PROCEDURE: Diabetes

GUIDELINE REVIEW CYCLE: Biennial

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PURPOSE:
To guide AzPC network physicians in the diagnosis and treatment of Diabetes. To prevent complications of diabetes and to achieve best practice in managing diabetes. This Clinical Practice Guideline is not intended to replace a physician’s clinical medical judgment which should be based on current medical knowledge and practices.

DESCRIPTION:
Diabetes is a complex, chronic illness that requires continuing medical care and patient self-management education to prevent acute complications and to reduce the risk of long-term complications. Diabetes care requires that many issues, beyond glycemic control, be addressed. A large body of evidence exists that supports a range of interventions to improve diabetes outcomes. These standards of care are intended to provide clinicians, with the components of diabetes care, treatment goals, and tools to evaluate the quality of care.

RECOMMENDATIONS TO PCP’s:
- AzPC recommends the adoption of the American Diabetes Association Clinical Practice Recommendation titled Standards of Medical Care in Diabetes which was published in the journal Diabetes Care January 2014 vol. 37 no. Supplement 1
- Monitor compliance to guidelines using current CMS Star results.
- Accept and follow strict practice guidelines to improve patient care and to prevent diabetic complications.
- HbA1c level correlates well with diabetic control.
- Cohesion among the diabetic care team including the patient and family.
ATTACHMENTS:
American Diabetes Association Clinical Practice Recommendation titled Standards of Medical Care in Diabetes which was published in the journal Diabetes Care 37, Supplement I, Jan 2014, Figure 2, Table 10, Table 15

GOALS:
To provide guidelines to:

• Achieve a near-normal glycemia defined by an HbA1c of <7.0%
• Achieve a preprandial plasma glucose level of 70 to 130mg/dL and <180 mg/dL peak postprandial
• Goals should be individualized based on duration of DM, age/life expectancy, comorbid conditions, known CVD or advance microvascular complications, hypoglycemia unawareness, individual patient considerations
• Detect and treat co-existing cardiovascular risk factors (hypertension, smoking, dyslipidemia and obesity)
• Prevent acute complications (ketoacidosis, hyperosmolar coma, hypoglycemia)
• Prevent major organ disease (retinopathy, nephropathy, vasculopathy, neuropathy)
• Achieve CMS 5 Star status for all Diabetes-related measures.
**DIAGNOSIS:**

Any one of the following three parameters on two separate days confirms the diagnosis of Diabetes Mellitus:

- A fasting (8 hours) plasma glucose test level of >126 mg/dL
- A 2 hour plasma glucose of >/= 200 mg/dL during an Oral Glucose Tolerance Test (OGTT) with glucose load 75 grams anhydrous glucose dissolved in water
- HbA1c >/= 6.5%
- In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose >/= 200 mg/dL
- In the absence of unequivocal hyperglycemia, result should be confirmed with retesting

**Categories of increased risk for Diabetes (Prediabetes), any one of the following**

- Fasting plasma glucose 100-125 mg/dL
- A 2 hour plasma glucose of 140-199 mg/dL during a 75 gram OGTT
- HbA1c 5.7-6.4%

**Screening for diabetes**

- Inform type 1 diabetic patients of the opportunity to have their relatives screened for type 1 diabetes risk in the setting of clinical research study; there is currently a lack of accepted screening programs
- Testing should be considered in all asymptomatic adults who are overweight, BMI >25 and with additional risk factors: sedentary, first degree relative with DM, high risk race/ethnicity, women who were diagnosed with gestational diabetes, hypertension or on therapy for hypertension, HDL <35 mg/dL or Triglycerides >250 mg/dL, women with polycystic ovarian syndrome, other syndromes associated with increased insulin resistance OR at age 45 if no risk factors, and if normal results, repeat testing every 3 years.

**ASSESSMENT:**

- Inquire about symptoms of hypoglycemia and look for signs of acute complication at every visit.
- Check for hypertension at every visit
- Check BMI at every visit
- Fundoscopic exam annually
- Comprehensive foot exams
- Thyroid palpation, skin check at insulin injection sites
- Assess and reinforce understanding of "basic" self-management
- Labs: HbA1c quarterly if have not met goals or twice a year if glycemic control, fasting lipid profile, liver enzymes, urine albumin excretion, renal function (Creatinine and GFR), TSH in type 1 DM or in women > age 50
- If type 1 DM, consider screening for other autoimmune diseases such as vitamin B12 deficiency, thyroid, celiac disease
**RECOMMENDED THERAPIES:**

