Online clinical pathway for chronic kidney disease (CKD) in primary care

September 10\textsuperscript{th}, 2016
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University of Calgary
Presenter Disclosure

• Presenter’s Name: Maoliosa Donald

• I have no current or past relationships with commercial entities

• Speaking Fees for current program:
  I have received no speaker’s fee for this learning activity
Commercial Support Disclosure

This program has received no financial or in-kind support from any commercial or other organization.
Personal Disclosure....

- Not a pharmacist
- Related to a retired pharmacist

So why am I here???
Outline

• Background
• Diagnosis, medical management and referral
• Experience the online CKD clinical pathway
• Preliminary evaluation of uptake
Background

The majority of patients with CKD in Alberta are cared for by primary care providers:

Background
But . . .

“Nearly two-third (62%) of publications cited to support primary care recommendations were of uncertain relevance to **patients in primary care.**”

National Institute for Health and Care Excellence (NICE) Guidelines
Background

Why a clinical pathway?

• Coordination & continuity of care enhanced
• Increase clinic efficiency
• Improve patient safety
• Increase team function
Components of the clinical pathway

• Diagnosis of CKD (who and how to test)

• Management of patients with CKD

• Referral
Background

- Practical
- Integrate into clinical care
- Feasible
- Pathway Characteristics
- Target primary care setting
- Harmonize with other Canadian CPGs
- Enhance patient care
Background

Worked closely with our pharmacy colleagues

Craig

Carlee
Background

The role of pharmacists in screening and prevention

It is estimated that approximately 89% of all deaths in Canada are caused by chronic diseases, including diabetes, heart disease and cancer. This number is expected to climb, necessitating a national strategy for prevention and intervention. As accessible, frontline health care providers, pharmacists are in an excellent position in which to optimize patient health through screening and prevention. This issue of the Translator brings to light the impact of pharmacists on detection and prevention of disease, as well as adverse health outcomes:

- A comparison between pharmacists’ ideal contribution and their actual level of involvement in health promotion and disease prevention
- Contributions of community pharmacists to coronary heart disease screening services
- Identification of previously undiagnosed cases of knee osteoarthritis by community pharmacists
- The role of clinical pharmacists in monitoring for significant drug-drug interactions in medical intensive care settings

The Translator is an initiative by the Canadian Pharmacists Association to support the knowledge translation between pharmacy practice research and health policy. Each issue selects a number of pharmacy practice research articles, briefly summarizes them and discusses the health care policy implications. These articles are submitted by researchers who have a strong desire to support evidence-based health care policy and best practices.
Who to test?

**Targeted for individuals** of increased risk of CKD:

- Hypertension
- Diabetes Mellitus
- Family hx of Stage 5 CKD or hereditary kidney dz
- Vascular disease (CVD, stroke/TIA or PVD)
- Multisystem disease with potential kidney involvement (SLE)
Recommended tests

• eGFR (estimate glomerular filtration rate)

• Urine:
  ✓ Random Urine ACR (albumin:creatinine ratio)
  ✓ Urinalysis for hematuria

[Chemistry (Urine) form]

[CLINICAL DATA]

Random urine ACR
How to test?

• Repeat eGFR, random urine ACR (albumin:creatinine ratio) and urinalysis if not tested in the prior 6 months

• A new finding of reduced eGFR may be due to reversible causes (e.g. acute kidney injury, or initiation of ACEi/ARB therapy)

• If previous finding of abnormal eGFR and ACR in the past 6 months, you do not have re-test
How frequent to test?

- eGFR (estimate glomerular filtration rate)
- Random Urine ACR (albumin:creatinine ratio)
- Urinalysis for hematuria

- **Every year** for hypertension and diabetes
- Every 2 years for all others
How to diagnose CKD?

Either of the following present for >3 months:

- **Markers of kidney damage:**
  
  Albuminuria (ACR ≥3 mg/mmol)

  OR

- **Decreased eGFR:**
  
  eGFR <60 mL/min/1.73 m²
### What eGFR constitutes a diagnosis of CKD?

