

# Chronic Kidney Disease and End-Stage Renal Disease: Prevention, Diagnosis, and Treatment

Edward Shahady, MD, FAAFP



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## Edward Shahady, MD, FAAFP

Medical Director, Diabetes Master Clinician Program; Clinical Professor, University of Miami, Florida; Clinical Professor, University of Florida, Gainesville.

Dr. Shahady is a graduate of the West Virginia University School of Medicine in Morgantown and board certified in Clinical Lipidology. As medical director of the Diabetes Master Clinician Program, he visits physicians' offices and teaches them how to use an Internet-based diabetes registry and conduct group visits. The program enables population-based achievement of quality goals for diabetes, lipids, and blood pressure. More than 500 physicians and 1,000 office staff use the program in seven other states. Dr. Shahady has contributed more than 190 scientific articles and five books to the medical literature in the areas of diabetes, lipidology, the metabolic syndrome, group medical visits, sports medicine, musculoskeletal medicine, behavioral science, physician retirement, patient centered medical home, participatory teams, and the contribution of family medicine to effective health systems. He serves on the editorial boards of Consultant, Consultant for Pediatricians, and the Journal of Clinical Lipidology. He created and manages three websites to help teach primary care physicians and their office staff, Diabetes Master Clinician Program, Diabetes University, and Family Medicine Teams.



## Learning Objectives

- Incorporate the major points of the National Kidney Foundation Quality Outcomes Initiative for chronic kidney disease (CKD) into practice.
- Accurately identify, screen, evaluate and classify patients who are at risk or have the diagnosis of CKD.
- Reduce the risk for progression of CKD to ESRD by applying appropriate, proven therapeutic interventions early in the disease process.
- Devise management strategies for anemia, bone disease, malnutrition, and electrolyte abnormalities in the later stages of CKD.



## Audience Engagement System

The image shows three sequential screenshots of a mobile application interface. Step 1 shows a home screen with various icons and a search bar. Step 2 shows a list of CME activities with details like title, date, and duration. Step 3 shows a detailed view of a specific activity, including a title, description, and a 'View Details' button. Red arrows indicate the flow from one step to the next.



## Agenda

- Prevalence of CKD
- Definition and Diagnosis of CKD
- Cardiovascular Disease in CKD
- Therapy to reduce CVD and progression in CKD
- Indications for referral to Nephrologist
- Cautions in Patients with CKD

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## “Chronic Kidney Disease can be as Lethal As Cancer of the Lung”

Katherine Tuttle MD. Chronic Kidney Disease and Diabetes / Risks of Kidney Disease / Future Therapies / Diagnosis, Presentation, and Prevention. Diabetes Insight Volume 05, Issue 20 October 7, 2014

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## CKD Prevalence

- CKD affects approximately 13.6% of all US adults,
- The prevalence increases with age; among adults aged 60 to 69 years, nearly 25% have either albuminuria or reduction in GFR,
- Among adults older than 70 years, nearly 50%
- Diabetes and Hypertension responsible for 75% of cases

Centers for Disease Control and Prevention. Chronic Kidney Disease Surveillance System—United States. website. <http://www.cdc.gov/ckd> Shahady E, Diabetes and Chronic Kidney Disease-Prevention, early recognition and treatment. Consultant 2014; 54(1):20-25

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## Polling Question

**Which of the following statements is true about Chronic Kidney Disease (CKD) and End Stage Renal Disease?**

- A. Most patients with CKD will die from a CV event before they reach end stage renal disease
- B. Less than 2% of patients with CKD go on to end stage renal disease
- C. Both A and B
- D. None of the above are true

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## CKD Epidemiology

- 20 million adults have CKD in the United States — 1 in 10 adults— >3X in African Americans—Most have Diabetes
- **Most patients with CKD will die of a CV event before they reach end stage renal disease (ESRD).**
- **Less than 2% progress to ESRD**
- Prevalence of Diabetic Kidney Disease is 35%: 17% with albuminuria, 10.8% with impaired Glomerular Filtration Rate <60, 6.9% with both albuminuria and impaired GFR.

