Standards of Care and Clinical Practice Recommendations: Type 2 Diabetes

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Introduction

In 1986, the Indian Health Service (IHS) Division of Diabetes Treatment and Prevention (DDTP) produced its first *IHS Standards of Care for Diabetes* (SOC). For more than 25 years, the SOC has been an essential part of individual providers', health care teams', and system-wide efforts to continuously improve the quality of diabetes care in the Indian Health system. As evidenced by the annual IHS *Diabetes Care and Outcomes Audit,* these efforts have led to consistent improvements in diabetes care for American Indian and Alaska Native (AI/AN) people.

With this edition of the *Standards of Care for Diabetes* (SOC), IHS is shifting its approach to publishing the SOC from a static, printed document, updated biennially, to an electronic version, updated regularly to reflect changes in national practice standards. Clinicians who use a print version of the SOC are encouraged to refer back frequently to the DDTP Website for updates.

With the advent of comprehensive, evidence-based diabetes guidelines by major organizations such as the American Diabetes Association (ADA), providers might wonder why IHS continues with these efforts. The answer is that we have a unique population served by unique health care systems whose issues are not always addressed adequately in more generic guidelines.

In developing this revised edition, a major goal is to emphasize the areas of unique importance in the life contexts of AI/AN people and in the care of their diabetes. One particularly notable change over the years has been in the demographics of AI/AN people with diabetes. As diabetes incidence occurs ever earlier in the lifespan, this has two critical implications for the Indian health system:

- First, there are increasing numbers of children, youth, and young adults with type 2 diabetes.
- Secondly, more people develop multiple diabetes complications at relatively young ages and live with them for many more years.

To address these trends, this edition of the SOC has added or enhanced sections on diabetes in youth, on the issues of caring for women of childbearing age, on diabetes in pregnancy, and on the care of patients with multiple comorbid conditions. As in previous versions, the SOC is not intended to be a comprehensive information source for clinical practice. The *Additional Tools and Resources* and *Bibliography* documents include sources clinicians may wish to consult for more in-depth information.

It is also important to acknowledge the relationship between the historical and current environments of AI/AN people that have contributed to the diabetes epidemic in our communities, and to note the science that is helping us to understand this connection. What science once thought was only a matter of genes and lifestyle choices has dramatically expanded to include many factors, including the intergenerational effects of epigenetic markers, in utero exposures, the quality of early life nutrition, adverse childhood experiences, and others. This new understanding has created a much more complete picture of where diabetes in AI/AN people has come from and what propagates it to future generations.

In the absence of this understanding, AI/AN people have often felt blamed for their diabetes, contributing to the sense of fatalism that has permeated some communities. To help reverse this trend and to enhance the quality of diabetes care provided in the Indian health system, providers are encouraged to use the *Standards of Care* in a manner that honors the resilience of AI/AN people and their response to the multiple historical traumas, and to the ongoing challenges that often include poverty, depression, and other chronic stresses, including diabetes.

As AI/AN people continue to revitalize their cultures and languages; to honor their relationships to their children, their elders, and to each other; and to develop resources to better feed and educate their people, they are bringing about the healing of their Nations. And the diabetes that afflicts so many cannot help but be affected.

IHS Key Diabetes Care Online Tools and Resources

The IHS Division of Diabetes Treatment and Prevention Website has a wealth of resources for providers and patients with diabetes. Throughout this document, you will be guided to these resources. http://www.ihs.gov/MedicalPrograms/Diabetes/

Diabetes LEARN Hubs

Linked **E**ducation **a**nd **R**esource **N**etwork (LEARN) is a collection of Web-based resources for specific diabetes topics. Each LEARN Hub includes links to all the materials available on the topic such as trainings, downloadable lectures, podcasts, and mobile 'How To' videos, quick reference cards, clinical algorithms, standards of care, and best practices.
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=Learn

Diabetes Treatment Algorithms

These eight (8) quick reference treatment algorithms for clinicians are based on national guidelines.
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsDTTreatmentAlgorithm

- Glucose Control
- Insulin
- Management of Hyperlipidemias
- Hypertension
- Neuropathy
- Chronic Kidney Disease
- Urine Albumin Screening and Monitoring
- Foot Care

Quick Guide Cards

These seven (7) quick guide cards contain a topic overview, resources for patients and professionals, diabetes programs, and 'How To' short video tutorials.
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsQuickGuides

- Anthropometry
- Glucose Control
- Chronic Kidney Disease
- Communication Skills
- Foot Care
- Physical Activity
- Program Planning and Evaluation

Indian Health Diabetes Best Practices

There are twenty (20) *Indian Health Diabetes Best Practices* documents. Each one provides in-depth information to aid clinicians and programs seeking to improve the care they provide in a particular diabetes topic area.
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsBPList

Table 1. IHS Standards of Care for Type 2 Diabetes Summary

Component	Care/Test/Screening	Frequency ("At diagnosis"=when ***diabetes*** is diagnosed)
General Recommendations for Care	Perform diabetes-focused visit Review care plan: assess goals/strengths/barriers Assess nutrition, physical activity, BMI, and growth in youth	Every 3-6 months Each diabetes visit, revise as needed Each diabetes visit
Self-Management Education (DSME)	Refer to diabetes educator	At diagnosis, then every 6-12 mo., or more as needed
Medical Nutrition Therapy (MNT)	Refer for MNT provided by a registered dietitian	At diagnosis and at least yearly, or more as needed
Glycemic Control	Check A1C, individualize goal: e.g., < 7%, 7-8%, 8-9%, etc. Review goals, medications, side effects If prescribed, review SMBG data	Every 3-6 months Every diabetes visit Every diabetes visit
CVD Risk Reduction	Prescribe statin with lifestyle therapy regardless of LDL level Check lipid profile Total cholesterol < 200 mg/dL Triglycerides < 150 mg/dL Non-HDL cholesterol < 130 mg/dL, < 100 mg/dL (for very high risk) LDL < 100 mg/dL (optimal goal), LDL < 70 mg/dL (for very high risk) Assess smoking/oral tobacco use Aspirin therapy 75-162 mg/day (unless contraindicated)	Adults with CVD; age > 40 y. with ≥ 1 CVD risk factor Annually. If abnormal, follow current NCEP guidelines. Each visit: Ask, Advise, Assess, Assist, Arrange Known CVD/PAD; 10-year CVD Risk > 10%
Blood Pressure	Check blood pressure Individualize goal: e.g., < 130/80 mmHg, < 140/90 mmHg Youth goal: Varies with age	Every visit
Kidney Care	Check urine albumin/creatinine ratio (UACR) for albuminuria using a random urine sample (normal < 30 mg/g; micro 30-300 mg/g; macro > 300 mg/g) Check serum creatinine and estimate GFR If HTN, prescribe ACE Inhibitor or ARB unless contraindicated	At diagnosis, then annually At diagnosis, then annually
Eye Care	Retinal camera photo or dilated eye exam by an ophthalmologist or optometrist	At diagnosis, then annually; or as directed by eye specialist
Foot Care	Visual inspection of feet with shoes and socks off Perform comprehensive lower extremity/foot exam Screen for PAD (consider ABI)	Each diabetes visit; stress daily self-exam At diagnosis, then annually At diagnosis, then annually
Oral Care	Inspection of gums/teeth Dental exam by dental professional	At diagnosis, then at diabetes visits At diagnosis, then every 6 -12 months
Autonomic Neuropathy	Assess CV symptoms; resting tachycardia, exercise intolerance, orthostatic hypotension Assess GI symptoms; gastroparesis, constipation, diarrhea Assess sexual health/function for men and women	At diagnosis, then annually At diagnosis, then annually At diagnosis, then annually
Emotional Health	Assess emotional health; screen for depression, substance abuse	At diagnosis, then annually
Immunizations	Influenza vaccine Pneumococcal vaccine Hepatitis B immunization	Annually Once < 65 y. Re-immunize if ≥65 y. and 1st dose given before age 65 and if vaccine was administered > 5 y. prior. Unvaccinated adults < 60 y.
Preconception, Pregnancy, and Postpartum Care	Ask about reproductive intentions/assess contraception Provide preconception counseling Screen for undiagnosed type 2 diabetes Screen for GDM in all women not known to have diabetes Screen for type 2 diabetes in women who had GDM	At diagnosis, and then every visit 3-4 months prior to conception At first prenatal visit At 24-28 weeks gestation At 6-12 weeks postpartum, then every 1-3 y. lifelong

Adapted with permission from Wisconsin Diabetes Mellitus Essential Care Guidelines. (2011). Quick Reference: 2011 Wisconsin Diabetes Guidelines at a Glance (DHS Publication No. P-49356 Rev.03/2011). Madison, WI: Wisconsin Department of Health Services, Division of Public Health.

Diagnosis of Type 2 Diabetes and Prediabetes

Diagnostic Criteria for Type 2 Diabetes

Recommendations for Diagnosing Type 2 Diabetes

- Use the criteria below to diagnose type 2 diabetes in non-pregnant patients:
  - Hemoglobin A1C (A1C) ≥ 6.5%; or
  - Fasting plasma glucose (FPG) ≥ 126 mg/dL, where FPG is defined as no caloric intake for at least 8 hours; or
  - 2-hour oral glucose tolerance test (OGTT) ≥ 200 mg/dL; or
  - Casual plasma glucose ≥ 200 mg/dL with symptoms of hyperglycemia, where "casual" is defined as any time of day without regard to time of last meal.
- In the absence of unequivocal hyperglycemia, confirm a positive result by repeat testing on a different day.

→ **Note:** While it is acceptable to **screen** for diabetes using a point-of-care (POC) capillary A1C and/or glucose, diabetes should only be **diagnosed** using laboratory-run tests. In addition, the A1C test alone may be less accurate when used to diagnose diabetes in youth.

Categories of Increased Risk for Diabetes (Prediabetes)

Recommendation for Identifying Patients at Increased Risk

- Use the following criteria to identify patients at increased risk for diabetes:
  - Impaired fasting glucose (IFG) defined as FPG 100-125 mg/dL, **or**
  - Impaired glucose tolerance (IGT) defined as 2-hour OGTT 140-199 mg/dL, **or**
  - A1C 5.7-6.4%.

Patients whose blood glucose levels are higher than normal but not high enough to be considered diabetes may be at increased risk for developing diabetes. Patients with impaired fasting glucose or impaired glucose tolerance have been referred to as having "prediabetes." Providers are encouraged to identify patients at increased risk for diabetes so they can start or intensify efforts to prevent progression to diabetes. Diabetes prevention programs for these patients are available throughout AI/AN communities.

→ **Note:** The A1C criterion of 5.7-6.4% is used by the American Diabetes Association (ADA). However, other standard-setting diabetes organizations do not recommend using the A1C test alone to identify increased risk for diabetes.

Testing for Diabetes/Prediabetes in Non-pregnant Asymptomatic AI/AN People

Recommendations for Testing for Diabetes/Prediabetes in AI/AN Adults

- Test AI/AN adults at least every 3 years.
- Consider testing more frequently in patients with additional risk factors, including:
  - Overweight/obese (Body Mass Index [BMI] ≥ 25 kg/m2)
  - Family history of type 2 diabetes in first degree relative
  - History of gestational diabetes (GDM) or delivery of a baby weighing > 9 pounds
  - Polycystic ovarian syndrome (PCOS)
  - Cardiovascular disease (CVD)
  - Hypertension
  - HDL cholesterol < 35 mg/dL and/or triglycerides > 250 mg/dL
  - *Acanthosis nigricans.*

Recommendations for Testing for Diabetes/Prediabetes in AI/AN Youth

- Test overweight AI/AN youth (BMI > 85th percentile) with **any** of the following risk factors:
  - Family history of diabetes
  - Signs of insulin resistance or conditions associated with it [e.g., *acanthosis nigricans,* polycycstic ovarian syndrome (PCOS), hypertension, dyslipidemia, small-for-gestational-age (SGA), or large-for-gestational-age (LGA) birth weight]
  - Maternal history of diabetes or gestational diabetes during child's gestation.
- Start testing at-risk children at age 10 years (or younger if puberty occurs earlier).
- Test at-risk children ≤ every 3 years.