<table>
<thead>
<tr>
<th>eGFR category</th>
<th>eGFR (mL/min/1.73 m²)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>&gt;90</td>
<td>Normal or high</td>
</tr>
<tr>
<td>G2</td>
<td>60-89</td>
<td>Mildly decreased</td>
</tr>
<tr>
<td>G3a</td>
<td>45–59</td>
<td>Mildly to moderately decreased (CKD)</td>
</tr>
<tr>
<td>G3b</td>
<td>30–44</td>
<td>Moderately to severely decreased (CKD)</td>
</tr>
<tr>
<td>G4</td>
<td>15–29</td>
<td>Severely decreased (CKD)</td>
</tr>
<tr>
<td>G5</td>
<td>&lt;15</td>
<td>Kidney failure (CKD)</td>
</tr>
</tbody>
</table>
How is ACR categorized?

<table>
<thead>
<tr>
<th>Category</th>
<th>ACR (Approximate equivalent) (mg/mmol)</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>&lt;3</td>
<td>Normal to mildly increased</td>
</tr>
<tr>
<td>A2</td>
<td>3-30</td>
<td>Moderately increased</td>
</tr>
<tr>
<td>A3</td>
<td>&gt;30</td>
<td>Severely increased</td>
</tr>
</tbody>
</table>

Abbreviations: ACR, albumin:creatinine ratio

* Note that where albuminuria measurement is not available, urine reagent strip results can be substituted
Where can I find more detailed information?

Evidence based recommendations from:

- Kidney Disease Improving Global Outcomes (KDIGO)
- Canadian Cardiovascular Society (CCS)
- Canadian Diabetes Association (CDA)
- Canadian Hypertension Education Program (CHEP)
- Canadian Society of Nephrology (CSN)
Case: Helen
68 year old retired teacher

PMHX:
- Type 2 DM
- Hypertension
- Anxiety
- OA
- Dyslipidemia

Medications:
- HCTZ 12.5 mg od
- Amlodipine 5 mg od
- Metformin 500 mg TID

BP: 149/84 mmHG
Diagnosis

About Who & How to Test

Who to Test
Testing for CKD should not be universal, but should be targeted for individuals at increased risk of developing CKD:

- Hypertension
- Diabetes Mellitus
- Family history of Stage 5 CKD or hereditary kidney disease
- Vascular disease (prior diagnosis of CVD, stroke/TIA or PVD)
- Multisystem disease with potential kidney involvement (e.g. SLE)

How to Test
For accurate diagnosis, retest eGFR. random urine ACR (albumin:creatinine ratio) and Urinalysis if not tested in the prior 6 months.

In patients with a new finding of reduced eGFR, repeat eGFR to exclude causes of acute deterioration of eGFR (e.g. acute kidney injury, or initiation of ACEI or ARB therapy).

In patients with a previous finding of an abnormal eGFR and ACR in the past 6 months, you do not have to re-test.

Recommended Tests
- eGFR (estimate glomerular filtration rate)
- Random Urine ACR (albumin:creatinine ratio)
- Urinalysis for hematuria
Diagnose

Lab prompt & hyperlink

<table>
<thead>
<tr>
<th>GLUCOSE</th>
<th>GLUCOSE, RANDOM</th>
<th>6.8 mmol/L</th>
<th>3.0-11.0</th>
</tr>
</thead>
</table>

eGFR <60 mL/min/1.73m² or urine Albumin/creatinine ratio >=3.00 mg/mmol for more than 3 months suggests chronic kidney disease. For more information on diagnosis, managements and referral see [www.diagnoseckd.ca](http://www.diagnoseckd.ca)

<table>
<thead>
<tr>
<th>ESTIMATED GFR</th>
<th>ESTIMATED GFR</th>
<th>33 mL/min/1.73m²</th>
<th>L &gt;=60</th>
</tr>
</thead>
</table>

eGFR <60 mL/min/1.73m² or urine Albumin/creatinine ratio >=3.00 mg/mmol for more than 3 months suggests chronic kidney disease. For more information on diagnosis, managements and referral see [www.diagnoseckd.ca](http://www.diagnoseckd.ca)
Case: Helen
68 year old retired teacher

Labs:
• eGFR = 42 ml/min/1.73m²
• ACR = 38 mg/mmol
The Chronic Kidney Disease (CKD) Clinical Pathway is a resource for primary care providers to aid in the diagnosis, medical management, and referral of adults with CKD.

Diagnose CKD
Enter the most recent lab values:

- **eGFR**: eGFR 30 - 60 mL/min/1.73m²
- **ACR**: ACR 3-60 mg/mmol
- **Hematuria**: Negative

**Your patient has CKD**

The following is recommended:

**Medical Management**

- Investigations for causes of CKD
Medical Management

Sodium Foods

Many foods contain sodium (salt). Ask your dietitian how you can limit foods high in sodium.

