Indian Health Service
Standards of Care for Adults With Type 2 Diabetes

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~ Official Version ~

Indian Health Service
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IHS Standards of Care for Adults With Type 2 Diabetes

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Contents

Introduction

In 1986, the Indian Health Service (IHS) Division of Diabetes Treatment and Prevention (DDTP) developed its first *IHS Standards of Care for Diabetes*. Over the past 20 years, these guidelines have helped health care professionals provide excellence in diabetes care to American Indians and Alaska Natives (AI/AN).

To keep these guidelines current with the ever-changing field of diabetes care, the IHS DDTP and the Area Diabetes Consultants (ADCs) have developed the *2006 IHS Standards of Care for Patients With Type 2 Diabetes*. The guidelines:

- Address the **unique aspects of care for AI/AN people**.
- Enable health care professionals and other members of a diabetes care team to offer **consistent quality diabetes care to AI/AN adults** with type 2 diabetes.
- Have been **developed using a consensus process** backed by literature review, guided by consultation with scientific experts, and refined with input from health professionals from many disciplines.
- Reflect and support the **concept of a team approach to diabetes care** in our facilities and the communities that surround them.
- Should be **used in the context of the whole patient**, not just a single disease entity.
- Should be **used in the context of a model of care** (such as the Chronic Care Model) that includes elements, which in combination, foster productive interactions between informed patients—who play an active role in their care—and providers with resources and expertise.

The IHS DDTP and ADCs endorse and support the current *American Diabetes Association (ADA) Clinical Practice Recommendations* as the foundation of excellence in diabetes. The *2006 IHS Standards of Care for Patients With Type 2 Diabetes* differ from the ADA clinical practice recommendations by bringing focus to the specific care issues of AI/AN adults with diabetes, placing greater emphasis on the prevention of complications that are most notable in the AI/AN population.

As such, these guidelines do not include clinical guidelines on the care of people with type 1 diabetes. The *ADA Standards of Medical Care in Diabetes—2006* thoroughly address the issues of the diagnosis and treatment of type 1 diabetes, and providers are encouraged to refer to these for guidance. (The *ADA Standards of Medical Care in Diabetes—2006* are available online at: http://care.diabetesjournals.org/cgi/content/full/29/suppl_1/s4.)

Part 1: Visit Checklists (References)

1. Components of the initial comprehensive evaluation

The following is an initial clinic visit checklist for a newly diagnosed patient or a patient with pre-existing diabetes but not previously followed in your clinic.

The initial evaluation should also include *Ongoing Management Recommendations* (see page 5) as part of a comprehensive evaluation.

Components of the Initial Comprehensive Evaluation of Adults With Type 2 Diabetes	
Diagnosis	❑ Review laboratory test related to the diagnosis of type 2 diabetes.
Date of diagnosis	❑ Record date of diagnosis in chart.
History	❑ Medical and family history. ❑ Assessment of lifestyle habits and activity level. ❑ Determine CVD co-morbidities: HTN, dyslipidemia, other CVD risk factors. ❑ Assess cultural and psychosocial issues. ❑ Assess social and economic resources.
Screening and assessments	❑ Depression screening. ❑ Tobacco use assessment. ❑ Evaluate TB status and place PPD if needed.
Measurements	❑ Height. ❑ Weight and weight with calculated BMI. ❑ Waist measurement.
Comprehensive physical exam	❑ Oral, thyroid palpation, cardiac, pulmonary, abdominal, pulses, extremities to include neurological foot check of sensation with 10-gm monofilament.
Labs and tests	❑ A1c. ❑ Fasting lipid profile. ❑ ALT, AST, electrolytes, BUN, creatinine, calculated GFR. ❑ TSH (if indicated). ❑ Urinary albumin, microalbuminuria/creatinine ratio. ❑ 12-lead electrocardiogram.
Medications	❑ Review previous treatments. ❑ Review current medications.
Referrals	❑ Optometrist or ophthalmologist/retinal photo for eye exam. ❑ Registered dietitian or nutritionist. ❑ Diabetes educator. ❑ Foot specialist if indicated.

2. Ongoing management recommendations

Components of Care Visits for Adults With Type 2 Diabetes	
Vitals	❑ Weight, recalculate BMI. ❑ Record height if not on chart. ❑ Compare with previous weight and BMI to monitor trends.
Blood pressure assessment	❑ Assess at every visit. ❑ Monitor and adjust therapy to keep **BP <130/80 mmHg**.
Glycemic control assessment	❑ A1c if indicated. **Goal: <7%** (e.g., <6.5% can be considered for some patients). ❑ Review log of patient's SBGM results. ❑ Point-of-care capillary blood glucose check if indicated. ❑ Monitor and adjust therapy to attain glycemic goals.

Chronic kidney disease assessment
❑ Annual for screening
❑ More frequently for monitoring of CKD
	❑ Estimated GFR:
	  ❑ Serum creatinine (needed for calculation of GFR).
	❑ Albumin to creatinine ratio (UACR) [review diagnosis].
	❑ Preserve kidney function:
	  ❑ Consider ACE inhibitor or ARB.
	  ❑ Lower targets for BP control: <120/70 mmHg.
	❑ If GFR <60:
	  ❑ Hemoglobin/hematocrit for presence of anemia.
	  ❑ Ca, PO4, and PTH to assess metabolic bone disease.

Lipids assessment	At least annually, more frequently if monitoring therapy: ❑ Fasting lipoprotein panel (total cholesterol, LDL, HDL, and triglyceride). ❑ If fasting lipids not possible, consider direct LDL, total cholesterol, and HDL. ❑ Additional lipid testing may be needed to adjust pharmacologic therapy.
Anti-platelet therapy	❑ Aspirin or other antiplatelet agent prescribed in appropriate clinical setting.
Visit exams	❑ Directed exam according to review of systems. ❑ Routine foot check. ❑ Annual comprehensive neurovascular foot exam to include 10-gm monofilament exam.
Immunization status review	❑ Influenza immunization annually. ❑ PneumoVax at diagnosis. Re-immunization if aged 65 or older, and first dose given before age 65. ❑ Tetanus and diphtheria every 10 years. ❑ HBV immunization if kidney status is compromised and GFR <60, or at high risk for HBV.

Lifestyle Practice Recommendations	
Mental and emotional health	❑ Assess depression annually or as clinically indicated using the PHQ-2 or PHQ-9. ❑ Provide timely diagnostic and therapeutic services for anyone with a positive screen.
Diabetes self-management education (DSME)	❑ Refer patients and their families for DSME at diagnosis and as needed thereafter. ❑ Refer to diabetes educator to complete an education needs assessment and establish self-management education and care plan.
Medical nutrition therapy (MNT)	❑ Refer patient to a registered dietitian for individualized MNT at diagnosis and as needed thereafter to achieve treatment goals.
Physical activity	❑ Screen and re-assess macrovascular and microvascular complications that may be worsened with physical activity. ❑ Provide and modify exercise prescription based on the medical evaluation. ❑ Provide education on proper footwear. ❑ Evaluate for risk of hypoglycemia, and make appropriate adjustments in pharmaceutical and non-pharmaceutical therapies as needed.
Tobacco	❑ Screen for tobacco use at diagnosis and periodically thereafter. ❑ Advise all patients not to smoke or use tobacco products. ❑ Refer to tobacco cessation program as indicated. Nicotine replacement therapy recommended.
Alcohol and other substance use	❑ Screen for alcohol and substance use at diagnosis and periodically thereafter. ❑ Counsel on appropriate use of alcohol. Moderation is considered one daily drink for adult women and two drinks for adult men. ❑ Refer patients with alcohol or substance abuse to appropriate behavioral health staff or treatment program. ❑ Advise abstention from alcohol for women during pregnancy and for people with medical problems such as pancreatitis, advanced neuropathy, severe hypertriglyceridemia, or alcohol abuse.

