

Cleveland Clinic Cardiovascular Intensive Care Unit Insulin Conversion Protocol

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Abstract

Background:

The importance of near-normal blood glucose in the immediate postoperative period is generally accepted and is best achieved in the perioperative period with a constant intravenous (IV) infusion of insulin. This requires intensive nursing only achievable in an intensive care unit (ICU) setting. Glucose management after transfer to a regular nursing floor (RNF) has not been studied systematically. In August 2006, the Cleveland Clinic began using long-acting insulin glargine as the insulin infusion was terminated in the ICU.

Methods:

This prospective analysis examined all patients receiving IV insulin infusion after cardiothoracic surgery in a 1 month period. The analyses evaluated the safety and efficacy of a protocol using a transition to subcutaneous insulin glargine of 50% of the calculated 24 h requirement at the end of the ICU insulin infusion protocol in preparation for transfer to the RNF.

Results:

Only 1 patient in 99 developed hypoglycemia, and no patient suffered severe hypoglycemia (glucose < 40 mg/dl), while the majority (70%) had euglycemia (glucose between 70 and 150 mg/dl).

Conclusions:

This approach was both safe—as there was very little hypoglycemia (1 patient in 99)—and effective, as blood sugar was well controlled in most subjects. Efficacy for achieving euglycemia was 70%. Efficacy was likely reduced because of the upper limit of insulin glargine dosage imposed by some providers as a safety consideration. Although there was a physician option to override, the maximum protocol dose of 30 U was rarely exceeded, leading to inadequate dosing in some subjects who required high insulin infusion rates in the ICU.

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Abbreviations: (CABG) coronary artery bypass graft, (CV) cardiovascular, (CVICU) cardiovascular intensive care unit, (ICU) intensive care unit, (IV) intravenous, (NPH) neutral protamine Hagedorn, (POC) point of care, (RNF) regular nursing floor, (SC) subcutaneous, (SICU) surgical intensive care unit

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