Choose

These foods are low in sodium.

- Hot cereal with no added salt
- Cold cereal
- Rice
- Bread
- Pasta
- Homemade muffins without salt
- Fresh meat, poultry, or fish
- Canned tuna or salmon, rinsed
- Hard cheese (cheddar, mozzarella, marble, Swiss)
- Crackers, unsalted
- Homemade soups, unsalted
- Fresh fruit
- Pasta sauce, canned tomatoes, and tomato juice with no added salt
- Fresh, frozen or canned vegetables with no added salt
- Herbs and spices
- Vinegar
- Lemon, lime
- Homemade gravies and sauces, unsalted
- Popcorn, unsalted

Limit

These foods have some sodium. Limit them to the amounts listed below.

- Salad dressings
  (1 Tbsp/15 mL per day)
- Condiments (ketchup, mustard, relish)
  (1 Tbsp/15 mL per day)
Living with Kidney Disease: What You Can Do to Manage Your Condition

Tips for Managing your Kidney Disease

1. Choose and prepare foods with less salt
   - To help control your blood pressure—aim for less than 2,000mg of sodium/day (equals 1 level teaspoon of salt)
   - Buy fresh, unprocessed food.
   - Do not add salt to your food at the table.
   - Do not use salt substitutes when cooking.
   - Use spices and herbs in place of salt.
   - Choose fresh and frozen food over canned food.
   - Rinse canned foods before eating them.

2. Choose foods that are healthy for your heart
   - To help keep fat from building up in your blood vessels.
   - Grill, broil, bake, roast or stir-fry foods instead of frying.
   - Trim fat from meat and remove skin from poultry before eating.

3. Be physically active
   - To improve blood pressure, blood sugar and blood cholesterol.
   - Make exercise a regular part of your life.
   - Aim for 30 minutes of activity 5 times per week.

4. Maintain a healthy weight
   - To protect your kidneys.
   - Being overweight makes your kidneys work harder.
   - Losing weight helps kidneys last longer.
   - Maintain a healthy weight (Body Mass Index (BMI) between 18.5 to 25).

5. Quit smoking—cigarette smoking can make kidney damage worse.

6. If you have diabetes, control your blood glucose levels (HbA1C below 7%). Good blood glucose control may help prevent or delay diabetes complications and kidney disease.

For more information, visit the Kidney Foundation of Canada website.

Your Next Appointment is:

Date: __________
Time: __________
Location: __________
Other Notes/Goals: __________

Sept 15, 2018
Case: Helen
68 year old retired teacher

• PMHX:
  • Type 2 DM
  • Hypertension
  • Anxiety
  • OA
  • Dyslipidemia

• Meds:
  • HCTZ 12.5 mg od
  • Amlodipine 5 mg od
  • Metformin 500 mg TID

• BP: 149/84 mmHG
Medical Management

Prescribing Information

- Diabetes: Prescribe an ACEI or ARB unless contraindicated.
- No Diabetes: Prescribe an ACEI or ARB if ACR > 30 mg/mmol and no contraindications.

Dosage

- Titrate to maximum tolerated dose.

Contraindications

- Pregnancy
- Women with childbearing potential should only use an ACEI or ARB if there is reliable contraception.

General Information

- Check potassium and eGFR within 2 weeks of starting or dose changes.
- Combined therapy of ACEI and ARB not recommended.
- ACEI or ARBs can cause a reversible reduction in eGFR when treatment is initiated (approximately 25%):
  - If the reduction in eGFR exceeds 25% below the baseline value, stop ACEI or ARB.
  - If the reduction in eGFR is 5 to 25%, re-check in 2-3 weeks to exclude further deterioration.
- Increases in serum potassium of up to 0.5mmol/L can be expected with ACEI or ARB use.
- ACEI or ARBs can safely be prescribed at all stages of CKD and should not be deliberately avoided with reduced eGFR.
- Assess for baseline cough, if bothersome cough with ACEI consider switching to ARB.
- Check the potassium and eGFR in times of acute illness, particularly influenza and diarrheal illness.