Lab Testing for Adults With Type 2 Diabetes	
A1c	❑ Twice yearly in patients who are meeting treatment goals. ❑ Quarterly in patients whose therapy has changed or who are not meeting treatment goals. ❑ Point-of-care testing for A1c allows for timely decisions on therapy changes.
Fasting lipid panel	❑ Fasting lipoprotein panel (total cholesterol, LDL, HDL, and triglyceride) obtained after a 9–12-hour fast. ❑ If fasting lipids not possible or reasonable, consider direct LDL, total cholesterol, and HDL. ❑ Re-evaluate lipid profiles 6–12 weeks after new therapies are initiated.
Serum creatinine with calculated GRF	❑ Measure to estimate GFR regardless of the degree of urine albumin excretion. ❑ Screen annually. If used for monitoring treatment, more frequent screening is recommended.
Albumin to creatinine ratio	❑ Test for protein in urine with albumin to creatinine ratio. ❑ Screen annually. If used for monitoring treatment, more frequent screening is recommended.
Liver enzymes	❑ ALT and AST to monitor medication therapy or assess fatty liver.
Hemoglobin and hematocrit	❑ Assess for presence of anemia.

Annual Specialty Referral	
Dilated eye exam	❑ Retinal exam either through dilated pupils or stereofundus photos.
Dental exam	❑ Screen for periodontal disease and examine gums and oral cavity for lesions.

Part 2: Supporting Statements

1. Criteria for the diagnosis of type 2 diabetes in adults (References)

The IHS DDTP supports the following ADA recommendations for the criteria for the diagnosis of type 2 diabetes in adults. We recommend three possible plasma blood tests in the diagnosis of diabetes; we do not recommend the use of an A1c in the diagnosis of diabetes.

Plasma blood tests	Diagnostic values
Casual plasma glucose (Casual is defined as any time of day without regard to time of last meal.)	≥200 mg/dl plus symptoms of diabetes: – Polyuria – Polydypsia – Unexplained weight loss
Or	
Fasting plasma glucose (Fasting is defined as no caloric intake for at least eight hours.)	≥126 mg/dl
Or	
Two-hour plasma glucose	≥200 mg/dl during a 75 g oral glucose tolerance test (OGTT)
Note: In the absence of unequivocal hyperglycemia, confirm these criteria by repeat testing on a different day.	

2. Glycemic control and microvascular risk reduction

Assessment of glycemic control (References)

We recommend that the results of self-monitoring blood glucose (SMBG) and lab determinations of A1c be available during the clinic visit for therapeutic management decisions.

A1c

A1c is a "weighted" measure of glycemic control over the preceding 120 days. The more recent days contribute more to the measure than the distant days. The mean level of blood glucose in the 30 days immediately preceding the test contributes about 50% of the final result.

Lowering A1c is associated with a reduction in microvascular and neuropathic complications of diabetes. We recommend A1c testing in all adults with diabetes to monitor progress toward clinical targets and facilitate therapeutic decision-making.

The A1c goal is <7%. However, the provider can consider more stringent goals (e.g., <6.5%) for some patients. A1c testing may be repeated as soon as one month later to assess response to therapy, or every 3–6 months in "stable" patients. Point-of-care A1c testing allows providers to make timely decisions on therapy changes.

Self-monitoring blood glucose

Patients can use SMBG to achieve and maintain specific glycemic goals. The patient should set reasonable goals on the frequency of testing with the provider. The provider should review these results with the patient during each visit. SMBG values can be used for clinical decisions in the timing, dose, and type of therapy, especially for patients on insulin.

Point-of-care blood glucose testing

Routine office measurement of casual glucose, either capillary or venous, has limited clinical utility. Ongoing therapeutic decisions cannot be made based on single office testing.

Assessment of chronic kidney disease (References) (Best practices)

In the past, the absence of a widely accepted definition of chronic kidney disease (CKD) and the lack of classification of the stages of CKD impaired our ability to communicate with each other. This also impaired our efforts to diagnose and treat people with kidney disease early in the course of their illness. In response to these problems, the National Kidney Foundation established the *Clinical Practice Guidelines for Chronic Kidney Disease: Evaluation, Classification, and Stratification*, which provide a common language for communication among providers, patients, and their families. The IHS DDTP fully supports the application of these principles to adults with diabetes.

Terminology

- Use the term “kidney” instead of “renal”.
- The term “chronic kidney disease (CKD)” replaces “end stage renal disease”, “pre-dialysis”, or “chronic renal failure”. ICD-9 codes are now available for these terms and precision can be used with these terms:

  585.1 Chronic kidney disease, Stage I

  585.2 Chronic kidney disease, Stage II (mild)

  585.3 Chronic kidney disease, Stage III (moderate)

  585.4 Chronic kidney disease, Stage IV (severe)

  585.5 Chronic kidney disease, Stage V

  585.6 End stage renal disease

Tests used to assess kidney disease

Screening includes an assessment of glomerular filtration rate (GFR) and measurement of urinary protein excretion. These tests should be done at diagnosis, and repeated at least annually. Providers can use these tests to monitor the progression of kidney disease and the effects of therapy. As such, these tests are continued for the life of the patient regardless of the stage of kidney disease or types of treatments provided.

Assessment of GFR

The kidney is usually described as “a filter”, and GFR is a measure of the kidneys’ ability to filter blood, which can be expressed on a continuous scale. Serum creatinine alone does not provide enough information for diagnosis and classification. GFR can be estimated by using the serum creatinine, body weight, and age. Formulas to calculate GFR include the MDRD (Modification of Diet in Renal Disease Study Group) and Cockcroft-Gault equations. The Resource and Patient Management System (RPMS) laboratory package with patch 16 will calculate the GFR automatically when you order a serum creatinine test. You may also use online calculators, such as the National Kidney Foundation’s MDRD GFR calculator, which is available online at: http://www.kidney.org/professionals/kdoqi/gfr_calculator.cfm.

Measurement of urinary protein excretion

In the past, our ability to measure protein in the urine was limited to semi-quantitative dipstick tests. Although sensitive dipstick tests were developed that could detect very small amounts of protein (i.e., microalbuminuria), the old, complicated terminologies persisted and were often confusing. Because urinary protein excretion is a continuous variable, it is better to use a quantitative measurement and to describe the rate of excretion of urinary protein. We recommend use of the urinary albumin to creatinine ratio (UACR), which can be estimated from a simple spot urine specimen. The

UACR is roughly equivalent to the 24-hour protein excretion in grams. *24-hour urine collection and testing is not recommended for routine diabetes nephropathy screening.* We recommend reporting the actual UACR in terms of mg of albumin per gm of creatinine. If you or your colleagues, laboratory, or specialists, choose a different test, you should review those test characteristics, expected values, and associated costs.

Definitions of Abnormalities in Albumin Excretion

Category	Spot collection (mg/gm creatinine)
Normoalbuminuria	<30
Microalbuminuria	30-299
Macroalbuminuria	≥300

Because of variability in urinary albumin excretion, at least two specimens, preferably first morning void, collected within a 3- to 6-month period should be abnormal before considering a patient to have crossed one of these diagnostic thresholds. Exercise within 24 h, infection, fever, congestive heart failure, marked hyperglycemia, pregnancy, marked hypertension, urinary tract infection, and hematuria may elevate urinary albumin over baseline values.

The IHS Kidney Disease Program suggests that people with 1+ or greater protein on dipstick or UACR ≥ 300 mg/gm can have their protein excretion ascertained with a Urine Protein-to-Creatinine Ratio instead of UACR.

Diagnosis of CKD

CKD is kidney damage for three months as defined by structural or functional abnormalities with or without decreased GFR, or a GFR of 60 ml/min/1.73 m^2 or less with or without kidney damage. So, if there is a UACR of 30 mg/gm or greater, or if the GFR is less than 60 for more than three months, then CKD is present.

