRAINDICATIONS

- There are no absolute contraindications.

EQUIPMENT LIST

- Real-time ultrasound scanner with transducer of appropriate frequency
    - Higher frequency transducers should be considered first on all pediatric, small infants, and newborns

    - Linear high frequency transducers should be used first when evaluating abdominal wall, liver surface, and bowel
    - Color and/or power Doppler should be used to characterize vascular structures and masses.
- Gel
- Patient gown (if applicable)

SAFETY

- Universal precautions for bodily fluids should be observed as per hospital protocol.
- All ultrasound carts are annually checked and are up to date with all state and manufacturer guidelines.
- Exams will be prioritized according to ordering status (STAT, ASAP or Routine)

PATIENT PREPARATION

Abdomen Complete, Abdomen Doppler and TIPS Protocols

- NPO 8 hours prior to exam. Small sips of water are okay to take medications.

Pyloric Stenosis Protocols

- Have patient fill stomach. Usually first born males 3-6 weeks of age up to 5 months old.

Abdomen Limited and Intussusception Protocols

- None

Mesenteric Artery Doppler

- No carbonated beverages, dairy or orange juice 36 hours prior to exam
- Clear liquids only 24 hours prior to exam
- Nothing to eat or drink 8 hours prior to exam

PROCEDURE

1. Check provider's orders for reason for exam and any comments.
2. Review report of patient's most recent ultrasound, relevant imaging or relevant labs if applicable.
3. Start exam in Epic
4. Verify patient by 2 patient identifiers (name, DOB, wristband).
5. Process should be explained to patient.
6. Have patient change into gown if appropriate
7. Perform imaging procedure
8. End exam in Epic

IMAGING PROCEDURE

Abdomen Complete Protocol

A normal Abdomen Complete ultrasound will aim to include the following views:

1. Trans Pancreas
2. Sag Pancreas Head
3. Sag Aorta Prox w/ measurement
4. Sag Aorta Mid w/ measurement
5. Sag Aorta Distal w/ measurement
6. Trans Aorta Bifurcation w/ measurement
7. Sag Left Liver w/ IVC and caudate lobe
8. Sag IVC w/ color or Doppler to demonstrate patency
9. Trans Left Liver w/ IVC and caudate lobe
10. Trans Right Liver w/ Hep Veins
11. Trans Right Liver w/ Portal Vein
12. Sag Right Liver w/ Porta Hepatis
13. Sag Right Liver w/ Rt Kidney
14. Sag Right Liver w/ measurement
15. Sag Right Kidney
16. Sag Right Kidney w/ length measurement & cortex measurement
17. Trans Right Kidney Mid
18. Sag GB Supine
19. Trans GB supine w/ wall measurement
20. Sag GB LLD
21. Trans GB LLD w/ wall measurement
22. Sag CHD and CBD w/ measurement
23. Sag Spleen
24. Sag Spleen w/ measurement
25. Trans Spleen
26. Sag Left Kidney
27. Sag Left Kidney w/ length measurement & cortex measurement
28. Trans Left Kidney Mid
29. RLQ & LLQ
30. Document pathological findings with all appropriate additional views to include color doppler and/or pulsed wave doppler

Abdomen Doppler (Hep C)

1. Spectral of main portal vein, right portal vein, left portal vein, mid hepatic vein, right hepatic vein, left hepatic vein to demonstrate direction of venous flow in relation to liver.
2. Spectral of hepatic artery to demonstrate direction of flow and Resistive Index.
3. Spectral of mid splenic artery and vein to demonstrate direction of flow.
4. Document any abdominal varices visualized.
5. Document pathological findings with all appropriate additional views to include color doppler and/or pulsed wave doppler

US Abdomen Limited Protocol

An Abdomen Limited should only be used when a prior imaging procedure has recently been performed. An Abdomen Limited is appropriate for the following:

1. Ascites in a single quadrant. Document any bowel or vessels that would obstruct a needle if evaluating for paracentesis.
2. Single organ
3. Follow up

Limited RUQ protocol:

To be used when indication is RUQ pain, AND US Abd complete is NOT ordered, AND US Gallbladder is not ordered.