→ **Note:** In patients who present with hyperglycemic symptoms, testing for diabetes is warranted regardless of risk factors listed above.

Glycemic Control

Assessment of Glycemic Control

Recommendations for Assessment of Glycemic Control

- Perform A1C testing every 3 to 6 months in "stable" patients to monitor progress toward clinical targets and facilitate therapeutic decision-making:
    - A1C testing may be repeated as soon as 1 month later to assess response to initiation or a change in therapy.
- In patients with hemoglobinopathies or increased red cell turnover, (e.g., dialysis), consider using an alternative measure of glycemia (e.g., fructosamine) since A1C is less reliable in these patients.

A1C Testing

A1C is a "weighted" measure of glycemic control over the preceding 120 days. The more recent days contribute a greater percentage to the measure than the distant days. Specifically, the mean level of blood glucose in the 30 days immediately preceding the test contributes approximately 50% of the final result.

Estimated Average Glucose (eAG)

The A1C test has been used to assess long-term management of diabetes for over a decade and many patients with diabetes are now familiar with it. However, because A1C is expressed as a percentage, it has been difficult for some patients to understand its significance and to relate their A1C number to other important diabetes measurements such as blood glucose expressed in mg/dL.

Health care providers can report A1C results to patients using eAG (estimated average glucose). The eAG uses the same units (mg/dL) that are used in home blood glucose measurements. For some patients, the eAG may be easier to understand than the A1C, and useful when discussing patients' glucose goals and results.

Table 2, below, shows the relationship between A1C and eAG. A calculator for converting A1C results into eAG, in either mg/dL or mmol/L, is available at: http://professional.diabetes.org/eAG.

Table 2. Correlation of A1C and Estimated Average Glucose (eAG) Results

A1C %	eAG mg/dL
6	126
7	154
8	183
9	212
10	240
11	269
12	298

Source: ADA Standards of Medical Care in Diabetes—2011, p. S18.

Some laboratories report eAG whenever an A1C is ordered. Providers at sites that do not receive the eAG in lab reports can use conversion estimates such as those provided in Table 2.

Glycemic goals can be set using eAG since it may be easier for patients to assess whether goals are being reached every day when blood glucose is tested at home. The conversion table may help some patients make the connection between daily and long-term glucose control.

Self-Monitoring of Blood Glucose (SMBG)

Recommendations for Self-Monitoring of Blood Glucose

- All insulin-treated patients should perform SMBG. If on multiple daily injections or an insulin pump, SMBG should be performed ≥ 3 times/day.
- The decision as to whether and how often to prescribe SMBG in non-insulin treated patients should be **individualized**. Providers are encouraged to consider SMBG when needed, such as when medication therapy is initiated or changed, in patients with any indication that their diabetes control is not stable (e.g., recent history of hypoglycemia), or in medically complex patients on multiple glucose-lowering medications.
- Prescribe the SMBG schedule so as to collect the information needed to adjust a patient's meal plan and medications, particularly insulin (e.g., check pre-supper values to see if the morning NPH insulin dose needs to be adjusted).
- Instruct patients clearly as to when and how often to check their blood glucose, and what to do with the results.

- Review SMBG data and A1C results with the patient at each diabetes visit, and take them into consideration when making therapeutic management decisions.

People with diabetes perform SMBG as a tool to help improve glycemic control. Since SMBG is expensive and can be burdensome for patients, research has been conducted to see if its effectiveness is worth its cost and inconvenience. The result has been general agreement that SMBG should be recommended for all insulin-treated patients with diabetes. The data are less clear, however, in patients treated with oral agents, and it is not known whether SMBG is useful in patients treated with diet alone.

Patients need hands-on instruction in how to use their glucose meter, including quality control. Training is more effective when patients are asked to demonstrate the correct procedure for checking blood glucose at the time of initial SMBG training, whenever they receive a new monitor, and periodically, to ensure they are still performing it correctly.

Setting Glycemic Control Goals

Recommendations for Setting Glycemic Control Goals

- In general, the A1C goal is < 7%. Consider:
  - **More stringent goals** (e.g., < 6.5-7%) for younger, healthier patients
  - **Less stringent goals** (e.g., < 7-8%, 8-9%) for those with increased risks with tight control (see Veterans Administration/Department of Defense [VA/DoD] guidelines in Table 3 on page 15).

- The patient and provider discuss and agree on a specific target range of glycemic control after discussing the risks and benefits of therapy.

Benefits of Tight Glycemic Control

There is strong research evidence for the benefits of tight glucose control **early** in the course of diabetes. In the United Kingdom Prospective Diabetes Study (UKPDS), each 1% reduction in mean A1C was associated with reductions in risk of 21% for any end point related to diabetes, 21% for deaths related to diabetes, 14% for myocardial infarction, and 37% for microvascular complications.

In a 10-year follow-up of the more than 5,000 newly diagnosed people with diabetes who had been enrolled in the UKPDS, significantly greater risk reductions in microvascular disease, myocardial infarction, and mortality were noted in the intensive therapy group than in the conventional therapy group. These results were observed even though there were no longer differences in glycemic control soon after the main study ended. This finding has been referred to as a "legacy effect," providing credible evidence for the importance of intensive therapy early in the course of diabetes to help reduce the risk of complications later in the patient's life.

Risks of Tight Glycemic Control

While intensive glycemic control in newly diagnosed patients is beneficial, tight control in the general diabetes population has not demonstrated the same benefits. Clinical trials, including Action to Control Cardiovascular Risk in Diabetes (ACCORD), Action in Diabetes and Vascular Disease: Preterax and Diamicron MR Controlled Evaluation (ADVANCE), and Veterans Affairs Diabetes Trial (VADT), have shown that the risks of tight glycemic control include severe hypoglycemia and increased mortality. Further, a recent meta-analysis concluded that intensive glycemic control does not significantly reduce risk for all-cause or cardiovascular mortality, non-fatal myocardial infarction, composite microvascular complications, or retinopathy.

→ **Note:** While the risks of intensive control outweigh the benefits for many patients, it is still important to achieve individualized glucose targets and to avoid poor glycemic control.

Individualizing Glycemic Control Targets

Given the risks and lack of benefits of intensive control for many people with diabetes, the *ADA Standards of Medical Care in Diabetes—2011* (p. S19) recommends that:

> "…less stringent A1C goals may be appropriate for patients with a history of severe hypoglycemia, limited life expectancy, advanced microvascular or macrovascular complications, extensive comorbid conditions, and those with longstanding diabetes in whom the general goal is difficult to attain despite DSME [Diabetes Self-Management Education], appropriate glucose monitoring, and effective doses of multiple glucose-lowering agents including insulin."

One approach for individualizing glycemic control targets is to use **target ranges** rather than single targets. As shown in Table 3, the Veterans Administration/Department of Defense (VA/DoD) Diabetes Practice Guidelines Working Group recommends these target ranges: from < 7%, 7-8%, and 8-9%.

Using ranges allows for the flexibility needed for patient safety. In addition, ranges are used because they better account for the limitations of A1C testing accuracy, particularly in some Clinical Laboratory Improvement Amendments (CLIA)-waived testing methods (e.g., point-of-care tests) that cannot reliably detect small changes in A1C. This may result in overestimation of A1C with consequent unwarranted intensification of therapy resulting in an increased likelihood of hypoglycemia.

Table 3. A1C Target Recommendations, VA/DoD Diabetes Practice Guidelines, 2010

Major Comorbidity *a* or Physiologic Age	Microvascular Complications: Absent or Mild *b*	Microvascular Complications: Moderate *c*	Microvascular Complications: Advanced *d*
Absent > 10 years of life expectancy	< 7	< 8	8-9 *e*
Present *f* 5-10 years of life expectancy	< 8	< 8	8-9 *e*
Marked *g* < 5 years of life expectancy	8-9 *e*	8-9 *e*	8-9 *e*

Source: VA/DoD Clinical Practice Guideline for the Management of Diabetes Mellitus, 2010. http://www.healthquality.va.gov/diabetes/DM2010_FUL-v4e.pdf

Footnotes for Table 3:

a. Major comorbidity includes, but is not limited to, any or several of the following active conditions: significant cardiovascular disease, severe chronic kidney disease, severe chronic obstructive pulmonary disease, severe chronic liver disease, recent stroke, and life-threatening malignancy.

b. Mild microvascular disease is defined by early background retinopathy, and/or microalbuminuria, and/or mild neuropathy.

c. Moderate microvascular disease is defined by preproliferative (without severe hemorrhage, intraretinal microvascular anomalies [IRMA], or venous bleeding) retinopathy, or persistent, fixed proteinuria (macroalbuminuria), and/or demonstrable peripheral neuropathy (sensory loss).

d. Advanced microvascular disease is defined by severe nonproliferative (with severe hemorrhage, IRMA, or venous bleeding) or proliferative retinopathy, and/or renal insufficiency (serum creatinine level, > 2.0 mg/dL), and/or insensate extremities or autonomic neuropathy (for example, gastroparesis, impaired sweating, or orthostatic hypotension).

e. Further reductions may be appropriate, balancing safety and tolerability of therapy.

f. Major comorbidity is present, but is not end-stage and management is achievable.

g. Major comorbidity is present and either is end-stage or management is significantly challenging.

Performance Indicators, Standards of Care, and Individualized Targets

It is important that providers distinguish between performance indicators, standards of care, and the need to individualize patient goals.

- **Performance indicators** such as the Government Performance and Results Act (GPRA) are established by a government agency or other official entity to evaluate the clinical performance of providers. These indicators compare clinical measures (e.g., A1C or blood pressure) of patient panels against a benchmark.
- **Standards of care** refer to clinical goals set by professional organizations (e.g., ADA) based on the best science available at the time. The standards of care set the goals for patients, in general, as well as the standards by which clinical care should be judged.

→ **Note:** However, neither performance indicators nor standards of care should be understood to dictate the clinical goals for a particular patient, especially those whose medical conditions make achieving such goals unwise or even unsafe.

Treatment for Achieving Glycemic Control Targets

As with setting glycemic control targets, treatment plans for achieving targets must be individualized for each patient. In general, recommended first line therapy upon diagnosis includes lifestyle therapy and metformin. For guidance on treatment decisions, please see the *Indian Health Type 2 Diabetes Algorithm Card* and the consensus statement by Nathan et al. listed below.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Glucose Management Hub. Includes CME/CE online training, Quick Guide Cards, Treatment Algorithms, educational materials, best practices, and podcasts. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=learn_gm

Nathan DM, et al. Medical Management of Hyperglycemia in Type 2 Diabetes: A Consensus Algorithm for the Initiation and Adjustment of Therapy: A Consensus Statement of the American Diabetes Association and the European Association for the Study of Diabetes. Diabetes Care. 2009;32(1):193-203. http://care.diabetesjournals.org/content/29/8/1963.full.pdf+html

Lifestyle Therapy

Diabetes Self-Management Education (DSME)

Recommendations for Diabetes Self-Management Education

- Ensure that every person with diabetes receives individualized DSME at diagnosis and as needed thereafter to achieve treatment goals:
  - Deliver high quality DSME that meets *National Standards for Diabetes Self-Management Education:* http://care.diabetesjournals.org/content/30/6/1630.full
  - Provide DSME that focuses on one or more of the seven domains for diabetes self-management, as defined by the American Association of Diabetes Educators: healthy eating, being active, blood glucose monitoring, taking medications, risk reduction, healthy coping, and problem solving.

Diabetes self-management education (DSME) is an integral part of diabetes care to help patients achieve glycemic control and successful outcomes. DSME provides knowledge and builds skills and abilities needed for effective self-care through informed decision making, problem solving, and collaboration with the health care team. The goal of DSME is to improve clinical outcomes, health status, and quality of life for people with diabetes. Ongoing self-management support from the diabetes care team helps individuals sustain behavioral changes as they confront challenges due to aging, lifestyle changes, and progression of the disease process.

DSME services may be offered through a formal education program or through brief encounters that focus on the individual needs of the patient and/or family member/caregiver. The diabetes care team and the patient use the DSME process to assess needs, set self-management goals, develop an action plan, and foster active participation in health care decisions. DSME is a Medicare-reimbursable service when provided by an accredited program.