Further evaluation and treatment of CKD

In adults with diabetes, the most likely cause of CKD is the diabetes itself. However, there are other treatable causes of CKD. Evaluation is appropriate. If you need assistance in evaluating for other causes of CKD, consultation may be appropriate.

Once CKD and its cause are established, there are important treatments that can delay progression and improve quality of life. Of critical importance is the aggressive treatment of blood pressure. Lower targets for systolic and diastolic blood pressure may be appropriate. Certain blood pressure medication, such as ACE inhibitors or ARBs, may play an important role. Treatment of anemia and metabolic bone disease becomes important in people with GFR <60.

Diabetes eye examination (References) (Best practices)

Complications of diabetes include several visual disorders, such as retinopathy, cataracts, and glaucoma, which may lead to blindness. Approximately 15–28% of people with type 2 diabetes have retinopathy at the time diabetes is diagnosed. This may be due to the extended period of time these individuals have diabetes, but remained undiagnosed and uncontrolled. The risk factors associated with the severity of retinopathy include high mean fasting blood glucose, high A1c level, elevated systolic blood pressure, high UACR, as well as whether the patient is on kidney dialysis or has had a long duration of diabetes.

Adults with diabetes should have a comprehensive dilated examination by an ophthalmologist or optometrist shortly after the diagnosis of diabetes. Re-examinations should be repeated annually. Examinations will be required more frequently if retinopathy is progressive.

Examinations can also be done by taking retinal photographs and having these read by experienced experts in this field. In-person exams are still necessary when the photos are unacceptable and for follow-up of detected abnormalities. This technology has its greatest potential in areas where qualified eye care professionals are not available. Results of eye examinations should be documented and transmitted to the referring health care professional.

Women with gestational diabetes are at very low risk for the development of diabetic retinopathy during pregnancy due to the very limited exposure to increased blood glucose. Retinopathy screening is therefore not indicated. However, women with pregestational diabetes who are planning pregnancy or who have become pregnant should have a comprehensive eye examination and should 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 one year postpartum.

Diabetes foot care (References) (Best practices)

Foot ulcers and amputations are a major cause of complications and disability for adults with diabetes. However, they are among the most common *preventable* complications from diabetes. Early recognition and management of independent risk factors for ulcers and amputations can prevent or delay the onset of adverse outcomes.

Foot inspection at each visit

Approximately one in five adults with diabetes who present for routine care will have a condition that requires prompt attention, including large calluses, bacterial or fungal infections, bulky or ingrown nails, or frank ulceration. Accordingly, shoes should be removed and feet inspected for acute problems at each visit.

Annual complete foot examination

Examination should include assessment of protective sensation, foot structure and biomechanics, vascular status, and skin integrity. Test sensation with the 10-gm monofilament on the plantar aspect of the first, third, and fifth digits and metatarsal heads of each foot. If the patient has no sensation on one or more of the tested sites, he or she is at high risk of developing an ulcer. Inspect the foot for deformities and altered biomechanics including hammer or claw toe deformities, bunions, Charçot foot, any bony prominence, and excessive pronation. Additionally, patients with a history of prior non-traumatic ulceration or amputation are at high risk.

Conduct a vascular assessment by feeling for dorsalis pedis and posterior tibial pulses on each foot. Alternatively, assess vascular status with an ankle brachial index (ABI). An absent pulse or ABI ratio of <0.9 on either foot confers high risk. Keep in mind these results may be falsely elevated in diabetics due to calcification of the arteries.

Patients with low-risk feet should be re-examined annually with interventions aimed at controlling blood glucose, blood pressure, and lipids, and to encourage patients who use tobacco to quit.

People with high-risk foot conditions should have their feet re-examined every one to three months with the goal of protecting the foot from injury through patient education, podiatry care, and protective footwear. Education should stress:

- Washing and inspecting feet on a daily basis.
- Clearing walking areas of dangerous objects.
- Selecting and using appropriate and properly fitted footwear.
- Using slippers indoors (i.e., no bare feet).
- Providing proper nail and callus care (e.g., no bathroom surgery).
- Avoiding extreme temperatures.
- Avoiding soaking feet.
- Promptly reporting problems, such as infections, ulcers, and cuts that do not heal. Advise the patient who and when to call.

Diabetes dental care (References) (Best practices)

Periodontal (gum) disease, an infection of the supporting tissues of the teeth caused by specific bacteria, is a common complication of diabetes. Therefore, adults with diabetes are at increased risk of periodontal disease. Among AI/AN adults with diabetes, advanced periodontal disease occurs at rates two to three times higher than for individuals who do not have diabetes. Infections associated with advanced periodontal disease can interfere with an individual's glycemic control and can actually cause blood glucose levels to rise.

Periodontal disease can result in the loss of all teeth in approximately one third of AI/AN adults with diabetes. People with no teeth can suffer not only emotionally, but also nutritionally because they may not have the ability to eat many types of important foods.

All adults with diabetes should have an annual screen for periodontal disease and other oral pathology. Regular dental examinations provide opportunities for prevention, early detection, and treatment of periodontal disease. Regular dental cleaning has been shown to improve glycemic control in patients with poorly controlled diabetes.

3. Cardiovascular disease risk reduction (Best practices)

Cardiovascular disease (CVD) is *the* major cause of mortality and a significant cause of morbidity for individuals with diabetes. Addressing dyslipidemia and hypertension is critical given that lowering blood glucose alone is not adequate to address the CVD risk in diabetes. Patients with type 2 diabetes have an increased prevalence of hypertension and lipid abnormalities, including high triglyceride and low HDL levels, which contribute to the higher rates of CVD. Management of hypertension and lipids results in significant CVD risk reduction for adults with diabetes. The following recommendations represent our best clinical understanding and approach *at the present time*; this will evolve as our understanding improves from further outcome studies.

Assessment and management of blood pressure (References)

Blood pressure (BP) control reduces the risk for diabetic microvascular and macrovascular complications and is a priority for AI/AN with diabetes.

Accurate BP measurement in the office is essential for the diagnosis and treatment of elevated BP. Ambulatory and home monitoring should be considered if office readings question the diagnosis or control of hypertension.

> The BP target for adults with diabetes is <130/80 mmHg. Lowering BP to <120/70 mmHg can offer additional protection against kidney disease.

Major lifestyle modifications have been shown to lower BP. These include weight reduction in overweight or obese individuals and adoption of the Dietary Approaches to Stop Hypertension (DASH) eating plan. The DASH eating plan emphasizes consuming foods rich in potassium and calcium, reducing dietary sodium, increasing physical activity, and cutting down on alcohol consumption.

Treatment with two or more anti-hypertensive agents is frequently required to achieve BP targets. Antihypertensive agents are initiated in a step progression and selected based on the patient's coexistent conditions and desired secondary benefits as outlined in JNC VII. ACE inhibitors or ARBs offer kidney protection and improve insulin sensitivity.

Assessment and management of dyslipidemia (References)

At minimum, perform a complete lipid profile annually. This includes total cholesterol, low-density lipoprotein cholesterol (LDL), high-density lipoprotein cholesterol (HDL), and triglycerides. *More frequent testing may be required* to assess therapeutic measures from therapies such as Medical Nutrition Therapy (MNT) and pharmacotherapy.

While a 9–12 hour fasting lipid profile is preferable, it is possible to make reasonable assessments of the lipid status on a non-fasting profile. If the triglycerides are too high to

calculate a reliable LDL, a direct LDL may be ordered; non-fasting status does not affect the *direct* LDL measurement. The calculation of the non-HDL may also be of benefit in therapeutic decision-making (see below). It is sometimes difficult for patients traveling significant distances to come in fasting. We recommend point-of-care testing, if possible, so that timely decisions can be made in regards to therapy.

