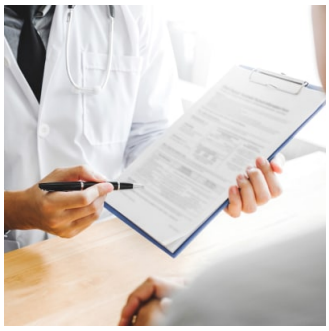
ICU
MANAGEMENT & PRACTICE

SCCM Guidelines on Glycaemic Control for Critically Ill Children and Adults 2024



Hyperglycaemia is common in critically ill patients and can lead to increased morbidity and mortality. While intensive insulin therapy (INT) has shown benefits in specific research settings, achieving them in clinical practice without risking hypoglycaemia is challenging. Current consensus guidelines recommend targeting moderate or conventional glucose control (CONV) levels to minimise risks and ensure consistent utilisation.

Updated guidelines from the Society of Critical Care Medicine (SCCM) address the uncertainty about target glucose levels for critically ill adults and paediatric patients. Neonates are excluded due to physiological differences. This is an updated version of the 2012 guidelines for INT.

A task force comprising 22 members was assembled, including experts in critical care, endocrinology, pharmacy, advanced practice providers, a methodologist, and two patient/family representatives. They formulated clinical questions, identified important patient outcomes, conducted systematic literature reviews and utilised The Grading of Recommendations, Assessment, Development, and Evaluation methodology to generate statements. Discussion centred on defining comparison groups, considering the wide range of targets for INT and CONV, spanning from 4.4 to 8.3 mmol/L for INT and 7.8 to 12 mmol/L for CONV.

In instances of insufficient evidence, the task force issued "in our practice" statements based on panel practices or "good practice" statements, considered equivalent to strong recommendations. Recommendations were primarily categorised for adult or paediatric populations, with some applicable to both.

This summary provides a review of the key recommendations and essential guideline statements for adults and children and compares them with a previous guideline on insulin infusion for managing hyperglycaemia in critically ill patients.

The 2012 guideline suggests initiating insulin therapy in adult critically ill patients when blood glucose (BG) levels reach or exceed 150 mg/dL, aiming to maintain BG below 150 mg/dL for most ICU patients and ensuring BG values stay below 180 mg/dL using a protocol with minimal hypoglycaemia (BG ≤ 70 mg/dL), despite limited impact on patient mortality. The quality of evidence supporting this recommendation is very low.

In the 2024 statement, there is a suggestion against titrating an insulin infusion to a lower BG target range (INT: 4.4–7.7 mmol/L) compared to a higher target range (CONV: 7.8–11.1 mmol/L) to minimise the risk of hypoglycaemia. This recommendation is conditional and supported by moderate certainty of evidence. Additionally, observational data indicate a potential benefit of personalised glucose targets that align more closely with chronic prehospital glycaemic control. Therefore, there is a recommendation for high-quality interventional trials to investigate individualised glycaemic targets in critically ill adults, stratified by prior glycaemic control, as indicated by factors such as glycosylated haemoglobin. This is classified as a research statement.

The 2012 statement recommends that ICUs implement a protocolised approach to manage glucose control, comprising several components. These include a validated insulin administration protocol, adequate staffing resources, monitoring technologies, and a data platform to monitor protocol performance and clinical outcomes. The insulin infusion protocol should encompass continuous glucose intake, standardised IV insulin infusion preparation, minimal bedside decision-making for dosing, frequent blood glucose monitoring, provisions for dextrose replacement, and protocolised dextrose dosing for prompt treatment of hypoglycaemia. The quality of evidence supporting these recommendations is classified as very low.

In the 2024 statement, a protocol incorporating explicit decision-support tools is suggested for managing hyperglycaemia in critically ill adults receiving IV insulin infusions. This recommendation is conditional and supported by moderate certainty evidence.

In the 2012 statement regarding paediatrics, no recommendation could be made for or against tight glycaemic control in paediatric critical care patients due to the lack of compelling data.

In the 2024 statement, there is a strong recommendation against intensive BG control (4.4–7.7 mmol/L) compared to conventional BG control

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(7.8–11.1 mmol/L) in critically ill children. This recommendation is supported by moderate certainty evidence. Additionally, it is suggested to use explicit decision support tools over no such tools in critically ill paediatric patients receiving IV insulin infusions for managing hyperglycaemia. However, the certainty of evidence for this recommendation is very low. Lastly, a strong recommendation for conducting high-quality research on using explicit decision support tools for insulin infusion titration in paediatric patients is categorised as a research statement.

In other recommendations and good practice statements, the guildeines suggest clinicians should use glycaemic management protocols and procedures to demonstrate a low risk of hypoglycaemia among critically ill adults and treat hypoglycaemia without delay. Clinical benefits of INT have not been consistently demonstrated in the RCTs. While INT targets were associated with increased frequency of severe hypoglycaemia, they showed no effect on mortality. Further research is recommended, particularly exploring individualised glycaemic targets based on preexisting glycaemic control.

In paediatrics, clinicians should use glycaemic management protocols and procedures that demonstrate a low risk of hypoglycaemia among critically ill children and treat hypoglycaemia without delay. INT targets were associated with increased frequency of severe hypoglycaemia and shorter ICU LOS but no effect on mortality or neurocognitive outcomes. The high risk of severe hypoglycaemia outweighs the trivial clinical benefits of INT glucose control among critically ill children. Further research is recommended to explore individualised glycaemic targets.

Protocols incorporating decision-support tools were associated with a reduced frequency of moderate hypoglycaemia and a greater proportion of BG values within the target range. While most studies evaluated adult protocols, processes of glycaemic management are comparable between adults and children, leading to similar recommendations. Further research is recommended to explore the effectiveness of decision-support tools in both age groups.

Source: Critical Care Medicine

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Published on : Wed, 17 Apr 2024

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