

Imaging Protocols for Measurement of Total Kidney Volume (TKV) in Autosomal Dominant Polycystic Kidney Disease (ADPKD)



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These protocols are for use when imaging has been requested for the sole purpose of measuring TKV in ADPKD. **The images may not be sufficient for other diagnostic purposes so should not be used in other settings.**

These protocols have been evaluated for TKV measurement in ADPKD and the parameters listed below are the ones used in that study (1)

UBC Ultra-Low-Dose CT protocol for TKV measurement

- Tube Current 20-30 mA (adjusted based on noise index)*.
- Tube voltage: 120kVp
- Use of iterative reconstruction to help limit noise is suggested but not mandatory if unavailable.
- This protocol was constructed with use of Auto-mA 3D (GE Healthcare), a vendor-specific tube current modulation software which sets the noise properties (noise index) as a linear function. Using this, the ultra-low-dose protocol was created by setting noise index (NI) to more than double that of the department standard CT abdomen (80 compared to 31).
- If not using an Auto-mA function setting mA at 25 will provide reasonable images for most patients
- Scans in the initial study (1) were reconstructed with department standard reconstruction algorithm (60%FBP and 40% ASIR blend). It is felt that more advanced iterative reconstruction algorithms will be at least equivalent if not better for renal volume assessment.
- If a prior CT or MRI was performed this can be used to limit z-axis coverage to further reduce radiation dose. It is suggested if a prior is not available that coverage similar to a CT KUB be employed as large kidneys in the context of ADPKD can extend into the pelvis.

Limited MR sequence for TKV measurement

- Study MRIs were performed without contrast agent enhancement by using a 1.5-T imager (GE Healthcare, Milwaukee, Wis). No antispasmodic medication was administered.
- Suggest performing axial, sagittal and coronal two-dimensional steady-state free precession gradient sequences (FIESTA).
- Imaging parameters utilized in our studies were as follows: 4-mm section thickness; reconstructed every 4 mm; repetition time 6-7 msec/echo time 2.2-2.3msec; field of view, 36 cm; and 256 × 256 matrix.

1. Bevilacqua MU, Hague CJ, Romann A, Sheitt H, Vasilescu DM, Yi TW, et al. CT of Kidney Volume in Autosomal Dominant Polycystic Kidney Disease: Accuracy, Reproducibility, and Radiation Dose. *Radiology*. 2019 Apr 9;181830.