DSME programs are available in many AI/AN communities. Many of these programs use a comprehensive, AI/AN-specific DSME curriculum, *Balancing Your Life and Diabetes:* http://www.ihs.gov/MedicalPrograms/Diabetes/RESOURCES/Catalog/rde/index.cfm?module=catalog&opt=3

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice Diabetes Self-Management Education (DSME) and Support, 2011. http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/2011_BP_DSME_508c.pdf

American Association of Diabetes Educators. Setting Goals for AADE7 Self-Care Behaviors. 2011. http://www.diabetesselfcare.org/downloads/Handout_Goals.pdf

Medical Nutrition Therapy (MNT)

Recommendations for Medical Nutrition Therapy

- Refer every person with diabetes/prediabetes to a registered dietitian (RD), whenever possible, for individualized MNT at diagnosis and as needed thereafter to achieve treatment goals.
- Lifestyle counseling by all clinicians needs to include these core messages: implement dietary modifications that reduce intakes of calories, saturated and trans fatty acids, and sodium, and increase physical activity to improve glycemia, dyslipidemia, and blood pressure.
- Evaluate patients for food insecurity and accessibility and affordability of nutritious foods available to them; refer them as needed to food resources available in the community.

MNT includes individualized assessment, intervention, monitoring, and follow-up of nutrition interventions specific to the management and treatment of diabetes, other diseases, and other health conditions. Delivered by a RD who uses nationally recognized American Dietetic Association protocols, MNT involves intensive nutrition counseling and therapy that relies heavily on follow-up and feedback to change behavior over a period of time.

There is good evidence that MNT is effective at any time in the disease process, but it appears to have its greatest effect in lowering A1C at initial diagnosis. MNT also has been shown to be cost-effective and is a Medicare-reimbursable service when provided by a RD.

A major factor that prevents many people with diabetes from adhering to MNT approaches is food insecurity. Nearly half of all households below the poverty level in the U.S. are food insecure, including AI/AN, who are overrepresented among low-income families. Food insecurity means these families are at risk of going hungry because of an inability to find or afford adequate food. In terms of diabetes, food insecurity creates a major barrier to managing and preventing diabetes effectively, and contributes to health disparities and disease burden.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice—Nutrition for Diabetes Prevention and Care, 2011.
http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/2011_BP_Nutrition_508c.pdf

Balancing Your Food Choices: Nutrition and Diabetes (Supplement to Balancing Your Life and Diabetes Curriculum)
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsCurricula

American Diabetes Association. Nutrition Recommendations and Interventions for Diabetes: A Position Statement of the American Diabetes Association. Diabetes Care. 2008 Jan;31 Suppl 1:S61-78. http://care.diabetesjournals.org/content/31/Supplement_1/S61.extract

Physical Activity

Recommendations for Physical Activity

- Document patients' level of physical activity at diabetes visits and encourage individuals to set behavioral goals to begin or increase physical activity.
- Assess patients for medical conditions that might affect the type, frequency, and intensity of physical activity in which they engage:
    - Some patients may require screening and additional testing before starting a physical activity program. See the American College of Sports Medicine (ACSM) *Guidelines for Exercise Testing and Prescription:* http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/QuickGuides/Exer_ECG_Flowchart_508c.pdf
- When available, referral to a fitness specialist for supervision and coaching is highly recommended. There are fitness specialists and programs available in many AI/AN communities.

Physical activity is important for achieving glycemic control goals, and it is a core component of diabetes self-management. Physical activity improves strength and endurance, improves insulin action, lowers blood glucose levels, improves body mass index, and reduces depression. Any increase in physical activity – from daily living, occupational pursuits, and structured aerobic or resistance exercise – is beneficial for patients.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Physical Activity and Diabetes Hub. Includes CME/CE online, quick guide cards, educational materials, best practices, and podcasts. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=learn_pa

IHS Health Promotion/Disease Prevention and University of New Mexico. Physical Activity Kit (PAK): Staying on the Active Path in Native Communities…A Lifestyle Approach! This comprehensive audiovisual toolkit promotes age-appropriate physical activities across the lifespan of AI/AN people. http://www.ihs.gov/hpdp/index.cfm?module=dsp_hpdp_resources_physicalactivitykit

The American College of Sports Medicine and the American Diabetes Association. Joint Position Statement: Exercise and Type 2 Diabetes. Diabetes Care. 2010 Dec;33(12):2692–6.

University of Washington Health Promotion Research Center. Rapid Assessment of Physical Activity (RAPA). 2006. The RAPA questionnaire enables clinicians to rapidly assess the level of physical activity of older adult patients. http://depts.washington.edu/hprc/rapa/

Weight Management, Overweight, and Obesity

Recommendations for Weight Management, Overweight, and Obesity

- Assess weight and Body Mass Index (BMI) at diabetes visits.
- Refer patients who are overweight (BMI 25.0-29.9 kg/m2) or obese (BMI ≥ 30 kg/m2) to structured community-based or clinic-based weight loss programs that 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.
- Provide weight management counseling by a multidisciplinary team.
- Providers may consider whether to discuss the option of bariatric surgery with diabetes patients who have a BMI ≥ 35 kg/m2, particularly when lifestyle therapy and pharmacotherapy fail to control diabetes or other comorbid conditions:
    - Ongoing lifestyle support and medical monitoring after surgery are needed for people with diabetes who undergo bariatric surgery.

Obesity and overweight, increasingly prevalent risk factors among AI/AN with diabetes, increase insulin resistance, and raise blood glucose levels. In turn, they exacerbate diabetes complications and make diabetes management more complex. Therapeutic lifestyle changes designed to achieve weight loss are the core components of weight management counseling, and are essential for managing diabetes and its comorbidities. See Table 4 for classification of weight and BMI.

Table 4. Classification of Weight and Body Mass Index (BMI)

Classification	BMI
Underweight	< 18.4 kg/m2
Normal	18.5-24.9 kg/m2
Overweight	25-29.9 kg/m2
Obesity (Class 1)	30-34.9 kg/m2
Obesity (Class 2)	35-39.9 kg/m2
Extreme Obesity (Class 3)	> 40 kg/m2

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice—Adult Weight and Cardiometabolic Risk Management, 2011. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsBestPractices

Quick Guide Card – Anthropometry. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsAnthroQuickGuides

IHS. Healthy Weight for Life: A Vision for Healthy Weight Across the Lifespan of American Indians and Alaska Natives. 2011.

- Actions for Health Care Teams and Leaders. http://www.ihs.gov/healthyweight/index.cfm?module=dsp_hw_teams
- Actions for Communities, Individuals, and Families. http://www.ihs.gov/healthyweight/documents/HW4L_Communities.pdf
- Healthy Weight for Life Website. http://www.ihs.gov/healthyweight/

American Diabetes Association. Nutrition Recommendations and Interventions for Diabetes: A Position Statement of the American Diabetes Association. Diabetes Care. 2008 Jan;31 Suppl 1:S61-78. http://care.diabetesjournals.org/content/31/Supplement_1/S61.extract

Tobacco Use

Recommendations for Tobacco Screening and Cessation

- Screen for non-ceremonial tobacco use (i.e., cigarette smoking and oral tobacco) at least annually and inquire periodically as to exposure to secondhand smoke.
- Ask tobacco users at every diabetes visit about their willingness to quit, provide counseling, and offer tobacco dependence treatment.

Tobacco use rates among AI/AN people are the highest of any racial/ethnic group in the U.S., with 36% of adults, 18% of pregnant women, and 23% of youth reporting cigarette smoking in 2008. Tobacco use increases the already elevated risk of cardiovascular and microvascular complications in people with diabetes. Research shows that a brief tobacco dependence treatment intervention delivered by one provider can increase quit rates by as much as 80%.

Tools and Resources

Tobacco Use and Dependence Guidance Panel. U.S. Department of Health and Human Services. Rockville (MD). 2008.

- Helping Smokers Quit: A Guide for Clinicians. 2008. http://www.ahrq.gov/clinic/tobacco/clinhlpsmksqt.pdf
- Quick Reference Guide for Clinicians. 2009. http://www.ahrq.gov/clinic/tobacco/tobaqrg.htm
- Treating Tobacco Use and Dependence: 2008 Update. Clinical Practice Guideline. http://www.tcln.org/cessation/pdfs/treating_tobacco_use08.pdf

University of Arizona HealthCare Partnership.

- Basic Tobacco Intervention Skills Certification for Medical and Allied Health Professionals. http://bandura.sbs.arizona.edu/hcp/hcp_medicalandalliedhealthprofessionals.htm
- Basic Tobacco Intervention Skills Certification for Native Communities. Tobacco Dependence Treatment Continuing Education Programs. 2009. http://bandura.sbs.arizona.edu/hcp/hcp_NativeAmericanBasicSkills.htm

U.S. Department of Health and Human Services. How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion. Office on Smoking and Health. 2010. http://www.surgeongeneral.gov/library/tobaccosmoke/index.html

Mental Health

Depression

Recommendations for Depression Screening and Follow-up

- Perform annual screening for depression in patients with diabetes.
- Investigate positive screening results with the patient.
- If depression is diagnosed, develop a treatment plan that includes appropriate monitoring and follow-up.

Depression is closely intertwined with type 2 diabetes, and the association between the two conditions is “bidirectional” – the presence of one increases the risk that the other will develop. Individuals with depression are at increased risk of developing diabetes, and as many as one-third of patients with diabetes will develop depression at some point. In the 2006 Behavioral Risk Factor Surveillance System (BRFSS), the overall rate of depression in people with diabetes was 8.3% but in American Indians and Alaska Natives (AI/ANs) it was 27.8%.

Depression not only affects patient self-management tasks such as medication adherence or lifestyle behaviors, but it also affects patient outcomes. Major depression is associated with a 25% increased risk of macrovascular complications and a 36% increased risk of microvascular complications in patients with type 2 diabetes. In a study of AI/AN patients with both diabetes and depression, A1C levels were found to be 1.2% higher (9.3% versus 8.1%).

Depression care involves providing support, screening, and interventions to improve a person's emotional well-being. Effective treatment of depression and diabetes has been shown to improve both conditions as well as quality of life and a number of functional outcomes.

To screen for depression, use a screening tool that is simple to administer and assess such as the *Patient Health Questionnaire (PHQ-9).* Other screening tools may be used, however, the PHQ-9 has been validated in many populations, is relatively short and simple to use, and is designed for use in the primary care setting.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice—Depression Care, 2011.
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsBestPractices

The MacArthur Initiative on Depression and Primary Care. Patient Health Questionnaire (PHQ-9).
http://www.depression-primarycare.org/clinicians/toolkits/materials/forms/phq9/

National Diabetes Education Program. Living a Balanced Life with Diabetes: A Toolkit Addressing Psychosocial Issues for American Indian and Alaska Native Peoples. Centers for Disease Control and Prevention and National Institutes of Health (to be available in 2012).

Alcohol and Other Substance Use

Recommendations for Alcohol and Other Substance Use

- Screen for use of alcohol and other substances periodically. Utilize motivational interviewing when appropriate.
- Be alert for behaviors, symptoms, signs, and laboratory test results suggestive of substance abuse.
- Refer patients for behavioral health care and substance abuse treatment as appropriate.

- Counsel patients on the appropriate use of alcohol:
  - Recognize and support that some AI/AN people and communities have chosen to be alcohol-free;
  - Advise abstention from alcohol for women planning a pregnancy and during pregnancy, and for people with medical problems such as liver disease, pancreatitis, advanced neuropathy, severe hypertriglyceridemia, or alcohol abuse;
  - For those who choose to use alcohol, recommend limiting alcoholic beverages to 1 serving per day for adult women and 2 servings per day for adult men. (1 serving = 12 oz. beer, 5 oz. glass of wine, or 1.5 oz. distilled spirits [e.g., vodka, whiskey, gin, etc.]).
- For patients unwilling or unable to limit/abstain from alcohol or substance use, adjust medication choices and dosing schedules to minimize patient safety risks.

