(PBL) Care of Diabetes Complications by Family Physicians

Edward Shahady, MD, FAAFP

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Edward Shahady, MD, FAAFP

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

Dr. Shahady is a graduate of the West Virginia University School of Medicine in Morgantown. 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 several 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, the patient-centered medical home (PCMH), participatory teams, and the contribution of family medicine to effective health systems. He serves on the editorial boards of *Consultant*, *Consultant for Pediatricians*, and *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 skills gained from Care of Diabetes Complications by Family Physicians sessions, through collaborative learning with peers and expert faculty.

2. Identify strategies that foster optimal management of diabetes complications, within the context of professional practice.

3. Formulate an action plan to implement practice changes, aimed at improving patient care.

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Associated Session

- Care of Diabetes Complications by Family Physicians

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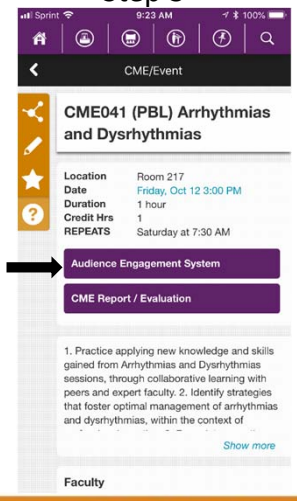
Audience Engagement System

Step 1

Step 2

Step 3



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History of Present Illness

- 55 year white male-Family HX positive for Diabetes
- HbA1c 6.2
- FBS 130
- 4 month history of being tired.
- BMI 35
- Notes increased appetite and increased urination
- Nothing significant with the physical exam

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Question

- What other lab tests would you obtain?

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Laboratory

- Triglycerides 180, HDL 39, LDL 129 Total Cholesterol 204, Non HDL 165
- GFR 80
- AM urine Albumin to Creatinine ratio <30 mg/g
- ALT AST Normal
- CBC and Metabolic Profile WNL

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Question

- How would you treat him?

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Follow up

- You encouraged lifestyle changes with a goal of 150 mins a week of exercise and a referral to a dietician.
- You decided to use metformin daily gradually increasing to 2000mg a day
- You also decided to prescribe atorvastatin 40 mg a day

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Metformin and Pre-diabetes

- The American Diabetes Association's 2017 guideline recommendations for metformin use in prediabetes have evolved
- Recommendations suggest lifestyle changes plus metformin in patients with prediabetes and additional risk factors (BMI ≥ 35 kg/m^2, age < 60 years, prior gestational diabetes mellitus) or rising hemoglobin A1c (HbA1c)
- Pre-diabetes (HbA1c 5.7-6.4%, fasting glucose 100-125 mg/dL, 2-h post-stimulated glucose 140-199 mg/dL)

American Diabetes Association Standards of Medical Care in Diabetes. Prevention or delay of type 2 diabetes. Diabetes Care 2017; 40 (Suppl. 1): S44-S47

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10 years later

- You have not seen since initial care—he moved out of town and recently returned.
- He now complains of night time leg pain in both legs, loss of balance and leg pain with exercise
- Has not been able to exercise and follow diet—he takes metformin 2000mg a day
- His Dr. stopped the atorvastatin
- Weight goes up and down-BMI 34
- B/P 143/88
- Labs HbA1c 8.3, Creatinine 1.7

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Further evaluation?

- What additional physical exam?
- What additional labs?

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Additional Information

- Exam reveals loss of ability to feel pressure from Mono filament being bent in both feet
- B12 levels normal,
- AST & ALT 4 X normal, GFR 41, Urine Alb/Crt ratio 65 mg/g
- ABI (Ankle Brachial Index)Normal,
- Cholesterol 200, LDL 111, HDL 33, Triglycerides 280, Non HDL cholesterol 167
- Blood Pressure 138/85 average of 3 measurements

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How would you Rx?

- Lipid abnormalities Cholesterol 200, LDL 111, HDL 33, Triglycerides 280, Non HDL cholesterol 167
- Blood Pressure 138/85 average of 3 measurements

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Rx

- Lipids—high dose statin atorvastatin 40 mg or Rosuvastatin 20 mg-will lower LDL, Trigs, Non HDL increase HDL
- B/P ACE or ARB with caution—measure GFR and Potassium one week later

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How would you Rx?

- Elevated A1C—8.3

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Rx

- Metformin reduced dose 1000 mg a day
- SGLT2-I not effective when GFR <45, GLP1 RA which one Liraglutide or Semiglutide.
- May need insulin but risk of hypoglycemia?

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How would you Evaluate and Rx?

- AST & ALT 4 X normal
- GFR 41, Urine Alb/Crt ratio 65 mg/g

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Key elements of Rx

- Lipids—high dose statin atorvastatin 40 mg or rosuvastatin 20 mg-will lower LDL, Trigs, Non HDL increase HDL
- B/P ACE or ARB with caution—measure GFR and K one week later
- Metformin reduced dose 1000 mg a day
- SGLT2-I not effective when GFR <45, GLP1 RA which one liraglutide or semiglutide.
- Life style, wt loss, Exercises and stretching for leg strength

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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 ≤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	**None GFR <45, 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. ww.fda.gov/Drugs/DrugSafety/ucm493244.htm

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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, any 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

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Distal Symmetric Polyneuropathy-(DSPN)

- Occurs in 20% type 1 diabetes-20 years of disease duration.
- DSPN present in at least 10%–15% of newly diagnosed type 2 diabetes , rates increasing to 50% after 10 years duration
- Most common neuropathy--75% of diabetic neuropathy
- Signs-- loss of sensory, proprioception, temperature and pain discrimination, **bilateral**
- Leads to unsteadiness, risk of falls

Pop-Busui R et al, Diabetic Neuropathy: A Position Statement by the American Diabetes Association Diabetes Care 2017;40:136–154

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Treatment DSPN

- Stretching-and resistance exercises decrease risk of falls (motion is lotion) (tight muscle is a weak muscle)
- The most effective drugs for treating diabetic peripheral neuropathy (DPN) are **duloxetine (Cymbalta), venlafaxine (Effexor), pregabalin (Lyrica),** oxcarbazapine (Trileptal), tricyclic antidepressants (eg, amitriptyline (Elavil), and atypical opioids (eg, tapentadol (Nucynta)
- Results are disappointing—some relief but not consistent and chance of addition with opioids is high

Waldfogel JM et al. Pharmacotherapy for diabetic peripheral neuropathy pain and quality of life: A systematic review. Neurology. 2017 Mar 24 [Epub ahead of print]. doi: 10.1212/WNL.0000000000003882. PMID: 28341643

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Questions

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Contact Information

Edward Shahady MD

eshahady@att.net

www.diabetesmasterclinician.org

www.diabetesuniversitydmcp.com

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