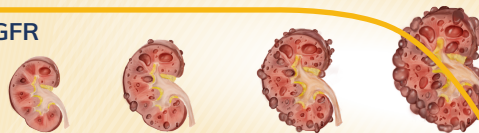


Why TKV Is Important

The decline in estimated glomerular filtration rate (eGFR) is usually preceded by an increase in kidney volume.³

eGFR



Cyst Development & Enlargement¹

A Methods That Estimate TKV^{2,3}

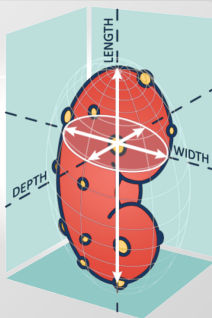
Ellipsoid Formula^{2,3}

Length (L) = Average of maximal coronal and sagittal length

Width (W) = Maximal axial width

Depth (D) = Maximal axial depth

Measured in millimeters (mm)



Left Kidney

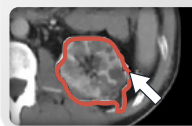
$$\frac{\pi}{6} \times (L \times W \times D)$$

Right Kidney

$$\frac{\pi}{6} \times (L \times W \times D)$$

$$= \text{TKV (mL)}$$

Manual Segmentation³



Stereology & Mid-Section Technique³



Semiautomated & Fully Automated³



B Calculate Height-Adjusted TKV (htTKV)

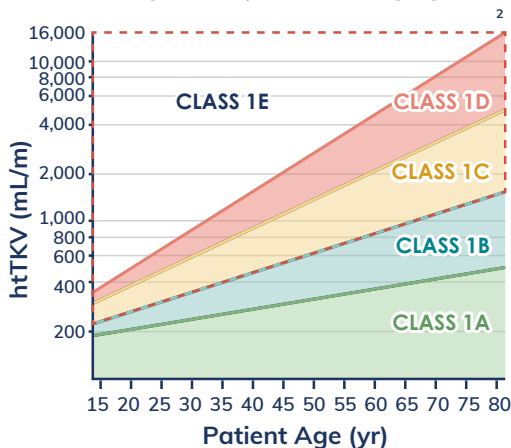
TKV (mL)

height (m)

$$= \text{htTKV (mL/m)}$$

C Determine ADPKD Imaging Classification

HtTKV can be used to determine a patient's risk of future kidney failure using the Mayo Clinic Imaging Classification (MCIC) system.



Class	Expected Annual Growth In htTKV	Estimated Slope Of Change In eGFR*	Rate Of Disease Progression
1E	>6.0%	~4.78	Rapid
1D	4.5%–6.0%	~3.48	Rapid
1C	3.0%–4.5%	~2.63	Rapid
1B	1.5%–3.0%	~1.33	Intermediate
1A	<1.5%	~0.23	Slow

*eGFR units = ml/min/1.73m²/yr

Patients with ADPKD and MCIC 1C, 1D, 1E are considered **high risk** for rapid progression to kidney failure.

How To Report^{2,3}

1

Exclude Mimics

2

Confirm Diagnosis

3

Classify

- Class I: Typical (can be classified based on Mayo classification)
- Class II: Atypical

4

Size Assessment

- Kidney size or volume
- Calculate htTKV
- Determine Mayo Classification

5

Report

- Complications
- Extrarenal findings

**When asked for a Total Kidney Volume or TKV:
Report either maximal bilateral kidney dimensions or a calculated volume.**

References:

1. Grantham JJ et al. (2011). Nat Rev Nephrol. 7(10):556-566.
2. Odedra, D. et al. Autosomal Dominant Polycystic Kidney Disease: Role of Imaging in Diagnosis and Management. Radiographics. 2023;43(1):e220126
3. Magistroni R, et al. (2018) Am J of Nephrology. 48:67-78.
4. Republished with permission of the American Society of Nephrology, Irazabal et al. (2015) J AM Soc Nephrol. 26:160-172.

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