

Approach to Renal Imaging in ADPKD

Ordering Imaging to Determine Renal Prognosis and Disease Progression



Step 1: Have you maximized already available or pre-existing information?

- Has your patient had any CT or MRI of the abdomen/pelvis previously? Remember to ask if this has been done in a different jurisdiction/health authority. Even if this was for a different indication, ask your radiologist if the images are sufficient to be used for Total Kidney Volume (TKV) measurement as this may eliminate the need for a new scan.

Step 2: If new imaging is needed, what imaging test do you need?

- If there is no previous imaging, a broad estimate of renal size may be a good first step and ultrasound performs well in this setting.
- If you need an accurate assessment of renal size rather than a broad estimate, TKV is the method of choice and should be done with cross-sectional imaging. Ultrasound TKV results are more variable than cross-sectional imaging and ultrasound is therefore not recommended if accurate assessment of TKV is desired.

Step 3: If you need cross-sectional imaging/TKV, which scan should you order?

In general, MRI is the preferred test for TKV measurement, but there are several considerations:

- Does your patient have contraindications to MRI or CT? Contrast is not needed for TKV measurement.
- What is your access to MRI? If access to MRI in your centre is an issue, have you discussed the option of abbreviated/single phase MRI scans with your radiology department? These offer images sufficient for TKV measurement with less scan time requirements.
- Does your patient have very enlarged kidneys (e.g.

>18 cm)? If you already know this, cross-sectional imaging may not yield much additional information. If cross-sectional imaging will be useful, remember that patients with large kidneys will require higher than average radiation exposure if imaged with CT so consider MRI if available.

- Do you foresee the need for multiple/serial scans? If so, this is another reason to consider MRI instead of CT to avoid cumulative radiation exposure.
- If MRI is not an option, CT can be used for accurate TKV measurements. The UBC Ultra-Low-Dose CT protocol for assessment of total kidney volume in ADPKD ([link](#)) is available online and can provide accurate TKV measurements with a dose of radiation similar to an abdominal X-ray series.

Step 4: Is repeat imaging required?

- Not all patients require repeat/serial measurement of TKV.
- Repeat/serial assessment of TKV may be helpful in some patients as a way to calculate observed annual rate of change in TKV. Situations where this may be helpful include to determine if a patient is following the trajectory you predicted for them based on a previous risk assessment, or as a way to further refine prognostication for a patient determined to be in an intermediate category with other risk prediction tools.
- If repeat imaging is requested, there should be an interval of at least one year between scans as there needs to be adequate time for an observable difference to occur.
- Repeat assessment of TKV is not recommended to monitor response to treatment(s) as growth trajectories in ADPKD are not linear and it is unclear how to compare growth rates before and after treatment.

