

Synthesis of the Evidence on Inpatient Hyperglycemia Management Finds Intensive Insulin Therapy Does Not Clearly Improve Health Outcomes

Hyperglycemia is a common finding in hospitalized patients and has been associated with negative outcomes in a variety of inpatient subpopulations. The use of insulin to control blood glucose has been advocated as a way to improve health outcomes in hospitalized patients with hyperglycemia, but the evidence for the efficacy of this approach and the thresholds for initiating insulin management are unclear.

Recently, investigators at the Portland VA Medical Center conducted a systematic, comprehensive review of the literature on inpatient hyperglycemia management (published from 1950 to May 2008), and conducted a survey of active research. Investigators sought to address three questions:

1. Does strict blood glucose control, compared to less strict control, improve final health outcomes in seven specific inpatient subpopulations?
2. What, if any, are the negative consequences of strict blood glucose control within the given subpopulations?
3. What are the most effective and safest means of normalizing blood glucose in the given subpopulations?

Overall, investigators found that the literature regarding Question 1 showed very little intervention data available to help clearly define a glucose threshold that would prompt glucose-lowering efforts in the specified inpatient populations. Further, the benefits of achieving normal blood glucose using intensive insulin therapy seen in earlier single-center studies have not been confirmed in subsequent studies. Finally, the literature indicates that higher glucose targets can likely be relatively safely achieved in inpatients, however, the impact of this practice on health outcomes remains uncertain.

With regard to Question 2, there is considerable risk of hypoglycemia in medical ICU patients treated with intensive insulin protocols designed to normalize blood glucose.

Literature addressing Question 3 showed that while a number of infusion protocols have been evaluated, comparative effectiveness data are lacking.

Future research recommendations include: enrolling general medical and surgical ward patients in blood glucose management studies; developing studies that examine the efficacy of higher glucose targets; and initiating investigations designed to examine the safest and most effective ways to adapt insulin management in patients transitioning

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Conclusions

The authors note that the use of intensive insulin therapy to achieve normal blood sugar levels in critically ill patients does not clearly result in health outcome benefits and is associated with high rates of hypoglycemia. More moderate blood glucose control to targets above the normal range can likely be safely achieved, though the health outcome benefit of this practice has not been well studied.

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