Rates of alcohol-related deaths in AI/ANs were 519% higher than the rate for U.S. all races from 2003-2005. AI/AN people are more likely than any other racial group to have either an alcohol or drug abuse disorder in the past year. Substance abuse disorders frequently coexist with and complicate the course of diabetes.

The toll these conditions take on AI/AN people, their families, and their communities is significant. Yet, while the risk of substance abuse is high, so is the rate of remission in AI/AN people.

Tools and Resources

IHS. Office of Clinical and Preventive Services. Emergency Services. Alcohol Screening and Brief Intervention (ASBI) Program Implementation and Operations Manual. IHS. 2008. http://www.ihs.gov/nonmedicalprograms/nc4/index.cfm?module=asbi

National Institute on Alcohol Abuse and Alcoholism (NIAAA).

- Helping Patients Who Drink Too Much: A Clinician's Guide. NIH Publication No. 07–3769. 2007. http://pubs.niaaa.nih.gov/publications/Practitioner/CliniciansGuide2005/guide.pdf
- Pocket Guide for Alcohol Screening and Brief Intervention. http://pubs.niaaa.nih.gov/publications/Practitioner/PocketGuide/pocket.pdf
- Screening Instrument: The Alcohol Use Disorders Identification Test (AUDIT). http://www.niaaa.nih.gov/Publications/EducationTrainingMaterials/Documents/Audit.pdf
- Alcohol Screening and Brief Intervention for Youth: A Practitioner's Guide. Designed to help health care professionals quickly identify youth at risk for alcohol-related problems. NIH Publication No. 11-7805. 2011. Full Guideline. http://pubs.niaaa.nih.gov/publications/Practitioner/YouthGuide/YouthGuide.pdf and
- Pocket Guide. http://pubs.niaaa.nih.gov/publications/Practitioner/YouthGuide/YouthGuidePocket.pdf

Cardiovascular Care

Cardiovascular disease (CVD) is the major cause of mortality and a significant cause of morbidity for individuals with diabetes, and is the leading cause of death in AI/ANs. To reduce patients' risk for CVD, it is essential to target both the specific clinical risk factors (i.e., hypertension on page 46, dyslipidemia on page 27) as well as the underlying CVD lifestyle risk factors (i.e., smoking on page 21, nutrition on page 18, and physical activity on page 19). While glucose control early in the course of diabetes appears to confer some long-term benefit in CVD risk reduction, research has shown that achieving hypertension and dyslipidemia targets confers the most benefit.

Assessing CVD Risk

Recommendations for Assessing CVD Risk

- Assess each patient's CVD risk at diabetes diagnosis and routinely thereafter until CVD is diagnosed.
- Tailor treatment and education interventions to each patient's CVD risk and life context.

In diabetes patients without known CVD, it is important to calculate each patient's CVD risk to determine appropriate risk reduction treatment goals and strategies. The *Framingham Heart Study Risk Score Profile* for 10-year risk of coronary heart disease is used most often for this purpose: http://www.framinghamheartstudy.org/risk/coronary.html.

Another option for calculating coronary heart disease risk in AI/AN patients is the Strong Heart Study risk calculator: http://strongheart.ouhsc.edu/CHDcalculator/calculator.html. Based on data collected among adults in thirteen American Indian Tribes in Arizona, North Dakota, South Dakota, and Oklahoma over the study's 10-year period, the Strong Heart Study risk calculator is an appropriate tool to help determine treatment goals to reduce CVD risk in AI (and AN) patients.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice—Cardiovascular Care and Diabetes, 2011.
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsBestPractices

2010 ACCF/AHA Guideline for Assessment of Cardiovascular Risk in Asymptomatic Adults: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation. 2010;122:e584-636.
http://circ.ahajournals.org/content/122/25/e584.full.pdf+html

AHA/ADA Scientific Statement. Primary Prevention of Cardiovascular Diseases in People with Diabetes Mellitus: A Scientific Statement from the American Heart Association and the American Diabetes Association. Circulation. 2007;115:114-26.
http://circ.ahajournals.org/content/115/1/114.full.pdf+html

Blood Pressure (BP)

Recommendations for Blood Pressure

- Measure BP at diabetes diagnosis and at every diabetes visit:
  - Ambulatory/home monitoring may be considered to assist providers in assessing hypertension diagnosis and control.
- Set and achieve individualized BP targets (e.g., < 130/80 mmHg, < 140/90 mmHg, etc.) for all patients with diabetes:
  - Blood pressure targets in youth vary by gender, age, and height. See section on youth on page 44 for separate BP recommendations.
- Prescribe an angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor (ARB) for all patients with diabetes and hypertension, unless contraindicated.

BP control reduces the risk for diabetic microvascular and macrovascular complications, and is essential in diabetes care. The 2011 IHS *Diabetes Care and Outcomes Audit* shows that, on average, AI/AN patients with diabetes are achieving excellent BP control, with a mean of 131/75 mmHg. Use of ACE inhibitors or ARB blockers has benefits not only for controlling BP but also for reducing albuminuria, a CVD risk marker.

BP treatment requires diligent efforts to achieve targets. For those patients who can achieve a BP of < 130/80 mmHg without adverse symptoms, this target may be selected. For other patients, a target of < 140/90 mmHg (or higher if symptoms and comorbidities dictate) should be selected. Ensuring that patients with diabetes achieve and maintain individualized BP targets over the long term will improve outcomes for AI/AN patients.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Diabetes Treatment Algorithm. Type 2 Diabetes and Hypertension.
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsDTTreatmentAlgorithm

National High Blood Pressure Education Program. National Heart, Lung, and Blood Institute. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. NIH Publication No. 04-5230. 2004.
http://www.nhlbi.nih.gov/guidelines/hypertension/index.htm

Lipids

Recommendations for Lipids

- Obtain a complete lipid profile (total cholesterol, LDL, HDL, triglycerides) at diabetes diagnosis and annually thereafter:
  - More frequent testing may be required to assess therapeutic responses from therapies such as medical nutrition therapy and pharmacotherapy;
  - While a 9- to 12-hour fasting lipid profile is preferable, reasonable assessments of lipid status can be made based on either a non-fasting lipid profile or a direct LDL cholesterol measurement.

- Implement a treatment plan to achieve lipid goals:
  - **Statin therapy should be prescribed unless contraindicated, regardless of baseline lipid levels for:**
    - diabetes patients with CVD, or
    - diabetes patients without overt CVD who are > 40 years of age and have ≥ 1 other CVD risk factor.
  - For patients with **elevated** lipid levels, prescribe statin treatment to achieve lipid targets as listed in Table 5 on page 28.

→ **Note:** Lipid-lowering medications, especially used in combination, may adversely affect the liver. Consider baseline and interval laboratory assessment of liver enzyme panels.

→ **Note:** Statins are highly unsafe in pregnancy and are classified as Category X. Consider pregnancy risk when prescribing statins for reproductive age women.

Lipid control in patients with diabetes is essential for reducing macrovascular complications. The 2011 IHS *Diabetes Care and Outcomes Audit* data show that lipid control has been improving steadily among AI/AN patients with diabetes. LDL cholesterol levels have declined over the past decade, reaching an average level below 100 mg/dL.

Patients with type 2 diabetes have an increased prevalence of lipid abnormalities, including high triglycerides and low HDL cholesterol levels. This pattern is a marker for small atherogenic LDL cholesterol particles that increase CVD risk, even when LDL cholesterol levels are not elevated. Recent research has shown that **non-HDL cholesterol** (total cholesterol minus HDL cholesterol) is an even stronger measure of atherogenic load than LDL cholesterol alone. Therefore, greater focus should be placed on achieving non-HDL cholesterol targets.

One of the most effective pharmacologic treatments to reduce CVD events is statin therapy. Statins reduce CVD risk beyond LDL cholesterol reduction alone. While other classes of medications (e.g., fibrates, niacin, ezetimibe, and bile acid sequestrants) do lower lipids, research

is not conclusive as to whether they reduce CVD risk. Lifestyle therapy (section begins on page 17), including MNT addressing fat and cholesterol intake, increased physical activity, weight loss, and smoking cessation, is indicated for any patient with type 2 diabetes, even those with "normal" lipid levels. Glycemic control also is important to help reduce hypertriglyceridemia.

Table 5. Goals for Lipid Control in Patients with Type 2 Diabetes

Target	Lipid	Goal
Primary target	LDL	< 100 mg/dL, if no CVD < 70 mg/dL, if CVD
Secondary target	Non-HDL*	< 130 mg/dL, if no CVD; < 100 mg/dL, if CVD
Secondary target	Triglycerides	< 150 mg/dL

* Non-HDL = Total Cholesterol minus HDL

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Diabetes Treatment Algorithm. Type 2 Diabetes and Management of Hyperlipidemias. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsDTTreatmentAlgorithm

National Heart, Lung, and Blood Institute. National Institutes of Health. Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III—ATP III). 2002. http://www.nhlbi.nih.gov/guidelines/cholesterol/index.htm.

At-A-Glance Quick Desk Reference. http://www.nhlbi.nih.gov/guidelines/cholesterol/dskref.htm

Antiplatelet Therapy

Recommendations for Antiplatelet Therapy

- Primary Prevention (see Table 6 on page 29):
  - Consider aspirin therapy at 75-162 mg/day in diabetes patients at increased risk for CVD (10-year risk > 10%), including most men > 50 years of age and women > 60 years of age with ≥ 1 other risk factor (i.e., family history of CVD, hypertension, smoking, dyslipidemia, albuminuria).
  - Use clinical judgment on whether to use aspirin in patients with 10-year CVD risk of 5-10%.

- Aspirin prophylaxis is **not recommended** in patients with diabetes who are otherwise at low risk for CVD (10-year CVD risk < 5%) because the potential risks associated with bleeding are likely to outweigh potential benefits.

- Secondary Prevention:
  - Aspirin therapy at 75-162 mg/day is recommended for adults with diabetes and CVD:
    - Clopidogrel may be substituted in aspirin-allergic patients and can be used in combination therapy with aspirin for up to a year after an acute coronary event.

Antiplatelet therapy, including aspirin and clopidogrel, may be used as a primary and a secondary prevention strategy to reduce the risk of CVD events. For primary prevention, the decision as to whether to prescribe aspirin is based on an estimation of the patient's 10-year CVD risk *(Framingham Heart Study Risk Score Profile:* http://www.framinghamheartstudy.org/risk/coronary.html). No specific data support an exact dose of aspirin; however, using lower doses decreases the risk of side effects.

Table 6. Aspirin Therapy in CVD Primary Prevention

Action	10-year CVD Risk	Examples of Patient Groups
Consider aspirin therapy at 75-162 mg/day	> 10%	Most men > 50 y. and women > 60 y. with ≥ 1 risk factor: family history of CVD, hypertension, smoking, dyslipidemia, albuminuria
Use clinical judgment on whether to use aspirin	5-10%	Men < 50 y. and women < 60 y. with multiple other risk factors
Aspirin NOT recommended	< 5%	Men < 50 y. and women < 60 y. with no additional risk factors

Tools and Resources

Aspirin for Primary Prevention of Cardiovascular Events in People with Diabetes: A Position Statement of the American Diabetes Association, a Scientific Statement of the American Heart Association, and an Expert Consensus Document of the American College of Cardiology Foundation. 2010. http://circ.ahajournals.org/content/121/24/2694.full.pdf.

Peripheral Arterial Disease (PAD)

Recommendations for Peripheral Arterial Disease

- Assist patients who smoke to quit. See the section on tobacco use on page 21.
- Obtain a history of claudication symptoms and assess pedal pulses as part of routine diabetes care.
- Obtain an Ankle-Brachial Index (ABI) in patients with diabetes:
  - Screen all patients with diabetes > 50 years of age.
  - In addition, consider a screening ABI in patients < 50 years of age who have ≥ 1 additional PAD risk factor, including smoking, hypertension, hyperlipidemia, or duration of diabetes > 10 years.
  - Obtain a diagnostic ABI in any patient with suspected lower extremity (LE) PAD, including those with abnormal pulses, symptoms of claudication, or non-healing LE wounds.
  - ABI results are defined as follows: abnormal < 0.9; normal range is 0.9-1.4.
- Refer patients with either significant symptoms or an abnormal ABI for vascular evaluation.
- Order one-time ultrasound screening for abdominal aortic aneurysm (AAA) in men aged 65 to 75 years who have ever smoked and in patients ≥ 65 years of age with a family history of AAA.