Kidney statistics for the US accessed on line July 2016 at [http://kidney.nih.gov/kidneydiseases/pubs/kidstats/KU\\_Diseases\\_Stats\\_508.pdf](http://kidney.nih.gov/kidneydiseases/pubs/kidstats/KU_Diseases_Stats_508.pdf)  
de Boer IH et al. Temporal trends in the prevalence of diabetic kidney disease in the United States. JAMA. 2011;305:2532–2539.

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## Agenda

- Definition and Diagnosis of CKD

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## Polling Question

**Chronic Kidney Disease (CKD) is defined by which of the following?**

- A. GFR is <60 ml/min for at least 1 month
- B. GFR is <60 ml/min for at least 3 months
- C. Albuminuria-Spot urine albumin to creatinine ratio is >30 mg/g
- D. B and C
- E. A and C

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## Definitions of Acute and Chronic Kidney Disease

**Acute Kidney Disease defined as**

- Increase in creatinine by 50% within 7 days or
- Increase in creatinine by 0.3 mg/dl within 48 hrs or
- Urine output <0.5 ml/kg/hour for 6 hrs

**Chronic Kidney Disease defined as**

- eGFR ↓ to < 60 ml/min for 3 months and
- Markers of kidney damage like albuminuria-Albumin to Creatinine ratio >30 mg/g

eGFR=estimated Glomerular Filtration Rate--Normal =>60 ml/min

Levey AS. Glomerular Filtration Rate and Albuminuria for Detection and Staging of Acute and Chronic Kidney Disease in Adults. JAMA. 2015;313(8):837-846

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## What are the Stages of CKD?

Stage	Description	GFR (mL/min/1.73 m <sup>2</sup> )
1	Kidney Damage with Normal or ↑ ↓ GFR	≥90
2	Kidney Damage with Mild ↓ GFR	89-60
3 A	Mild to Moderate ↓ GFR	59-45
3 B	Moderate ↓ GFR	44-30
4	Severe ↓ GFR	29-15
5	Kidney Failure	<15 or dialysis

**Severity increases**

Renal Association web site Accessed on line July 2015  
http://www.renal.org/information-resources/the-uk-eckd-guide/ckd-stages#sthash.xqY2pVyN.dpbs.

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## Calculating estimated Glomerular Filtration Rate (eGFR)

- Serum Creatinine should not be used as a stand alone source of assessing kidney function
- Serum Creatinine used to calculate eGFR
- Not always sure which equation/formula your lab uses—MDRD, Cockcroft Gault or CKD-EPI

Levey AS. Glomerular Filtration Rate and Albuminuria for Detection and Staging of Acute and Chronic Kidney Disease in Adults. JAMA. 2015;313(8):837-846

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## CKD-EPI Equation More Accurate than MDRD for GFR at higher levels

- CKD-EPI reclassified 24% of patient from <60 to >60 GFR (older, women, less muscle mass)
- Available at no charge on App Store from National Kidney Foundation—smart phone search “GFR calculator”

Levey, et al. A New Equation to Estimate Glomerular Filtration Rate. Ann Intern Med. 2009;150:604-612.  
Matsushita K, et al. Comparison of risk prediction using the CKD-EPI equation and the MDRD study equation for estimated glomerular filtration rate. JAMA. 2012;307(18):1941-1951.

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 National Kidney Foundation™

**CKD-EPI Creatinine Equation**  
Preferred method

**MDRD Study Equation**

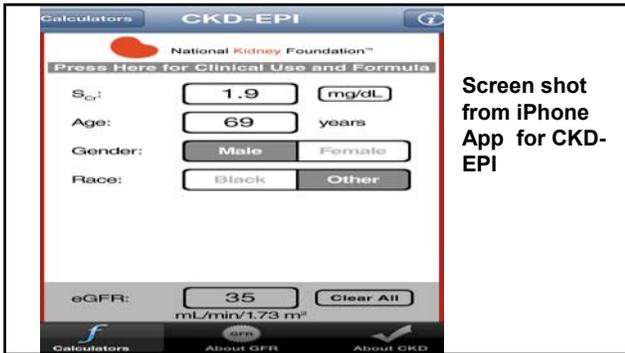
**CKD-EPI Cystatin and Creatinine 2012 Equation**

