MALAYSIAN ASSOCIATION OF CLINICAL BIOCHEMISTS

CHRONIC KIDNEY DISEASE

RECOMENDATIONS FOR THE LABORATORY REPORTING OF eGFR AND URINE ALBUMIN

2024

Prepared By:

MACB CKD Task Force

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Foreword

The first Malaysian Association of Clinical Biochemists Chronic Kidney Disease (MACB CKD) Task Force recommendations on laboratory reporting of estimated glomerular filtration rate (eGFR) and urine albumin were uploaded onto the MACB website on 20 November 2019. The first version was based on the Kidney Disease Improving Global Outcomes (KDIGO) 2012 and National Institute for Health and Care Excellence (NICE) 2014 guidelines. KDIGO and NICE have since updated their guidelines. Based on KDIGO 2024 [1] and NICE 2021 [2] guidelines, the newly constituted MACB CKD Task Force has updated their recommendations on laboratory reporting of eGFR and urine albumin, as well as to include 5-year and 2-year predicted risk of progressing to end stage kidney disease (ESKD), calculated using the kidney failure risk equation (KFRE). KFRE-predicted risk will be included in blood reports when eGFR (Chronic Kidney Disease Epidemiology Collaboration, CKD-EPI) is less than 60 ml/min/1.73 m^2 and where urine albumin to creatinine ratio (uACR) is measured. This will not only help predict who will have a high risk of progression to ESKD, but also to help identify individuals who need referral to nephrologists to modify the progression of kidney disease.

My sincere thanks to all members of the MACB CKD Task Force for their invaluable contributions in the updating of the recommendations and to Associate Professor Pavai Sthaneshwar for presenting these updated recommendations at the 34th Malaysian Association of Clinical Biochemists Conference on 23 July 2024 for comments. It is our hope that all laboratories in Malaysia will adopt these updated recommendations.

Leslie Charles Lai Chin Loy
Chair, MACB CKD Task Force
1 August 2024

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Recommendations for laboratory reporting of estimated glomerular filtration rate (eGFR):

Pre-analytical

1. Separate serum/plasma from red blood cells by centrifugation within 12 hours of venepuncture.

Analytical

2. Enzymatic method for creatinine assay shall be used, where possible.
3. Creatinine measurement shall be traceable to isotope-dilution mass spectrometry.
4. The analytical imprecision of the creatinine assay shall be less than 2.3% with bias less than 3.7% compared with reference methodology (or appropriate international standard reference method group target in external quality assessment [EQA]).

Post-analytical

5. Serum creatinine concentration shall be rounded to the nearest whole number when expressed in µmol/L.
6. The Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) 2009 equation shall be used in the calculation of eGFR without using the race correction factor.
7. eGFR shall be rounded to the nearest whole number and reported using the units mL/min/1.73 m^2.
8. Clinical laboratories shall report eGFR as >90 mL/min/1.73 m^2 if it is more than 90 mL/min/1.73 m^2.
9. eGFR levels less than 60 mL/min/1.73 m^2 shall be flagged as being low.
10. eGFR must be interpreted with caution in people with extremes of muscle mass or certain illnesses (e.g., bodybuilders, people who have had amputations, muscle wasting disorders, acute myocardial infarction and acute kidney injury).
11. In people with eGFR less than 60 mL/min/1.73 m^2, the laboratory shall use 4-variable Kidney Failure Risk Equation (KFRE) (4 variables, i.e., age, sex, eGFR and of urine albumin to creatinine ratio (uACR)) to estimate the absolute risk of kidney failure and shall include
    a. A 5-year kidney failure risk (low risk <5% and high risk >15%)
       and
    b. A 2-year kidney failure risk (low risk <10% and high risk >20%)

Recommendations for laboratory reporting of urine albumin

Pre-analytical

1. The first void urine in the morning shall be used for the measurement of uACR.
2. Samples for urine albumin measurement shall not be stored frozen at -20^{o}C.
3. Samples for urine albumin measurement shall be analysed fresh or stored at 4^{o}C for up to 7 days.

Analytical

4. Urine reagent strips can only be used if they are capable of specifically measuring urine albumin at low concentrations and expressing the result as uACR.
5. Analytical CV of methods to measure urine albumin shall be less than 15%.

Post-analytical

6. For the initial detection of proteinuria:
    a. use uACR rather than urine protein to creatinine ratio (uPCR) because of the greater sensitivity for low levels of proteinuria.
    b. repeat uACR between 3 mg/mmol and 70 mg/mmol in a subsequent early morning sample to confirm the result.
    c. A repeat sample is not needed if the initial uACR is 70 mg/mmol or more.
7. For quantification and monitoring of large amounts of urine protein (more than 70 mg/mmol), uPCR may be used as an alternative.
8. If unexplained proteinuria is an incidental finding on a reagent strip, testing for CKD using eGFR and uACR is recommended.
9. uACR shall be reported to 1 decimal place whether in mg/mmol.

References

1. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney Int. 2024; 105(4S):S117-S314.
2. Chronic kidney disease: assessment and management. NICE guideline [NG203] Published: 25 August 2021 last updated: 24 November 2021. https://www.nice.org.uk/guidance/ng203

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