Lifestyle intervention, including MNT addressing fat and cholesterol intake, increased physical activity, weight loss, and smoking cessation, is indicated for any patient with type 2 diabetes because of the increased risk of CVD, even with "normal" lipid levels. Glycemic control is also important for modifying plasma lipid levels and should be addressed to help reduce hypertriglyceridemia.

Goals for lipid control in patients with type 2 diabetes

	Lipid	Goal
Primary target	**LDL**	<100 mg/dl if no CVD
		<70 mg/dl if CVD
Secondary target	**Triglycerides**	<150 mg/dl
	Non-HDL (Total Cholesterol – HDL)	<130 mg/dl if no CVD
		<100 mg/dl if CVD

Primary target

Although lifestyle modification including MNT is always the foundation of therapy, we recommend pharmacotherapy for patients without known CVD who have not attained the LDL target of 100 mg/dl through lifestyle interventions within three months. HMG–CoA reductase inhibitors (statins) are considered first-line therapy for the primary LDL target, but providers may consider other agents depending on the triglyceride and HDL levels. Consider initiating statin therapy in conjunction *with* lifestyle modification for those with LDL levels >130 mg/dl.

Providers should consider all individuals with diabetes and known CVD for statin therapy regardless of initial LDL levels to achieve a reduction of 30–40%; a goal LDL of 70 mg/dl is an option.

Secondary targets

The **triglyceride** target outlined above is a secondary goal of therapy for dyslipidemia. Optimal use of lifestyle modifications and glycemic control should help reach this goal. In selected patients and especially those at higher risk, combining a fibrate or niacin with a statin may be warranted, although no large-scale clinical outcome trials have evaluated these combinations. For those with near normal LDL levels and known clinical CVD, fibrates are associated with a reduction in CVD events. Therefore, some patients may be appropriate candidates for fibrate or niacin alone, depending on their initial triglycerides, reaction to medications, or other clinical considerations.

Setting goals for **HDL** presents a special challenge. A low HDL should be defined as a level of < 40 mg/dl in both men and women. Although clinical trials suggest that raising HDL will reduce the risk for CVD, effective pharmacologic therapies are limited. Therefore, a specific goal for HDL is not identified by the National Cholesterol Education Program ATP-III guidelines. We support the recommendation that non-drug and drug therapies that raise HDL and are part of management of other lipid and non-lipid risk factors should be part of a lipid management strategy for adults with diabetes.

Non-HDL is an important secondary goal for lipid therapy following successful interventions for LDL level. The non-HDL is a simple calculation of subtracting the HDL from the total cholesterol and represents the total "atherogenic load". This has been validated as a useful tool in identifying CVD risk and can be performed in the non-fasting state. The target, as identified above, is 30 mg/dl higher than the LDL target. Statin therapy to improve CVD risk would be considered first line when addressing the non-HDL.

Monitoring for HMG–CoA reductase inhibitors (statins) therapy

Before initiating statin therapy, you should document baseline measurements, including a liver and lipoprotein profile, which will be used to follow the drug's efficacy and safety. We also recommend a baseline thyroid-stimulating hormone (TSH) measurement since hypothyroidism is a secondary cause of high cholesterol.

Anti-platelet therapy (References)

Aspirin has been used as a primary and secondary prevention strategy to prevent cardiovascular events.

Primary prevention

Aspirin therapy (*or other anti-platelet therapy*) is strongly recommended as a primary prevention strategy for men and women aged 40 and above with diabetes at increased risk for CVD. This includes individuals with a family history of CVD, cigarette smoking, hypertension, obesity, albuminuria, or dyslipidemia.

Secondary prevention

Aspirin therapy at 75–325 mg/day is recommended for adults with diabetes and evidence of large vessel disease, such as a history of myocardial infarction (MI), stroke, peripheral vascular disease, claudication, or angina.

No specific data support an exact dose of aspirin; however, using lower doses decreases the risk of side effects. Combination therapy with medication such as clopidrogel (Plavix) may be considered in patients with severe and progressive CVD.

Other considerations

Providers should consider initiating long-term aspirin therapy in people aged 30–40 who have additional cardiovascular risks. Aspirin therapy is not recommended for patients under the age of 21 due to the increased risk of Reye's syndrome.

Consider using clopidrogel (Plavix) as an alternative to aspirin therapy if the patient has significant gastrointestinal intolerance or a true aspirin allergy. Studies show similar, if not better, efficacy with clopidrogel when compared to aspirin.

Peripheral arterial disease in diabetes (References)

Peripheral arterial disease (PAD), or atherosclerosis affecting the limb, can lead to disabling symptoms of claudication or critical limb ischemia threatening limb viability. Moreover, PAD is a marker of systemic atherosclerosis; as a result, patients are at increased risk for MI, stroke, and death. Risk factors associated with PAD include older age, cigarette smoking, diabetes, hypercholesterolemia, hypertension, and possibly genetic factors.

Initial screening for PAD should include a history for claudication and an assessment of pedal pulses. As many patients with PAD are asymptomatic, an ankle brachial index (ABI) may be considered in the evaluation of suspected PAD. The ABI, a ratio of Doppler-recorded systolic pressures in the lower and upper extremities, is a simple and accurate noninvasive test for the screening and diagnosis of PAD. Both the sensitivity and specificity of ABI less than 0.9 (the accepted cut-off for the presence of PAD) is about 95% for detecting angiographic arterial disease. Data from the Strong Heart Study suggest that the upper limit of normal ABI should not exceed 1.40. Patients with significant or positive ABI should be referred for further vascular assessment; exercise, medications, and surgical options should be considered.

Smoking cessation and lipid-lowering agents improve claudication symptoms and lower extremity functioning among patients with symptomatic PAD. Smoking cessation and physical activity training also increase maximal walking distance among men with early PAD. In the Appropriate Blood Pressure Control in Diabetes (ABCD) Trial, intensive blood pressure control was shown to be effective in reducing the risk of fatal and nonfatal CVD events among adults with diabetes.

4. Lifestyle practices

Anthropometric measurements (References)

In people who have diabetes, overweight and obesity can worsen complications and complicate diabetes management by increasing insulin resistance and raising blood glucose levels. Lifestyle changes are the core components of weight management and are essential for the management of diabetes and its co-morbidities hypertension, dyslipidemia, and CVD. The role of the clinician is to educate, monitor, and support the patient during these processes. All clinical providers should encourage their adults with diabetes to make healthier diet choices.

Regular documentation of weight and height for Body Mass Index (BMI) computation is necessary for meaningful monitoring, support, and encouragement. Following BMI trends over time may identify weight gain issues early. The degree of insulin resistance, the incidence of type 2 diabetes, and the increased risk for CVD are highest in individuals with upper body or abdominal obesity, as manifested by a waist-to-hip circumference ratio that is >0.95 in men and >0.85 in women. Measurement of waist circumference and/or waist-to-hip ratio should be considered as these have also been correlated with increased risk for CVD.

We highly recommend that weight management counseling be a multidisciplinary team approach and include a registered dietitian or a public health nutritionist. Patients who are overweight (BMI 25.0–29.9 kg/m^2) or obese (BMI ≥30 kg/m^2) should be referred to community or clinic based structured programs where weight loss is addressed. Such programs should emphasize goal setting, coaching and motivational interviewing, education and skills development, physical activity, self-monitoring, problem solving, behavioral change, stress and stimulus control, the importance of social support, and the use of community resources.