**Cockcroft-Gault Formula**

**Revised Bedside Schwartz Formula**  
For ages 1 - 17

Screen shot from iPhone App

Search iTunes for GFR calculator



### GFR values with same SCr--CKD-EPI

Age	Gender	African American	Creatinine	eGFR Stage
65	F	No	1.5	36 3B
65	M	No	1.5	48 3A
65	M	Yes	1.5	56 3A
50	F	No	1.5	40 3B
50	M	No	1.5	54 3A
50	M	Yes	1.5	62 2

### Cystatin C for eGFR

- It is generally not affected by extra renal factors such as muscle mass, age, gender, or race
- Cost about \$5
- Of significant value if eGFR 59-45 and many will be reclassified to > 60
- Allows for use of more drugs without limitations

*Einhorn D, Mende CW Endocr Pract 2015;21:1301-1302*

### Agenda

- Cardiovascular Disease in CKD

### Risk of CVD, Death and Hospitalization with CKD

Risk of CV events increases with increasing GFR

eGFR-STAGE	Risk of events per 100 person Years
>60 1-2	2.11
45-59 3A	3.65
30-44 3B	11.29
15-29 4	21.8
<15 5	36.6

Alan, et al. Chronic Kidney Disease and the Risks of Death, Cardiovascular Events, and Hospitalization. *N Engl J Med.* 2004;351:1296-1305.

### Hospitalization for Cardiovascular Disease increases risk for End Stage Renal Disease (ESRD)

- 1264 patients with chronic kidney disease stages 3 to 5 (glomerular filtration rate <60) followed for 2.5 years
- CV event (myocardial infarction, heart failure, or stroke) associated with a higher risk of subsequent ESRD (hazard ratio, 5.33)
- Intensive secondary preventative strategies may be of particular benefit in these patients because evidence-based therapies, such as statins and antiplatelet drugs, are generally underutilized in patients with CKD**

Sud M et al, Risk of End-Stage Renal Disease and Death After Cardiovascular Events in Chronic Kidney Disease. *Circulation.* 2014;130:458-465

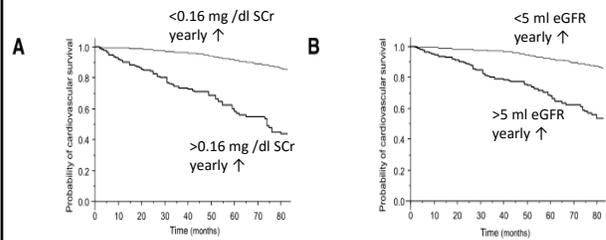
## Chronic Kidney Disease Prevalence in Acute Myocardial Infarction (MI)

- CKD (<60 mL·min) prevalence is **30.5% among patients presenting with ST-segment-elevation MI** and **42.9% among patients presenting with non-ST-segment-elevation MI**
- The presence of CKD among patients presenting with ACS **has been associated with worse outcomes**, including higher rates of mortality and bleeding.
- **Despite the increased risk for adverse outcomes, CKD patients presenting with ACS are less likely to receive evidence-based therapies,**

Washam JB et al. *Pharmacotherapy in Chronic Kidney Disease Patients Presenting With Acute Coronary Syndrome*. *Circulation*. 2015;131:000-000. DOI: 10.1161/CIR.000000000000183.

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## Annual change in Creatinine and GFR and CV events in Diabetes



Ragot S et al. *Dynamic Changes in Renal Function Are Associated With Major Cardiovascular Events in Patients With Type 2 Diabetes*. *Diabetes Care* 2016;39:1259-1266

## Risk for CVD, Morbidity and Progression to ESRD by GFR and Albuminuria

CKD Stages	GFR	Albumin to Creatinine Ratio Stages mg/g			Colors represent risk of progression, mortality and morbidity
		10-29	30-299	>300	
1	90+	Green	Yellow	Pink	Green Low Risk Yellow Moderate Risk Pink High Risk Red Very High Risk
2	89-60	Green	Yellow	Pink	
3 A	59-45	Yellow	Pink	Red	
3 B	44-30	Pink	Red	Red	
4	29-15	Red	Red	Red	
5	<15	Red	Red	Red	

Levey AS et al. *The definition, classification, and prognosis of chronic kidney disease: a KDIGO controversies conference report*. *Kidney Int* 2011; 80: 17-28;

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## Polling Question

Which of the following statements is correct about urinary albumin measurement?

