Improving Glycemic Control for Post-Operative Cardiac Surgery Patients: A Nurse Practitioner-Led Project

Principal Investigator: Linda Kerr, DNP, RN, FNP-BC, CDE
Study Team: Peggy Kalowes, PhD, RN, CNS, FAHA
Kim West, MSN, RN, ACNP-BC
Barbara Easterbrook, MSN, RN, ANP
Darice Hawkins, MN, RN, CNS, CCRN

Background
- Hyperglycemia during the first 48 hours following cardiac surgery has been found to be independently associated with the incidence of Deep Sternal Wound Infection.
- Hyperglycemia in hospitalized patients is an independent predictor of mortality for cardiac surgery patients, with or without diabetes.
- Intensive insulin therapy has been shown to increase the occurrence of hypoglycemia and result in complications and adverse clinical outcomes.
- The complexity of insulin therapy, and strategies surrounding planned staff education opportunities, requires clinical providers that are knowledgeable in glycemic management.

Problem
- Among adult cardiac surgery patients, what is the effect of nurse practitioner-led insulin management and glycemic-related process changes compared to existing standards of glycemic care?

PICO Question
- Among adult cardiac surgery patients (P), what is the effect of nurse practitioner-led insulin management and glycemic-related process changes (I), compared to existing standards of glycemic care (C), on post-operative hyperglycemia (O)?

Study Aims
- To determine the effectiveness of a nurse practitioner (NP) led team in glycemic management of cardiac surgery patients
- To determine if NP management would cause an inadvertent increase in hypoglycemic events
- To evaluate nursing perception of the clinical change process

Methodology
- Design: Single-center descriptive, comparative analysis of an NP-led quality improvement project
- Pre-intervention Group: 2014 (January, December)
- Post-intervention Group: 2015 (January, February)

Inclusion Criteria
- 18 years of age or greater
- 2015 (March, April, May)
- Insulin order set changes
- Standardized nutrition orders added
- Reduced carbohydrates per meal from 60 grams to 30 grams (first 24 hours)
- Individualization of insulin therapy, POD 1
- Individualized insulin therapy, POD 1
- Increased availability/visibility of the NP team

Exclusion Criteria
- Transcatheter Aortic Valve Replacement (TAVR)
- Mitral Valve Repair/Replacement (MVR)
- Coronary Artery Bypass Graft (CABG)
- Allergic to Levemir (insulin detemir)
- Expired prior to discharge
- Not included in the cardiac ICU census

Interventions
- NP-LED INTERVENTION PLAN
  - Insulin order set changes
  - Standardized nutrition orders added
  - Reduced carbohydrates per meal from 60 grams to 30 grams (first 24 hours)
  - Individualization of insulin therapy, POD 1
  - Increased availability/visibility of the NP team

Discussion
- Study results demonstrated a significant increase in achievement of the SCIP Inf-4 benchmark following NP-led clinical process changes (p<.001).
- Study results demonstrated a decrease in hypoglycemic events following NP-led clinical process changes. The results were not statistically significant (p=.642), however, there may be clinical significance due to the association between hyperglycemia and increased morbidity for cardiac surgery patients.
- Outcome data for nursing perception of the clinical change process indicated a need for the NP team to expand the number of nursing education sessions.

Study Results
- Study results demonstrated a significant increase in achievement of the SCIP Inf-4 benchmark following NP-led clinical process changes (p<.001).
- Study results demonstrated a decrease in hypoglycemic events following NP-led clinical process changes. The results were not statistically significant (p=.642), however, there may be clinical significance due to the association between hyperglycemia and increased morbidity for cardiac surgery patients.
- Outcome data for nursing perception of the clinical change process indicated a need for the NP team to expand the number of nursing education sessions.

REFERENCES: