

AlohaCare

Clinical Practice Guideline: Diabetes Mellitus	
Section: Care Management	Total Number of Pages: 6
Original Date Adopted: 12/20/2002	Review / Revision Date: 8/19/2011

PURPOSE: These recommendations are intended to be used as guidelines. Practitioners are encouraged to make these procedures routine in their care of patients with diabetes.

SUMMARY OF RECOMMENATIONS: DIABETES MELLITUS – TYPE 1 and TYPE 2 (Please refer to Appendices for complete recommendations).

PROCEDURE	FREQUENCY	ACTION
A1C Goal: <6.5% (A new category: A1C range of 5.7 - 6.4% indicates increased risk for future diabetes)	At least twice a year.	Testing to detect type 2 diabetes and assess risk for future diabetes in asymptomatic people should be considered in adults of any age who are overweight or obese (BMI > 25 kg/m ²) and who have one or more additional risk factors for diabetes. If tests are normal, repeat testing should be carried out at least at 3 year intervals. <i>(Appendix A)</i>
Complete Foot Examination	At least once a year.	Sensory testing with a 5.07 (10 gm) nylon monofilament, applied perpendicularly until monofilament buckles. Loss of protective sensation (LOPS) if no perception present at ≥ 1 site (plantar surface of 1st or 5th toes, or 1st, 3rd, or 5th metatarsal heads). <i>(Appendix B)</i>
Dilated Eye Examination by an ophthalmologist or optometrist knowledgeable and experienced in diagnosing diabetic retinopathy	Type 1: Annually beginning 5 years after onset. Type 2: Annually beginning at diagnosis	If diabetic retinopathy is detected, follow-up referral to an ophthalmologist who is knowledgeable and experienced in treating diabetic retinopathy. Include the use of fundus photography as a screening strategy. <i>(Appendix C)</i>
Blood Pressure	Every Office visit	If BP > 130/80, lifestyle therapy alone for a maximum of 3 months, and then if targets are not achieved, addition of pharmacological agents. If > 140/90, at diagnosis or follow up should receive pharmacologic therapy in addition to lifestyle therapy. <i>(Appendix D)</i>
Early Nephropathy Detection	Type 1: Annually beginning 5 years after onset.* Type 2: Annually beginning at diagnosis.	If positive 2 of 3 tests > 30 mg/24 hr, begin treatment with ACE inhibitor or ARBs. <i>(Appendix E)</i>
Lipid Management	Annually. If lipid levels within target guidelines for two consecutive years, may decrease frequency to every 2 years.	If LDL > 100 mg/dl OR If HDL < 40 mg/dl (men), or < 50 mg/dl (women), OR If TG > 150 mg/dl.
Self-Monitoring of Blood Glucose (SMBG)	Should be encouraged in all patients to help reach and maintain treatment goals.	SMBG logs should be reviewed at all regularly scheduled diabetes visits.
Education: Provided by a registered, licensed, or certified health professional with training in diabetes, preferably a CDE.	At diagnosis and annually thereafter.	People with diabetes should receive diabetes self-management education according to national standards when their diabetes is diagnosed and as needed thereafter. <i>(Appendix G)</i>
Tobacco Use Assessment	Non-smoker; ask and advise at diagnosis and annually thereafter. Smokers: Ask and advise at every visit.	<ol style="list-style-type: none"> 1. Strongly urge all smokers to quit. 2. Identify smokers willing to make a quit attempt. 3. Assist the patient in quitting (pharmacologic therapy, referral, etc.) 4. Schedule follow-up contact.

