Chronic Kidney Disease and End-Stage Renal Disease: PBL

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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.

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Learning Objectives

1. Practice applying new knowledge and competencies gained from chronic kidney disease and end-stage renal disease sessions, and receive feedback from expert faculty.
2. Interact collaboratively with peers to solve complex and challenging case-study scenarios.
3. Develop problem-solving skills that promote effective reasoning to manage chronic kidney disease and end-stage renal disease within the context of professional practice.

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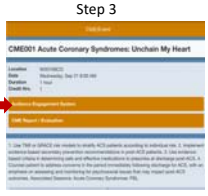
Audience Engagement System

Step 1

Step 2

Step 3



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Case History

- Jack a 52-year-white man is scheduled to see you for follow-up of an emergency department visit for chronic back pain.
- Further chart review reveals he has type 2 diabetes and takes metformin 2000 mg a day.
- BMI 32,and blood pressure is 145/87 today but was 155/90 in the ED.
- He takes no other prescribed medications. Family History of Father with Diabetes and MI at age 55

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Case History

- Laboratory results drawn at the emergency visit reveal a serum creatinine level of 1.8 mg/dL.
- Only other creatinine value in the records is 1.5 mg/dL 2 years ago.
- What additional lab tests would you obtain

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Results of Lab tests

- GFR 42—did you calculate it yourself? smart phone calculate GFR (52 yr old white male 1.8 Scr)
- ACR—Albumin to creatinine ratio spot urine is 45
- Total Cholesterol 220 LDL 150 Triglycerides 150 HDL 40
- HbA1C=8.6

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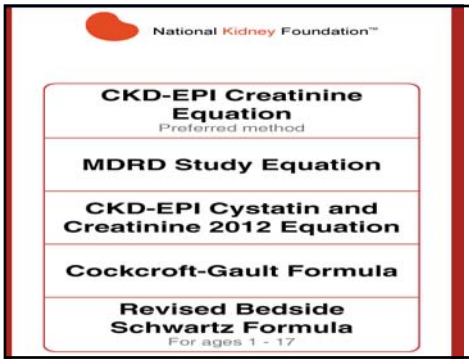
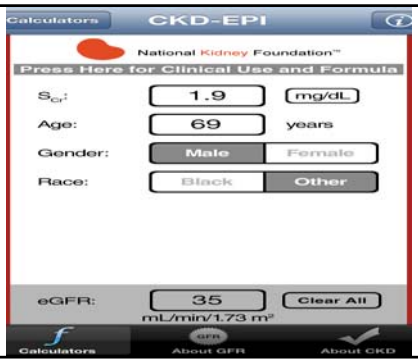


Screen shot from iPhone App

Search iTunes for GFR calculator



Screen shot from iPhone App for CKD-EPI

Treatment Discussion

- What medications might he be taking that are decreasing his GFR

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Treatment Discussion

- How would you treat his Hyperglycemia? Would you change the dose of Metformin

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 ≤50 Linagliptin no dose adjustment**
GLP 1 RA	**Exenatide BID and weekly GFR 30-50 use with caution, Albiglutide, Liragultide, Dulaglutide no dose adjustment**
SGLT-2 inhibitors	**Canaglifozin GFR 45-59 lower dose--Dapaglifozin avoid GFR <60--Empaglifozin 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

Treatment Discussion

- How would you treat his hypertension?
- Any cautions to use with your treatment of his hypertension?

Treatment Discussion

- How would you treat the lipids?
- Any concerns of safety with treatment?

Cautions with other Medications

- **ACE and ARB**
  - GFR <45 lower dose
  - GFR <30 ↓ dose 50%
  - Access 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 inter., Suppl. 2013; 3: 1–150. Xie Y, Bowe B, Li T, et al

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

		Albumin to Creatinine Ratio Stages mg/g		
CKD Stages	GFR	10-29	30-299	>300
1	90+			
2	89-60			
3 A	59-45			
3 B	44-30			
4	29-15			
5	<15			

Colors represent risk of progression, mortality and morbidity

Green Low Risk
Yellow Moderate Risk
Pink High Risk
Red Very High Risk

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

Questions

- Patient needs MRI with contrast—what precautions do you advise?
- Will have surgery—what are the precautions?
- Sometime later he develops pneumonia—what antibiotics would you use and not use.

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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 inter., Suppl. 2013; 3: 1–150.

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Tasks to Work on at Home

- Choose 10 patients with Diabetes and 10 with Hypertension and follow them for one year
- Calculate GFR from smart phone or computer by CKD-EPI formula on all 20 patients
- Decrease progression of CKD by keeping LDL <100, B/P < 140/90 and HbA1c <7
- Appropriately Adjust Medications in patients with CKD

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Questions

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Contact information

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Web Sites
www.diabetesmasterclinician.org
www.diabetesuniversitydmcp.com
www.familymedicineteams.org

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Associated Session

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

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