

Diabetes Complications Guideline Based Screening, Management, and Referral

Eric L. Johnson, M.D.

Associate Professor

Department of Family and Community Medicine

Assistant Medical Director

Altru Diabetes Center

Objectives

- Review Diabetes Complications (and co-existing conditions)
- Discuss, understand, and implement screening for Diabetes Complications
- Learn guideline based treatment strategies for treatment and referral for Diabetes Complications

Diabetes Complications

Macrovascular Complications

- Cardiovascular disease
 - Coronary Heart disease (CHD)
 - Stroke
 - Peripheral arterial disease (PAD)/amputation

Diabetes Complications

Microvascular Complications

- Eye disease (retinopathy)
- Kidney disease (nephropathy)
- Nerve disease (neuropathy)

Diabetes Complications

Other complications

- Liver disease (NAFLD, NASH)
- All cause mortality risk

Blood Pressure and Lipids

Cardiovascular Disease

Cardiovascular Disease

- Risk:
 - Stroke 2 to 4 times higher
 - Heart Disease 2 to 4 times higher
- ~75% of diabetes patients have high blood pressure (hypertension)
- ~75% of people with diabetes have a dyslipidemia (cholesterol disease)

Cardiovascular Disease

- Heart disease and stroke ~65% of diabetes deaths
- **Routine screening of asymptomatic not recommended**
- Treat risk factors (lipids, BP, smoking, etc)

Diabetes Care January 2012; 35 (Supplement 1)

Blood Pressure

- Done at every visit (x2?)
- Target is $<140/<90$
- Consider lower targets, but $<130/<70$ may not be beneficial in this population

American Diabetes Association. *Diabetes Care*. 2016;39(suppl 1)

Common Anti-Hypertensives

- ACEI: Lisinopril (Prinivil), Ramipril (Altace), others
- ARB: Valsartan (Diovan), Losartan (Cozaar), others
- Beta-Blockers: atenolol, metoprolol (Toprol), carvedilol (Coreg-mixed function), others

Common Anti-Hypertensives

- Calcium Channel Blockers- Amlodipine (Norvasc), Verapamil (Covera, Verelan), Diltiazem (Cardizem), others
- Diuretics- Hydrochlorothiazide, others

Hypertension Treatment

- ACEI, ARB, thiazide diuretic, dihydropyridine calcium channel blockers (i.e., nifedipine, amlodipine) are all choices for initial therapy (all shown to reduce CVD in DM)
- ACEI and ARB medications are initial drugs of choice for HTN in DM if albuminuria or proteinuria
- NOTE: this is a guideline change
- Be sure to check potassium levels, serum creatinine, and eGFR

Hypertension Treatment

- Lowering blood pressure reduces CVD and kidney disease
- Caveat: worsening renal function on ACEI or ARB warrants imaging of kidneys/renal arteries or nephrology referral
- If on more than one anti-hypertensive, consider giving one at bedtime

Lipids (Cholesterol)

- Increased cardiovascular risk (e.g., LDL cholesterol ≥ 100 mg/dL [2.6 mmol/L], high blood pressure, smoking, albuminuria, and family history of premature ASCVD) and with ASCVD
- Obtain a lipid profile at initiation of statin therapy and periodically thereafter because doing so may help monitor the response to therapy and inform about adherence

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Anti-Lipid Therapy

Age	Risk factors	Recommended statin intensity*
<40 years	None	None
	ASCVD risk factor(s) [†]	Moderate or high
	ASCVD	High
40–75 years	None	Moderate
	ASCVD risk factors	High
	ASCVD	High
	ACS and LDL >50 mg/dL who cannot tolerate high-dose statin	Moderate plus ezetimibe
>75 years	None	Moderate
	ASCVD risk factors	Moderate or high
	ASCVD	High
	ACS and LDL >50 mg/dL who cannot tolerate high dose statin	Moderate plus ezetimibe

*In addition to lifestyle therapy.

[†]ASCVD risk factors include LDL cholesterol \geq 100 mg/dL (2.6 mmol/L), high blood pressure, smoking, overweight or obesity, and family history of premature ASCVD.

ACS, acute coronary syndrome.



Statin Intensity

High–intensity statin therapy	Moderate–intensity statin therapy
<p>Lowers LDL by ≥ 50:</p> <ul style="list-style-type: none">Atorvastatin 40–80 mgRosuvastatin 20–40 mg	<p>Lowers LDL by 30% to <50%:</p> <ul style="list-style-type: none">Atorvastatin 10–20 mgRosuvastatin 5–10 mgSimvastatin 20–40 mgPravastatin 40–80 mgLovastatin 40 mgFluvastatin XL 80 mgPitavastatin 2–4 mg

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Commonly Used Anti-Lipid Medications

- Statins
 - Potent
 - Lower total cholesterol, LDL most effectively
 - Cut CVD risk by ~30%

Ezetimibe

- Add to statin if high dose not tolerated

What About Statin Intolerance?

