PEDIATRIC RENAL ULTRASOUND

Patient Preparation: None

III. Equipment: Performed with real-time scanner using a sector or curved linear transducer with frequencies ranging from 4.0 MHz to 10 MHz, higher frequencies often necessary for young children and infants.

IV. Procedure Protocol:

Note: Begin scan with urinary bladder, if bladder is not distended, give fluids, and rescan bladder at end of exam.

A. Urinary Bladder

Sagittal Views:

1. distended urinary bladder when possible
2. longitudinal and AP measurements while bladder is distended
3. maximum longitudinal and AP measurements immediately post void documenting any post void residual fluid

Transverse Views:

1. distended urinary bladder
2. transverse measurement while bladder is distended
3. AP measurement of bladder wall thickness
   (normal wall thickness = 3mm with distended urinary bladder, 5mm with empty bladder)
4. document ureteral jets using Power Doppler
5. transverse measurement immediately post void documenting any post void residual fluid
6. *COMMENT - survey bladder wall for any focal lesions, image any record any adjacent abnormalities. Assess for debris within the urinary bladder, dilated distal ureter, posterior ureterocele, pelvic fluid.
7. Urinary bladder volume may be calculated using the following modified volume formula: L x W x H x 0.9 = cc

B Kidneys

Long Axis Views:

1. Longitudinal view to include liver/right kidney or spleen/left kidney interface; compare renal echogenicity to adjacent hepatic or splenic echogenicity
2. Longitudinal views - include maximum renal length at the level of the hilum
3. Longitudinal medial view - include medial portion of kidney
4. Longitudinal lateral view - include lateral portion of kidney

5. Longitudinal color/power Doppler view to assess for pyelonephritis (hypovascular). Can perform 3D color flow map.

Transverse Views:

1. superior pole
2. mid pole - to include renal pelvis
3. inferior pole
4. If hydronephrosis (pelvicaliectasis) is seen, then must image with an EMPTY bladder to see if it persists.
5. *COMMENT - PW and/or Color Doppler may be used to document renal artery and vein patency, to evaluate for medical renal disease, when clinically indicated, or to differentiate a dilated collecting system from vascular structures; assess kidney and perirenal areas for any abnormalities during routine imaging; assess for horshoe kidney or cross-fused ectopia; assess for renal parenchymal scarring, masses, pyelonephritis

C. **Adrenal Glands**

1. longitudinal view
2. transverse view

D. **Pancreas**

Transverse Views:

1. head/uncinate process - assess distal common bile duct for dilatation
2. body/tail - assess for pancreatic duct dilatation with measurement when indicated

Sagittal Views:

1. head - assess for common bile duct dilatation

"COMMENT - assess peripancreatic region for any evidence of adenopathy, inflammation, pseudocyst and/or fluid

E. **Abdominal Aorta** Sagittal

Views:

1 proximal / mid abdominal aorta - posterior to left lobe of liver, include celiac axis and SMA when possible; include maximum AP diameter measurement

2. mid / distal abdominal aorta - distal to SMA; include maximum AP diameter measurement

"COMMENT - document and image any aortic dilatation in long axis (include maximum length and AP diameter measurements) and transverse views (include maximum transverse and AP diameter measurements);

PW and/or Color Doppler may be used when clinically indicated to evaluate flow in the abdominal aorta

F. **Inferior Vena Cava**

1. image in long axis documenting position of inferior vena cava as it passes through liver

PEDIATRIC RENAL]ULTRASOUND
IMAGE SUMMARY

Image:

1. bladder – long
2. bladder - trans
3. bladder wall thickness
4. ureteral jet documentation
5. bladder (post void) - long
6. bladder (post void) - trans

7. right kidney/liver - long
8. right kidney - long
9. right kidney - long
10. right kidney - long medial
11. right kidney - long lateral
12. right kidney - trans superior
13. right kidney - trans mid
14. right kidney - trans mid
15. right kidney - trans inferior

16. right adrenal - long
17. right adrenal - transverse

18. left kidney/spleen - long
19. left kidney - long
20. left kidney - long
21. left kidney - long medial
22. left kidney - long lateral
23. left kidney - trans superior
24. left kidney - trans mid
25. left kidney - trans mid
26. left kidney - trans inferior

27. left adrenal - long
28. left adrenal - transverse

29. pancreas (head/uncinate) - transverse
30. pancreas (body/tail) - transverse

31. aorta (proximal) - long

32. aorta (mid) – long
33. aorta (distal)- long

34. IVC - long

Measurement:

1. AP + Length
2. AP + transverse
3. AP

5. AP + length
6. AP and transverse
7. AP + length
8. Length
13. AP + transverse
19. Length
24. AP + transverse
31. AP
32. AP