Medical Nutrition Therapy and nutrition education
(References) (Best practices)

Every person with diabetes should receive individualized MNT at diagnosis and as needed thereafter to achieve treatment goals. MNT for diabetes is delivered by a registered dietitian following nationally-recognized American Dietetic Association protocols. MNT includes individualized assessment, intervention, monitoring, and follow-up of nutrition interventions specific to the management and treatment of diabetes or kidney disease. MNT is intensive nutrition counseling and therapy that relies heavily on follow-up and feedback to change behavior over a period of time. MNT is cost-effective and is a Medicare reimbursable service when provided by a registered dietitian. (The *ADA [American Diabetes Association] Standards of Medical Care in Diabetes—2006* provide specific recommendations for MNT.)

Given the established benefits of MNT, every attempt should be made to provide MNT to all individuals with diabetes. However, the IHS recognizes that certain communities

have limited access to a registered dietitian. When providing other nutrition counseling and education in the absence of a registered dietitian, health care professionals within IHS, tribal, and urban (ITU) programs should convey consistent, culturally relevant messages. This includes the use of traditional foods, social and religious traditions, and family and community customs and beliefs.

Diabetes self-management education (References) (Best practices)

Diabetes self-management education (DSME) is an integral part of diabetes care for all individuals with diabetes who want to achieve successful health-related outcomes. Comprehensive diabetes education helps adults with diabetes initiate effective self-care when they are first diagnosed; on-going DSME helps people maintain effective self-management for the long term.

Health care providers with specialized diabetes training, including registered dietitians, registered nurses, or pharmacists who are certified diabetes educators (CDE), should provide DSME to individuals when their diabetes is first diagnosed and as needed thereafter. In addition, community health workers who have completed specialized training in diabetes are uniquely positioned to collaborate with diabetes educators and other health care providers to improve the quality of diabetes education in their communities.

Providing DSME through programs that meet national standards helps ensure high-quality diabetes care and education. The IHS, through its Integrated Diabetes Education Recognition Program (IDERP), is one of only two organizations that has been approved by the Centers for Medicare and Medicaid Services (CMS) as a national accrediting organization for outpatient DSME services. Accreditation by the IHS IDERP not only acknowledges a program for the quality of its diabetes services, but also allows a program to seek reimbursement of DSME services for eligible Medicare beneficiaries. In addition, accreditation can enhance the marketing of diabetes services to the community and providers, and improve clinical and behavioral outcomes for participating clients.

The *IHS IDERP Standards, Review Criteria, and Application Manual* provides guidelines for education program development with criteria specific for AI/AN health care facilities. The guidelines have been used by ITU health care facilities to guide and improve diabetes education and care.

Physical activity and exercise (References) (Best practices)

The IHS recommendations for physical activity and exercise in this document do not diverge from those of the ADA. The ADA uses the terms “physical activity” and “exercise” interchangeably in the *ADA Standards of Medical Care in Diabetes—2006*. However, the term “aerobic exercise” better describes the type of physical activity emphasized in their recommendations.

Given the often-earlier onset of diabetes and the increased rate of complications in AI/AN populations, the initial medical examination should carefully screen for the presence of macrovascular and microvascular disorders that may worsen as a result of an exercise program. The provider is responsible for:

- Giving medical clearance.
- Providing an exercise prescription based on the medical evaluation.
- Ensuring the patient has the resources and ability to evaluate his or her glycemic response to an exercise session (i.e., SMBG). This may require a referral to a diabetes educator.
- Ensuring the patient can identify and treat hypoglycemic episodes. This may require a referral to DSME or other resource.
- Educating the patient about proper footwear and care, especially when prescribing weight-bearing activities. This responsibility may be referred to another member of the diabetes team.

Referral to resources for supervision by a fitness specialist and for coaching is highly recommended. Many ITU programs have invested *Special Diabetes Program for Indians* (SDPI) grant funds in physical activity services, professionals, and equipment. This has increased patients' access to knowledgeable exercise specialists who can assist in problem solving and provide ongoing support. An individualized exercise program minimizes the risk and maximizes the benefits of exercise by:

- Considering the appropriate type of activity based on interest and indications and contraindications due to the complications of diabetes.
- Prescribing specific guidelines for intensity, duration, and frequency of exercise.
- Teaching proper methods and techniques for performing resistance exercise, a new recommendation by the ADA.

Any increase in physical activity—from daily living, occupational pursuits, structured aerobic exercise or resistance exercise—will add to the overall caloric expenditure that could contribute to weight loss and may have other beneficial effects. The American Heart Association has identified physical inactivity as a major modifiable risk for chronic heart disease. Therefore, providers should encourage any increase in physical activity.

Mental and emotional health: Screening for depression in patients with diabetes (References) (Best practices)

Depression in adults with diabetes has a significant impact on the individual, as well as the health care system. A previous diagnosis of depression doubles the risk for developing diabetes. Adults with diabetes are more likely to experience depression than those without diabetes. Approximately 15–20% of adults with diabetes suffer from depression, as compared with 2–9% of the general population. Specific information on depression in AI/AN with diabetes is limited; however in the Pima Indian population, the

prevalence was documented at 16.3%. Individuals with other chronic diseases in addition to diabetes have greater levels of depression.

In addition, depression is linked to poor glycemic control, poor diabetes self-care, diabetes complications, and higher health care costs. Research shows adults with diabetes who struggle with depression have a significant overall greater risk of mortality than those without depression.

For the person with diabetes and depression, a multidisciplinary approach to care, which may include a behavioral health professional, is beneficial. Timely diagnosis of depression with the initiation of a treatment plan that has a follow-up mechanism (when indicated) is necessary for patients with a positive *screen* for depression.

Depression screening recommendations

Use a screening tool that is simple to administer and assess, such as the Patient Health Questionnaire (PHQ) screening tool. This assesses DSM-IV criteria and is designed for use in the primary care setting. The PHQ-2 is a basic screening tool that asks the following two questions:

"Over the last two weeks, have you been bothered by any of the following problems:

1. Little interest or pleasure in doing things?
2. Feeling down, depressed, or hopeless?"

If the patient responds "yes" to either question, administer the PHQ-9, which asks seven additional questions. Patients who screen positive should receive timely evaluation by a medical provider or behavioral health provider to determine whether the patient meets diagnostic criteria for depression and, if so, to initiate a treatment plan. (See references for further information and a website where you can download the PHQ-9.)

Tobacco (References)

Assessment

Every visit should include an assessment of tobacco use, status and history, and continued reassessment of tobacco status. Providers should systematically document the history of tobacco use for all adolescent and adult individuals with diabetes.

Counseling

All health care providers should advise individuals with diabetes not to initiate tobacco use (e.g., smoking or chew tobacco). This advice should be consistently repeated to prevent smoking and other tobacco use, particularly among children and adolescents with diabetes.

Tobacco users should complete cessation counseling as a routine component of diabetes care. Providers should:

- Use a clear, strong, and personalized manner to urge every tobacco user to quit.
- Describe the added risks of tobacco use and diabetes.
- Ask every tobacco user with diabetes if he or she is willing to quit at the present time. If the patient answers "no", he or she should receive a brief and motivational discussion regarding the need to stop using tobacco and the risks of continued use, as well as encouragement to quit and support when ready. If the patient answers "yes", providers should assess the patient's treatment preference and initiate either minimal, brief, or intensive cessation counseling and offer pharmacological supplements as appropriate.

Systems for delivery of tobacco cessation resources

Diabetes health care providers should consider training in the Public Health Service guidelines regarding tobacco cessation. Providers should also use follow-up procedures designed to assess and promote quitting status for all tobacco users with diabetes.

Alcohol and other substance use (References)

Providers should assess all adults with diabetes for alcohol and other substance use. Providers should also counsel all patients on the appropriate use of alcohol:

- Recommend limiting alcoholic beverage to one serving per day for adult women and two servings per day for adult men. (One serving = a 12 oz beer, 5 oz glass of wine, or 1½ oz distilled spirits [e.g., vodka, whiskey, gin, etc.])
- Advise abstention from alcohol for women during pregnancy and for people with medical problems such as liver disease, pancreatitis, advanced neuropathy, severe hypertriglyceridemia, or alcohol abuse.
- Refer patients with alcohol or substance abuse to the appropriate behavioral health staff or treatment program.