- 24 hour urine measurement is the most reliable
- Lowest variability for Albumin to Creatinine ratio on a spot urine is specimens obtained late in the day
- Expressing albumin as a ratio to creatinine reduces intra-individual variability
- All of the above
- None of the above

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## Why Albumin to Creatinine Ratio (ACR) and not just Albumin ?

- Expressing albumin as a ratio to creatinine reduces intra-individual variability:
- Variability reduced from 80% to 52% when expressed as an ACR rather than an albumin concentration.
- Lowest variability for the ACR reported in Early Morning Urine
- Dipstick not as reliable—24 hour urine collection difficult to do so not as reliable

Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. *KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease*. *Kidney Int., Suppl.* 2013; 3: 1-150.

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## Agenda

- Therapy to prevent Cardiovascular Disease and progression of Chronic Kidney Disease

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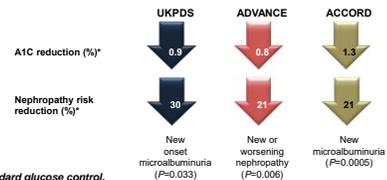
## Assessment and prevention

- Assessment of eGFR and albuminuria yearly
- Prevention of CVD and CKD progression
  - blood pressure <140/90 mm Hg or <130/80 if albuminuria
  - use of angiotensin-converting enzyme inhibitors or angiotensin receptor blockers for patients with albuminuria and or hypertension,
  - hemoglobin A1c <7% for patients with diabetes if possible .
  - LDL <100 mg/dl
  - Weight reduction
- Reduce risk of CKD progression by prevention of acute kidney injury, cardiovascular disease, anemia as well as mineral and bone disorder.

Kiefer MM, Ryan MJ, Primary Care of the Patient with Chronic Kidney Disease Med Clin N Am 2015;99:935–952

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## Reducing A1C Reduces Nephropathy Risk in Type 2 Diabetes

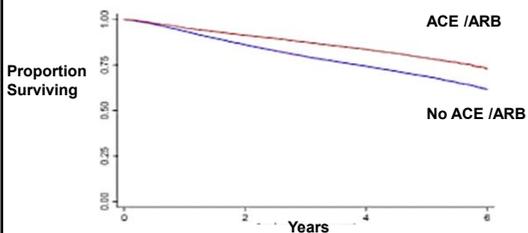


*\*Intensive vs standard glucose control.*

UK Prospective Diabetes Study (UKPDS) Group. *Lancet.* 1998;352:837-853. ADVANCE Collaborative Group. *N Engl J Med.* 2008;358:2560-2572. Ismail-Beigi F, et al. *Lancet.* 2010;376:419-430.

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## ACE and ARB use and Mortality in CKD



Molnar MZ *et al*, Angiotensin-Converting Enzyme Inhibitor, Angiotensin Receptor Blocker Use, and Mortality in Patients With Chronic Kidney Disease *J Am Coll Cardiol* 2014;63:650–658

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## Empagliflozin reduced progression of Kidney disease in T2 Diabetes

- Empagliflozin (Jardiance) reduced progression or onset of CKD in T2 Diabetes with eGFR  $\geq 30$  by **36%**
- Doubling of the serum creatinine level occurred 1.5% in the empagliflozin group and 2.6% in the placebo group, a relative risk reduction of 44%.
- Empagliflozin reduced ACR in patients with micro & macro albuminuria
- Is this a class effect for all SGLT 2 Inhibitors?

Wanner C *et al*, Empagliflozin and Progression of Kidney Disease in Type 2 Diabetes. June 14, 2016 DOI: 10.1056/NEJMoa1515920—Cherney *et al* The effect of sodium glucose cotransporter 2 inhibition with empagliflozin on microalbuminuria and macroalbuminuria in patients with type 2 diabetes *Diabetologia* 2016 Jun 17;[Epub Ahead of Print]

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## Polling Question

Which of the following statements is correct about use of diabetes drugs in CKD?