1. Liver- Complete evaluation. Please document 1 image RLL sag, 1 image LLL sag, 1 image RLL trans, 1 image LLL trans. MPV with color and PW doppler for direction.
2. GB and CBD, measured proximal and distal as much as possible.
3. Pancreas, head body and tail if possible. Trans image. If gassed out, show attempt.
4. Rt kidney, mid sag image for any hydronephrosis, AND image w/ kidney and liver for echogenicity comparison.

US Gallbladder:

To be used when r/o cholecystitis or eval gallbladder or something else very specific to GB is the indication.

1. GB and CBD as above.
2. Liver limited to portahepatis and GB fossa. Tech to comment on echogenicity only if abnormal.
3. Pancreas- head/neck. Stop if normal and no ductal dilatation, mass or peripancreas fluid

US Transjugular Intrahepatic Portosystemic Shunt (TIPS) Protocol

1. Trans liver with hepatic veins: take more than one image if necessary to be sure left and middle hepatic veins are images. Typical TIPS involves the right hepatic vein, therefore it won't be visible
2. Trans image of liver with portal vein
3. Sag liver images to include

Left lobe liver with prox aorta

Left lobe liver with left portal vein

Liver with IVC

Right lobe liver with TIPS

Right lobe liver / kidney interface

Right lobe document size

4. Color & angle corrected spectral Doppler images:

LHV

MHV

RHV (shunt)

Prox TIPS –measure PSV

Mid TIPS – measure PSV

Dist TIPS – measure PSV

MPV – measure PSV & document flow direction

Hepatic artery – measure PSV

Splenic vein – document flow direction

IVC – document flow direction

5. Document pathological findings with all appropriate additional views to include color doppler and/or pulsed wave doppler

US Pyloric Stenosis Protocol

1. TRANS measure muscle wall thickness multiple times (abnl >= 3mm)
2. SAG measure length of pyloris canal (abnl >12 mm)
3. NOTE prescence of peristalsis (abnl if no peristalsis)
4. Document pathological findings with all appropriate additional views to include color doppler and/or pulsed wave doppler

TRANS image SMA/SMV relationship

(Abnl/malrotation of bowel if SMV left of SMA)

US Intussusception Protocol

1. RLQ (most commonly found in right abdomen)
2. RUQ
3. LUQ
4. LLQ
5. Evaluate bowel for target sign or pseudo kidney sign
6. Document lymph nodes and/or free fluid

7. Document pathological findings with all appropriate additional views to include color doppler and/or pulsed wave doppler

US Mesenteric Artery Doppler

Preprandial Evaluation:

1. Sag Aorta with color & angle corrected spectral Doppler measure PSV
2. Celiac Artery with color & angle corrected spectral Doppler measure PSV
3. Hepatic Artery with color & angle corrected spectral Doppler measure PSV
4. SMA with color & angle corrected spectral Doppler measure PSV

Origin

Prox

Mid

Distal

IMA (if possible)

Postprandial Evaluation (use 8oz of high fat meal replacement drink or high fat meal):

Stop when diastolic response of 20-30% is identified, or when change of spectral Doppler waveform from high resistance to low resistance is achieved.

1. SMA (5 mins elapsed) with color & angle corrected spectral Doppler measure PSV & PDV
2. SMA (10 mins elapsed) with color & angle corrected spectral Doppler measure PSV & PDV
3. SMA (15 mins elapsed) with color & angle corrected spectral Doppler measure PSV & PDV
4. SMA (20 mins elapsed with color & angle corrected spectral Doppler measure PSV & PDV

DOCUMENTATION

1. Written, verbal, or electronic order from provider
2. The worksheet and images need to be scanned into PACS under appropriate exam and put online.
3. Ultrasound images should be labeled with anatomy imaged and orientation (SAG or TRANS)
4. All images are submitted with above documentation for dictation and stored in PACS
5. For all STAT, ER and Urgent Care ultrasound exams, call radiologist for prelimanary report to give to ordering provider
6. If it is between 2200 - 0700, submit exam along with proper documentation to teleradiology

REFERENCE

- Approved by Pharmacy and Therapeutics Board on 08/14/2020
- Approved by Medical Executive Team on 09/11/2020
- Approved by Medical Director, Dr. Muneer Desai, on 08/20/2020
- Approved by Radiology Protocol Committee on 3/9/2020
- ACR Practice Parameters Resolution 27 (2017)

References

Reference Type	Title	Notes
Documents referenced by this document		
Referenced Documents	ACR Practice Parameters Resolution 27 (2017)	