

## Hyperglycemia in Hospitalized Adult Patients in Non-Critical Care Settings

### About the Guideline

- The management of diabetes and hyperglycemia in the inpatient noncritical arena was the research focus that answered 10 clinical questions and resulted in 15 recommendations.
- The following areas took priority and were considered most important: continuous glucose monitoring; continuous subcutaneous insulin infusion; inpatient education about diabetes; predetermined glycemic goals preoperatively; neutral protamine Hagedorn (NPH) insulin usage for hyperglycemia related to glucocorticoid usage and enteral nutrition; noninsulin treatments; carbohydrate (CHO)-containing oral fluids preoperatively; CHO-counting for dosing of insulin at meals; and insulin treatments, either corrective and/or scheduled (basal or basal bolus).
- Consideration of patients' moral principles, goals, preferences, and willingness to comply with treatment, along with factors such as cost, resources available, and health equity contributed to the recommendations.
- The reviewing workgroup consisted of 11 experts in the areas of endocrinology, primary care, internal medicine, nursing, and pharmacology, along with a patient spokesperson and experts in guideline development and methodical reviews.
- The purpose of the guideline is to support health care professionals and other healthcare partners, such as regulators, payors, and hospital executives, in the management, assessment, and treatment of diabetes and hyperglycemia in the inpatient noncritical arena.

### Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work in the acute care setting.

### Recommendations

- Real-time continuous glucose monitoring, combined with bedside point of care (POC) blood glucose, is suggested instead of POC blood glucose alone to monitor changes in insulin doses.
  - POC blood glucose can be used when continuous glucose monitoring is not available.
- NPH-based insulin or basal bolus insulin (BBI) is the recommended treatment for hyperglycemia caused by glucocorticoid treatment in noncritical patients.
  - In patients on a BBI schedule, NPH may be added as needed.
  - When glucocorticoids are being lowered or stopped, monitor blood glucose carefully to avoid episodes of low blood glucose.
- For patients who used an insulin pump prior to admission, it is suggested they continue with insulin pump therapy rather than change to subcutaneous (SC) BBI treatment.
  - If healthcare providers with insulin pump expertise are not available or if the patient's length of stay is expected to be more than two days, transitioning to SC BBI is recommended.
  - For insulin pump use to continue during hospitalization, the patient's condition and level of consciousness must remain adequate to manage the pump safely.

- Discharge planning for patients with diabetes should include inpatient diabetes education, arranging for follow-up appointments, diabetes self-management education and support, and the adequate provision for self-care and diabetes-management at home.
- For patients with diabetes having elective surgery, a hemoglobin A1c (Hb A1c) below 8% and blood glucose of 100 to 180 mg/dl are the recommended preoperative goals.
  - If a Hb A1c below 8% is not possible, the recommendation remains for a blood glucose goal of 100 to 180 mg/dl within 1 to 4 hours prior to surgery.
- For patients with diabetes receiving enteral nutrition, regardless of the type of formulation, either a BBI or an NPH-based insulin regimen is recommended.
- Scheduled insulin is recommended over the use of noninsulin medication to control blood glucose in adults with hyperglycemia with or without type 2 diabetes (T2D).
  - Prior to discharge, changing to a noninsulin medication is suggested as a transitional plan.
- For mild hyperglycemia in select patients with T2D who have a Hb A1c less than 7.5% and a blood glucose less than 180 mg/dL, and who are on a daily insulin dose of less than 0.6 units/kg/day, a dipeptidyl peptidase-4 inhibitor (DPP4i) with correction insulin or scheduled insulin therapy is suggested.
  - Patients with elevated blood glucose while on DPP4i therapy should be managed with insulin therapy.
  - A discussion with the patient about the cost and acceptability of the proposed medication regimen should take place before discharge.
- Administration of preoperative CHO-containing fluids is not recommended for any adult patient with diabetes having a surgical procedure.
- CHO-counting as a means for determining the insulin dose at meals is not recommended for hospitalized patients with T2D who are treated with insulin doses at meals.
- For patients who have no history of diabetes and who experience a blood glucose greater than 140 mg/dL while hospitalized, correctional insulin is suggested over scheduled insulin.
  - If the patient's blood glucose is equal to or greater than 180 mg/dL despite correctional insulin, and if it persists on two or more POC readings in 24 hours, the addition of scheduled insulin is suggested.
- For patients with diabetes who are not on insulin therapy at home, correctional or scheduled insulin therapy is suggested to maintain blood glucose of 100 to 180 mg/dL.
  - If the patient's blood glucose is equal to or greater than 180 mg/dl on correctional insulin treatment alone, and if it persists on two or more POC readings in 24 hours, the addition of scheduled insulin is suggested.
- For patients with insulin-treated diabetes, continuation of their home regimen is suggested, with modifications as needed to support a blood glucose goal 100 to 180 mg/dL during hospitalization.

#### Reference

Korytkowski, M. T., et al. (2022). Management of hyperglycemia in hospitalized adult patients in non-critical care settings: An Endocrine Society clinical practice guideline. *Journal of Clinical Endocrinology & Metabolism*, 107(8), 2101–2128. <https://doi.org/10.1210/clinem/dgac278>