- Stop Metformin when GFR is less than 60
- The SGLT 2 inhibitor Canagliflozin (Invokana) can be used when GFR <45
- The DPP4 inhibitor Linagliptin (Trajenta) requires no dose adjustment in CKD
- None of the above
- All of the above

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## Use of diabetes drugs in CKD

Thiazolidinediones (pio, rosiglitazone)	No dose adjustment-but caution with edema
DPP4 Inhibitors	Reduce dosage for alogliptin, saxagliptin, and sitagliptin if GFR $\leq 50$ Linagliptin no dose adjustment
GLP 1 RA	Exenatide BID and weekly GFR 30-50 use with caution, Albiglutide, Liraglutide, Dulaglutide no dose adjustment
SGLT-2 inhibitors	Canagliflozin GFR 45-59 lower dose-Dapagliflozin avoid GFR <60—Empagliflozin avoid use GFR <45
Metformin	GFR < 45 lower dose <30 stop
Insulin	Lower dose with progressive decrease in GFR

Garber AJ, *et al*. *Endocr Pract.* 2015;21:438-447. Inzucchi SE, *et al*. *Diabetes Care.* 2015;38:140-149. Handelsman YH, *et al*. *Endocr Pract.* 2015;21(suppl 1):1-87. NKF. *Am J Kidney Dis.* 2012;60:850-886. www.fda.gov/Drugs/DrugSafety/ucm493244.htm

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## FDA changes Metformin Guidelines

- **Previous**—stop metformin in men creatinine >1.5 mg/dL and women >1.4 mg/dL. **But as of April 2016**
  - eGFR of >45 no change in dose
  - eGFR of 30-44 lower dose and closely follow eGFR
  - eGFR of <30 stop Metformin
- Discontinue metformin before iodinated contrast imaging procedure in patients with an eGFR between 30 and 60 mL-re-evaluate eGFR 48 hrs after procedure--

Accessed on line May 2016 at [www.fda.gov/Drugs/DrugSafety/ucm493244.htm](http://www.fda.gov/Drugs/DrugSafety/ucm493244.htm)

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## Hypoglycemia

- Risk of hypoglycemia increases as kidney function becomes impaired.
- Declining kidney function will necessitate changes to some diabetes medications
- **Target A1c usually <7 but if GFR <45, comorbidities, limited life expectancy, etc A1C closer to 8 recommended.**

NKF KDOQI. Diabetes and CKD: 2012 Update. Am J Kidney Dis. 2012;60:850-856.

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## CKD and Obesity

- [Morbidly obese individuals](#) who lost weight on a 12-week regimen of restricted calories paired with an exercise plan appeared to have significant [kidney function](#) improvement,
- The average weight of the participants in the study was 289 lbs at baseline (baseline body mass index 52.67 kg/m<sup>2</sup>) --- reduced to an average of 260 lbs at 12 weeks.
- **eGFR increased from about 47.41 mL/min to almost 55.17 mL/min. Independent of decrease in BP, A1C and Lipids**

American Association of Clinical Endocrinologists [Schwasinger-Schmidt T, et al. "A retrospective analysis of the impact of weight loss on renal function" AACE 2016; Abstract 701.](#)

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## Blood Pressure Control and CKD

- Control of BP more important than exactly which agents are used.
- With proteinuria: diuretic + ACEi or ARB.
- No proteinuria: no clear drug preference- ACEi or ARB ok to use.
- Target blood pressure in non-dialysis CKD:
  - ACR <30 mg/g: 140/90 mm Hg
  - ACR >30 mg/g: 130/80 mm Hg\*

Fujisaki K, et al. Impact of combined Losartan/hydrochlorothiazide on proteinuria in patients with CKD and hypertension. *Hypertens Res.* 2014;37:993-998.  
Kidney Disease: Improving Global Outcomes (KDIGO) Blood Pressure Work Group. *Kidney Int Suppl.* 2012;2:341-342.

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## National Kidney Foundation Management of Normotensive Patients with and without Albuminuria and Diabetes

- Recommend not using an ACE-I or an ARB for the primary prevention of CKD in normotensive normoalbuminuric patients with diabetes.
- Suggest using an ACE-I or an ARB in normotensive patients with diabetes and albuminuria levels >30 mg/g.
- Hypertension without Albuminuria use any agent to reduce B/P

National Kidney Foundation. KDOQI Clinical Practice Guideline for Diabetes and CKD: 2012 update. Am J Kidney Dis. 2012;60(5):850-886.

