Renal & Bladder Ultrasound Cheat Sheet

Introduction

Basics

- Use curvilinear probe with abdominal settings
- Indications: flank pain, hematuria, urinary retention

Technique

- Patient position - supine

Renal

- Probe marker: to patient head & rotated slightly towards bed (to fit between ribs)
- Probe position: parallel to floor in posterior axillary line
- Ideal image: long axis view of bilateral kidneys
- Assess color flow if concern for hydronephrosis (renal vessels look similar)

Bladder

- Probe marker: to head for longitudinal & to pt right for transverse
- Probe position: perpendicular to floor, just superior to pubic symphysis
- Ideal image: transverse & longitudinal bladder
- Extra: color/power doppler over posterior transverse bladder = urine jets (a few per min)

Normal Anatomy

Renal

- Left kidney is more cephalad & posterior than right
- Renal cortex is hypoechoic (grey)
- Renal pelvis is hyperechoic white with or without small anechoic (black) calyces
- Ureter not normally identified unless dilated
- Psoas muscle visible posterior to kidney

Bladder

- Thin walled anechoic fluid filled structure
- Will see posterior acoustic enhancement behind bladder
- Females: uterus posterior to bladder
- Males: may see prostate or seminal vesicles (flat rounded fluid filled structure) posterior to bladder. Don't confuse for free fluid.

Hydronephrosis

- Dilated renal pelvis & increase in anechoic fluid w/in hyperechoic renal sinus/pelvis
- Mild: only involves renal pelvis
- Moderate: fluid dilates into calyxes & looks like "bear claw"
- Severe: causes parenchymal thinning
- No color flow in hydro. If color flow, fluid is vasculature of renal hilum & not hydro.
- Unilateral hydronephrosis → ureteral obstruction
- Bilateral hydronephrosis → distal obstruction OR bilateral ureteral obstructions

Cysts & Stones

- Cyst: smooth walled, hypoechoic/anechoic center w/ posterior acoustic enhancement
- Nephrolithiasis: hyperechoic with posterior shadowing for large stones
- Twinkle artifact: smaller stones in kidney will "twinkle" with power doppler

Urinary Retention

- Bladder volume: hit calc button, select volume, & take three measurements
- Measurements: make a plus sign on transverse and a diagonal minus sign on longitudinal
- Urinary retention: > 50 ml post void residual