ONTARIO ASSOCIATION OF MEDICAL LABORATORIES

OAML Communiqué

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Routine Reporting of Estimated Glomerular Filtration Rate

Ontario's community laboratories will soon begin reporting an estimated glomerular filtration rate (eGFR) for all adult patients (19 and older) for whom a serum creatinine level is ordered. The eGFR is a calculated value, derived from the Modification of Diet in Renal Disease (MDRD) equation. Laboratories will also continue to report a serum creatinine level with reference ranges.

Ontario's community laboratories will work with the Canadian External Quality Assessment Laboratory (CEQAL) to report a standardized eGFR across all Ontario's community laboratories. This will minimize inter-laboratory variation in reported eGFR's. CEQAL will provide continuing proficiency assessment.

Background

One in five Canadian seniors now has kidney disease, according to the Kidney Foundation of Canada, and that number is growing by 10 percent per year.

Diabetes is the most common cause of kidney disease in Canada, but kidney disease is also associated with the metabolic syndrome, hypertension and cardiovascular disease. The Kidney Foundation of Canada reports that an estimated 1.9 million Canadians have some form of kidney disease but that most are unaware of it. Early diagnosis and treatment are key to managing kidney disease and to avoiding or, at least, delaying the need for interventions such as dialysis or kidney transplantation.

The eGFR provides practitioners with a measure of renal function that is more sensitive than serum creatinine and thus provides opportunity for earlier detection of kidney disease. Earlier detection permits earlier assessment and management of the disease.

Why report an eGFR?

- GFR is considered the best index of kidney function but direct measurement is difficult. Indirect estimation of the GFR by established calculation has been demonstrated to be an accurate and efficient replacement for direct measurement, in most situations.
- GFR and creatinine clearance are poorly inferred from serum creatinine alone.
- GFR is inversely and exponentially related to serum creatinine, age, gender and muscle mass.
- If a decreased GFR is reported, physicians must consider a diagnosis of chronic kidney disease (CKD).

About the MDRD Equation

- The MDRD equation is the most thoroughly validated equation for estimating GFR in individuals with kidney dysfunction.
- Nephrologists routinely use the MDRD equation for estimating GFR.
- The MDRD equation does not require weight as a variable.
- The MDRD equation requires the patient's age, gender and serum or plasma creatinine level.
- The result is normalized to an average adult surface area of $1.73 m^2$.
- The MDRD equation should be corrected for race; the eGFR is multiplied by 1.21 to correct for patients of African descent.
- The MDRD equation is not valid in pregnancy.
- An MDRD-calculated eGFR should not be used to adjust drug dosages.
- Further validation of the MDRD equation among other patient groups is underway.
- Patients with diets unusually low in protein or at the extremes of body size should be considered on an individual basis.

Interpretation of Results

The US National Kidney Foundation's (NKF) diagnostic criteria for stage 1 or 2 CKD are defined as an eGFR greater than 60 mL/min/1.73m^2 **and** evidence of kidney damage*. An eGFR < 60 mL/min/1.73m^2 is indicative of CKD even without other criteria and requires further investigation.

Repeat measurements may be helpful in avoiding misdiagnosis of patients with low but stable eGFR. A decrease of 20% in the eGFR should be reviewed for clinical significance.

Stages of Chronic Kidney Disease (National Kidney Foundation, US)

*Kidney damage is indicated by the presence of significant proteinuria or an elevated urine albumin-to-creatinine ratio.

NKF Stage	Description	eGFR (ml/min/1.73m^2)
1	Kidney damage with normal or elevated GFR	**≥90**
2	Kidney damage with mildly depressed GFR	**60 - 89**
3	Kidney damage with moderately depressed GFR	**30 - 59**
4	Severely depressed GFR	**15 - 29**
5	Kidney Failure	**< 15**

Reference Table for Population Average GFR's[1]

Age (Years)	Average eGFR (ml/min/1.73m^2)
20 - 29	**116**
30 - 39	**107**
40 - 49	**99**
50 - 59	**93**
60 - 69	**85**
70+	**75**

Specialist Referrals

Clinical circumstances and patient history should always be considered in addition to laboratory findings; however, it is recommended that referral to a renal specialist be considered when

- The reported/repeated eGFR is less than 30 mL/min/1.73m^2
- The reported/repeated eGFR has declined by 20% or more
- Significant proteinuria as evidenced by a urine albumin/creatinine ratio >60 is reported.

To Learn More

For additional resources and answers to Frequently Asked Questions: www.oaml.com/eGFR

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[1] Coresh, J. "Prevalence of chronic kidney disease and decreased kidney function in the adult US population: third National Health and Nutrition Examination Survey," *Am J Kidney Dis*. 2003; 41 (1-12).