PROCEDURE	FREQUENCY	ACTION
Preconception Counseling	At time of initial visit in all women of childbearing potential or upon reaching childbearing age.	
Immunizations • Influenza • Pneumococcal	Annually. At diagnosis if not already vaccinated.	Administer in the fall (October is optimal). Revaccinate if patient ≥ 65 AND first vaccination was more than 5 years ago when patient was 64 years or younger. (<i>Appendix H</i>)
Oral/Dental Screening	Optimally every 6 months, but at least annually. Oral prophylaxis at least annually.	
(ASA) Prophylaxis In patients ages 21-39 with cardiovascular risk factor and in all patients > 40 years if no contraindications.		Consider aspirin therapy (75-162 mg/day) as a primary prevention strategy in those with type 1 or type 2 diabetes at increased cardiovascular risk (10 –year risk > 10%). This includes most men >50 years of age or women > 60 years of age who have at least one additional major risk factor (family history of CVD, hypertension, smoking, dyslipidemia, or albuminuria). (<i>Appendix I</i>)

Resource: *The American Diabetes Association—Standards of Medical Care in Diabetes – 2010*

Appendix A: A1C

The American Diabetes Association (ADA) recommends

- Perform the A1C test at least two times a year in patients who are meeting treatment goals (and who have stable glycemic control.)
- Perform the A1C test quarterly in patients whose therapy has changed or who are not meeting glycemic goals.
- Use of point-of-care testing for A1C allows for timely decisions on therapy changes, when needed.

Because A1C is thought to reflect average glycemia over several months and has strong predictive value for diabetes complications, A1C testing should be performed routinely in all patients with diabetes, at initial assessment and then as part of continuing care. Measurement approximately every 3 months determines whether a patient’s glycemic targets have been reached and maintained. For any individual patient, the frequency of A1C testing should be dependent on the clinical situation, the treatment regimen used, and the judgment of the clinician. Some patients with stable glycemia well within target may do well with testing only twice per year, while unstable or highly intensively managed patients (e.g. pregnant type 1 diabetic women) may be tested more frequently than every 3 months. The availability of the A1C result at the time that the patient is seen (point of care testing), has been reported to result in increased intensification of therapy and improvement in glycemic control.

Appendix B: Complete Foot Examination

- For all patients with diabetes, perform an annual comprehensive foot examination to identify risk factors predictive of ulcers and amputations. The foot examination should include inspection, assessment of foot pulses, and testing for loss of protective sensation (LOPS) (10-g monofilament plus testing any one of: vibration using 128 – Hz tuning fork, pinprick sensation, ankle reflexes, or vibration perception threshold).
- Provide general foot self-care education to all patients with diabetes.
- A multidisciplinary approach is recommended for individuals with foot ulcers and high-risk feet, especially those with a history of prior ulcer or amputation.
- Refer patients who smoke, have LOPS and structural abnormalities or have history of prior lower-extremity complications to foot care specialists for ongoing preventive care and life long surveillance.

- Initial screening for peripheral arterial disease (PAD) should include a history for claudication and an assessment of the pedal pulses. Consider obtaining an ankle-brachial index (ABI), as many patients with PAD are asymptomatic.
- Refer patients with significant claudication or a positive ABI for further vascular assessment and consider exercise, medications, and surgical options.

At least annually, all adults with diabetes should undergo a comprehensive foot examination to identify high-risk conditions. Clinicians should ask about history of previous foot ulceration or amputation, neuropathic or peripheral vascular symptoms, impaired vision, tobacco use, and foot care practices. A general inspection of skin integrity and musculoskeletal deformities should be done in a well-lit room. Vascular assessment would include inspection and assessment of pedal pulses.

Appendix C: Retinopathy Screening and Treatment Recommendations

General recommendations:

- To reduce the risk or slow the progression of retinopathy, optimize glycemic control.
- To reduce the risk or slow the progression of retinopathy, optimize blood pressure control.

