Translating CKD Research into Practice
Agenda

- Review guidelines and evidence for CKD identification and management
- Discuss how “TPF-TRIP” can be applied to improve adherence to these guidelines
- Explore potential research questions related to managing CKD in primary care
Chronic Kidney Disease (CKD)

- Affects 13% of the US adult population
- 60% treated only in the primary care office
- Early detection and management may prevent kidney failure and reduce risks for cardiovascular disease
- Management in primary care is suboptimal
2012 KDIGO Guideline for the Evaluation and Management of CKD

- Update to 2002 NKF KDOQI Guidelines
- Emphasis on early identification
- Classification by cause, eGFR and albuminuria
- BP goal based on level of albuminuria
- Use of ACEI/ARB for albuminuria
- Statins for most CKD patients
Individuals with CKD should be viewed as one of the highest risk groups for cardiovascular disease.

- In pts with CKD, CVD is more frequent and severe and often not recognized.
- Even early CKD is a risk factor for cardiovascular disease mortality.
- In pts with known CAD, concomitant CKD portends a worse prognosis.
- Pts with CKD have doubled risk of heart failure, stroke, peripheral artery disease, coronary heart disease and atrial fibrillation.
- Increased risk in CKD is independent of HTN and DM.
PPRNet CKD Research 2011-2012

- Developed primary care clinical quality measures (CQMs)
- Developed EHR-based clinical decision support tools (CDS)
2012-2014: Pilot test of CDS in 11 PPRNet practices

2016-2018: RCT of practice-based improvement model in 21 PPRNet practices

Identified “best practices” for CKD management in primary care
What do we mean by improving CKD care?

1. Identifying and staging
2. Monitoring
3. Treating

http://kdigo.org/home/guidelines/
Identifying and Staging CKD
Which patients should be screened for CKD?

- Diabetes Mellitus
- Hypertension
- Heart disease
- Family history of kidney failure
Screening for CKD: eGFR

- Use eGFR equation rather than serum creatinine
- CKD-EPI is preferred equation
- eGFR < 60 is considered abnormal
- Confirm abnormality > 3 months before making diagnosis
Screening for CKD: Albumin to Creatinine Ratio

- Urine albumin to creatinine ratio (ACR) is preferred test (early morning sample is preferred)
- ACR ≥ 30 mg/g is abnormal
- Confirm random sample with a subsequent early morning sample
Monitoring CKD
Monitoring eGFR

- Assess eGFR at least annually
- 2-4 X a year in pts at risk for progression or with more severe CKD
Monitoring Urine Albumin

- Assess urine albumin at least annually and more frequently with more severe CKD.
- Important to continue to monitor albumin in pts on ACEI/ARBs.
Independent association between kidney function/albuminuria and CVD mortality

Monitoring for Anemia

Measure hgb:

- At least annually in pts with CKD 3(B) and worse
- Diagnose anemia when Hb < 13 in males or <12 in females
- Evaluate anemia further (retic count, ferritin, transferrin sat, B12, folate)
Managing CKD
Use of ACEI/ARB

- ACEI/ARBs reduce urine albumin levels
- ACEI/ARBs may help reduce progression of CKD and possibly CVD
Use of ACEI/ARB

Indicated for pts with CKD with or w/o DM if:

- ACR >300 (stronger evidence)
- ACR 30-300 (weaker evidence)
Goal < 140/90 mmHg
CKD with ACR ≤300

Goal < 130/80 mmHg
CKD with ACR >300

- Albuminuria is a major risk factor for CVD and CKD progression.
- BP < 130/80 may reduce CKD progression in pts with urine albumin >300.
Association Between More Intensive vs Less Intensive Blood Pressure Lowering and Risk of Mortality in Chronic Kidney Disease Stages 3 to 5
A Systematic Review and Meta-analysis

Rakesh Malhotra, MD, MPH; Hoang Anh Nguyen, MD, MPH; Oscar Benavente, MD, PhD, et al.

Author Affiliations

- Meta-analysis of 18 RCTs
- Included 15924 pts with CKD 3-5
- Mean SBP 148->132 in intensive arm
- Mean SBP 148->140 in less intensive arm
- 14% lower risk of all-cause mortality in more intensive arm
Lipid Management

- Adults age ≥ 50 CKD (either eGFR <60 or albuminuria) not on HD, statin therapy recommended
- Adults 18-49, statin therapy recommended in pts with CAD, DM, h/o CVA, estimated 10 year incidence of CHD >10%
- Uncertain evidence RE statins for patients on HD
Risk of CHD, HF, Stroke in pts with CKD