PAD is atherosclerosis of arteries to the head, organs, and limbs. PAD manifests most commonly in patients with diabetes as symptoms of leg claudication. If left untreated, PAD can progress to critical leg ischemia that can threaten limb viability. Moreover, PAD is a marker of systemic atherosclerosis, indicating patients are at increased risk for myocardial infarction (MI), stroke, and death. Risk factors associated with PAD include older age, cigarette smoking, diabetes, hypercholesterolemia, hypertension, and possibly genetic factors.

Tools and Resources

2011 ACCF/AHA Focused Update of the Guideline for the Management of Patients with Peripheral Artery Disease (Updating the 2005 Guideline). A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2011;58:2020-45, doi:10.1016/j.jacc.2011.08.023 (Published online 29 Sep 2011). http://content.onlinejacc.org/cgi/content/full/58/19/2020

PAD Coalition. Web-based resources for health professionals include Webcasts on PAD topics, online CME, and conference proceedings. http://www.padcoalition.org/resources/professional.php

Kidney Care

Recommendations for Kidney Disease

- Order serum creatinine/estimated glomerular filtration rate (eGFR) and urine albumin-to-creatinine ratio (UACR) at diabetes diagnosis and then at least annually thereafter.
- Consider nephrology consultation if the etiology of the chronic kidney disease (CKD) is unclear, if CKD is progressing rapidly, if there is any difficulty managing CKD complications, and if eGFR is < 30 mL/min/1.73 m2.
- Set and achieve individualized blood pressure targets (e.g., < 130/80 mmHg, < 140/90 mmHg, etc.) for all patients with diabetes:
    - Prescribe an ACE inhibitor or ARB for all patients with diabetes and hypertension, unless contraindicated.
- Begin laboratory testing, monitoring, and treatment of CKD complications such as anemia and metabolic bone disease when patients' eGFR < 60 mL/min/1.73 m2.

Diabetes significantly increases the risk of developing chronic kidney disease. The AI/AN population used to have the highest incidence rate of end-stage renal disease (ESRD) among patients with diabetes. While still higher than for several other groups, the rate has decreased significantly in recent years, due at least in part to good clinical care of patients with diabetes. To continue this trend toward lower rates of ESRD, emphasis on improving CKD prevention, screening, monitoring, and treatment is as important as ever in AI/AN people with diabetes.

Screening and Monitoring to Assess Kidney Status: eGFR and UACR

Screening includes an assessment of eGFR **and** a measurement of urinary protein excretion – the spot UACR. These tests should be done at diabetes diagnosis and repeated at least annually – more often, if results are changing rapidly or to assess the effectiveness of interventions.

Use the eGFR and UACR to screen for, diagnose, and monitor the progression of CKD, and to assess the effectiveness of interventions. These tests are continued for the life of the patient, regardless of the stage of kidney disease or types of treatment provided. However, once a patient is on dialysis, these tests no longer are indicated.

Estimated Glomerular Filtration Rate (eGFR)

The eGFR is an estimation of the kidneys' ability to filter blood and is based on a calculation that includes serum creatinine, body weight, and age. Equations used to calculate eGFR include the Modification of Diet in Renal Disease Study Group (MDRD) (http://www.nkdep.nih.gov/professionals/gfr_calculators/index.htm) and Cockcroft-Gault equations. While the Cockcroft-Gault equation may still be used for medication dosing, the MDRD

is the preferred equation for CKD assessment for adults with diabetes. For youth < 18 years of age, a different equation, the Bedside Schwartz equation (http://nkdep.nih.gov/professionals/gfr_calculators/idms_schwartz_si.htm) should be used.

The Resource and Patient Management System (RPMS) calculates the eGFR automatically using the MDRD equation when a serum creatinine test is ordered. Because the MDRD equation estimates do not produce reliable results when > 60 mL/min/1.73m2, these results are reported simply as "above 60." Thus, it is not possible to distinguish clinically between Stages 1 and 2 of CKD.

Urine Albumin-to-Creatinine Ratio (UACR)

The UACR is the test recommended to assess urine albumin excretion and is reported as the ratio of milligrams of albumin to grams of creatinine (mg/g). The UACR is a quantitative test, performed using a single spot urine specimen. Twenty-four hour urine collections are no longer needed nor recommended for routine diabetes nephropathy screening. Also, semi-quantitative "test strips" for urine protein are not sufficiently accurate for CKD diagnosis and monitoring.

The definitions of normal and abnormal albumin excretion on a UACR test are:

- Normoalbuminuria < 30 mg/g
- Albuminuria ≥ 30 mg/g:
    - Microalbuminuria 30-300 mg/g
    - Macroalbuminuria > 300 mg/g.

Because of variability in urinary albumin excretion, at least 2 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. Factors that may elevate urinary albumin over baseline values include exercise within 24 hours, infection, fever, congestive heart failure, marked hyperglycemia, pregnancy, marked hypertension, urinary tract infection, and hematuria.

Diagnosis of Chronic Kidney Disease

Chronic kidney disease (CKD) is defined as ≥ 3 months duration of **either**:

- **Decreased kidney function:** eGFR < 60 mL/min/1.73 m2, **or**
- **Evidence of kidney damage:** albuminuria (e.g., UACR ≥ 30 mg/g) or abnormalities on kidney blood tests, imaging, or biopsy.

Table 7. Stages of Chronic Kidney Disease (CKD)

Stages of CKD	1*	2*	3	4	5
eGFR, mL/min	> 60	> 60	30-59	15-29	< 15

* Distinguishing Stage 1 from Stage 2 CKD is not possible in clinical settings.

In adults with diabetes, the most likely cause of CKD is the diabetes itself. However, not all CKD in patients with diabetes is due to diabetic nephropathy and it is important to look out for patients whose CKD pattern (e.g., significant albuminuria early in the course of diabetes, a rapid rise in urine albumin excretion) suggests another etiology. These patients should be referred to a nephrologist for further testing (e.g., kidney biopsy) for a definitive diagnosis and treatment plan.

Monitoring and Treatment of Chronic Kidney Disease

Once CKD and its cause(s) are established, there are effective treatments that can delay progression to ESRD and improve quality of life. CKD further increases CVD risk in patients with diabetes. Therefore, modification of CVD risk factors, including tobacco cessation, lipid control, and blood pressure control, is essential.

Treatment of blood pressure requires diligent efforts to achieve targets. For those patients who can achieve a target of < 130/80 mmHg without adverse symptoms, this target may be selected. For other patients, a target of < 140/90 mmHg (or higher if symptoms and comorbidities dictate) should be selected.

The use of ACE inhibitors or ARBs should be considered for all patients with diabetes and hypertension, and/or albuminuria. In addition to lowering blood pressure, these medications also decrease the rate of urinary albumin excretion. Monitoring patients' serial UACR results will help assess the effectiveness of interventions, and also is prognostic as to the rate of kidney decline. Laboratory testing, monitoring, and treatment of CKD complications such as anemia and metabolic bone disease become important in patients with eGFR < 60 mL/min/1.73 m2.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Chronic Kidney Disease and Diabetes Hub. Includes CME/CE online, Quick Guide Cards, Treatment Algorithms, educational materials, best practices, and podcasts.
http://www.ihs.gov/medicalprograms/diabetes/index.cfm?module=learn_ckd

National Kidney Disease Education Program.

- Information Sheet on Urine Albumin-to-Creatinine Ratio (UACR) and Estimated Glomerular Filtration Rate (eGFR) in Evaluating Patients with Diabetes for Kidney Disease. http://www.nkdep.nih.gov/resources/UACR_GFR_QuickReference_508.pdf
- MDRD and Bedside Schwartz GFR Calculators. http://www.nkdep.nih.gov/professionals/gfr_calculators/index.htm

Eye Care

Recommendations for Eye Care

- Refer people with diabetes for a comprehensive dilated retinal examination by an ophthalmologist or optometrist:
  - at diabetes diagnosis, and
  - annually, or more or less often, as recommended by the patient's eye professional.
- Retinal imaging may be used to screen and monitor for retinopathy; a comprehensive eye examination is still needed to screen for and evaluate other eye problems.

People with diabetes are at lifelong risk for eye and vision problems, including diabetic retinopathy, cataracts, glaucoma, age-related macular degeneration, and blindness. Good control of glucose and blood pressure helps to prevent onset and reduce progression of diabetic retinopathy. In addition, early detection, monitoring, and treatment of retinopathy are essential to reducing the risk of blindness.

A retinal examination (i.e., a dilated fundus examination by an eye care professional or retinal imaging with interpretation by a qualified, experienced reader) should be used to detect retinopathy. Although serious vision loss due to diabetes can nearly be eliminated through timely diagnosis and treatment, only about half of all AI/AN people with diabetes receive an annual retinal examination.

→ **Note:** Women with pregestational diabetes, who either are planning a pregnancy or have become pregnant, should have a comprehensive eye examination, and be counseled on the risk of development and/or progression of diabetic retinopathy. This examination should occur in the first trimester and should be followed throughout pregnancy and for one year postpartum.

→ **Note:** Women with true gestational diabetes (GDM), however, are at very low risk for developing diabetic retinopathy during pregnancy due to the limited exposure to increased blood glucose. Therefore, retinopathy screening is not indicated in GDM.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice—Diabetes Eye Care, 2011. http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/2011_BP_Eye_Care_508c.pdf

IHS – Joslin Vision Network Teleophthalmology Program (IHS JVN). http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Resources/FactSheets/JVN_FactSheet03.13.08.pdf

American Academy of Ophthalmology Retina Panel. Preferred Practice Pattern: Diabetic Retinopathy. San Francisco (CA): American Academy of Ophthalmology. 2008. http://one.aao.org/CE/PracticeGuidelines/PPP_Content.aspx?cid=d0c853d3-219f-487b-a524-326ab3cecd9a

American Optometric Association. Optometric Clinical Practice Guideline Care of the Patient with Diabetes Mellitus. Reference Guide for Clinicians. St. Louis (MO): American Optometric Association. 2009. 74 p. http://www.aoa.org/documents/CPG-3.pdf

Foot Care

Recommendations for Foot Care

- Inspect patients' feet for acute problems at each diabetes visit.
- Perform complete foot examination at least annually to include assessment of protective sensation, foot structure and biomechanics, vascular status, and skin integrity:
    - Test protective sensation with a 10-gm monofilament and at least 1 of the following: vibration sensation using a 128-Hz tuning fork, pinprick sensation, ankle reflexes, or vibration perception threshold. Assign a category of foot risk for each patient.
- Provide risk-appropriate monitoring, treatment, and self-management education, including smoking cessation, as appropriate.
- Refer patients as needed to foot care specialists (podiatrists, wound care specialists), footwear providers, orthopedists, and vascular surgeons.

Foot ulcers and amputations due to diabetic neuropathy [section begins on page 37] and/or peripheral arterial disease (PAD) [section begins on page 30] are common, yet often preventable causes of disability in adults with diabetes. Because early identification and management of patients at high risk for foot problems can prevent or delay the onset of adverse outcomes, it is important to evaluate the feet of all patients with diabetes. Categories of risk are defined as:

- **Low Risk**: normal sensory exams, foot structure, vascular status, and skin integrity, and no prior non-traumatic ulcerations.
- **High Risk**: abnormalities on exam or a history of non-traumatic ulcerations.

