

eGFR – Early detection of Chronic Kidney Disease (CKD) (TRT-5018)

Definition of Chronic Kidney Disease - CKD

Glomerular filtration rate (GFR) less than 60mL/min/1.73m² that is present for 3 or more months with or without evidence of kidney damage **OR** Evidence of kidney damage (with or without decreased GFR) that is present for >3 months as evidenced by any of the following:

- microalbuminuria or proteinuria
- glomerular haematuria
- pathologic abnormalities (e.g. abnormal renal biopsy)
- anatomical abnormalities (e.g. scarring seen on imaging or polycystic kidneys) [1]

Risk factors for CKD

Modifiable risk factors	<ul style="list-style-type: none"> • Smoking • Obesity • Diabetes • Hypertension
Non-modifiable risk factors	<ul style="list-style-type: none"> • Age over 50 years • Family history of kidney disease • Aboriginal or Torres Strait Islander heritage

Screening for kidney disease

Who is at higher risk of kidney disease?	What should be done?	How often?
Increased risk <ul style="list-style-type: none"> • age > 50 years • smoking 	BP, urine dipstick	Every 12 months
High risk Over 50 years of age with one of the following risk factors: <ul style="list-style-type: none"> • hypertension • family history of kidney disease 	BP, urine dipstick, and GFR	Every 12 months
Very high risk	BP, urine dipstick and GFR	Every 12 months

<ul style="list-style-type: none"> • diabetes • Aboriginal or Torres Strait Islander > 35 years of age • multiple risk factors • evidence of kidney disease 	(microalbuminuria for diabetics)	
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Estimated Glomerular Filtration Rate (eGFR)

<ul style="list-style-type: none"> • GFR is the best measure of kidney function • GFR can be estimated (eGFR) from serum creatinine using prediction equations • eGFR recommended to be automatically reported (using Modification of Diet in Renal Disease (MDRD) equation) with every request for serum creatinine in adults • See calculator at http://www.kidney.org.au
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Limitations of eGFR

Clinical situations where eGFR results may be unreliable and/or misleading:

- Acute changes in kidney function (e.g. acute kidney failure)
- Dialysis-dependent patients
- Exceptional dietary intake (e.g. vegetarian diet, high protein diet, recent consumption of cooked meat, creatine supplements)
- Extremes of body size
- Diseases of skeletal muscle, paraplegia, amputees (may underestimate) or those with high muscle mass (may overestimate)
- Children under the age of 18 years
- Severe liver disease present

Use of eGFR in different ethnic populations:

- The original MDRD formula contains a factor to be applied to African-American subjects raising the possibility that other variations in the formula may be required for optimal performance in different racial groups
- Pending publication of validation studies it is recommended Australasian laboratories continue to automatically report eGFR in Aboriginal and Torres Strait Islander peoples and other ethnic groups.

eGFR and drug dosing:

- Where an eGFR (using MDRD) is on hand it is clinically appropriate to use this to assist drug dosing decision making

- For critical dose drugs, particularly in the hospital setting, it remains important to adhere to the published recommendations
- Published recommendations usually involve the use of Cockcroft-Gault equation to estimate eGFR, or to measure creatinine clearance in order to amend dosing for renal function.

eGFR Action Plan

eGFR mL/min/1.73m ²	Description	Clinical Action Plan
≥ 90	No kidney damage OR Stage 1 CKD - kidney damage* with normal kidney function	Further investigation for CKD may be indicated in those at increased risk**: <ul style="list-style-type: none"> • assessment of proteinuria • urinalysis • blood pressure
60 - 89	Stage 2 CKD - kidney damage* with mild ↓ kidney function	Cardiovascular risk reduction: <ul style="list-style-type: none"> • blood pressure • lipids • blood glucose • lifestyle modification (smoking, weight, physical activity, nutrition, alcohol)
30 - 59	Stage 3 CKD - moderate ↓ kidney function	As above, plus: <ul style="list-style-type: none"> • monitor eGFR 3 monthly • avoid nephrotoxic drugs • prescribe antiproteinuric drugs (ACE inhibitors and/or ARBs) if appropriate • address common complications • ensure drug dosages appropriate for level of kidney function <p>Consider indications for referral to nephrologist</p>

15 - 29	Stage 4 CKD - severe ↓ kidney function	As above + referral to nephrologist is usually indicated for physical and psychosocial preparation for renal replacement therapy (dialysis, pre-emptive transplantation, transplantation) or conservative medical management
< 15	Stage 5 CKD - end-stage kidney failure	As above + referral to nephrologist

* *imaging or biopsy abnormalities, or proteinuria/haematuria*

** *hypertension, diabetes, smoker, age > 50 yrs, obesity, family history of kidney disease, Aboriginal and Torres Strait Islander people*

Practice tip!

A clinically significant change in eGFR requires a difference of ≥15% from the previous reading, irrespective of the baseline level.

[1] K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification and stratification. Am J Kidney Dis 2002;39:S266.

[2] Mathew T, Johnson D. Measurement of kidney function. Medical Observer. 29 July 2005.

[3] Johnson, D. W. and Usherwood, T. Automated reporting of glomerular filtration rate: coming soon to a laboratory near you! Aust.Fam.Physician. 2005 (In press).