

KIDNEY (RENAL) CYSTS

- Renal cysts are fluid-filled sacs that develop in the kidneys.
- Simple renal cysts are found in approximately 25-33% of adults over the age of 50.
- Up to 50% of people over 50 may have at least one renal cyst.
- The exact cause of why cysts form is unclear --- one theory suggests that the cell wall of tubule inside the kidney may weaken, form a pouch that become filled with fluid, and the fluid becomes stuck within the pouch thus creating a cyst.
- Most simple renal cysts are asymptomatic and are often discovered incidentally during imaging tests, such as ultrasounds or CT scans, performed for other reasons.
- They can vary in size, number, and type.
- Usually *do not* cause symptoms (aches/pain, infection/UTI, bleeding).
- A classification system using roman numerals called the “Bosniak Classification System” is used.

SIMPLE RENAL CYSTS (BOSNIAK I)

- Benign (non-cancerous) and are the most common type of cyst with almost no malignant potential.
- Filled with clear or straw-colored fluid that is similar to plasma and contains water, salts, and other dissolved substances.
- Thin, smooth walls.
- No septations (internal walls), calcifications, or solid components.
- Appear as round or oval shapes with well-defined borders on imaging.
- They don't enhance after contrast administration.
- Do not harm the function of the kidney.
- The size of the cyst, or if it changes in size, is not typically relevant or needing to be tracked.
- If asymptomatic and discovered incidentally, it typically does not require treatment.
- Periodic imaging is usually not required but may be recommended if there's any uncertainty. If there's any doubt about the benign nature of the cyst, a follow-up ultrasound (or CT or MRI) may be performed after 6-12 months to ensure stability.
- Treatment (if necessary):
 - Percutaneous Aspiration: A radiologist inserts a small needle through the back to drain the cyst fluid.
 - Sclerotherapy: A chemical agent is injected into the cyst after drainage to reduce the chance of recurrence.
 - Surgery: In rare cases where the cyst is large or symptomatic, laparoscopic removal might be recommended.

COMPLEX RENAL CYSTS (BOSNIAK II, IIF, III, IV)

- Has features that make them more suspicious for malignancy (cancer).
- May contain fluid that is more dense/thicker and contain more proteins or other debris or may have blood (hemorrhagic cysts), making the contents appear darker.
- Thicker walls or irregular borders, septations (internal walls or septations), calcifications (hard, mineralized deposits) or solid components.
- Potential for enhancement after intravenous contrast on imaging.

BOSNIAK CLASSIFICATION SYSTEM - categorizes kidney cysts using roman numerals

- **BOSNIAK I**: Simple cysts with thin, smooth outer walls, containing clear fluid, and no internal, calcifications, or solid components. Benign, close to zero chance of being cancer.
- **BOSNIAK II**: Minimally complex cysts, few thin septations, possibly thin calcifications. Very low malignant potential and generally benign, no follow-up needed but may be monitored.
- **BOSNIAK IIF**: More complex cysts, more thin septations, minimal thickening of the walls or septations or calcifications, but no solid components. There is a low to mild (non-negligible) risk of malignancy. The “**F**” stands for “**F**ollow-up” and imaging is recommended at 6-12 months, then annually.
- **BOSNIAK III**: Indeterminate cysts with thickened, irregular walls or septations, solid components that enhance with contrast. There is a moderate risk of malignancy (about 30-50%), and surgical evaluation is often recommended.
- **BOSNIAK IV**: Cystic masses with clearly solid enhancing components, with high likelihood of malignancy (greater than 50%) and surgical removal is typically recommended (partial or complete removal of the cyst or th affected portion of the kidney).

Bosniak classification of renal cysts