5. Other topics for consideration

Distinguishing type 1 and type 2 diabetes (References)

Distinguishing type 1 diabetes and type 2 diabetes is not always straightforward, yet the distinction can be critical. Type 1 diabetes exists in AI/AN patients and must be considered in patients of any age or weight who present with a new diagnosis of diabetes and an unclear clinical picture. This is especially true in children, even if they are overweight. Some type 1 diabetes variants, such as Latent Autoimmune Diabetes of Adults (LADA), may not require insulin to avoid ketosis in the early stages.

Although no test can definitively distinguish type 1 from type 2 diabetes, several laboratory studies may be helpful when the diagnosis is not clear clinically. Providers should consider obtaining consultation if they are unfamiliar with the use of these tests or how to make a diagnosis in a complex patient. Incorrectly diagnosing type 2 diabetes in a patient who truly has type 1 diabetes can cause considerable problems.

Measurement of endogenous insulin secretion

The results for these tests may be low in type 2 diabetes patients with glucose toxicity. If in doubt, measure after glycemic control has been restored for several weeks:

- Fasting insulin level—if the patient is not on exogenous insulin.
- C-peptide, the other half of pro-insulin. This test is useful even if the patient is taking insulin injections.

Autoantibodies

Positive antibody tests denote an autoimmune process, but negative tests do not rule it out:

- Islet cell antibodies (ICA).
- Glutamic acid decarboxylate antibodies (GADA).
- Other antibody tests have been used in research and some clinical settings (e.g., thyroid peroxidase antibodies, insulin autoantibodies, etc.).

Other lab tests and exams

Gauging the degree of insulin deficiency versus insulin resistance with the following tests can be helpful. Although some overweight type 1 diabetes patients may have some signs of insulin resistance, in general, they will not have the usual type 2 diabetes measurements at diagnosis:

- Lipids: Type 2 diabetes patients have the typical low HDL/high triglyceride pattern.
- Blood pressure: Type 2 diabetes patients often have some degree of hypertension at diabetes diagnosis.

- Ketones: Although patients with type 2 diabetes can have ketonuria and even diabetic ketoacidosis (DKA), generally these only occur at very high glucose levels or with a serious concurrent illness or infection. More often, it is patients with type 1 diabetes who have significant ketonuria and who are more profoundly acidotic with DKA.
- Microvascular complications: Many type 2 diabetes patients already have retinopathy, microproteinuria, or neuropathy at the time of diagnosis, whereas this is almost never true of patients with type 1 diabetes.
- Weight loss: The degree and speed of weight loss before diagnosis is usually more rapid in patients with type 1 than type 2 diabetes.

Pregnancy and diabetes (References) (Best practices)

During the last two generations, diabetes during pregnancy has increased significantly in AI/AN women. Hyperglycemia during pregnancy can be associated with morbidity and mortality for both the mother and her infant. Therefore, management of diabetes in pregnancy offers a unique opportunity to affect both patients' health positively. Currently, women with diabetes and good glycemic control can look forward to pregnancy outcomes that are comparable to that of the general population.

Preconception planning and type 2 diabetes

Pregnancy in women with type 2 diabetes is associated with an increase in risk to both the fetus and the mother. The incidence of congenital anomalies and spontaneous abortions increases during the period of fetal organogenesis in women with poor glycemic control. A woman may not know she is pregnant during fetal organogenesis, which is not complete until eight weeks post-conception. Therefore, preconception counseling and planning are essential in women of childbearing age who have diabetes to optimize their diabetes control before becoming pregnant.

Gestational diabetes

AI/AN women are at increased risk for developing gestational diabetes (GDM), as are women with certain other risk factors, including but not limited to the following:

- Previous GDM.
- Previous fetal macrosomia.
- Unexplained stillbirth.
- Congenital anomaly.
- Obesity.
- Insulin resistance syndrome.
- Polycystic ovarian syndrome.
- Family history of diabetes.

AI/AN women should be screened for pre-existing diabetes early in pregnancy with a 50 gram one-hour OGTT. If early screening is negative, repeat the screen for GDM at 24–28 weeks gestation. The screening can be repeated at 32 weeks in selected cases. A positive screening test should be followed by a 100 gram three-hour OGTT. The IHS guidelines (see references), written by Neil Murphy, MD, at the Alaska

Native Medical Center, give a comprehensive outline on the screening, testing, and management of patients with GDM that is beyond the scope of this document.

Management of glycemic levels during pregnancy

The treatment of diabetes in pregnant women involves several components, including careful and frequent monitoring of blood glucose, the administration of insulin if indicated, and dietary interventions.

Hypoglycemia, a major risk of insulin therapy, can usually be prevented with careful SBGM and education of the mother. Exercise therapy has been shown to be effective in some randomized controlled data in this field.

Women with diabetes who are planning pregnancy or who have become pregnant (i.e., women with pregestational diabetes) should have a comprehensive eye examination and should 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 one year postpartum. Women who develop GDM during pregnancy do not require a comprehensive eye examination during pregnancy due to the short period of exposure to elevated glucose and the low risk of developing diabetic retinopathy.

Postpartum gestational diabetes screening for type 2 diabetes

Women with GDM are at increased risk of developing type 2 diabetes after delivery. About one third of all AI/AN women with GDM will develop diabetes within five years of delivery. These women should be re-tested by a 75 gram two-hour OGTT at least 6–12 weeks post delivery to determine their glycemic status. Women with a normal postpartum OGTT should be re-tested every 1–3 years with a fasting blood glucose. Providers should monitor blood glucose in the postpartum and lactating period as clinically appropriate.

All women with a history of GDM should receive counseling and education regarding lifestyle modifications that will reduce or delay the development of type 2 diabetes. Moreover, the importance of maintaining optimal glucose control prior to and during any subsequent pregnancy should be stressed. Women with a history of diabetes in pregnancy can be offered all standard Food and Drug Administration-approved contraceptive agents.

Mothers should also be made aware that children of GDM pregnancies should be monitored for obesity and abnormalities of glucose utilization.

Cancer screening (References)

The American Cancer Society (ACS) recommends early detection of cancer in average-risk asymptomatic people. As part of comprehensive diabetes care, patients should be offered cancer screening based on national recommendations, family history, and increased risk. Further recommendations and guidelines for cancer screening may be found in the references section.

Cervical cancer

- Pap smear and pelvic exam annually or according to ACS guidelines.

Breast cancer

- Clinical breast examination according to ACS guidelines.
- Counseling to raise awareness of breast cancer symptoms.
- Mammogram every one to two years in women aged 40–49, yearly thereafter.

Prostate cancer

- Digital rectal exam (DRE) and prostate-specific antigen test (PSA) should be offered annually, starting at the age of 50, for men who have a life expectancy of at least 10 more years and a discussion take place about the potential benefits, limitations, and harms associated with testing.

Colorectal cancer

Potential colorectal cancer (CRC) screening options are numerous. However, within the IHS setting, access to care and cost constraints may limit provider options. As a result, the IHS recommends the following:

- Renewed emphasis on CRC screening.
- Improved patient education on CRC screening.
- Fecal occult blood testing (FOBT) (three samples gathered at home) every year if possible; every two years at a minimum starting at the age of 50.
- Appropriate follow-up for positive FOBT results.

Additional screening options if available:

- Flexible sigmoidoscopy every five years starting at the age of 50.
- Annual FOBT plus flexible sigmoidoscopy every five years, starting at the age of 50.
- Double contrast enema every five years, starting at the age of 50.
- Colonoscopy every 10 years, starting at the age of 50.

If the patient is at risk for earlier onset CRC (e.g., first degree relative with onset of CRC before the age of 50), screening should begin earlier and more frequently.

