***Evaluation of Glycemic Management and Outcomes for Patients Requiring Parenteral Nutrition***

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**Background**: Current standards for glycemic management vary among institutions, with reported incidence of inpatient hyperglycemia among recent studies ranging between 32-56%. Receipt of glucose via parenteral nutrition (PN) supplementation may result in sustained serum blood glucose (BG) levels leading to stress hyperglycemia, with complications such as glucosuria, hyperosmolarity, and hepatic dysfunction.Providers among Novant Health inpatient medical facilities may utilize multiple strategies to attain glycemic control for patients on PN, and a formal review of glycemic outcomes is pertinent to assess adherence to glycemic goals for these patients. Utilizing recent guideline recommendations from the ADA and A.S.P.E.N., evaluation of available treatments will provide insight to the effect on glycemic management with each treatment modality.

**Purpose**: The purpose of this study is to evaluate glycemic outcomes in patients receiving parenteral nutrition (PN) supplementation, who required management with insulin, to guide validation of current practices and to optimize pharmacy services.

**Objectives**: The primary outcome of this study is to evaluate glycemic management practices among patients requiring PN by quantifying and evaluating percentages of patients receiving PN that experienced any occurrence of hypoglycemia (BG < 70mg/dL), and/or hyperglycemia (BG > 250 mg/dL). Secondary outcomes include evaluation of the percentage of patients who required rescue therapy for profound hypoglycemia (BG < 50 mg/dl), and evaluation of glycemic management practice trends among included study facilities.

**Methods**: This was a retrospective cohort study utilizing data collected from five inpatient treatment facilities within Novant Health (Forsyth, Presbyterian, Huntersville, Rowan, and Matthews Medical Centers) with timeframe being January 1, 2019 to December 31, 2020. Patients were included if 18 years or older, required PN support and initiation of surveillance monitoring, eGlycemic Management Software (eGMS) or correctional sliding scale insulin (SSI) dosing/insulin added to PN. Patients were stratified by treatment location, and randomized for inclusion.

**Results:** Baseline demographics were comparable amongst treatment groups, including patients requiring ICU level care, corticosteroid use, and prior diagnosis of diabetes mellitus. Regarding the primary outcome, patients managed via eGMS compared to patients managed with correctional subcutaneous sliding scale insulin experienced higher rates of hypoglycemia (p = 0.0096), and hyperglycemia (p = <0.00001). Regarding secondary outcomes, 44% of patients only required surveillance monitoring of BG, 33% of patients were managed by eGMS, and 24% of patients were managed via a traditional subcutaneous SSI. Rates of profound hypoglycemia were not significant (p = 0.46) between treatment groups.

**Conclusion:** For patients on PN requiring glycemic management, our findings suggest that traditional management with correctional subcutaneous SSI may be more efficacious in achieving target glucose levels. Use of eGMS in the management of PN patients resulted in greater incidence of hyperglycemic, and hypoglycemic episodes, without a difference in rates of profound hypoglycemia. Practice trends for glycemic management among Novant Health facilities varies, with some locations utilizing traditional subcutaneous SSI options more commonly to manage patients on PN.