

Evidence Summary for KidneyWise Clinical Algorithm

PURPOSE

The KidneyWise Clinical Algorithm was created as a resource for primary care providers to aid in the identification, detection, and management of chronic kidney disease (CKD). Note, the clinical algorithm may not apply in the following situations:

- Frail and elderly patients or those with a short life expectancy
- When clinical circumstances warrant investigation for suspected acute kidney injury (i.e. volume depletion, urinary obstruction, etc.)
- When an eGFR (estimated Glomerular Filtration Rate) is necessary in prescribing medications that require dose adjustment for reduced kidney function (e.g. new oral anticoagulants, certain antibiotics)

KEY ELEMENTS

IDENTIFY

Diabetes mellitus (DM) is the leading cause of CKD and end-stage renal disease (ESRD) in Canada. Hypertension (HTN) is an important risk factor for CKD and its progression, although it is uncommon as the sole cause if blood pressure is well controlled. Other risk factors listed for CKD are based on epidemiologic findings (e.g. age 60–75 with cardiovascular disease). First Nations, Inuit and Métis patients are at particularly high risk of developing ESRD, although this risk is primarily mediated through an increased risk for DM and HTN.

DETECT

Most relevant guidelines, including Kidney Disease Improving Global Outcomes (KDIGO)¹, recommend testing with both an eGFR and a urine ACR (Albumin to Creatinine Ratio), as both measures are independent risk factors for progression to ESRD. An eGFR with a value < 60^a should be repeated if < 60^a, as many patients will have a value above on repeat testing. Consider the possibility of a reversible cause for a low eGFR, including dehydration (i.e. recent gastrointestinal illness or excess diuretic use), or the concomitant use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs). The diagnosis of CKD requires evidence of chronicity (i.e. at least 3 months with an eGFR < 60^a). The urine ACR should be repeated if abnormal; confirmation requires at least 2 of 3 values to be elevated.

Patients with an eGFR ≥ 60^a and an ACR < 3^b can be re-screened at an interval commensurate with the underlying risk factor. Re-testing annually in patients with DM is reasonable. Patients with HTN may require less frequent testing, depending on patient age, the presence of other co-morbidities, and the degree of blood pressure control. It is important to note that a substantial proportion of otherwise healthy elderly individuals will have an eGFR < 60^a due to normal aging (40% of women > 75 years of age and 30% of men > 80 years of age).

MANAGE

Review of the KDIGO Clinical Practice Guideline for Lipid Management in CKD², Canadian Hypertension Education Program (CHEP)³, and Canadian Diabetes Association (CDA)⁴ clinical practice guidelines is recommended for detailed advice regarding hyperlipidemia, hypertension, and glycemic control, respectively.

ACE inhibitors (ACEI) or angiotensin receptor blockers (ARB), but not both, are recommended as outlined for most CKD patients who also have albuminuria; for normotensive patients with diabetes with an elevated ACR (> 3^b), an ACEI or ARB can be considered although careful monitoring for signs or symptoms of hypotension is advised. Most patients with DM and an elevated ACR will have hypertension in the absence of any anti-hypertensive therapy. For patients without diabetes with a blood pressure > 140/90 and an ACR > 30^b, an ACEI or ARB should be used as first-line therapy. CKD patients who require statin therapy should be treated regardless of baseline lipid status and do not routinely require follow-up measurement of lipid levels. Patients with a non-renal indication for one of these agents (i.e. heart failure) should be treated accordingly.

It is recommended that a serum potassium and creatinine be repeated approximately 2 weeks after any initiation or dose increase of an ACEI or ARB to monitor for the development of hyperkalemia and/or a substantial decrease in eGFR. An increase in serum creatinine of up to 30% after initiation of

an ACEI or ARB is not associated with an increased risk of worsening long-term kidney function. Larger increases may suggest excessive diuretic use and/or underlying renovascular disease.

Note, given the high risk of influenza-related complications among CKD patients, primary care providers should recommend they receive the seasonal influenza vaccine on an annual basis⁵.

SICK DAY MEDICATION LIST

If patients with CKD are unable to maintain adequate fluid intake during an illness, it is recommended that potentially nephrotoxic or renally excreted drugs should be withheld until the patient has recovered. As outlined in the CDA guidelines, this can be recalled by referring to the acronym **SADMAN** (Sulfonylureas, ACEI, Diuretics, Metformin, ARB, NSAIDs).

Adapted from: Change in appropriate referrals to nephrologists after the introduction of automatic reporting of the estimated glomerular filtration rate. Akbari A, Grimshaw J, Stacey D, et al. CMAJ 2012. DOI: 10.1503/cmaj.110678

^a units for eGFR are ml/min/1.73m²

^b units for ACR are mg/mmol

¹ Kidney Disease Improving Global Outcomes CKD Guidelines 2012. <http://kdigo.org/home/guidelines/ckd-evaluation-management/>

² Kidney Disease Improving Global Outcomes Clinical Practice Guideline for Lipid Management in CKD 2013. <http://kdigo.org/home/guidelines/lipids/>

³ Canadian Hypertension Education Program Guidelines 2014. <http://www.hypertension.ca/en/chep>

⁴ Canadian Diabetes Association Clinical Practice Guidelines 2013. <http://guidelines.diabetes.ca/Browse.aspx>

⁵ Public Health Agency of Canada 2013. <http://www.phac-aspc.gc.ca/index-eng.php>