Tuberculosis treatment (References)

A positive purified protein derivative (PPD) skin test (i.e., ≥10 mm induration 48–72 hours after administration) means that a person has either latent tuberculosis infection (LTBI), LTBI that has been treated, or active tuberculosis (TB) disease. Active TB

disease needs to be ruled out prior to starting treatment for patients with LTBI. Treatment for active TB and LTBI are different.

Diabetes and latent tuberculosis

Adults with diabetes and LTBI are at high risk of progressing to active TB if they are not treated for LTBI. Studies have shown that the risk is two to six times greater than in patients without diabetes. Other factors that further increase the risk for TB include:

- Recent PPD conversion within two years.
- Intravenous drug use.
- Chest film showing prior active disease that was never treated.
- Immuno-suppressive drugs.
- Chronic kidney disease (CKD).

Cutaneous anergy increases as patients age and develop complications of diabetes, such as CKD. Anergy may lead to false negative PPD test results.

In most cases, progression of LTBI to active TB can be prevented by treatment with Isoniazid (INH). In general, adults with diabetes who have a positive PPD test (accurately read by a provider trained in interpreting PPD tests) should receive treatment for LTBI, *except* in the following circumstances:

- Severe liver disease.
- Suicidal ideation.
- Adverse reaction to INH.

Providers should follow and monitor patients for potential hepatotoxicity if they are receiving LTBI treatment. National recommendations emphasize monitoring hepatotoxicity through systematic repetitive patient education and clinical evaluation for signs and symptoms of hepatotoxicity. However, providers should also consider liver function tests at baseline and after one month, especially in patients receiving other potentially hepatotoxic medications. Some experts recommend that INH be discontinued if transaminase levels exceed three times the upper limit of normal when associated with symptoms, or exceed five times the upper limit of normal if the patient is asymptomatic.

IHS tuberculosis protocol for adults with diabetes

Check the PPD status of all adults with diabetes. If the PPD status is *negative or unknown*:

- PPD testing should be done within one year of the initial work-up for the diabetes diagnosis; patients should be treated if they have LTBI.
- If no PPD has been *placed* since the diagnosis of diabetes, a PPD status needs to be determined.

- Subsequent PPD testing is done only if there is contact with an active TB case.

If the PPD status is *positive*, check for completion of past treatment for active TB or LTBI (six to nine months of INH for LTBI or multiple drug therapy for active disease).

If the patient has not been adequately treated, search for active disease by history (weight loss, etc.), fever (record temperature), and recent chest x-ray (within six months).

If there is no evidence of active disease, treat all adults with diabetes for LTBI (nine months of INH 300 mg daily), regardless of age, unless the patient has liver disease, suicide ideation, or a previous adverse reaction to INH:

- Adults with diabetes should be given pyridoxine (10–50 mg/day) with their INH.
- Consider directly observed therapy of LTBI when possible, especially for patients on dialysis.

Diabetes neuropathies (References)

Diabetes neuropathies are a heterogeneous group of disorders and present a wide range of abnormalities. They are among the most common long-term complications of diabetes and are a significant source of morbidity and mortality. Proximal and distal peripheral sensory and motor nerves can be affected, as well as the autonomic nervous system. The major morbidity of somatic neuropathy is foot ulceration. Neuropathy increases the risk of amputation 1.7 fold. An in-depth discussion of diabetic neuropathies is beyond the scope of this document.

Anemia (References)

Anemia is a common complication of diabetes. For many adults with diabetes, anemia could occur for several reasons. Anemia of chronic disease is associated with a number of disease states, especially if there is a significant inflammatory component (e.g., individuals with diabetes who also have metabolic syndrome).

Anemia is commonly associated with CKD (as a result of erythropoietin deficiency) and nephropathy. Anemia can be expected in patients with stage 3 CKD. Recent reports suggest that anemia is common in patients with stage 2 CKD and normal serum creatinine. Providers should assess diabetes patients for anemia and, when identified, determine the cause. Appropriate and effective treatment of anemia will decrease morbidity, improve survival, and increase quality of life.

Anemia also aggravates pre-existing CVD.

Nonalcoholic fatty liver disease and nonalcoholic steatohepatitis (References)

Nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH) represent a spectrum of disease from simple fatty liver (steatosis) to steatosis with inflammation, necrosis, and cirrhosis. NAFLD occurs in people who drink little or no alcohol and affects all age groups. NASH represents the more severe end of this spectrum, and it is associated with liver disease that progresses to fibrosis and cirrhosis.

The etiology of NASH and the cellular basis for fat accumulation in the liver is unclear. Most patients with NASH are obese and have associated type 2 diabetes, hypertension, dyslipidemia, and insulin resistance.

The diagnosis is often made during a work-up of persistent AST/ALT elevation. Liver imaging studies with ultrasound or CT scan may show evidence of fat infiltration in the liver. Providers should eliminate other possible causes for chronic liver disease through tests such as viral and autoimmune testing for liver disease. The gold standard diagnostic test is a liver biopsy.

Treatment for both NAFLD and NASH include weight loss, exercise, improved diabetes, and lipid control. Glycemic control medications that reduce insulin resistance, such as metformin and thiazolidinediones (TZD), have been shown to improve serum AST/ALT and liver pathology through increasing insulin sensitivity.

Part 3: References

American Diabetes Association Standards of Medical Care in Diabetes—2006

- ADA *Standards of Medical Care in Diabetes*

1. Visit checklists (Back to the Standards of Care)

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Assessment of glycemic control (Back to the Standards of Care)

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Assessment of chronic kidney disease (Back to the Standards of Care)

IHS Primary Care Provider articles

The *IHS Primary Care Provider* published a series of articles by Andrew Narva and Theresa Kuracina on a primary care approach to patients with chronic kidney disease. The following web links will direct you to the articles:

- CKD is a public health issue (September 2002)
- CKD: Definition and classification (October 2002)
- CKD: Screening and staging (November 2002)
- CKD: Association of GFR level with complications (December 2002)
- Hypertension and CKD (January 2003)
- Anemia and CKD (February 2003)
- Nutrition and CKD (March 2003)
- Bone disease in CKD (April 2003)
- Managing dyslipidemias in CKD (May 2003)
- Functional status, well-being, and CKD (June 2003)
- Preparing “advanced CKD” patients for renal replacement therapy (July 2003)

- FAQs about the GFR (August 2003)
- CKD series: references and resources (September 2003)

- Nephropathy in diabetes

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- IHS Kidney Disease Program

  This outstanding website includes many useful articles, tools, and links.

- IHS Kidney Disease Program: Link to KDOQI Guidelines
- Hypertension, Dialysis, and Clinical Nephrology
- National Kidney Disease Education Program
- National Kidney Foundation

Diabetes eye examination (Back to the Standards of Care)

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- Detecting and grading diabetic retinopathy

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  IHS. *An Oral Health Survey of American Indian and Alaska Native Dental Patients: Findings, Regional Differences, and National Comparisons*. 1999.

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  Saremi A *et al*. Periodontal disease and mortality in type 2 diabetes. *Diabetes Care*. 2005;28:27–32.

3. Cardiovascular disease risk reduction

Assessment and management of blood pressure (Back to the Standards of Care)

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Physical activity and exercise (Back to the Standards of Care)

Galloway JM *et al*. Appropriate exercise prescription for patients with diabetes mellitus. *IHS Prim Care Provid*. 2002;27(11):221–25.

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- American College of Sports Medicine
- CDC Community Guide
- CDC Division of Nutrition and Physical Activity
- Cooper Institute for Aerobics Research
- Exercise and type 2 diabetes

  Albright A *et al*. American College of Sports Medicine position stand: exercise and type 2 diabetes. *Med Sci Sports Exerc*. 2000;32:1345–60.