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## Dyslipidemia in CKD

- Large number of patients with CKD are affected by dyslipidemia
- This places them at risk for acute and chronic CVD, recurrent MI, stroke, and CHF
- Poor control of dyslipidemia may accelerate CKD progression
- Reducing LDL-C limits CV mortality, decreases cardio-metabolic risk and may slow the progression of CKD,

Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Inter., Suppl.* 2013; 3: 1-150.

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## Reduction of CVD in CKD with Statins

- The Study of Heart and Renal Protection (SHARP) the largest RCT in people with CKD to date. Results demonstrate that a lipid-lowering strategy which included fixed dose simvastatin and ezetimibe (20/10) resulted in a 17% reduction in atherosclerotic events
- The cohort enrolled included those with eGFR under 60-- age, greater than 40 years or age, including more than 9000 subjects. The lipid-lowering strategy was effective and safe.

Balgent, C et al. The effects of lowering LDL cholesterol with simvastatin plus ezetimibe in patients with chronic kidney disease (Study of Heart and Renal Protection): a randomized placebo-controlled trial *Lancet* 2011;377 (9784):2181 - 2192

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## Anemia in CKD

- Anemia affects 12% stage 3a CKD, and 50% of those stage 4 or 5 CKD
- Normocytic Normochromic--erythropoietin synthesis by the kidney as well as decreased RBC half-life. Coupled with iron deficiency anemia common.
- Cut points WHO <13 g/dL for men and <12 g/dL for women
- Treatment of anemia with erythropoietin analogues has become more judicious, initiated at lower Hb levels and with lower Hb targets because of the increased risk of CV events and failure to meaningfully improve quality of life--

Tilman B et al, Summary of the KDIGO guideline on anemia and comment: reading between the (guide)line(s) *Kidney International* 2012;82:952-960

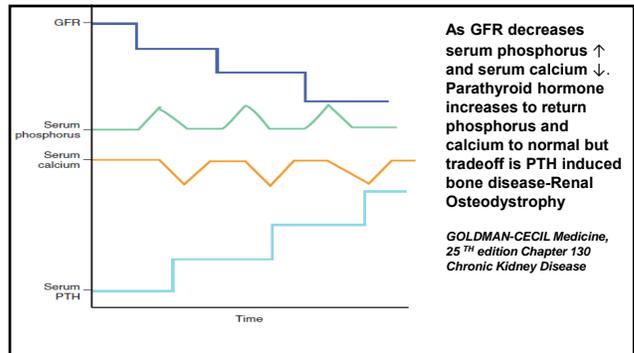
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## Mineral and Bone Disorders (MBD) in CKD

- Complications of CKD-MBD include renal osteodystrophy, tertiary hyperparathyroidism, vascular calcification
- Measuring serum levels of calcium, phosphate, PTH, at least once in adults with GFR <45 in order to determine baseline values--abnormal consider nephrology consult
- Bone mineral density testing misleading when eGFR <45
- Suggest Not prescribing bisphosphonate treatment in people with GFR <30 ---IV bisphosphonate nephrotoxic

Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Inter., Suppl.* 2013; 3: 1-150.

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## Agenda

- Indications for referral to Nephrologist

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## Indications for Referral to Nephrologist

- Referral to nephrology improves outcomes and reduces costs. Refer for any of below especially with more than one
- Acute kidney injury or abrupt sustained fall in GFR—5 ml/year
- Consider if GFR <45 and other morbidities -definite referral when GFR <30
- Persistent albuminuria (ACR >300 mg/g) at any stage
- Hypertension refractory to treatment with 4 or more antihypertensive agents
- Significant Anemia—↑Phosphorus ↓Calcium- ↑ PTH - ↑K

Kiefer MM, Ryan MJ, Primary Care of the Patient with Chronic Kidney Disease *Med Clin N Am* 2015;99:935-952

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## Agenda

- Cautions in Patients with CKD

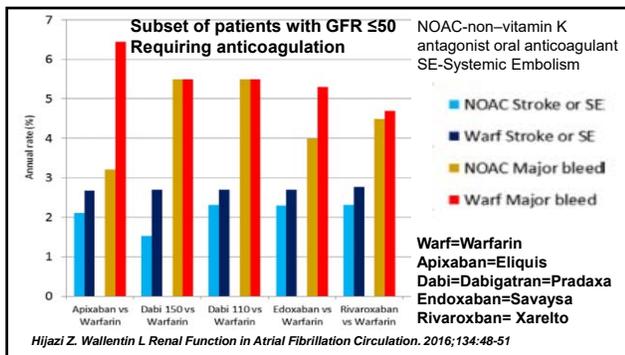
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## Analgesia and CKD