- Be sure that's what it is
- Consider pravastatin
- Fish oil+niacin+ezetimibe

Anti-Lipid Medications

Caveats:

- Use with caution in known liver disease (but may improve fatty liver-NAFLD)
- Use with caution in more advanced kidney disease (usually dose reduction)
- Increasing muscle aches- rare complication of rhabdomyolysis

Summary: Blood Pressure and Lipids Treatment

BP:

ACEI or ARB if albuminuria or proteinuria

Lipids:

- Statins first line +/- ezetimibe
- Fibrates, Fish Oil, Niacin, Colsevelam not a lot of data

Treating these appropriately aggressively reduces CVD and renal disease

Aspirin

- If no contraindications
- Men >50 years of age
- Women >50 years of age
- Younger if higher risk

American Diabetes Association. *Diabetes Care*. 2013;37(suppl 1)

Smoking

- Refer to appropriate resources
- Consider FDA approved medications
- E-cigs are NOT recommended at this time

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Heart Disease and Stroke Symptoms

- Educate patients about heart disease and stroke symptoms
- I have seen patients with fairly advanced disease without a lot of symptomatology
- Large knowledge gaps exist with patients

Kidney Disease

Diabetic Kidney Disease

- Characterized by proteinuria
- Prevalence 15-40% in type 1
- Prevalence 5-20% in type 2
- More common in African Americans, Asians, and Native Americans
- Associated with risk of CVD

NKF

Diabetic Kidney Disease Screening

- Annual urine testing for albuminuria or proteinuria
(microalbuminuria will no longer be used)
- Annual creatinine and GFR
- Start at diagnosis for type 2
- Start 5 years after diagnosis type 1

Diabetes Care. 2014;37(suppl 1)

Kidney Disease Management

- ACEI or ARB for albuminuria or proteinuria
- Serum creatinine and creatinine clearance (or GFR) monitoring
- May need 24 hour urine protein
- May need nephrology referral
- Blood pressure to target <140/<90
- A1C <7 for appropriate patients

Diabetes Care. 2013;36(suppl 1)

ACEI/ARB in Diabetes

- Not prescribed only for the diagnosis of diabetes
- Used for hypertension or albuminuria/proteinuria in the absence of hypertension

Retinopathy

Retinopathy Screening

- Type 1 annual starting after age 10 or after 5 years post diagnosis
- Type 2 annual starting shortly after diagnosis
- Consider less frequent if one or more normal exams (not usually done)

Diabetes Care. 2014;37(suppl 1)

Retinopathy Management

- A1C < 7 for appropriate patients
- Laser photocoagulation by ophthalmologist or retinologist

Neuropathy

Diabetic Peripheral Neuropathy

- DPN affects ~60-70% of patients with diabetes
 - Feet typical initial presentation, burning, tingling, numbness
- Neuropathy contributes to amputations

Neuropathy Screening

- Screen at diagnosis and annual thereafter
- Be aware of less common presentations

Foot inspection every visit plus annual/prn:

- Filament testing
- Vibratory testing (128 HZ)
- Reflexes

American Diabetes Association. *Diabetes Care*. 2014;37(suppl 1)

Neuropathy: Treatment

- Optimize blood glucose control
- Consider other differentials, i.e. B12 deficiency in metformin users, thyroid
- Anti-seizure meds (gabapentin, pregabalin)
- Tricyclic anti-depressants (amitriptyline)
- Duloxetine-antidepressant with neuropathy indication
- Capsazin creme

Other Screening

Celiac Disease Screening

- At diagnosis in Type 1 and periodic (?), pregnant
- Rescreen if GI symptoms, failure to thrive, glycemic control changes
- ~10% of type 1?

Test:

- Tissue transglutaminase IgA and IgG

Or

- Anti-endomysial antibodies with serum IgA
- Confirmed with small bowel biopsy

American Diabetes Association. *Diabetes Care*. 2014;37(suppl 1)

Thyroid Screening

- Type 1 screen at diagnosis and every 1 to 2 years, and if pregnant
- At diagnosis, thyroid peroxidase and thyroglobulin antibodies
- TSH thereafter

Liver Disease

Fatty Liver

- NAFLD (non-alcoholic fatty liver disease)
- NASH (non-alcoholic steatohepatitis)
- At least 30% of type 2 patients
- Underdiagnosed
- Current treatment is weight loss, possible future medication role
- Type 2 also higher risk of hepatitis C

Tolman KG et al Diabetes Care 2007;30: 734-74
Johnson EL Journal of Family Practice 2012

Fatty Liver

- Usually marked by minor liver function test abnormalities (alkaline phosphatase, ALT, AST)
- No specific treatment, but metformin, TZD, glp-1, insulin may improve
- If persistent LFT abnormalities:
 - imaging (ultrasound, CT, MRI)
 - screen for hepatitis
 - consider gastroenterology referral

Psychological

- Be aware of depression or anxiety
- Diabetes Distress

Cases

Case #1

- 32 year old with type 1 diabetes
- BP 144/86, 148/90 2 separate occasions
- No albuminuria/proteinuria
- “I’ve never had high blood pressure before”
- What next?

Case #1

- Hard for persons with type 1 to “get their heads around” having high blood pressure

Clear indication for HTN treatment

Case #2

- 56 year old female 10 years duration type 2 diabetes
- HTN on ARB
- 20 pack year history smoking, quit 3 years ago
- Chol 202 TG 260 HDL 34 LDL 104
- Now what?

Case #2

- Should be on aspirin 81 mg daily
 - High risk (2 additional CVD risk factors)
 - Would be tempting to use low dose statin to start
 - 40-75, risk factors, high dose statin
 - Atorvastatin 40–80 mg
 - Rosuvastatin 20–40 mg
- Take time to explain why

Case #3

- 60 year old Hispanic male
- Metformin, DPP-IV inhibitor
- Started on ACEI for HTN
- Serum creatinine at start 1.1
- 4 weeks later 2.9
- Now what?

Case #3

- Renal ultrasound shows bilateral renal artery stenosis

Summary

- Diabetes complications can be avoided or minimized with good glucose control
- Appropriate, guideline based screening is important for early detection
- Cardiovascular disease is extremely common in diabetes, treat risk factors appropriately
- Know when to make appropriate referrals