Other Considerations

- Management of elevated serum potassium (PDFs)
- Potassium Food Handout (PDF)
- Drugs that may raise potassium (PDF)

Common drugs that may have nephrotoxic effects

Common drugs that may require renal dose adjustments

Sick day Medication List
### Medical Management

#### ACEI/ARB

<table>
<thead>
<tr>
<th>Drug Type</th>
<th>ACEI/ARB</th>
<th>Statins</th>
<th>Antiplatelet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribing Information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>No Diabetes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prescribe statin unless contraindicated.</td>
<td>Age ≥ 50: Prescribe statin unless contraindicated.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 18 – 49: Prescribe statin if no contraindications and if any one of the following:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Known coronary disease (myocardial infarction or coronary revascularization).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Prior ischemic stroke.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Estimated 10-year incidence of coronary death or non-fatal MI &gt;1%. (Calculate your Patient’s Framingham Risk Score)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Dosage

<table>
<thead>
<tr>
<th>Statin</th>
<th>eGFR &lt; 60 mL/min/1.73m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lovastatin</td>
<td>Not studied</td>
</tr>
<tr>
<td>Fluvastatin</td>
<td>80 mg</td>
</tr>
<tr>
<td>Atorvastatin</td>
<td>20 mg</td>
</tr>
<tr>
<td>Rosuvastatin</td>
<td>10 mg</td>
</tr>
<tr>
<td>Simvastatin/ezetimibe</td>
<td>20 mg/10 mg</td>
</tr>
<tr>
<td>Pravastatin</td>
<td>40 mg</td>
</tr>
<tr>
<td>Simvastatin</td>
<td>40 mg</td>
</tr>
</tbody>
</table>

Recommended doses (mg/d) of statins in adults with CKD

- Active liver disease, high alcohol consumption or pregnancy.
- Women with childbearing potential should only use statin if there is reliable contraception.
## Medical Management

### Drug Therapy

<table>
<thead>
<tr>
<th>Prescribing Information</th>
<th>Diabetes</th>
<th>No Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dosage</strong></td>
<td>Low dose ASA (81mg) may be used for secondary prevention in patients with established vascular disease:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Acute coronary syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Prior MI or coronary revascularization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Prior stroke or TIA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- PVD (high risk patients with low bleeding risk).</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>History of ASA induced GI bleed.</td>
<td></td>
</tr>
<tr>
<td><strong>General Information</strong></td>
<td>Low dose ASA for secondary prevention only.</td>
<td></td>
</tr>
</tbody>
</table>

### Other Considerations

- Management of elevated serum potassium (PDFs)
- Potassium Food Handout (PDF)
- Drugs that may raise potassium (PDF)
- Common drugs that may have nephrotoxic effects
- Common drugs that may require renal dose adjustments
- Sick day Medication List
# Medical Management

## Anti-diabetic drugs

<table>
<thead>
<tr>
<th>eGFR (mL/min/1.73m²)</th>
<th>Safe</th>
<th>Caution</th>
<th>Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 60</td>
<td>All agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30–59</td>
<td>acarbose, linagliptin, gliclazide, glimepiride, repaglinide, thiazolidinediones</td>
<td>metformin, saxagliptin (2.5 mg), sitagliptin (50 mg), exenatide, liraglutide, glyburide</td>
<td>liraglutide (eGRF &lt; 50)</td>
</tr>
<tr>
<td>15–29</td>
<td>linagliptin, repaglinide</td>
<td>saxagliptin (2.5 mg), sitagliptin (25 mg), gliclazide, glimepiride, thiazolidinediones</td>
<td>metformin, exenatide, liraglutide, glyburide, acarbose</td>
</tr>
<tr>
<td>&lt; 15</td>
<td>repaglinide</td>
<td>linagliptin, sitagliptin (25 mg), thiazolidinediones</td>
<td>saxagliptin, gliclazide</td>
</tr>
</tbody>
</table>
### Anti-diabetic drugs

#### Biguanide

Use with caution in patients with eGFR < 60 mL/min/1.73m²

Avoid in patients with eGFR < 30 mL/min/1.73m²
- Metformin may be used in certain circumstances if eGFR is 20–29 mL/min/1.73m², but requires very close monitoring of serum bicarbonate levels to detect acidosis

When deciding which agent to add to metformin, consideration should be given to a number of factors including effectiveness in blood glucose lowering, degree of hyperglycemia, kidney function, and risk of hypoglycemia.