- Individualized *medical nutrition therapy* (MNT) with at least one initial consultation with a Registered Dietitian and an individualized exercise plan (150 min/week of moderate intensity activity or 75 min/week of vigorous intensity activity including resistance training at least twice/week), unless contraindicated.
- Patients on multi-dose insulin (MDI) or insulin pump therapy should do **Self-monitoring of blood glucose (SMBG)** prior to meals and snacks, occasionally postprandially, at bedtime, prior to exercise, when suspect hypoglycemia or when treating hypoglycemia, prior to critical tasks like driving.
- **Type 1 Diabetes Drugs:** 3-4 insulin injections daily (basal and prandial) as indicated based upon SMBG or continuous subcutaneous insulin infusion; education to match prandial insulin to carbohydrate intake, premeal blood glucose, and anticipated activity.
- **Type 2 Diabetes Drugs:** Metformin is preferred initial pharmacological agent, if not contraindicated; can start with insulin therapy if new diagnosis and markedly symptomatic and/or elevated blood glucose; add a 2nd agent if noninsulin monotherapy at maximum tolerated dose and treatment goal not achieved over 3 months, consider a glucagon-like peptide 1 receptor agonist (ex. Exenatide), or insulin. See Figure 2, Antihyperglycemic therapy in type 2 Diabetes; general recommendations.
- **Angio-converting enzyme (ACE) inhibitors or ARBs** for patients with hypertension and albuminuria/nephropathy and patients over 55 with one or more cardiac risk factors. Angiotensin receptor blockers (ARBs): treatment of choice for type 2 patients with Hypertension and albuminuria/nephropathy.
- Early intensive management of hyperglycemia.
- **Vaccines:** Influenza, pneumococcal, and hepatitis B
- **Alcohol restriction**
- **Smoking cessation**
- Sodium restriction to < 2300 mg/daily (and further restriction if also have hypertension)

**Primary Prevention of Type 2 Diabetes:** Patients with high risk of developing type 2 diabetes, focus on lifestyle changes that include moderate weight loss (7% of body weight) and regular physical activity (150 min/week of moderate intensity or 75 min/week of vigorous intensity), reduced fat and calorie diet, and achieve USDA recommendation for dietary fiber intake (14 g fiber/1000 kcal).
- Screen for **psychosocial status/depression**
- Focus on prevention/management of Diabetes Complications: see attachment, Summary of recommendations for glycemic, blood pressure, and lipid control for most patients with diabetes, Table 10. Consider aspirin therapy for patients at increased cardiovascular risk. Use aspirin in patients with DM and known cardiovascular disease. Evaluate and manage retinopathy and neuropathy.
- **Care of the older adult with diabetes,** see attachment, Table 15 Framework for considering treatment goals for glycemia, blood pressure, dyslipidemia in older adults with diabetes.
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**PATIENT INSTRUCTIONS:**

- Self-management and problem solving (e.g., sick day management, use of glucose, hypoglycemia recognition, carbohydrate counting, record keeping) and support
- Self-monitoring blood glucose
- Preventive foot and skin care
- Annual diabetic retinal exam

**SPECIAL INVOLVEMENT:**

- Specialist involvement may be indicated when the following are present:
  - Any hospital admission for diabetes or acute metabolic complications
  - Evidence of target organ disease
  - Persistent elevation of HbA1c
  - Pre-conception for females during child bearing years and post-conception
  - Consideration and management of an insulin pump

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Figure 2 - Antihyperglycemic therapy in type 2 diabetes; general recommendations.

**Healthy eating, weight control, increased physical activity**

**Initial drug monotherapy**
- Efficacy (↓ HbA₁c)
- Hypoglycemia
- Weight
- Side effects
- Costs

**Metformin**
- high
- low risk
- neutral/loss
- GI / lactic acidosis
- low

If needed to reach individualized HbA₁c target after ~3 months, proceed to two-drug combination (order not meant to denote any specific preference):

- **Two-drug combinations**
- Efficacy (↓ HbA₁c)
  - high
  - moderate risk
- Hypoglycemia
- Weight
- Major side effect(s)
- Costs

- **Sulfonylurea**
  - high
  - moderate risk
  - gain
- **Thiazolidinedione**
  - high
  - low risk
  - gain
- **DPP-4 Inhibitor**
  - intermediate
  - low risk
- **GLP-1 receptor agonist**
  - high
  - high risk
  - low risk
- **Insulin (usually basal)**
  - highest
  - high risk
  - gain

If needed to reach individualized HbA₁c target after ~3 months, proceed to three-drug combination (order not meant to denote any specific preference):