Brief Report
March 2017

Absolute Rates of Heart Failure, Coronary Heart Disease, and Stroke in Chronic Kidney Disease
An Analysis of 3 Community-Based Cohort Studies

Nisha Bansal, MD, MAS1; Ronit Katz, DPhil1; Cassianne Robinson-Cohen, PhD1; et al

Pooled participants without CVD in 3 community-based cohort study
CKD (eGFR <60) associated with increased risk of CHD and stroke
Also associated with increased risk of HF comparable to risk for CHD
Higher risk in pts with ACR>30
Higher risk in African American and Hispanic patients
NSAIDs

- Can cause acute reduction in eGFR, sodium and water retention, HTN, hyperkalemia, and potentially contribute to progression of CKD
- Avoid if eGFR<30
- Prolonged therapy is not recommended if eGFR<60
- Avoid if on ACEI/ARB
Glycemic Control

- Tight glycemic control prevents albuminuria
- Target A1c ~7% to prevent microvascular complications of CKD unless risk of hypoglycemia
Applying TPF-TRIP to CKD Identification and Management
Applying TPF-TRIP model: EHR-Based Reminders

Use Health Maintenance or disease management templates/protocols to prompt for:

- Annual urine albumin to cr ratio screening in pts with HTN, DM
- Annual urine albumin to cr ratio in pts with CKD
- Annual Hemoglobin in patients with eGFR<45
- eGFR every 6 to 12 months in pts with CKD
Applying TPF-TRIP model: Standing Orders

Adopt protocol to empower clinical staff (i.e. nurses, lab tech) to draw/collect needed labs based on EHR prompts
## Clinigence QCDR Screening for CKD Measure

| 3.1 PPRNET32 | Screening for albuminuria in patients at risk for CKD (DM and/or HTN) | Adults with active Dx of Diabetes Mellitus and/or active Dx of Hypertension, excluding patients meeting criteria for CKD | Test for albuminuria or urine protein (spot albumin to creatinine, albumin specific dipstick, urine protein/creat ratio, 24 hr urine albumin, “microalbumin”) in past 12 months |

© The PPRNet Foundation | 2018 Inaugural Meeting
<table>
<thead>
<tr>
<th>3.2</th>
<th>Monitoring for albuminuria in patients with CKD</th>
<th>Adults meeting criteria for CKD, excluding pts with Stage A3 albuminuria</th>
<th>Lab test for urine albumin to creatinine ratio or urine protein to creatinine ratio (spot or 24 hours) in past 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4 PPRNET14</td>
<td>Chronic Kidney Disease (CKD): Hemoglobin Monitoring</td>
<td>Adults with Stage 3B-5 CKD (eGFR&lt;45)</td>
<td>Hemoglobin lab result recorded in past 12 months</td>
</tr>
</tbody>
</table>
Applying TPF-TRIP model: Registry-based Care Management

Use patient level report (individual CQM registry) to identify CKD patients:

- Not at BP goal
- Not on ACEI/ARB
- Not on statin
- On NSAIDS
- With elevated A1c
Applying TPF-TRIP model: 
Care Management Approaches

- Contact by phone/email/portal to arrange:
  - In face-encounter
  - Medication revisions (statin, ACE/ARB, other anti-hypertension)
  - Patient education
- Flag Chart to remind providers about care gap
| 3.7 | ACE Inhibitor or ARB Therapy in patients with HTN and Stage A2 or A3 Albuminuria | Adults with dx of HTN and meeting criteria for CKD with stage A2 or A3 albuminuria | Active Rx for ACEI or ARB |
Applying TPF-TRIP model: Engaging Patients

Focus less on kidney disease and more on “heart disease risk” and how it can be reduced.
How well are your kidneys working?

Explaining Your Kidney Test Results

What your kidneys do
You have two kidneys. Their main job is to filter wastes and extra water out of your blood to make urine.

How your kidneys are checked
Two tests are used to check for kidney disease.

- A blood test checks your GFR, which tells how well your kidneys are filtering.
- A urine test checks for albumin in your urine, a sign of kidney damage.

Why your kidneys are being checked
You need to have your kidneys checked because you can’t feel kidney disease. Kidney tests are very important for people who have diabetes, high blood pressure, or heart disease. These conditions can hurt your kidneys.

What happens if you have kidney disease
Kidney disease can be treated. The sooner you know you have kidney disease, the sooner you can get treatment to help delay or prevent kidney failure. Treating kidney disease may also help prevent heart disease.

Treatment goals are to:
- Keep your GFR from going down
- Lower your urine albumin

No matter what your results are:
- Keep your blood pressure, blood glucose, and blood cholesterol in your target range.
- Choose foods that are healthy for your heart and cut back on salt.
- Be more physically active.
- If you smoke, take steps to quit.
- Take medicines the way your provider tells you to.

