

Glycemic Control for Critically Ill Children and Adults (2024)

About the Guideline

- The guideline taskforce panel consisted of 22 clinicians, patient/family advocates, and a methodologist. The clinician group included six adult intensivists, three endocrinologists, three pediatric intensivists, one cardiac surgeon, two adult pharmacy specialists, one pediatric pharmacy specialist, and three advanced practice providers (pediatric and adult).
- The quality of evidence was assessed using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) methodology.
- This guideline addresses glycemic control in critically ill adults and children (defined as equal to or greater than 42 weeks [adjusted gestational age] and up to 18 years of age).

Key Clinical Considerations

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

Critically Ill Adults

- Glycemic management protocols and procedures should be initiated to treat persistent hyperglycemia greater than or equal to 180 mg/dL.
 - Hyperglycemia is defined as two consecutive blood glucose (BG) levels greater than or equal to 180 mg/dL.
 - Hyperglycemia is a marker of more severe illness and insulin resistance, and it is associated with a stress response
 - There is no evidence that defines an optimal BG level that would prompt initiation of an insulin infusion.
- Glycemic management protocols and procedures should be used that minimize the risk of hypoglycemia.
- Treatment for hypoglycemia should not be delayed.
- To reduce the risk of hypoglycemia, titrating insulin infusions to a lower BG target (80 to 139 mg/dL) rather than a higher BG target (140 to 200 mg/dL) is *not* suggested.
- For the acute management of hyperglycemia, continuous intravenous (IV) insulin infusion is suggested over intermittent subcutaneous administration.
- For the management of hyperglycemia in patients receiving IV insulin experiencing glycemic instability, frequent (1 hour or less, continuous, or near-continuous) glucose monitoring is suggested over monitoring at intervals greater than hourly.
 - The use of subcutaneous continuous glucose monitoring (CGM) is not currently approved for hospital use by the US Food and Drug Administration (FDA). If utilized, consider concurrent point of care (POC) BG monitoring to correlate the accuracy of glucose levels.
- The use of a protocol that includes clear decision support tools is suggested for critically ill adults receiving IV insulin for hyperglycemia.
 - Decision support tools for glycemic management should include the following:
 - Instructions to manage each BG level.
 - Consistent management for all patients.
 - Considerations for management, including but not limited to, BG level, lability of BG levels, presence and frequency of hypoglycemia episodes, nutritional intake.

- Allowance for provider modification.

Critically Ill Children

- Glycemic management protocols and procedures should be initiated to treat persistent hyperglycemia greater than or equal to 180 mg/dL.
 - Insulin therapy should be initiated if hyperglycemia is persistent after eliminating any glucose infusions and/or medications that induce insulin resistance or impair beta cell function.
- Glycemic management protocols and procedures should be used that minimize the risk of hypoglycemia.
- Intensive glucose control is not recommended; an acceptable range is defined as a BG of 80 to 139 mg/dL.
- For patients in whom insulin therapy is indicated, no recommendation could be made regarding the use of continuous IV infusion over intermittent subcutaneous administration; however, it is considered best practice to utilize continuous IV insulin over intermittent subcutaneous administration.
- For patients on insulin infusions, no recommendation could be made regarding the optimal frequency of BG monitoring; however, it is considered best practice to monitor BG frequently at intervals of one hour or less.
- The use of a protocol that includes clear decision support tools is suggested for critically ill children receiving IV insulin for hyperglycemia.

Adult and Pediatric **Glucose Monitoring Devices**

- Due to lack of evidence, no specific statement or recommendation could be made regarding the optimal glucose monitoring device.
 - POC glucose monitoring is the most widely used, as results can be obtained quickly.
 - The use of subcutaneous CGM is considered off-label use in the critical care setting.
 - Intravascular BG monitoring devices are not widely available for use.

Reference

Honarmand, K., Sirimaturus, M., Hirshberg, E. L., Bircher, N. G., Agus, M. S. D., Carpenter, D. L., Downs, C. R., Farrington, E. A., Freire, A. X., Grow, A., Irving, S. Y., Krinsley, J. S., Lanspa, M. J., Long, M. T., Nagpal, D., Preiser, J. C., Srinivasan, V., Umpierrez, G. E., & Jacobi, J. (2024). Society of Critical Care Medicine Guidelines on Glycemic Control for Critically Ill Children and Adults 2024. *Critical care medicine*, 52(4), e161–e181. <https://doi.org/10.1097/CCM.0000000000006174>