

# Tight glycemic control has no proven benefits for children in the cardiac ICU

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Although some studies have portrayed tight blood sugar control as a potential means of lowering infection rates in critically ill adults, a new study—led by principal investigator Michael Agus, MD, director of the Medicine Critical Care Program at Boston Children's Hospital—found no indication that the approach benefits pediatric patients undergoing heart surgery. The results of the Safe Pediatric Euglycemia in Cardiac Surgery (SPECS) trial, which was conducted at Boston Children's and at the University of Michigan C.S. Mott Children's Hospital, will appear in the September 7 online edition of the *New England Journal of Medicine* and in the September 27 print version of the publication.

SPECS examined the effects of tight glycemic control with insulin compared to standard glucose management in 980 children hospitalized in the [cardiac intensive care](#) unit (CICU). All of these patients, who ranged in age from newborn to age 3, underwent [open heart surgery](#) with heart-lung bypass. "The cardiac problems faced by the children in our patient population are fundamentally different than the cardiac problems affecting adults," says Agus, Boston Children's Hospital and Harvard Medical School. "But we chose to focus on CICU patients because the cardiac arena is where the bulk of the benefits have been observed in adults."

Although Agus and his fellow researchers discovered that using insulin to maintain [normal blood sugar](#) levels had no demonstrable impact on the incidence of care-related infections (such as surgical site infections and pneumonia), length of stay in the CICU, organ failure or mortality,

they did reach other key milestones. "There were two successes for this trial," explains Agus. "One was that we were able to show that children and adults are different when it comes to the benefit of [glucose control](#) in an CICU. We were also able to demonstrate that we can safely control glucose in a young, vulnerable, sick population."

The research team used subcutaneous [glucose monitors](#) and a custom insulin-dosing algorithm that took continuous values into account, only making changes based on a specific blood value. Consequently, Agus notes, "we put together a system that achieved normal glucose control with the lowest hypoglycemia rate ever documented in a prospective trial."

The investigators also identified a risk category posed by adding unproven new therapies to the patient care regimen: increasing the workload for nursing staff. "The nurses in the study shouldered a significant workload while keeping their focus on the central aspects of patient care," Agus says. "Every task that a nurse does at the bedside ought to be examined scientifically, and that is a significant insight gleaned by this study."

In conclusion, Agus states, "The general lesson of SPECS is that patient populations are unique in all sorts of ways. It's essential to do well-designed studies in well-defined populations to identify the particular needs and characteristics of those populations."

Next, the team will conduct a broader study of glycemic control, Heart and Lung Failure – Pediatric Insulin Titration (HALF-PINT). The randomized, multi-center trial will compare two glucose control ranges in hyperglycemic, critically ill children, ages 2 weeks through 18 years, who are hospitalized in the pediatric intensive care unit with heart and/or lung failure.

Provided by Children's Hospital Boston

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