



## Diabetes Management Clinical Guidelines

The purpose of this guide is to provide general care information regarding the management of diabetes. The guidelines are not intended to preclude more extensive evaluation and management of the patient by specialists as needed.

**Source:** These guidelines are based on the *American Diabetes Association: Standards of Medical Care in Diabetes – 2011, Diabetes Care, volume 34, Supplement 1, January 2011*

### General Principles:

Persistent hyperglycemia is the hallmark of all forms of diabetes. Treatment aimed at lowering blood glucose to or near normal levels in all patients is mandated by the following proven benefits:

1. The danger of acute decompensation due to diabetic ketoacidosis (DKA) or hyperosmolar hyperglycemic nonketotic syndrome, with their accompanying morbidity and mortality, is markedly reduced.
2. The symptoms of blurred vision are alleviated, and the risk of polyuria, polydipsia, fatigue, weight loss with polyphagia, vaginitis, or balanitis may be decreased.
3. The risks of development or progression of diabetic retinopathy, nephropathy, and neuropathy are all greatly decreased. It is possible that these complications may even be prevented by early effective management.
4. Near normalization of blood glucose has been demonstrated to be associated with a less atherogenic lipid profile.

Achieving near normal or normal blood glucose levels in patients requires comprehensive education in self-management and, for most individuals, intensive treatment programs. Such programs include the following components according to individual patient need:

- Appropriate frequency of self-monitoring of blood glucose (SMBG)
- Medical nutrition therapy (MNT)
- Regular exercise
- Physiologically based insulin regimens, i.e., multiple daily injections of rapid- (e.g., lispro), short- (e.g., regular), intermediate- (e.g., NPH or lente), or long-acting (e.g., ultralente) insulins or continuous subcutaneous insulin infusion, in type 1 and some type 2 patients
- Less-complex insulin regimens or oral glucose-lowering agents in some type 2 patients
- Instruction in the prevention and treatment of hypoglycemia and other acute and chronic complications
- Continuing education and reinforcement
- Periodic assessment of treatment goals

| Evaluation   | Glycemic Control  | On-going Management  |
|--|---|--|
| <ul style="list-style-type: none"> <li>• <b>Initial evaluation</b> <ul style="list-style-type: none"> <li>▪ Medical history (polydipsia, weight loss, blurred vision, polyuria, polyphagia, vaginitis)</li> <li>▪ Physical examination</li> <li>▪ Laboratory evaluation – blood glucose (&gt;200 mg/dl), urine ketone, GHb, fasting lipid profile, serum creatinine, urinalysis, EKG (adults)</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Determine which pharmacologic alternative is best considering:           <ul style="list-style-type: none"> <li>▪ Severity of disease</li> <li>▪ Capability &amp; motivation of patient</li> <li>▪ Presence of concurrent diseases &amp; complications</li> <li>▪ Weight &amp; age of patient</li> <li>▪ Mechanism of drug action</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>Maintain treatment goals:</b> <ul style="list-style-type: none"> <li>▪ Monitor HbA1c every 3-6 months, at a minimum annually</li> <li>▪ Monitor lipid profile yearly</li> <li>▪ Monitor BP every visit</li> <li>▪ Ask about aspirin use</li> <li>▪ Ask about tobacco use</li> <li>▪ Monitor &amp; encourage nutritional compliance</li> <li>▪ Monitor &amp; encourage exercise compliance</li> </ul> </li> </ul> |
| <ul style="list-style-type: none"> <li>• <b>Stabilization</b> as needed for:           <ul style="list-style-type: none"> <li>▪ Pregnancy</li> <li>▪ Severe symptoms, marked weight loss, and/or ketonuria</li> </ul> </li> </ul>  | <ul style="list-style-type: none"> <li>• <b>Insulin Therapy</b> <ul style="list-style-type: none"> <li>• Human insulin is preferred</li> <li>• Dose range from 5 units/day to several hundred units/day</li> </ul> </li> </ul>  | <ul style="list-style-type: none"> <li>• <b>Annual Assessment</b> <ul style="list-style-type: none"> <li>▪ Targeted history &amp; physical</li> <li>▪ Refer for retinal exam</li> <li>▪ Urine protein assessment</li> </ul> </li> </ul>  |