Screening

- Adults and children aged 10 years or older with type 1 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist within 5 years after the onset of diabetes.
- Patients with type 2 diabetes should have an initial dilated and comprehensive eye examination by an ophthalmologist or optometrist shortly after the diagnosis of diabetes
- Subsequent examinations for type 1 and type 2 diabetic patients should be repeated annually by an ophthalmologist or optometrist. Less frequent exams (ever 2-3 years) may be considered following one or more normal eye exams. Examinations will be required more frequently if retinopathy is progressing.
- High-quality fundus photographs can detect most clinically significant diabetic retinopathy. Interpretation of the images should be performed by a trained eye care provider. While retinal photography may serve as a screening tool for retinopathy, it is not a substitute for a comprehensive eye exam, which should be performed at least initially and at intervals thereafter as recommended by an eye care professional.
- Women with preexisting diabetes who are planning pregnancy or who have become pregnant should have a comprehensive eye examination and be counseled on the risk of development and/or progression of diabetic retinopathy. Eye examination should occur in the first trimester with close follow up throughout pregnancy and for 1 year postpartum.

Treatment

- Promptly refer patients with any level of macular edema, severe NPDR (non-proliferative diabetic retinopathy), or any PDR (proliferative diabetic retinopathy) to an ophthalmologist who is knowledgeable and experienced in the management and treatment of diabetic retinopathy.
- Laser photocoagulation therapy is indicated to reduce the risk of vision loss in patients with high risk PDR < clinically significant macular edema, and in some cases of severe NPDR.
- The presence of retinopathy is not a contraindication to aspirin therapy for cardio protection, as this therapy does not increase the risk of retinal hemorrhage.

Diabetic retinopathy is a highly specific vascular complication of both type 1 and type 2 diabetes, with prevalence strongly related to duration of diabetes. Diabetic retinopathy is the most frequent cause of new cases of blindness among adults aged 20-74 years. Glaucoma, cataracts, and other disorders of the eye occur earlier and more frequently in people with diabetes.

Appendix D: Blood Pressure control – Screening and Diagnosis

Blood pressure should be measured at every routine diabetes visit. Patients found to have systolic blood pressure ≥ 130 mmHg or diastolic blood pressure ≥ 80 mmHg should have blood pressure confirmed on a separate day. Repeat systolic blood pressure ≥ 130 mmHg or diastolic blood pressure ≥ 80 mmHg confirms a diagnosis of hypertension.

Goals

- Patients with diabetes should be treated to a systolic blood pressure <130 mmHg.
- Patients with diabetes should be treated to a diastolic blood pressure <80 mmHg.

Treatment

- Patients with a systolic blood pressure 130-139 mmHg or a diastolic blood pressure 80 - 89 mmHg may be given lifestyle therapy alone for a maximum of 3 months, and then if targets are not achieved. Patients should be treated with the addition of pharmacological agents.
- Patients with more severe hypertension (systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg) at diagnosis or follow up should receive pharmacologic therapy in addition to lifestyle therapy.
- Lifestyle therapy for hypertension consists of weight loss if overweight, DASH-style (Dietary Approaches to Stop Hypertension) dietary pattern including reducing sodium and increasing potassium intake, moderation of alcohol intake and increased physical activity.
- Pharmacologic therapy for patients with diabetes and hypertension should be paired with a regimen that includes either an ACE inhibitor or an angiotensin II receptor blocker (ARB). If one class is not tolerated, the other should be substituted. If needed to achieve blood pressure targets, a thiazide diuretic should be added to those with an estimated glomerular filtration rate (GFR) ≥ 30 ml. min/1.73 m² and a loop diuretic for those with an estimated GFR < 30 ml. min/1.73 m².
- Multiple drug therapy (two or more agents at maximal doses) is generally required to achieve blood pressure targets.
- If ACE inhibitors, ARBs, or diuretics are used, kidney function and serum potassium levels should be closely monitored.
- In pregnant patients with diabetes and chronic hypertension, blood pressure target goals of 110-129/65-79 mmHg are suggested in the interest of long-term maternal health and minimizing impaired fetal growth. ACE inhibitors and ARBs are contraindicated during pregnancy.