- Nutrition and physical activity best practice

  IHS. *Indian Health Diabetes Best Practices: Nutrition and Physical Activity*. June 2006.

- Physical activity, exercise, and diabetes

  ADA. Physical activity/exercise and diabetes. *Diabetes Care*. 2004;27(Suppl 1):S58–62.

- Women's Health Council: Women's Health, Diabetes, and Physical Activity

Mental and emotional health: Screening for depression in adults with diabetes

(Back to the Standards of Care)

Patient Health Questionnaire (PHQ)

The following websites provide sample PHQ forms. The PHQ-2 is the first two questions of the PHQ-9.

- http://www.depression-primarycare.org/clinicians/toolkits/materials/forms/phq9/
- http://www.americangeriatrics.org/education/dep_tool_05.pdf

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- Behavioral Diabetes Institute: Addressing Real-Life Aspects of Diabetes
- Depression care and diabetes best practice

  IHS. *Indian Health Diabetes Best Practices: Depression Care and Diabetes*. June 2006.
- Health Disparities Collaboratives

  Health Resources and Services Administration Bureau of Primary Health Care
- MacArthur Initiative on Depression Primary Care
- National Institute of Mental Health: Depression
- Screening for Mental Health, Inc.

Tobacco (Back to the Standards of Care)

- Smoking and diabetes

  ADA. Smoking and diabetes. *Diabetes Care*. 2004;27:S74–75.
- Treating tobacco use and dependence

  DHHS. *Clinical Practice Guideline: Treating Tobacco Use and Dependence*. June 2000.

Alcohol and other substance use (Back to the Standards of Care)

ADA. Evidence-based nutrition principles and recommendations for the treatment and prevention of diabetes and related complications. *Diabetes Care*. 2002;25:148–98.

5. Other topics for consideration

Distinguishing type 1 and type 2 diabetes (Back to the Standards of Care)

Pin-Hamiel O and Zeitler P. The importance of a name. *N Engl J Med*. 1999;34(18):1419–21.

Pregnancy and diabetes (Back to the Standards of Care)

American College of Obstetricians and Gynecologists. Clinical management guidelines for obstetrician-gynecologists. Number 30, September 2001. Gestational diabetes. *Obstet Gynecol*. 2001;98(3):525–38.

American College of Obstetricians and Gynecologists. Clinical management guidelines for obstetrician-gynecologists. Number 60, March 2005. Pregestational diabetes. *Obstet Gynecol*. 2005;105(3):675–85.

Kitzmiller JL *et al.* Preconception care of diabetes, congenital malformations, and spontaneous abortions. *Diabetes Care*. 1996;19:514–41.

- Diabetes and pregnancy best practice

  IHS. *Indian Health Diabetes Best Practices: Diabetes and Pregnancy*. June 2006.

- Gestational diabetes mellitus

  ADA. Gestational diabetes mellitus. *Diabetes Care*. 2004;27(Suppl 1):S88–90.

- IHS Maternal and Child Health Program: Women's Health and Diabetes

- Preconception care of women with diabetes

  ADA. Preconception care of women with diabetes. *Diabetes Care*. January 2004;27(Suppl 1):S76–78.

- Pregnancy screening and management guidelines

  IHS. *Diabetes in Pregnancy Screening and Management Guidelines.*

- Pregnancy screening and diagnosis education

  IHS. *Diabetes in Pregnancy: Screening and Diagnosis Education Module.*

- Pregnancy management, delivery and postpartum education

  IHS. *Diabetes in Pregnancy: Management, Delivery, and Postpartum Education Module*.

Cancer screening (Back to the Standards of Care)

- Guidelines for the early detection of cancer

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Tuberculosis treatment (Back to the Standards of Care)

- CDC Core Curriculum on Tuberculosis

  CDC. *Core Curriculum on Tuberculosis: What the Clinician Should Know*, 4th edition. Atlanta: Centers for Disease Control and Prevention, 2000. This resource provides detailed information on treatment for active tuberculosis.

- Targeted tuberculin testing and treatment

  CDC. Recommendations for targeted tuberculin testing and treatment of LTBI. *MMWR*. 2000;49(RR06):1–54.

Diabetes neuropathies (Back to the Standards of Care)

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Anemia (Back to the Standards of Care)

Afzali B *et al*. Anemia is common in microalbuminuria/early diabetic nephropathy-screening is more effective using estimated glomerular filtration (eGFR) than serum creatinine. *Diabetes*. 2005;54(Suppl 1):A550 (Abstract 2283-PO).

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- Anemia guidelines

  National Kidney Foundation. NKF-K/DOQI clinical practice guidelines for anemia of chronic kidney disease: update 2000. *Am J Kidney Dis*. 2001;37(Suppl 1):S182–238.

Nonalcoholic fatty liver disease and nonalcoholic steatohepatitis

(Back to the Standards of Care)

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Abbreviations

Alanine transferase ..... ALT
American Cancer Society ..... ACS
American Diabetes Association ..... ADA
American Indian and Alaska Native ..... AI/AN
Angiotensin converting enzyme ..... ACE
Angiotensin receptor blocker ..... ARB
Ankle brachial index ..... ABI
Appropriate Blood Control in Diabetes Trial ..... ABCD
Area Diabetes Consultants ..... ADCs
Aspartate transferase ..... AST
Blood pressure ..... BP
Blood urea nitrogen ..... BUN
Body Mass Index ..... BMI
Cardiovascular disease ..... CVD
Casual plasma glucose ..... CPG
Centers for Disease Control and Prevention ..... CDC
Centers for Medicare and Medicaid Services ..... CMS
Certified diabetes educators ..... CDE
Chronic kidney disease ..... CKD
Colorectal cancer ..... CRC
Creatinine kinase ..... CK
Department of Health and Human Services ..... DHHS
Diabetes self-management education ..... DSME
Diabetic ketoacidosis ..... DKA
Diagnostic and Statistical Manual of Mental Disorders, fourth edition ..... DSM-IV
Dietary Approaches to Stop Hypertension ..... DASH
Digital rectal exam ..... DRE
Division of Diabetes Treatment and Prevention ..... DDTP
Fecal occult blood testing ..... FOBT
Gestational diabetes ..... GDM
Glomerular filtration rate ..... GFR
Glutamic acid decarboxylate antibodies ..... GADA

Hepatitis B vaccine ..... HBV

High-density lipoprotein cholesterol ..... HDL

Hypertension ..... HPN

Indian Health Service ..... IHS

Integrated Diabetes Education Recognition Program ..... IHS IDERP

Islet cell antibodies ..... ICA

Isoniazid ..... INH

Indian Health Service, tribal, and urban ..... ITU

Latent autoimmune diabetes of adults ..... LADA

Latent tuberculosis infection ..... LTBI

Low-density lipoprotein cholesterol ..... LDL

Magnetic resonance angiography ..... MRA

Medical Nutrition Therapy ..... MNT

Modification of Diet in Renal Disease Study Group ..... MDRD

Myocardial infarction ..... MI

National Heart, Lung, and Blood Institute ..... NHLBI

National Kidney Foundation ..... NKF

Nonalcoholic fatty liver disease ..... NAFLD

Nonalcoholic steatohepatitis ..... NASH

Oral glucose tolerance test ..... OGTT

Parathyroid hormone ..... PTH

Patient health questionnaire ..... PHQ

Peripheral arterial disease ..... PAD

Prostate-specific antigen test ..... PSA

Purified protein derivative ..... PPD

Resource and Patient Management System ..... RPMS

Self-monitoring blood glucose ..... SMBG

Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure ..... JNC VII

Special Diabetes Program for Indians ..... SDPI

Thiazolidinediones ..... TZD

Thyroid-stimulating hormone ..... TSH

Tuberculosis ..... TB

Urinary albumin to creatinine ratio ..... UACR