Since 10-20% of patients with diabetes who present for routine care will have a condition that requires prompt attention (e.g., calluses, bacterial or fungal infections, bulky or ingrown nails, or frank ulceration), it is important to inspect patients' feet at every diabetes visit, regardless of their risk category.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Diabetes Foot Care Hub. Includes CME/CE online, Quick Guide Cards, Treatment Algorithm, educational materials, best practices, and podcasts. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=learn_fc

American Diabetes Association Position Statement: Preventive Foot Care in Diabetes. Diabetes Care. 2004 Jan;27 Suppl 1:S63-4. http://care.diabetesjournals.org/content/27/suppl_1/s63.full

Oral Care

Recommendations for Oral Care

- Examine the patient's mouth as part of routine diabetes care:
  - Examine teeth and gums for plaque, gingival inflammation, and caries.
  - Inquire about pain and look for problems, including sores, swollen or bleeding gums, loose teeth, mouth ulcers or growths, candidiasis, or decayed teeth.
  - If a patient uses oral tobacco, be sure to examine gums and oral mucosa, especially where the patient usually places the tobacco.
- Refer for professional dental care:
  - Annually for routine dental examination.
  - More often for people with periodontal disease as determined by the dental care professional.
  - As needed for evaluation of oral health problems.

People with diabetes frequently have problems with their teeth and gums, especially when they have poor glycemic control. The higher the blood glucose, the greater the risk for developing periodontal disease. AI/AN people with diabetes have two to three times more advanced periodontal disease than people who do not have diabetes.

Periodontal disease results in the loss of all teeth in approximately one-third of AI/AN people with diabetes. People without teeth can suffer emotionally and nutritionally because they may not be able to eat many important types of foods. Every attempt should be made to replace missing teeth with dental prosthetics when there is significant loss of chewing function.

Periodontitis can negatively affect diabetes control and development of diabetes complications. The infection and inflammation associated with periodontitis can aggravate blood glucose control and increase risk for many of the complications of diabetes such as CVD and CKD.

In addition to periodontal disease, other oral health issues observed in people with diabetes include: dental caries, burning mouth syndrome and potential difficulty in wearing dental prosthetics, salivary gland dysfunction/dry mouth, fungal infections, *lichen planus* and lichenoid reactions, delayed healing, and taste disorders.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice—Oral Health Care, 2011.
http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/2011_BP_OralHealth_508c.pdf

Lamster IB, et al. The Relationship Between Oral Health and Diabetes Mellitus. J Am Dent Assoc. 2008;139 Suppl 5:S19-24. http://jada.ada.org/content/139/suppl_5/19S.full

National Diabetes Education Program. Working Together to Manage Diabetes: A Guide for Pharmacists, Podiatrists, Optometrists, and Dental Professionals. Centers for Disease Control and Prevention and National Institutes of Health. 2007**.** 68 p.
http://www.ndep.nih.gov/media/PPODprimer_color.pdf

Neuropathy

Recommendations for Neuropathy

- Screen patients with diabetes for distal symmetric polyneuropathy (DPN) and autonomic neuropathy at diabetes diagnosis, and then at least annually.
- Consider treatment to reduce neuropathic pain.

Neuropathy is a common complication of diabetes affecting multiple organ systems, and is a significant cause of morbidity and mortality. Poor blood glucose control and smoking can significantly increase the risk of neuropathy and its complications. There is no specific treatment for the nerve damage associated with diabetic neuropathy. Improving glycemic control may slow progression, but does not reverse nerve loss.

There are two main types of diabetic neuropathy: distal symmetric polyneuropathy and autonomic neuropathy.

- **Distal symmetric polyneuropathy**, often referred to as peripheral neuropathy, most commonly affects the feet and legs in people with diabetes, and is the major cause of lower extremity problems, including pain, ulceration, and amputations. See the foot care section for recommendations on DPN screening, management, and referral. For guidance on treatment of neuropathic pain, see the IHS *Type 2 Diabetes and Neuropathy Treatment Algorithm* listed in the Tools and Resources section below.
- **Autonomic neuropathy** is responsible for various cardiovascular, gastrointestinal, and genitourinary clinical problems that can have significant associated morbidity and increased mortality rates. This form of neuropathy can manifest as: resting tachycardia, exercise intolerance, orthostatic hypotension, constipation, gastroparesis, erectile dysfunction, and sudomotor dysfunction. Screening consists of assessing signs and symptoms of autonomic dysfunction when taking the patient's history and during physical examination. Treatments are available for symptomatic autonomic neuropathy that may improve quality of life, but these treatments do not alter the disease process. See the Tools and Resources below for sources that contain comprehensive discussions of this topic.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention.

- Type 2 Diabetes and Neuropathy Treatment Algorithm http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsDTTreatmentAlgorithm
- Advancements in Diabetes Seminars. What's New in Diabetic Neuropathy. J. Kimm, MD. Available for CME/CE credit. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=trainingSeminars

Bril V, et al. Evidence-Based Guideline: Treatment of Painful Diabetic Neuropathy. Report of the American Academy of Neurology, the American Association of Neuromuscular and Electrodiagnostic Medicine, and the American Academy of Physical Medicine and Rehabilitation. Neurology. 2011 May 17;76(20):1758-65. http://www.aan.com/globals/axon/assets/8404.pdf

Vinik AI, et al. Diabetic Neuropathies. Chapter 13. Endotext.org. http://www.endotext.org/diabetes/diabetes31/diabetes31.htm

Sexual Health

Recommendation for Sexual Health

- Ask both men and women about sexual health concerns, review therapeutic options, and provide referrals as needed.

Changes in sexual function are common health problems as people age. Having diabetes can mean early onset and increased severity of these problems. Sexual dysfunction for people with diabetes can be due to autonomic neuropathy, cardiovascular disease, hormone deficiencies, side effects of medications, smoking, alcohol abuse, and psychological concerns such as depression, stress, and anxiety, or a combination of these. Many patients will welcome the opportunity to address these important quality of life issues during diabetes care visits.

Common sexual problems in men with diabetes include:

- Erectile dysfunction
- Low testosterone
- Retrograde ejaculation

Common sexual problems in women with diabetes include:

- Decreased vaginal lubrication during stimulation
- Decreased or no sexual desire
- Decreased or absent sexual response

Tools and Resources

Erectile Dysfunction Guideline Update Panel. The Management of Erectile Dysfunction: An Update. American Urological Association. 2005 with update in 2006, validity confirmed in 2009. http://www.auanet.org/content/clinical-practice-guidelines/clinical-guidelines.cfm?sub=ed

National Institute of Diabetes and Digestive and Kidney Diseases. National Institutes of Health. Sexual and Urologic Problems of Diabetes. NIH Publication No. 09–5135. 2008. http://diabetes.niddk.nih.gov/dm/pubs/sup/sup.pdf

Nonalcoholic Fatty Liver Disease and Nonalcoholic Steatohepatitis

Recommendations for Nonalcoholic Fatty Liver Disease (NAFLD) and Nonalcoholic Steatohepatitis (NASH)

- Check Aspartate Aminotransferase/Alanine Aminotransferase (AST/ALT) periodically in patients with diabetes.
- For significant and persistent AST/ALT abnormalities, perform a workup to determine the cause.
- Counsel patients with fatty liver disease regarding weight loss and exercise, and consider the use of medications shown to improve insulin resistance.

NAFLD and NASH represent a spectrum of diseases 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 are unclear. Most patients with NASH are obese and have associated type 2 diabetes, hypertension, dyslipidemia, and insulin resistance.

NAFLD or NASH diagnosis often is made during a workup of persistent AST/ALT elevations. Liver imaging studies with ultrasound or CT scan may show evidence of fat infiltration in the liver. Providers should rule out other causes of chronic liver disease (e.g., viral, autoimmune, etc.). Gastroenterology consultation is often indicated to assist with diagnosis, staging, and treatment of liver disease.

Treatment for both NAFLD and NASH includes weight loss, exercise, improved diabetes control, 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.

Tools and Resources

National Institute of Diabetes and Digestive and Kidney Diseases. National Institutes of Health. Nonalcoholic Steatohepatitis Fact Sheet. NIH Publication No. 07–4921. 2006. http://digestive.niddk.nih.gov/ddiseases/pubs/nash/NASH.pdf

Obstructive Sleep Apnea (OSA)

Recommendations for Obstructive Sleep Apnea

- Assess patients for symptoms of obstructive sleep apnea (OSA), including snoring, observed apnea during sleep, and daytime somnolence:
  - Consider using a standardized sleep apnea screening tool – see Tools and Resources below.
- Refer patients who screen positive for OSA symptoms for further evaluation such as a sleep study.

The most common form of sleep-disordered breathing is OSA. An apnea is a temporary absence or cessation of breathing, lasting 10 or more seconds. With OSA, the upper airway collapses, obstructing air flow, even as the person makes an effort to breathe.

OSA is associated with comorbidities such as hypertension, obesity or overweight, memory problems, headaches, erectile dysfunction, and cardiovascular disease. In patients with diabetes, OSA increases the likelihood of worse glycemic control.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Advancements in Diabetes. Update on Obstructive Sleep Apnea: New Links to Diabetes and the Role of Home Sleep Testing. T. Green, MD, and K. Acton, MD. Available for CME/CE training. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=sleepapnea_pt_1

American Sleep Apnea Association.

- Health Care Professional Resources. http://www.sleepapnea.org/i-am-a-health-care-professional.html
- STOP BANG Questionnaire: A Tool to Screen Patients for Obstructive Sleep Apnea. http://sleepapnea.org/assets/files/pdf/STOP-BANG%20Questionnaire.pdf

International Diabetes Federation (IDF). IDF Consensus Statement on Sleep Apnoea and Type 2 Diabetes. 2008. http://www.idf.org/webdata/docs/APNOEA_final.pdf

Immunizations

Recommendations for Immunizations

Conduct an immunization status review at diabetes diagnosis and as a routine part of diabetes care.

- Provide the following immunizations:
  - Annual influenza immunization.
  - Pneumococcal vaccine at diabetes diagnosis; re-immunization if ≥ 65 years, and first dose was given before age 65 and if vaccine was administered > 5 years prior.
  - Tetanus and diphtheria (Td) every 10 years; tetanus, diphtheria, and acellular pertussis (Tdap) should replace a single dose of Td for persons < 65 years who have not previously received a dose of Tdap.
  - Hepatitis B vaccination for unvaccinated adults with diabetes:
    - **Adults < 60 years of age: recommended**, as soon as feasible after diabetes diagnosis
    - **Adults ≥ 60 years of age: consider**, based on patient's likelihood of acquiring hepatitis B virus infection (e.g., anticipated need for assisted blood-glucose monitoring), the likelihood of experiencing chronic sequelae or other complications if infected, and the decline in immunologic response to hepatitis B vaccine with advancing age.
  - Zoster vaccine for persons ≥ 60 years as a single dose, regardless of reported history of prior herpes zoster episode.
  - Human papillomavirus (HPV) vaccine:
    - Females ≤ 26 years of age
    - Males aged 11 to 12 years; a catch-up dose for males aged 13 to 21 years; and permissive use of the vaccine in males aged 22 to 26 years.

People with diabetes are at increased risk of contracting several vaccine-preventable infections and/or for experiencing more severe complications. Vaccinations are highly effective at reducing morbidity and mortality from these diseases.

Tools and Resources

Centers for Disease Control and Prevention. Recommendations and Guidelines:

- Adult Immunization Schedule. http://www.cdc.gov/vaccines/recs/schedules/adult-schedule.htm.
- Child and Adolescent Immunization Schedule. http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm

Tuberculosis Screening

Recommendations for Tuberculosis Screening

- Perform either a Tuberculin skin test (TST) or a T-cell interferon-γ release assay (IGRA) to test for latent tuberculosis (TB) infection (LTBI) at least once after diabetes diagnosis (more often as indicated).
- If the TST or IGRA test is positive, obtain a medical history, review of symptoms, targeted physical exam, and chest radiograph.

Adults with diabetes and LTBI are at high risk for progressing to active TB disease if they are not treated. Studies have shown that this risk is 2 to 6 times higher than in patients without diabetes. On average, an estimated 30% of individuals with diabetes will develop active TB disease over the course of their lifetime if they have TB infection and have not been treated. Other factors that increase the risk of progression from latent TB infection to TB disease include: intravenous drug use, immunosuppressive drugs (particularly TNF-α inhibitors) and chronic kidney disease. In most cases, progression of LTBI to active TB can be prevented with treatment.

