

Common Structural Kidney Anomalies *Script for Providers*

Common Structural Kidney Anomalies Detected on Imaging: *What to Tell Your Families*

1. Hydronephrosis

Mild hydronephrosis is often asymptomatic and may be found incidentally. Typically, hydronephrosis is detected on a renal ultrasound and is also referred to as pelviectasis or pelvicaliectasis, depending on the degree of dilation. If your patient has been diagnosed with hydronephrosis, below is some information to share with your patient and their family while they await their nephrology consultation.

What is it?

- Hydronephrosis is a term for dilation or swelling in the collecting system of the kidney.
- It can be found prenatally or later in childhood (congenital) or develop later in a child's life (acquired).
- The severity can range from very mild to severe.

What causes it?

- Congenital causes may be a blockage of urine flow from the kidneys to the bladder or from vesicoureteral reflux (urine flow backwards from the bladder to the kidney). The cause may not always be identified.
- An example of an acquired blockage is a kidney stone.

How do you treat it? Is additional testing needed?

- Mild congenital hydronephrosis may resolve without intervention, but often requires monitoring.
- Severe, worsening or symptomatic hydronephrosis (e.g., flank/back pain, nausea or vomiting) may require additional imaging studies or consultation with our urology colleagues.

[Seattle Children's Hydronephrosis patient family handout](#)

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2. Horseshoe Kidney

Children with a horseshoe kidney are generally asymptomatic. If your patient has a horseshoe kidney, below is some information to share with your patient and their family while they await their nephrology consultation.

What is it?

- Horseshoe kidney occurs when 2 kidneys are fused together. The majority of the time, the fusion is of the lower poles preserving the 2 individual ureters.
- This occurs in the first trimester (5th to 9th week) of gestation.

What causes it?

- Disruption of the normal embryonic process
- Sometimes associated with other anomalies (particularly genital/urinary anomalies) or genetic syndromes.

How is it diagnosed?

- It is usually diagnosed on a prenatal ultrasound.
- If detected on a prenatal ultrasound, an ultrasound after birth can confirm a horseshoe kidney and assess for hydronephrosis.
- May be found on imaging when investigating for complaints of hematuria or abdominal pain.

How do you treat it? Is additional testing needed?

- Additional imaging and evaluation are based on findings such as hydronephrosis. Additionally, patients are at risk for kidney stones and urinary tract infections, so may require testing or therapies related to those conditions.
- Often, children do quite well and no intervention is needed.

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3. Isolated (Simple) Renal Cysts

Children with isolated (simple) renal cysts are typically asymptomatic. Cysts are common in children and are often found incidentally. If your patient has been diagnosed with an isolated (simple) renal cyst, below is some information to share with your patient and their family while they await their nephrology consultation.

What is it?

- A simple renal cyst has certain, nonworrisome characteristics. The cyst walls are thin. There are no septa, calcifications or solid matter.

What causes it?

- It may be due to a variety of genetic or nongenetic causes.

How do you treat it? Is additional testing needed?

- In those with a single simple renal cyst, normal kidney anatomy and normal kidney function, intervention is rarely needed.
- Additional testing may be warranted based on physical findings, medical history or family history.

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4. Kidney or Renal Asymmetry

Renal asymmetry occurs when 1 kidney is smaller than the other. If your patient has renal asymmetry, below is some information to share with your patient and their family while they await their nephrology consultation.

What is it?

- The term kidney or renal asymmetry is used when 1 kidney is significantly smaller than the other.
- The smaller kidney may be described as hypoplastic or hypodysplastic.

What causes it?

- It may be due to a disruption of the normal developmental process possibly related to in utero vascular abnormalities, other urogenital abnormalities such as vesicoureteral reflux or as part of a genetic disorder.

How do you treat it? Is additional testing needed?

- If the contralateral kidney is healthy, many children are asymptomatic and no intervention is needed. However, monitoring with imaging, blood pressure assessments and urine evaluation is often recommended at least through childhood. Bloodwork may also be indicated.
- Further investigation may be warranted based on the presence of other imaging findings such as cysts or hydronephrosis, the child's past medical history (such as recurrent urinary tract infections) or the physical exam, including blood pressure measurements.

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5. Duplicated Collecting System (Duplex Kidney)

A duplicated collecting system (duplex kidney) describes a kidney that has 2 ureters draining the kidney. It is the most common anatomical malformation of the urinary tract and is often found incidentally on renal ultrasound. If your patient has been diagnosed with a duplicated collecting system, below is some information to share with your patient and their family while they await their nephrology consultation.

What is it?

- A duplicated collecting system may be partial or complete.
- In complete duplication, there are 2 pelvicaliceal systems and 2 ureters. The ureters remain independent, with both inserting into the bladder or 1 of the ureters inserting into the bladder with the other inserting ectopically.
- In partial duplication, which is more common, there are 2 pelvicaliceal systems that may have a single ureter or 2 ureters that join prior to inserting into the bladder.
- Duplex systems can be unilateral or bilateral.

What causes it?

- Developmental variation occurring early in the formation of the genitourinary tract.

How do you treat it? Is additional testing needed?

- Often duplex systems are asymptomatic and require no intervention.
- Further investigation may be warranted based on the presence of other imaging findings such as hydronephrosis or the child's past medical history (for example, recurrent urinary tract infections).