- NSAIDs Avoid when GFR <30 MI, Prolonged therapy is not recommended when GFR <60 mL
- Opioids Reduce dose of renal excreted agents (morphine, hydrocodone, codeine) when GFR <60

Vassalotti JA et al, Practical Approach to Detection and Management of Chronic Kidney Disease for the Primary Care Clinician American Journal of Medicine 2016 129, 153-162

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## Cautions with other Medications

- Aminoglycosides ↓dose when GFR <60
- Macrolides ↓ dose by 50% when GFR <30
- Fluoroquinolones ↓ dose by 50% when GFR <15
- Tetracycline ↓ dose when GFR <45
- Antifungals avoid amphotericin when GFR <60  
↓ maintenance dose of fluconazole by 50% when GFR <45

Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney Int., Suppl. 2013; 3: 1-150.

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## Cautions with other Medications

- **ACE and ARB**
  - GFR <45 lower dose
  - GFR <30 ↓ dose 50%
  - Assess GFR and Potassium 1 week after dose ↑
  - Suspend use before and after radiocontrast, colonoscopy, procedures, sepsis illness when GFR <60
- **Statins**—use lower dose—myopathy GFR <60
- **Proton Pump Inhibitors-like** Nexium, Protonix and Aciphex limit use and watch BUN and Creatinine -

Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease-may. Kidney Int., Suppl. 2013; 3: 1-150. Xie Y, Bowe B, Li T, et al

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## Using Radiocontrast Media for CKD

- For patients with GFR <60
  - Avoid of high osmolar agents
  - Use of lowest possible radiocontrast dose
  - Withdrawal of potentially nephrotoxic agents before and after the procedure-NSAIDs, Metformin, NSAIDs etc
  - Adequate hydration before, during, and after the procedure
  - Measurement of GFR 48-96 hours after the procedure

Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney Int., Suppl. 2013; 3: 1-150. Xie Y, Bowe B, Li T, et al Proton pump inhibitors and risk of incident and progression of chronic kidney disease and ESRD [published online April 14, 2016]. J Am Soc Nephrol. doi:10.1681/ASN.2015121377.

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## “Chronic Kidney Disease can be as Lethal As Cancer of the Lung”

Katherine Tuttle MD. Chronic Kidney Disease and Diabetes / Risks of Kidney Disease / Future Therapies / Diagnosis, Presentation, and Prevention. Diabetes Insight Volume 05, Issue 20 October 7, 2014

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## Practice Recommendations

- Be aggressive in diagnosing and managing CKD to decrease progression and complications (CKD)
- Measure GFR with CKD-EPI Equation—More Accurate than MDRD for GFR
- Blood pressure target 140/90 unless ACR is >30 then 130/80
- Increase use of Statins in CKD—and lower dose to ↓ myopathy
- Treat hyperglycemia to decrease progression of CKD but limit chance of hypoglycemia (insulin and sulfonylureas)
- Be alert for Acute Kidney Failure--
- Be cautious with drug dose, avoid some drugs and IV contrast materials as GFR decreases

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## Questions

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## Contact information

Edward Shahady MD  
[eshahady@att.net](mailto:eshahady@att.net)

Web Sites

[www.diabetesmasterclinician.org](http://www.diabetesmasterclinician.org)  
[www.diabetesuniversitydmc.com](http://www.diabetesuniversitydmc.com)  
[www.familymedicinetteams.org](http://www.familymedicinetteams.org)

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## Billing & Coding

When services performed in conjunction with:

Office Visit 992xx \*

Nutritional Therapy 97802-97804

\*Time-based selection documentation criteria:

- Face-to-face time
- greater than 50% spent counseling/coordinates care

Additional tests to confirm or monitor:

99490 Chronic Care Management-20 minutes monthly  
90951- End-stage renal disease related services for dialysis by age and  
90970 stage

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## Associated Session

- Chronic Kidney Disease and End-Stage Renal Disease: PBL

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Interested in More CME on this topic?  
**[aafp.org/fmx-internal](http://aafp.org/fmx-internal)**

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