There are two types of tests approved for LTBI testing:

- **Tuberculin skin test (TST).** The first is the familiar tuberculin skin test. The TST was referred to previously as a purified protein derivative (PPD). In a person with diabetes, induration ≥ 10 mm 48-72 hours after administration is considered a positive result.
- **T-cell interferon-γ release assays (IGRA).** The second type of test is the T-cell interferon-γ release assays. Two IGRA tests are currently FDA approved: the QuantiFERON®-TB Gold In-Tube test (QFT-GIT) and the T-SPOT®.*TB* test (T-Spot). While IGRA tests usually are more expensive than TSTs, one of their advantages is that only a single blood draw is required – patients do not have to return several days later as they do for the TST.

Tools and Resources

Centers for Disease Control and Prevention (CDC).

- CDC Core Curriculum on Tuberculosis: What the Clinician Should Know. 2011. http://www.cdc.gov/tb/education/corecurr/pdf/corecurr_all.pdf
- CDC Tuberculosis Guidelines Testing and Diagnosis Website. http://cdc.gov/tb/topic/testing/default.htm

Updated Guidelines for Using Interferon Gamma Release Assays to Detect Mycobacterium Tuberculosis Infection—United States, 2010. Morb Mort Wkly Rep. 2010 Jun 25;59 (No. RR-5): 1-25. http://www.cdc.gov/mmwr/pdf/rr/rr5905.pdf

Cancer Screening

Recommendation for Cancer Screening

- Ensure that patients with diabetes receive cancer screening tests according to national guidelines:
    - Check periodically for updated cancer screening protocols.

Cancer screening is a core component of the care of people with diabetes. Routine screening for and early detection of breast, cervical, and colorectal cancers can reduce morbidity and mortality. Diabetes is associated with at least a two-fold increased risk for cancers of the liver, pancreas, and endometrium, and a 1.2- to 1.5-fold increased risk for cancers of the colon and rectum, breast, and bladder. While screening tests are not available for many cancers, providers are encouraged to take this increased cancer risk into account when discussing cancer screening tests with patients as well as when evaluating symptoms of unknown cause or an abnormality on laboratory studies or radiologic imaging.

Tools and Resources

American Society for Colposcopy and Cervical Pathology (ASCCP) Cervical Consensus Guidelines and Algorithms http://www.asccp.org/ConsensusGuidelines/tabid/7436/Default.aspx

Giovannucci E, et al. Diabetes and Cancer: A Consensus Report. Diabetes Care. 2010;33:1674–85. http://care.diabetesjournals.org/content/33/7/1674.full.pdf

National Cancer Institute Screening and Testing to Detect Cancer Website http://www.cancer.gov/cancertopics/screening/

Diabetes Care Issues Across the Lifespan

Youth and Type 2 Diabetes

AI/AN youth have the highest prevalence rate of type 2 diabetes compared with youth of all other racial and ethnic groups in the U.S. Among AI/AN youth ages fifteen to nineteen, the prevalence of diabetes was 6.81 per 1000 in 2009. From 1990 to 2009, diabetes prevalence in this age group more than doubled – from 3.24 per 1000 in 1990 to 6.81 per 1000 in 2009, a 110% increase. Providers need to consider several important differences in approaches to testing and treatment of youth with diabetes, as compared with adults.

Recommendations for Testing for Type 2 Diabetes in Youth

- Test overweight (BMI > 85th percentile) AI/AN youth with **any** of the following risk factors:
  - Family history of diabetes.
  - Signs of insulin resistance or conditions associated with it (e.g., *acanthosis nigricans,* PCOS, hypertension, dyslipidemia, small-for- gestational-age (SGA) or large-for-gestational-age (LGA) birth weight).
  - Maternal history of diabetes or gestational diabetes during child's gestation.
- Start testing these higher risk children at age 10 years (or younger if puberty occurs earlier).
- Test at-risk children ≤ every 3 years.

Treatment Issues for Diabetes in Youth

AI/AN youth with type 2 diabetes are at risk for developing or may even present with the same comorbidities as adults. Therefore, it is essential to measure blood pressure, blood lipids, and urine albumin upon diagnosis. While much of diabetes management for youth is similar to that for adults, there are a few differences to be aware of.

Glycemic Control

Recommendations for Glycemic Control in Youth

- Glycemic control targets for youth with type 2 diabetes are:
  - A1C < 8% for ages 6 to 12 years
  - A1C < 7.5% for ages 13 to 19 years.
- The only FDA-approved diabetes medications for use in children are metformin and insulin. While other medications are sometimes used in clinical practice, there is less evidence to support their use, and that use would be off-label.

All targets and medication regimens need to take into consideration not only the age of the child but also adverse effects of medications such as hypoglycemia, the amount of appropriate and consistent adult assistance, and family resources.

Blood Pressure Control

Recommendations for Blood Pressure (BP) Control in Youth

- Screen youth with type 2 diabetes for hypertension at diabetes diagnosis and at every diabetes visit.
- Consider pharmacologic treatment for patients with blood pressure (BP) > 95th percentile for gender, age, and height; or > 130/80 mmHg – whichever is less.
    - ACE inhibitors and ARBs are FDA-approved for treating hypertension in children.

Unlike in adults, BP norms in youth vary by gender, age, and height. To determine a patient's BP percentile, categorized by gender, age, and height, use these tables developed by the National Heart, Lung, and Blood Institute: http://www.nhlbi.nih.gov/guidelines/hypertension/child_tbl.pdf. Once the BP percentile is obtained, use Table 8 to classify and diagnose hypertension in children and adolescents.

Table 8. Classification of Blood Pressure in Children and Adolescents

Blood Pressure Category	Definition
Normal	< 90th percentile
Prehypertension	90th-95th percentile or 120/80 mmHg
Hypertension Stage 1	95th-99th percentile + 5 mmHg
Hypertension Stage 2	> 99th percentile + 5 mmHg

Source: National Heart, Lung, and Blood Institute, National Institutes of Health. Blood Pressure Tables for Children and Adolescents from the Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents, 2004. http://www.nhlbi.nih.gov/health/prof/heart/hbp/hbp_ped.pdf

Chronic Kidney Disease

Recommendations for Chronic Kidney Disease in Youth

- Order a UACR and eGFR at diabetes diagnosis and then at least annually:
  - In youth < 18 years of age, use the Bedside Schwartz equation to calculate eGFR: GFR (mL/min/1.73 m2) = (0.41 × Height in cm)/Creatinine in mg/dL.
  - An easy-to-use Bedside Schwartz equation calculator can be accessed at: http://nkdep.nih.gov/professionals/gfr_calculators/idms_schwartz.htm
- Consider treatment with an ACE inhibitor for youth with albuminuria.

Youth should be screened for chronic kidney disease using the same two screening tests used in adults: eGFR and UACR. There is no difference in UACR testing between adults and youth. However, while eGFR in adults with diabetes is calculated using the MDRD equation, this equation is not accurate in youth. Instead, the Bedside Schwartz equation should be used to calculate eGFR in patients < 18 years of age.

Tools and Resources

IHS Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice—Youth and Type 2 Diabetes Prevention and Treatment, 2011. http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/2011_BP_Youth_T2DM_508c.pdf

Flint A and Arslanian S. Treatment of Type 2 Diabetes in Youth. Diabetes Care. 2011;34:Suppl 2, S177-83. http://care.diabetesjournals.org/content/34/Supplement_2/S177.full.pdf+html

International Diabetes Federation. International Society for Pediatric and Adolescent Diabetes. Global IDF/ISPAD Guideline for Diabetes in Childhood and Adolescence. 2011. http://www.ispad.org/NewsFiles/IDF-ISPAD_Diabetes_in_Childhood_and%20Adolescence_Guidelines_2011.pdf

Distinguishing Between Type 1 and Type 2 Diabetes

Recommendations for Distinguishing Between Type 1 and Type 2 Diabetes

- Consider a diagnosis of type 1 diabetes or one of its variants in AI/AN patients of any age or weight who present with a new onset of diabetes and an unclear clinical picture.
- Obtain laboratory studies and exams as needed to aid in diabetes classification.

As diabetes science has progressed and as more children are being diagnosed with diabetes, it has become clear that type 1 and type 2 diabetes are at either end of a continuum that includes autoimmune-mediated insulin deficiency and insulin resistance. While providers easily recognize patients with classic type 1 or type 2 diabetes, there are a fair number of patients whose clinical presentation does not lend itself to such classification.

Making the distinction between type 1 and type 2 diabetes is important because it will dictate the immediate and long-term need for insulin treatment. For example, in patients with type 2 diabetes who also have one or more positive antibodies, there will be a shorter timeframe until insulin will be required – for glycemic control, if not for preventing ketosis. In patients with the type 1 variant known as Latent Autoimmune Diabetes of Adults (LADA), insulin may not be required initially, but over time they will progress to requiring insulin to avoid ketosis.

While the vast majority of AI/AN patients with diabetes have type 2, type 1 diabetes and its variants do occur in AI/AN patients, particularly those of mixed heritage. Type 1 diabetes must be considered in patients of any age or weight who present with a new onset of diabetes and an unclear clinical picture. This is especially true in children, even if they are overweight.

Although no test can distinguish definitively between type 1 and type 2 diabetes, several laboratory studies may be helpful when the diagnosis is not clinically clear. 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.

Measurement of Endogenous Insulin Secretion

The results for tests to measure endogenous insulin secretion may be low in type 2 diabetes patients with glucose toxicity. If in doubt, measure the following 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 is useful even if the patient is taking insulin injections.

Autoantibody Tests

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

- IA-2 (Insulinoma-associated protein-2)
- GAD-65 (Glutamic acid decarboxylate-65)
- Other antibody tests have been used in research and clinical settings – e.g., ZnT8 (Zinc Transporter 8), thyroid peroxidase antibodies, insulin autoantibodies, etc.

Other Lab Tests and Exams

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. Gauging the degree of insulin deficiency versus insulin resistance with the following tests can be helpful:

- 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 time of diabetes diagnosis.
- Ketones – Although patients with type 2 diabetes can present with 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 present with significant ketosis and who are more profoundly acidotic with DKA.
- Microvascular complications – Many type 2 diabetes patients already have some degree of retinopathy, microalbuminuria, or neuropathy at the time of diabetes diagnosis. This is seldom 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 diabetes than with type 2 diabetes.

Even taking the results of these tests into consideration, there still will be a few patients whose type of new-onset diabetes is not initially clear; over time, however, the diagnosis will become apparent. In the meantime, if there is concern that the patient may become acidotic if taken off insulin or if insulin is needed for glycemic control, insulin therapy should be continued, at least until it is established that it is no longer necessary.

Contraception

Recommendations for Contraception

- Beginning at puberty, discuss sexual activity, the need for pregnancy prevention or planning, and contraception as part of routine diabetes care for women.
- Providers need to assess each woman's situation:
    - Women with diabetes should be considered for contraception, preferably a form that is long-acting such as an IUD or Contraceptive Implant since these methods have much lower failure rates.
    - For women not on a long-acting form of contraception, consider prescribing only those diabetes-related medications that are safe in the event of an unplanned pregnancy.

- Discuss with patients the increased risk of pregnancy with medications such as metformin and TZDs that may increase fertility:
    - Offer contraception when starting these medications.

Optimally, pregnancies in women with diabetes of all ages are planned for, including achieving preconception glycemic control and switching to medications that are safe to use in pregnancy. While this goal is not always achieved in adult women, it is even less likely to occur in adolescent girls. Hyperglycemia, as well as certain diabetes-related medications (e.g., statins, ACE inhibitors, ARBs), are potentially toxic to the developing fetus. As such, providers need to be proactive in regard to contraception and to anticipate the possibility of unplanned pregnancies. Women with diabetes often have comorbid issues that affect the selection of an optimal contraceptive method. An excellent tool to aid in this decision is the *U.S. Medical Eligibility Criteria for Contraceptive Use (USMEC).*

Tools and Resources

The U. S. Medical Eligibility Criteria for Contraceptive Use (USMEC), 2010.
http://www.cdc.gov/reproductivehealth/unintendedpregnancy/USMEC.htm

Update to CDC's U.S. Medical Eligibility Criteria for Contraceptive Use, 2010: Revised Recommendations for the Use of Contraceptive Methods During the Postpartum Period. Morb Mort Wkly Rep. 2011 July 8;60(26):878-83.
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6026a3.htm?s_cid=mm6026a3_w

Preconception, Pregnancy, and Postpartum Diabetes Testing and Care

As diabetes incidence has increased in younger AI/AN people, both pregestational diabetes (PGDM) and gestational diabetes (GDM) have also increased significantly. 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.