<table>
<thead>
<tr>
<th>Normal dose range</th>
<th>eGFR (mL/min/1.73m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 50</td>
</tr>
<tr>
<td>Metformin</td>
<td>500–1000 mg PO BID-TID (max 2500 mg/day)</td>
</tr>
</tbody>
</table>
Case: Helen
68 year old retired teacher

- Ramipril 5 mg daily started
- Potassium increase from 4.9 mmol/L to 5.2 mmol/L
Medical Management

Management of Elevated Serum Potassium

Potassium 
5.5 – 6.2 mmol/L

Acute management
- Stop ACEi, ARB or other drugs that may raise potassium
- Low potassium diet (patient handout)
- Consider renin (500g) and lasix (30cc) 1 – 2 doses

Re-check potassium in 1-2 weeks

Potential
If potassium normalizes, consider restarting ACEi, ARB or other drugs at reduced dose

Potassium Foods
Ask your dietician how many servings of potassium foods you should have from each group.

Low potassium foods
Serving sizes are ½ cup or 1 medium unless another amount is listed.

Apple
Apricots (2 raw, 1 canned)
Berries (strawberries, blueberries, blackberries, raspberries)
Cherries (10)
Grapes (20)
Lemon, lime
Mango (%)
Mandarin orange, tangerine
Peach
Pear
Pineapple
Plum
Pomegranate (% raw, ½ cup or 60 ml juice)
Prunes (3 dried or canned)
Watermelon
Beans (green, yellow)
Broccoli
Cabbage
Carrot
Cauliflower
Celery
Corn
Cucumber
Eggplant
Garlic
Leeks
Lettuce
Mushrooms (3 raw or cooked, ½ cup canned)
Onion
Peas
Peppers
Potato (peeled, cut into small pieces, then boiled)
Tomato (½ raw, 2 Tbsp ketchup, ½ cup/60 mL sauce)
Turnip
Zucchini
Case: Helen – 1 year later
69 year old retired teacher

Labs:

- eGFR = 46 ml/min/1.73m²
- ACR = 70 mg/mmol
The Chronic Kidney Disease (CKD) Clinical Pathway is a resource for primary care providers to aid in the diagnosis, management, and referral of adults with CKD.

Learn more: CKD, The Pathway, Who and How to Test

Diagnose CKD
Enter the most recent lab values:

- eGFR 30-60 mL/min/1.73m²
- ACR ≥60 mg/mmol
- Hematuria: Negative

Your patient has CKD
Date: September 25, 2014 12:14

The following is recommended:
- Medical Management
- Referral to a nephrologist
- Investigations for causes of CKD
# Referral

## Routine Referral

Recommended for any one of the following:
- $\text{eGFR} < 30 \text{ mL/min/1.73m}^2$, irrespective of albuminuria or hematuria.
- Persistent albuminuria ($\text{ACR} > 60 \text{ mg/mmol}$), irrespective of hematuria.
- Hematuria sustained and not readily explained by a urinary tract source with:
  - Persistent albuminuria ($\text{ACR} = 3 - 60 \text{ mg/mmol}$) irrespective of eGFR
  - or -
  - $\text{eGFR} < 60 \text{ mL/min/1.73m}^2$
- An unexplained, progressive decline in eGFR that occurs over 6 months, confirmed in 2 weeks (ACEI or ARBs can cause a reversible reduction in eGFR when initiated).

## Urgent Referral

Recommended for any one of the following:
- Rapid decline in eGFR over days to weeks.
- eGFR declining over weeks to months PLUS hematuria and/or albuminuria.
- $\text{eGFR} < 15 \text{ mL/min/1.73m}^2$
- Acute nephrotic syndrome ($\text{ACR} > 180 \text{ mg/mmol}$ or proteinuria $> 3g/d$)
- Suspected vasculitis / autoimmune disease in the setting of hematuria and/or albuminuria.

## Emergent Referral

Recommended for any one of the following:
- New diagnosis of $\text{eGFR} < 10 \text{ mL/min/1.73m}^2$
- Life threatening uremic symptoms (marked hyperkalemia $> 6.5$)

If you are concerned about a patient that does not fall within these categories contact the nephrology group in your area.

