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American College of Surgeons

Intensive Insulin Protocol Improves Glucose Control and is Associated with a Reduction in ICU Mortality

Charles C Reed, BSN, Ronald M Stewart, MD, FACS, Michele Sherman, BSN, John G Myers, MD, FACS, Michael G Corneille, MD, FACS, Nanette Larson, BSN, Susan Gerhardt, MSN, Randall Beadle, BSN, Conrado Gamboa, MS, RPh, Daniel Dent, MD, FACS, Stephen M Cohn, MD, FACS, Basil A Pruitt Jr, MD, FACS.

Intensive insulin therapy to maintain serum glucose levels between 80 and 110 mg/dL has previously been shown to reduce mortality in the critically ill; recent data, however, have called this benefit into question. In addition, maintaining uniform, tight glucose control is challenging and resource demanding. We hypothesized that, by use of a protocol, tight glucose control could be achieved in the surgical trauma intensive care unit (STICU), and that improved glucose control would be beneficial.

During the study period [led by RALS user Charles Reed, RN at University Hospital in San Antonio] a progressively more rigorous approach to glucose control was used, culminating in an implemented protocol in 2005. We reviewed STICU patients' blood glucose levels, measured by point-of-care testing, from 2003 to 2006. Mortality was tracked over the course of the study, and patient charts were retrospectively reviewed to measure illness and injury severity.

For the results of this study, [click here to access the pdf file](#).

The Endocrine Society's 88th Annual Meeting

Safety of a Computerized IV Insulin Infusion Protocol to Control Blood Glucose in non-ICU Settings.

Rattan Juneja, Adam Golas, Joni Carroll, Deborah Nelson, Samuel Flanders and Corbin Roudebush. Indiana University and Clarian Health Partners, Indianapolis, IN*

Acute hyperglycemia, both recognized and unrecognized, is fairly common in the hospital and not only is it associated with increased morbidity and mortality but efforts to achieve Tight Glucose Control (TGC) with subcutaneous insulin present challenges. We have previously reported that TGC can be achieved safely and effectively in ICUs utilizing an indigenously developed computerized IV Insulin (IVI) program that uses insulin sensitivity factors/multiplier (1). Numerous safeguards are built in and a paper record is maintained in case of computer malfunction. In this open label study, we evaluated the feasibility and safety of our IVI protocol in 251 patients (353 drip runs) admitted to Medical/Surgical Units at an academic Medical Center (University Hospital) and a semi-private Hospital (Methodist Hospital). Target Blood Glucose (BG) was set at 100-150 mg/dl for these insulin infusions.

Initial BG was in the target range (100-150mg/dl) in 82/353 (23.2%) drip runs and remained at target throughout the infusion period. Of the 271 drips that were not at target on the initial BG, 268 (98.9%) achieved and maintained the BG target. The overall rate of hypoglycemia (< 50 mg/dl) was only 0.52%. Our computerized IVI offers a safe and effective alternative to sliding scale or no insulin therapy in achieving and maintaining TGC on Medical/Surgical non-intensive care Units. The cost effectiveness of this approach however still needs to be determined.

References: Juneja, Rattan; Macy, Angela; Wall, Donna; Wolverton, Cheryl; Roudebush, Corbin; Flanders, Samuel J; Utilization Of A Computerized IV Insulin Infusion Protocol To Control Blood Glucose In The ICU; Diabetes, 54 (Suppl 1), June 2005, A103

Society of Critical Care Medicine

First do no harm...Hypoglycemia or Hyperglycemia?

Dr. Van den Berghe has received a research grant from Novo Nordisk to the University of Leuven.

Hyperglycemia is common in intensive care unit (ICU) patients, and severity of hyperglycemia has been repeatedly associated with adverse outcome of a variety of illnesses including critical illness. Traditionally, insulin was not administered until blood glucose exceeded 180–200 mg/dL based on the rationale that such mild increases were not deleterious and tighter control might be complicated by life-threatening hypoglycemia.

In 2001, our large, randomized, controlled study revealed that intensive insulin therapy to maintain normal blood glucose levels (<110 mg/dL) saves lives and prevents debilitating and expensive complications in a predominantly surgical ICU population. The level of blood glucose control rather than the insulin dose explained the benefits. This study was followed by a publication by Krinsley, who reported that when intensive insulin therapy is implemented in real life intensive care, the benefits on morbidity and mortality can be largely reproduced. [Click here for more >](#)

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