Hypertension is a common co-morbidity of diabetes that affects the majority of patients, with prevalence depending on type of diabetes, age, obesity and ethnicity. Hypertension is a major risk factor for both CVD and micro vascular complications. In type 1 diabetes, hypertension is often the result of underlying nephropathy, while in type 2 diabetes it usually coexists with other cardio metabolic risk factors.

Appendix E: Early Nephropathy Detection

General Recommendations

- To reduce the risk or slow the progression of nephropathy, optimize glucose control.
- To reduce the risk or slow the progression of nephropathy, optimize blood pressure control.

Screening

- Perform an annual test to assess urine albumin excretion in type 1 diabetic patients with diabetes duration of 5 years and in all type 2 diabetic patients, starting at diagnosis.
- Measure serum creatinine at least annually in all adults with diabetes regardless of the degree of urine albumin excretion. The serum creatinine should be used to estimate GFR and stage the level of chronic kidney diseases (CKD), if present.

Treatment

- In the treatment of the non pregnant patient with micro- or macroalbuminuria, either ACE inhibitors or ARBs should be used.
- While there are no adequate head-to-head comparisons of ACE inhibitors and ARBs, there is clinical trial support for each of the following statements.
 1. In patients with type 1 diabetes, hypertension, and any degree of albuminuria, ACE inhibitors have been shown to delay the progression of nephropathy.
 2. In patients with type 2 diabetes, hypertension, and microalbuminuria, both ACE inhibitors and ARBs have been shown to delay the progression to macroalbuminuria
 3. In patients with type 2 diabetes, hypertension, macroalbuminuria, and renal insufficiency (serum creatinine >1.5 mg/dl), ARBs have been shown to delay the progression of nephropathy.
 4. If one class is not tolerated, the other should be substituted.
- Reduction of protein intake to $0.8 - 1.0 \text{ g} \cdot \text{kg body wt.}^{-1} \cdot \text{Day}^{-1}$ in individuals with diabetes and the earlier stages of CKF and to $0.8 \text{ g} \cdot \text{kg body wt.}^{-1} \cdot \text{day}^{-1}$ in the later stages of CKD may improve measures of renal function (urine albumin excretion rate and GFR) and is recommended.
- When ACE inhibitors, ARBs, or diuretics are used, monitor serum creatinine and potassium levels for the development of acute kidney disease and hyperkalemia.
- Continued monitoring of urine albumin excretion to assess both response to therapy and progression of disease is recommended.
- Consider referral to a physician experienced in the care of kidney disease when there is uncertainty about the etiology of kidney disease (active urine sediment, absence of retinopathy, or rapid decline in GFR), difficult management issues, or advanced kidney disease.

Diabetic nephropathy occurs in 20-40% of patients with diabetes and is the single leading cause of end-stage renal disease (ESRD). Persistent albuminuria in the range of 30-299 mg/24 hr h (microalbuminuria) has been shown to be the earliest stage of diabetic nephropathy in type 1 diabetes and a marker for development of nephropathy in type 2 diabetes. Microalbuminuria is also a well-established marker of increased CVD risk. Patients with microalbuminuria who progress to macroalbuminuria (>300 mg/24 h) are likely to progress to ESRD. However, a number of interventions have been demonstrated to reduce the risk and slow the progression of renal disease.

Appendix F – Dyslipidemia/Lipid Management Recommendations

Screening

In most adult patients, measure fasting lipid profile at least annually. In adults with low-risk lipid values (LDL cholesterol < 100 mg/dl, HDL cholesterol >50 mg/dl, and triglycerides <150 mg/dl), lipid assessments may be repeated every 2 years.