- **Three-drug combinations**
- **Sulfonylurea**
  - high
  - moderate risk
- **Thiazolidinedione**
  - high
  - low risk
- **DPP-4 Inhibitor**
  - intermediate
  - low risk
- **GLP-1 receptor agonist**
  - high
  - high risk
- **Insulin (usually basal)**
  - highest
  - high risk
  - gain

If combination therapy that includes basal insulin has failed to achieve HbA₁c target after 3-6 months, proceed to a more complex insulin strategy, usually in combination with one or two noninsulin agents:

- **Insulin**
  - (multiple daily doses)

- **More complex insulin strategies**
  - **TZD**
  - **DPP-4-i**
  - **GLP-1-RA**
  - **Sulfonylurea**
  - **DPP-4-i**
  - **GLP-1-RA**
  - **Insulin**
  - **TZD**
  - **DPP-4-i**
  - **GLP-1-RA**
| A1C              | <7.0%*         |
| Blood pressure  | <140/80 mmHg** |
| Lipids           |                |
| LDL cholesterol  | <100 mg/dL (<2.6 mmol/L)†  |
|                  | Statin therapy for those with history of MI or age over 40 plus other risk factors |

*More or less stringent glycemic goals may be appropriate for individual patients. Goals should be individualized based on duration of diabetes, age/life expectancy, comorbid conditions, known CVD or advanced microvascular complications, hypoglycemia unawareness, and individual patient considerations. **Based on patient characteristics and response to therapy, lower SBP targets may be appropriate. †In individuals with overt CVD, a lower LDL cholesterol goal of <70 mg/dL (1.8 mmol/L), using a high dose of a statin, is an option.
### Table 15 - Framework for considering treatment goals for glycaemia, blood pressure, and dyslipidemia in older adults with diabetes.

<table>
<thead>
<tr>
<th>Patient characteristics/health status</th>
<th>Rationale</th>
<th>Reasonable A1C goal†</th>
<th>Fasting or preprandial glucose (mg/dL)</th>
<th>Bedtime glucose (mg/dL)</th>
<th>Blood pressure (mmHg)</th>
<th>Lipids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy (few coexisting chronic illnesses, intact cognitive and functional status)</td>
<td>Longer remaining life expectancy</td>
<td>&lt;7.5%</td>
<td>90–130</td>
<td>90–150</td>
<td>&lt;140/80</td>
<td>Statin unless contraindicated or not tolerated</td>
</tr>
<tr>
<td>Complex/intermediate (multiple coexisting chronic illnesses* or 2+ instrumental ADL impairments or mild-to-moderate cognitive impairment)</td>
<td>Intermediate remaining life expectancy, high treatment burden, hypoglycemia vulnerability, fall risk</td>
<td>&lt;8.0%</td>
<td>90–150</td>
<td>100–180</td>
<td>&lt;140/80</td>
<td>Statin unless contraindicated or not tolerated</td>
</tr>
<tr>
<td>Very complex/poor health (long-term care or end-stage chronic illnesses** or moderate-to-severe cognitive impairment or 2+ ADL dependencies)</td>
<td>Limited remaining life expectancy makes benefit uncertain</td>
<td>&lt;8.5%†</td>
<td>100–180</td>
<td>110–200</td>
<td>&lt;150/90</td>
<td>Consider likelihood of benefit with statin (secondary prevention more so than primary)</td>
</tr>
</tbody>
</table>

This represents a consensus framework for considering treatment goals for glycemia, blood pressure, and dyslipidemia in older adults with diabetes. The patient characteristic categories are general concepts. Not every patient will clearly fall into a particular category. Consideration of patient/caregiver preferences is an important aspect of treatment individualization. Additionally, a patient’s health status and preferences may change over time. ADL, activities of daily living. †A lower goal may be set for an individual if achievable without recurrent or severe hypoglycemia or undue treatment burden. *Coexisting chronic illnesses are conditions serious enough to require medications or lifestyle management and may include arthritis, cancer, CHF, depression, emphysema, falls, hypertension, incontinence, stage 3 or worse CKD, MI, and stroke. By multiple, we mean at least three, but many patients may have five or more (132). **The presence of a single end-stage chronic illness such as stage 3-4 CHF or oxygen-dependent lung disease, CKD requiring dialysis, or uncontrolled metastatic cancer may cause significant symptoms or impairment of functional status and significantly reduce life expectancy. †A1C of 8.5% equates to an eAG of ~200 mg/dL. Looser glycemic targets than this may expose patients to acute risks from glycosuria, dehydration, hyperglycemic hyperosmolar syndrome, and poor wound healing.