[Referral Form (PDF)](http://departmentofmedicine.com/mas/documents/mas_form_interactive.pdf)

Specific tests / investigations required with referral:
- Recent serum creatinine / eGFR (including multiple)
- Recent random urine albumin/creatinine ratio (ACR) for known diabetic patients or those patients with $\text{eGFR} < 60 \text{ mL/min/1.73m}^2$.  

[Download specific test info (PDF)](http://departmentofmedicine.com/mas/documents/mas_form_interactive.pdf)
Referral

Specific tests / investigations required to enable triage:

- Recent serum creatinine / eGFR (including multiple measurements over previous years)
- Recent routine urinalysis
- Recent random urine albumin/creatinine ratio (ACR) (for known diabetic patients or those patients with eGFR < 60 mL/min/1.73m²)
Referral

Elements of a good referral:

☐ Clinical question (what do you want)
☐ Past medical history
☐ Medication list
☐ **Serial** creatinine measurements
☐ Urinalysis
☐ Quantification of albuminuria
☐ Ultrasound only if clinically indicated
The Chronic Kidney Disease (CKD) Clinical Pathway is a resource for primary care providers to aid in the diagnosis, management, and referral of adults with CKD.

**Diagnose CKD**
Enter the most recent lab values:

- **eGFR**: eGFR 30 - 60 mL/min/1.73m²
- **ACR**: ACR ≥60 mg/mmol
- **Hematuria**: Negative

**Your patient has CKD**

The following is recommended:

- **Medical Management**
- Referral to a nephrologist

Investigations for causes of CKD
Case: Mark
48 year old mechanic

• PMHX:
  • Hypertension
  • OA

• Meds:
  • HCTZ 12.5 mg od
  • Ibuprofen

• BP – 125/80 mmHG

• eGFR 45
• ACR 2 mg/mmol
Medical Management

Framingham Calculator

- Gender: Male
- Age: 55-59
- Diabetes: Yes
- Smoker: Yes
- HDL-C (mmol/L): 0.9-1.19
- Total Cholesterol (mmol/L): 4.1-5.2
- Systolic BP (mmHg): 120-129

Is blood pressure being treated with medications? Yes

10-year CVD Risk Score = 15.9%
LDLc monitoring is not recommended:

• The "treat-to-target" strategy has not been proven beneficial in any clinical trials.

• Escalation of statin dose based on lipid levels is not recommended because the safety of high dose statins is unknown in CKD patients and they are at higher risk of adverse effects.

• Association between LDLc and clinical outcomes is weaker in CKD patients so does not reliably predict prognosis.

• Use "treat-and-forget" strategy with statin doses known to be safe in CKD population.

If patient develops symptoms suggestive of myopathy.
Case: Mark
48 year old mechanic

Meds:
- HCTZ 12.5 mg od
- Ibuprofen

BP – 125/80 mmHG
eGFR 45
ACR 2 mg/mmol

NSAIDs and COX-2 inhibitors

Nephrotoxic Effects
- Altered intraglomerular hemodynamics resulting in acute kidney injury (AKI)
- Acute or chronic interstitial nephritis
- Glomerulonephritis

Management
- Avoid in patients with eGFR less than 30 mL/min/1.73m²
- Avoid long term use
- Use alternative agents that are less likely to cause nephrotoxicity such as acetaminophen or certain opioids
3 Key Messages
1. Who should be tested?

- Hypertension
- Diabetes Mellitus
- Family history Stage 5 CKD or hereditary kidney diagnosis
- Vascular disease (CVD, stroke/TIA or PVD)
- Multisystem disease with potential kidney involvement (SLE)
2. What tests should be ordered?

- eGFR to assess kidney function
- Random urine ACR to assess for significant persistent albuminuria
- Urinalysis to assess hematuria
3. What do you do with the results?

Go to www.ckdpathway.ca to determine medical management and referral.
Other resources

W21C Patient Safety Podcast

Chandra Thomas
Clinical Assistant Professor of Medicine Nephrology

Episode 45
Medication Safety in Chronic Kidney Disease

Craig Curtis
Clinical Pharmacist Alberta Health Services Nephrology

Episode 46
Safe Drug Therapy in Chronic Kidney Disease

www.patientsafetypodcast.com
Acknowledgements

• Primary care physicians, nurses, pharmacists, nephrologists and dieticians

• Financial support from:
  • CIHR
  • AI-HS
  • Northern and Southern Alberta Renal Programs
Questions

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www.ckdpathway.ca