Treatment recommendations and goals

- Lifestyle modification focusing on the reduction of saturated fat, *trans* fat, and cholesterol intake, increase of n-3 fatty acids, viscous fiber, and plant stanols/sterols, weight loss (if indicated), and increased physical activity should be recommended to improve the lipid profile in patients with diabetes.
- Statin therapy should be added to lifestyle therapy, regardless of baseline lipid levels, for diabetic patients:
 1. With overt CVD.
 2. Without CVD who are over the age of 40 years and have one or more other CVD risk factors.
- For patients without overt CVD and under the age of 40 years, statin therapy should be considered in addition to lifestyle therapy if LDL cholesterol remains > 100 mg/dl or in those with multiple CVD risk factors.
- In individuals without overt CVD, the primary goal is an LDL cholesterol < 100 mg/dl (2.6 mmol/l)
- In individuals with overt CVD, a lower LDL cholesterol goal of <70 mg/dl (1.8 mmol/l) using a high dose of a statin, is an option.
- If drug-treated patients do not reach the above targets on maximal tolerated statin therapy, a reduction in LDL cholesterol of ~30-40% from baseline is an alternative therapeutic goal.
- Triglycerides levels < 150 mg/dl (1.7 mmol/l) and HDL cholesterol >40 mg/dl (1.0 mmol/l) in men and >50 mg/dl (1.3 mmol/l) in women, are desirable. However, LDL cholesterol-targeted statin therapy remains the preferred strategy. If targets are not reached on maximally tolerated doses of statins, combination therapy using statins and

other lipid-lowering agents may be considered to achieve lipid targets but has not been evaluated in outcome studies for either CVD outcomes or safety.

- Statin therapy is contraindicated in pregnancy.

For most patients with diabetes, the first priority of dyslipidemia therapy (unless severe hypertriglyceridemia is the immediate issue) is to lower LDL cholesterol to a target goal of < 100 mg/dl (2.60 mmol/l).

Appendix G: Diabetes Self-Management Education (DSME) Recommendations

- People with diabetes should receive DSME according to national standards when their diabetes is diagnosed and as needed thereafter.
- Effective self management and quality of life are the key outcomes of DSME and should be measured and monitored as part of care.
- DSME should address psychosocial issues, since emotional well-being is associated with positive diabetes outcomes.

Appendix H: Immunization Recommendations

Influenza and pneumonia are common, preventable infectious diseases associated with high mortality and morbidity in the elderly and in people with chronic diseases.

- Annually provide an influenza vaccine to all diabetic patients ≥ 6 months of age.
- Administer pneumococcal polysaccharide vaccine to all diabetic patients ≥ 2 years of age. A one-time revaccination is recommended for individuals > 64 years of age previously immunized when they are < 65 years of age if the vaccine was administered >5 years ago. Other indications for repeat vaccination include nephrotic syndrome, chronic renal disease, and other immune compromised states, such as after transplantation.

Appendix I: Anti-platelet Agents Recommendations

Aspirin has been shown to be effective in reducing cardiovascular morbidity and mortality in high risk patients with previous MI or stroke (secondary prevention).

- Consider aspirin therapy (75-162 mg/day) as a primary prevention strategy in those with type 1 or type 2 diabetes at increased cardiovascular risk (10-year risk). This includes most men >50 years of age or women >60 years of age who have at least one additional major risk factor (family history of CVD, hypertension, smoking, dyslipidemia, or albuminuria).
- There is no sufficient evidence to recommend aspirin for primary prevention in lower risk individuals, such as men <50 years of age or women < 60 years of age without other major risk factors. For patients in these age-groups with multiple other risk factors, clinical judgment is required.
- Use aspirin therapy (75-162 mg/day) as a secondary prevention strategy in those with diabetes with a history of CVD.
- For patients with CVD and documented aspirin allergy, clopidogrel (75 mg/day) should be used.
- Combination therapy with ASA (75-162 mg/day) and clopidogrel (75 mg/day) is reasonable for up to a year after an acute coronary syndrome.

Appendix J: Smoking cessation recommendations

Cigarette smoking contributes to one of every five deaths in the U.S., and is the most important modifiable cause of premature death.

- Advise all patients not to smoke
- Including smoking cessation counseling and other forms of treatment as a routine component of diabetes care.