Table 9. Screening and Counseling for Women with Diabetes during Reproductive Years

Actions	Frequency
Ask about reproductive intentions/assess contraception.	At diagnosis, and then every visit
Provide preconception counseling and assessment.	3-4 months prior to conception
Screen for undiagnosed type 2 diabetes in pregnant AI/AN women (PGDM).	At first prenatal visit
Screen for GDM in all women not known to have diabetes.	At 24-28 weeks gestation
Screen for type 2 diabetes in women who had GDM.	At 6-12 weeks postpartum, then ≤ 3 years lifelong

Preconception Care – Pregnancy Planning and Type 2 Diabetes

Recommendations for Preconception Care

- Inform women that risk is minimized with optimal glycemic control prior to conception, and that glycemic targets are stricter in pregnancy: fasting BG, 65-95 mg/dL; 1 h BG, 100-129 mg/dL; 2 h BG < 120 mg/dL, A1C < 6.0%.
- Women with diabetes who are contemplating pregnancy should be evaluated, and, if indicated, treated for diabetic retinopathy, nephropathy, neuropathy, and cardiovascular disease.
- Evaluate medications prior to conception and switch to only those approved for use during pregnancy.
- Discuss importance of optimal nutrition, folic acid supplementation, and tobacco/alcohol/substance use cessation.
- Consult or refer to multidisciplinary team (e.g., CDE, dietitian) experienced in caring for pregnant women with diabetes.

Pregnancy in women with pregestational diabetes (PGDM) is associated with an increase in risk to both the fetus and the mother. In women with poor glycemic control, the incidence of congenital anomalies and spontaneous abortions increases during the period of fetal organogenesis. A woman may not know she is pregnant during fetal organogenesis, which is not complete until 8 weeks post-conception.

Preconception counseling and planning are essential in women of childbearing age who have type 2 diabetes to optimize their diabetes control before becoming pregnant. It is important to discuss

with women who are contemplating pregnancy the need for preparation prior to conception, including excellent glycemic control, use of pregnancy-approved medications, optimal nutrition, and abstinence from tobacco/alcohol/substance use.

Medications commonly used to treat diabetes and its complications may be contraindicated or not recommended in pregnancy, including statins, ACE inhibitors, ARBs, and noninsulin therapies. While there is some evidence supporting the use of glyburide and metformin in gestational diabetes, the ADA and the American College of Obstetrics and Gynecology (ACOG) both have recommended that further study be completed before their use can be supported in pregnancy. **Insulin therapy should remain the recommended and preferred treatment for diabetes in pregnancy.**

Screening for Diabetes during Pregnancy

Recommendations for Screening for Diabetes during Pregnancy

- Screen women without known diabetes at their initial prenatal visit to assess for PGDM:
  - If the patient is fasting, obtain:
    - Fasting plasma glucose, A1C;
  - If the patient is not fasting, then obtain:
    - A1C, random plasma glucose.

- Screen for GDM at 24 to 28 weeks gestation in patients without PGDM using **either**:
  - Fasting 75 gram, 2-hour OGTT (ADA/IADPSG), **or**
  - Non-fasting 50 gram 1-hour oral glucose tolerance test (OGTT). If abnormal, then follow with a fasting 100 gram, 3-hour OGTT (ACOG).

Patients with a pre-existing diagnosis of type 1 or 2 diabetes do not require diabetes testing. All other patients should be screened at their initial prenatal visit to assess for previously undetected overt diabetes (PGDM) as defined by the criteria listed in Table 10, below.

Table 10. Diagnosis of Overt Diabetes in Pregnancy (IADPSG 2010)

Measure of Glycemia	Consensus Threshold	Action
Fasting Plasma Glucose (FPG)	≥ 126 mg/dL ≥ 92 mg/dL but < 126 mg/dL < 92 mg/dL	Diagnose type 2 diabetes. Diagnose GDM. Test for GDM 24-28 weeks.
Hemoglobin A1C (A1C)	≥ 6.5% 5.7%-6.4%	Diagnose type 2 diabetes. Perform FPG for type 2 or GDM diagnosis.
Random plasma glucose	≥ 200 mg/dL + confirmation	Confirm with FPG or A1C above threshold to diagnose type 2 diabetes.

Currently, there is a lack of consensus among major guideline-setting organizations as to the optimal screening protocol for GDM. Two testing protocols shown in Table 11 below are acceptable for screening for GDM:

- ADA/International Association of Diabetes and Pregnancy Study Groups (IADPSG) 2010 Recommendations. http://care.diabetesjournals.org/content/33/3/676.full.pdf and
- ACOG 2011 Recommendations. http://journals.lww.com/greenjournal/Citation/2011/09000/Committee_Opinion_No__504__Screening_and.43.aspx

Table 11. Screening for and Diagnosis of GDM

<table>
<tr><th>ADA and IADPSG 2010 Recommendations</th><th>ACOG 2011 Recommendations</th></tr>
<tr><td>Perform a fasting 75-g OGTT, with plasma glucose measurement fasting, and at 1 and 2 h, at 24-28 weeks of gestation in women not previously diagnosed with overt diabetes.

The OGTT should be performed in the morning after an overnight fast of at least 8 h.

The diagnosis of GDM is made when <u>any of the following</u> plasma glucose values are exceeded:
• Fasting ≥ 92 mg/dL (5.1 mmol/l)
• 1 h ≥ 180 mg/dL (10.0 mmol/l)
• 2 h ≥ 153 mg/dL (8.5 mmol/l)</td><td>Two-step process:
1. At 24-28 weeks, perform a screening, non-fasting 50-g glucose challenge. If 1 h value exceeds chosen threshold is ≥ 130 or ≥ 140 mg/dL, go to step 2.
2. Perform a diagnostic fasting 100-g OGTT. Either the plasma or serum glucose level established by Carpenter and Coustan or the plasma level designated by the National Diabetes Data Group are appropriate to use. A diabetes diagnosis requires that <u>two or more</u> thresholds be met or exceeded. One abnormal value equals carbohydrate intolerance.
<table>
<tr><th>Status</th><th>Plasma or Serum Glucose Level, Carpenter and Coustan Conversion</th><th>Plasma Level, National Diabetes Data Group Conversion</th></tr>
<tr><td>Fasting</td><td>95 mg/dL (5.3 mmol/l)</td><td>105 mg/ dL(5.8 mmol/l)</td></tr>
<tr><td>1 h</td><td>180 mg/dL (10.0 mmol/l)</td><td>190 mg/ dL (10.6 mmol/l)</td></tr>
<tr><td>2 h</td><td>155 mg/dL (8.6 mmol/l)</td><td>165 mg/ dL (9.2 mmol/l)</td></tr>
<tr><td>3 h</td><td>140 mg/dL (7.8 mmol/l)</td><td>145 mg/ dL (8.0 mmol/l)</td></tr>
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The *Indian Health Diabetes Best Practice—Diabetes in Pregnancy,* listed in the Postpartum Screening: Tools and Resources section below, addresses screening, testing, and management of patients with GDM and PGDM in detail that is beyond the scope of this document.

Postpartum Screening for Type 2 Diabetes in Women With Previous GDM

Recommendation for Postpartum Diabetes Screening

- Women with previous GDM should be tested postpartum using a fasting 75 gram 2-hour OGTT at 6-12 weeks post-delivery to determine their glycemic status.
    - Providers should monitor blood glucose in the postpartum and lactating period as clinically appropriate.
- Women with a normal postpartum OGTT should be re-tested every 1 to 3 years with fasting blood glucose and/or A1C.

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

Tools and Resources

IHS Division of Diabetes Treatment and Prevention.

- Indian Health Diabetes Best Practice—Diabetes in Pregnancy, 2011. http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/2011_BP_DiabPreg_508c.pdf
- Indian Health Diabetes Best Practice—Breastfeeding Support, 2011. http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/2011_BP_Breastfeed_508c.pdf
- Beautiful Beginnings: Pregnancy and Diabetes. 2010. Diabetes self-management education curriculum as a supplement to the Balancing Your Life and Diabetes Curriculum. Addresses pre-gestational and gestational diabetes. http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsCurricula

Agency for Healthcare Research and Quality. Gestational Diabetes. Caring for Women During and After Pregnancy. Clinician's Guide. AHRQ Publication No. 09-EHC014-3. 2009. http://effectivehealthcare.ahrq.gov/ehc/products/107/163/2009_0804GDM_Clinician_final.pdf

American College of Obstetricians and Gynecologists Committee on Obstetric Practice. Committee Opinion Number 504: Screening and Diagnosis of Gestational Diabetes Mellitus. Obstet Gynecol 2011 Sep;118(3):751-3.

American Diabetes Association. Position Statement. Diagnosis and Classification of Diabetes Mellitus, Gestational Diabetes Mellitus, Diagnosis of Gestational Diabetes. Diabetes Care. 2011;34(Suppl1):S 65,67-69.

Care of Older Adults and Patients with Multiple Comorbidities

Recommendations for Care of Older Adults and Patients with Multiple Comorbidities

- For elders with limited comorbidities, significant life expectancies, and good functional abilities, treatment targets may be similar to those for younger patients, with the caution that older patients often do not tolerate hypoglycemia well.
- For frail elders and patients with multiple comorbid conditions, treatment targets should be selected cautiously, balancing the benefits of tighter control with the risks (e.g., hypoglycemia, hypotension, etc.) posed to them by the multiple medications required to achieve these targets:
    - Assess patients for fall risk, cognitive impairment, depression, urinary difficulties, and chronic pain,
    - Ask about social and functional support, financial resources, access to nutritious foods, etc., and
    - Refer for evaluation/intervention as needed.

Older adults differ markedly in their functional abilities, level of diabetes complications, and other comorbidities, life expectancies, and level and type of social and financial resources. Older adults with diabetes are more likely than those without diabetes to develop geriatric-related difficulties, including depression, cognitive impairment, urinary incontinence, falls causing injury, and pain syndromes. All of these issues should be factored in as providers and patients set diabetes-related treatment targets.

For elders with recent onset of diabetes and/or limited complications, significant life expectancies, and good functional abilities, treatment targets will be similar to those for younger patients. However, for frail elders and patients whose bodies are older than their chronological ages due to multiple comorbid conditions, treatment targets should be selected cautiously – to balance the benefits of reasonable control of specific targets with the risks posed by the multiple medications required to achieve these targets. Further, the particular medications selected need to be considered for both their individual effects as well as their interactions with the patient's other medications, disease conditions, and overall quality of life.

As diabetes has been diagnosed in younger AI/AN people over the last few decades, more patients are living with diabetes longer, and consequently developing multiple diabetes complications during what is usually considered middle life. This trend has many implications for these patients – for their physical health as well as their mental health and the ability to function

effectively in their many life roles (e.g., as parents, employees, caregivers to elderly parents, community members, etc.). Providers who get to know their patients, their families, and their life contexts can address their patients' medical concerns while helping them to enjoy the highest possible quality of life for many years to come.

Tools and Resources

IHS Elder Care Initiative. http://www.ihs.gov/medicalprograms/eldercare/index.cfm?module

Brown AF, et al. California Healthcare Foundation/American Geriatrics Society Panel on Improving Care for Elders with Diabetes. Guidelines for Improving the Care of the Older Person with Diabetes Mellitus. J Am Geriatr Soc. 2003;51:S265-80.
http://www.americangeriatrics.org/files/documents/JAGSfinal05.pdf

National Indian Council on Aging (NICOA). Sacred Path to Wellness Support Group Curriculum.
http://www.nicoa.org/Publications/sacred-path-2-wellness_final.pdf