Notes:

For more information, visit www.nkdep.info or call 1-866-4 KIDNEY (1-866-454-3639). The National Kidney Disease Education Program (NKDEP) is an initiative of the National Institutes of Health (NIH). NIH Publication No. 12-4210 * Revised February 2012
Sodium
Tips for People with Chronic Kidney Disease (CKD)

What Is Sodium?
Sodium is a part of salt. Sodium is found in many canned, packaged, and “fast” foods. It is also found in many condiments, seasonings, and meats.

Why Is Sodium Important for People with CKD?
Eating less sodium helps lower blood pressure and may slow down CKD. Try to keep your blood pressure below 140/90 mmHg.

One of the kidneys’ important jobs is to filter sodium out of the body and into the urine. Damaged kidneys cannot filter as well as healthy kidneys can. This can cause sodium to stay in your body and make your blood pressure go up.

How Much Sodium Should I Eat Every Day?
Most people need to eat less sodium than they are eating. Aim for less than 2,300 milligrams of sodium each day. Much of the sodium you eat does not come from a salt shaker. Sodium is added to the prepared foods you buy at the supermarket or at restaurants.

Foods Lower in Sodium
- Fresh or frozen fruits and vegetables
- Rice, noodles
- Cooked cereal without added salt
- Fresh meat, poultry, seafood
- Low-fat, low-sodium cheese
- Unsalted nuts
- Low- and reduced-sodium frozen dinners, peanut butter, salad dressings
- Air-popped popcorn

Foods Higher in Sodium
- Bacon, corned beef, ham, hot dogs, luncheon meat, sausage
- Bouillon, canned, and instant soups
- Boxed mixes, like hamburger meals and pancake mix
- Canned beans, chicken, fish, and meat
- Canned tomato products,including juice
- Canned and pickled vegetables, vegetable juice
- Cottage cheese
- Frozen meals
- Frozen vegetables with sauce
- Olives, pickles, relish
- Pretzels, chips, crackers, salted nuts
- Salt and salt seasonings, like garlic salt
- Seasoning mix and sauce packets
- Soy sauce
- Salad dressings, bottled sauces, marinades
- Some ready-to-eat cereals, baked goods, breads
- Ready-to-eat boxed meals and side dishes

How Do I Lower the Sodium in My Diet?
- Buy fresh foods more often.
- Cook foods from scratch, instead of eating prepared foods, “fast” foods, frozen dinners, and canned foods that are higher in sodium.
- Use spices, herbs, and sodium-free seasonings in place of salt. Check with your healthcare provider about using salt substitutes.
- Rinse canned vegetables, beans, meats, and fish with water to remove extra sodium.

Always read the Nutrition Facts label to compare foods. Choose foods with the lowest Percent Daily Value (%DV) for sodium. The %DV lets you see if a food is high or low in sodium. 5% or less is low and 20% or more is high.

- Check the label on fresh meats and poultry. Sodium additives can be used to make meat last longer.
- Look for foods labeled: sodium free, salt free, very low sodium, low sodium, reduced or less sodium, light in sodium, no salt added, unsalted, and lightly salted.

Check the Ingredient Label for Added Sodium
- Salt (sodium chloride)
- Monosodium glutamate or MSG
- Baking soda (sodium bicarbonate)
- Baking powder
- Sodium nitrate
- Sodium sulfate
- Sodium phosphate
- Sodium alginate
- Sodium benzoate
- Sodium hydroxide
- Sodium propionate

For more information, visit www.nkdep.nih.gov or call 1-866-4 KIDNEY (1-866-454-3639).

The National Kidney Disease Education Program (NKDEP) encourages people to get tested for kidney disease and educate those with kidney disease and their providers about treatments that can help delay or prevent kidney failure. NKDEP is a program of the National Institutes of Health.

NIH Publication No. 14-7607 • Revised June 2014
Applying TPF-TRIP model: Home BP Monitoring

- Literature suggests adherence with BP goals may improve when patients are able to check their BP at home
- Patients and providers both supportive of the flexibility
- Enables more frequent readings
- Reduces provider workload and
- Convenient for patients
- Enhanced doctor patient rapport
Potential Research Questions
Research Questions

- What is the best way to disseminate the CKD TRIP model?
- How do you engage larger primary care practices in CKD improvement projects?
- What are the most effective ways to discuss CKD with patients?
- Are certain patients on NSAIDS at higher risk for AKI than others? How do you identify them?
- How do you best employ home blood pressure monitoring in primary practice?
Other research questions?
Thank you