

1 ☐ **Fetal Urinary System**

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2 ☐ **Fetal Kidneys**

- Sonographically visible by 14 weeks
 - Lateral to spine, caudal to abdominal circumference plane.
 - Superior to cord insertion plane
- Hypoechoic area delineated by hyperechoic bright border
- Measurements when taken:
 - Sagittal-length
 - Transverse- AP diameter
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3 ☐ **Bladder**

- Can be seen in both transverse and longitudinal sections by 12 weeks
- Empties every 30-45 minutes
- Umbilical arteries run lateral

4 ☐ **Renal Agenesis**

- Absent kidneys, renal arteries, ureters
- Adrenal glands present
- Anhydramnios
 - Empty bladder with bilateral agenesis

5 ☐ **Renal Dysplasia**

- Enlarged kidneys that contain cysts
- Typically bilateral
- Distinguish:
 - Laterality
 - Cyst number/size
 - Appearance of renal cortex
 - Bladder size
 - Amniotic fluid volume

6 ☐ **Infantile Polycystic Kidney Disease**

- Bilateral involvement
- Autosomal recessive-prenatal testing available
- Cysts range from microscopic to several millimeters causing HYPERECHOIC
- Often have oligohydramnios, but if some renal function is present, fluid may just be low.

7 ☐ **Multicystic Dysplastic Kidney Disease**

- Multiple thoughts of occurrence
 - Consequence of early obstruction to the ureter or bladder
 - Failure in the development of the nephrons
 - Bilateral or unilateral or segmental

- When unilateral can be accompanied by agenesis of the contralateral kidney
- Non-communicating cysts of varying size
- Large cystic kidneys, that don't communicate

8 ☐ **Renal Cysts**

- Unilateral
- Cysts, rare and harmless

9 ☐ **Meckel-Gruber Syndrome**

- Renal dysplasia, Encephalocele, Polydactyly
- Enlarged kidneys, often with oligohydramnios as they don't function properly.

10 ☐ **Renal Pelvic Dilation**

- Second trimester
 - 5mm AP diameter
- Third trimester
 - 10 mm AP diameter
- Typically resolves prenatally-often followed up postnatally

11 ☐ **Hydronephrosis**

- Dilatation of the renal pelvis
- Most common fetal anomaly
- Sonographic appearance:
 - Varies according to severity
 - Dilated renal pelvis, communicates with calyces

12 ☐ **Ureteropelvic Junction Obstruction**

- Most common cause of neonatal hydronephrosis
- Sonographic findings:
 - Dilated renal pelvis with/out caliectasis
 - Normal ureter and bladder size
 - Chronic may present with thinned cortex
 - Typically normal AFV
- Typically monitor with serial sonograms
 - Will scan after birth

13 ☐ **Ureterovesical Junction Obstruction**

- Commonly from aperistaltic distal ureteral segment
- Evaluate for other urinary tract anomalies
- Sonographic findings:
 - Dilatation of renal pelvis AND ureter
 - Ureter often tortuous
 - Follow back to renal pelvis

14 ☐ **Congenital Malformations**

- Renal Agenesis

- Complete absence of the kidneys
- Horseshoe Kidney
 - Inferior poles of the kidney fuse while they are still located in the pelvis
- Renal Ectopia
 - Kidneys located outside the normal renal fossa
 - Often found in the pelvis

15 ☐ **Obstructive Uropathy**

- Dilatation of some or all of the urinary tract due to obstruction.
- Ultrasound appearances depends on the site and severity of obstruction

16 ☐ **Urethral Obstruction**

- Posterior urethral valves
 - Folds of mucosa at bladder neck-one way valve
 - Exclusively in males
- Urethral atresia
- Kidneys will be present-bladder very distended, oligohydramnios often present

17 ☐ **Bladder Exstrophy**

- Failure of muscle development of anterior abd wall
- Typically isolated defect
- Sonographic findings:
 - Inability to identify bladder in normal position
 - Abd wall mass
 - Umbilicus inferiorly displaced
- Distinguish from omphalocele or gastroschisis by evaluating cord insertion and content within the abd. mass

18 ☐ **Potters Syndrome**

- Lack of amniotic fluid and renal failure
 - Renal disease can be from a multitude of pathologies
- Prognosis depends on severity
 - Pulmonary hypoplasia may develop
 - Renal failure also has to be dealt with after birth

19 ☐ **Prune belly Syndrome**

- Occurs almost always in males
- Thin or lax anterior abdominal wall
- Tortuous, dilated urethra
- Varying amounts of hydronephrosis and renal dysplasia
- Amniotic fluid may be normal or even decreased
- Males always have cryptorchidism
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20 ☐ **Conclusion**

- 1 Renal dysplasia

- 2
 - Renal agenesis
 - Infantile Polycystic Kidney Disease
 - Multicystic Kidney Disease
 - Renal Cysts
 - Pelviectasis or Hydronephrosis
 - Meckel-Gruber Syndrome
 - Potters Syndrome
 - Congenital Malformations
- 3 Bladder and Ureter Problems
- 4
 - Bladder Extrophy
 - Posterior Urethral Valves
 - Hydroureter
 - Prune Belly Syndrome
 - Obstructive uropathies