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| with fasting glucose > 300mg/dl<br>or random glucose > 350 mg/dl   | <ul style="list-style-type: none"> <li>• Average doses are 0.6-0.8 units/kg body weight</li> <li>• Obese patients may require more than 100 units/day</li> <li>• Consult specialist for combination of insulin &amp; oral agents</li> <li>• Synchronize with food intake</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Comprehensive foot exam</li> <li>▪ Encourage influenza vaccine</li> <li>▪ Encourage pneumococcal vaccine at age 65 or earlier if indicated</li> </ul> |
| <ul style="list-style-type: none"> <li>• After stabilization, recommend <b>self-management program</b>:               <ul style="list-style-type: none"> <li>▪ Nutrition therapy</li> <li>▪ Physical activity</li> <li>▪ Health education classes</li> <li>▪ Foot care</li> </ul> </li> </ul>  | <p><b>Oral Hypoglycemic Therapy</b></p> <ul style="list-style-type: none"> <li>• <b>Sulfonylureas</b> <ul style="list-style-type: none"> <li>▪ Increase dose every 1 – 2 weeks until control or maximum dose reached</li> <li>▪ Rare cross sensitivities for patients with sulfa allergies</li> <li>▪ Use with caution in patients with renal disease</li> </ul> </li> <li>• <b>Metformins</b> <ul style="list-style-type: none"> <li>▪ Reduces hepatic glucose production</li> <li>▪ Enhances insulin action, but does not stimulate insulin secretion</li> <li>▪ Can be used with sulfonylureas</li> <li>▪ May cause transient metallic taste, diarrhea, nausea &amp; anorexia</li> <li>▪ May be more effective with obese patients</li> <li>▪ Do not use in renal disease, COPD, CHF, severe hepatic disease or alcoholism</li> </ul> </li> </ul> |  |
| <ul style="list-style-type: none"> <li>• Develop <b>individualized treatment goals</b>:               <ul style="list-style-type: none"> <li>▪ Glycemic control – HBA1c ≤7%</li> <li>▪ Lipid levels – LDL &lt;100 mg/dl</li> <li>▪ Blood pressure control – BP &lt;130/80 mm Hg</li> <li>▪ Aspirin unless contraindicated</li> <li>▪ Tobacco cessation if indicated</li> <li>▪ Include Annual Assessments</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>Other oral agents to consider</b>:               <ul style="list-style-type: none"> <li>▪ <b>Acarbose</b>: most effective when glucose &amp; glycosylated hemoglobin are only moderately above goal</li> <li>▪ <b>Thiazolidinediones</b>: can be used alone or in combination with sulfonylureas, insulin or metformin; Monitor liver function tests prior to and during treatment</li> <li>▪ <b>Repaglinide</b>: can be used alone or in combination with metformin</li> </ul> </li> </ul>  |  |
| <ul style="list-style-type: none"> <li>• If <b>treatment goals</b> are <b>not being met</b>:               <ul style="list-style-type: none"> <li>▪ Modify treatment based on appropriate guideline and/or</li> <li>▪ See <i>Glycemic Control</i> guide and/or</li> <li>▪ Refer to diabetes case management and/or specialists</li> </ul> </li> </ul>  | <ul style="list-style-type: none"> <li>• When to consider adding or alternative oral agent and/or insulin:               <ul style="list-style-type: none"> <li>▪ Initial agent has been increased to maximum effective and tolerated dose</li> </ul> </li> </ul>  |  |
| <ul style="list-style-type: none"> <li>• When <b>treatment goals</b> are <b>met</b> see <i>Ongoing Management</i> guideline for maintaining goals and complication prevention</li> </ul>   | <ul style="list-style-type: none"> <li>• When <b>treatment goals</b> are <b>met</b> see <i>Ongoing Management</i> guideline for maintaining goals and complication prevention</li> </ul>   |  |