

Effect of pharmacist intervention on glycemic control in intensive care unit patients



Reagan King, PharmD; Ryan Meadows, PharmD, BCCCP, BCIDP, BCPS; Clifford Cornett, PharmD, BCPS, BCCP; Amanda Hall, PharmD
Appalachian Regional Healthcare - Hazard, Kentucky



Background

- Hyperglycemia is a common issue among hospitalized patients with or without known diabetes.
- Numerous observational and prospective randomized trials have shown a correlation between inpatient hyperglycemia and poor clinical outcomes, such as: mortality, morbidity, length of stay, overall complications.
- Glycemic control data was obtained from the intensive care unit at Hazard ARH Regional Medical Center.

Purpose

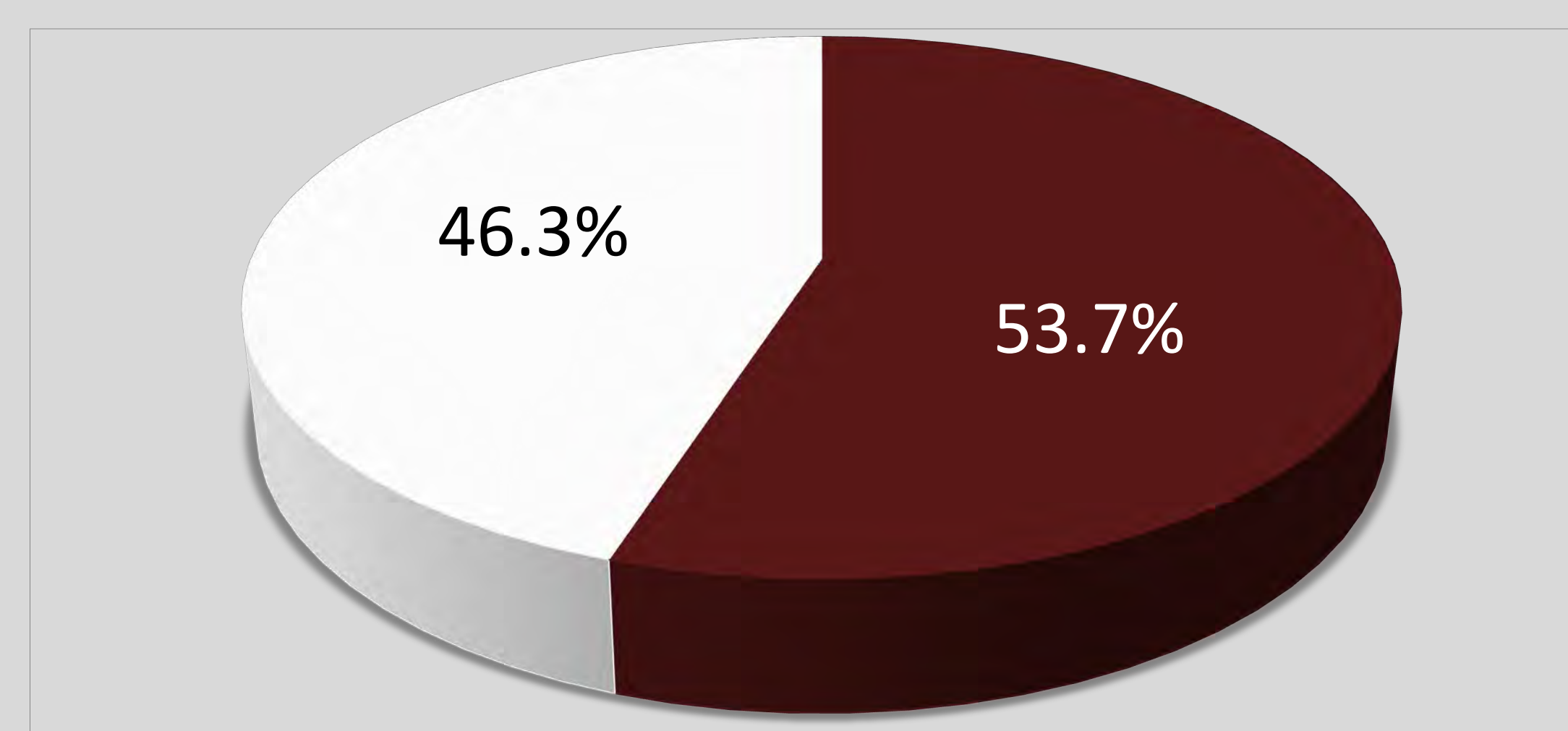
To assess the effect of pharmacist intervention on glycemic control and clinical outcomes of patients in the intensive care unit.

Methods

- A retrospective chart review was conducted on intensive care unit patients from November 1, 2019 to December 31, 2020.
- Data included ICU length of stay (LOS), total patient days and percentage of patient days with an average blood glucose > 180 mg/dL.
- An intervention will be defined as pharmacist implementation of glycemic control processes.
- Inclusion criteria:
 - Patients who are 18 years of age or older
 - Admitted to the intensive care unit
 - Patients with at least one blood glucose > 180 mg/dL
- Exclusion criteria:
 - Patients less than 18 years of age
 - Not admitted to the intensive care unit
 - Patients without at least one blood glucose > 180 mg/dL

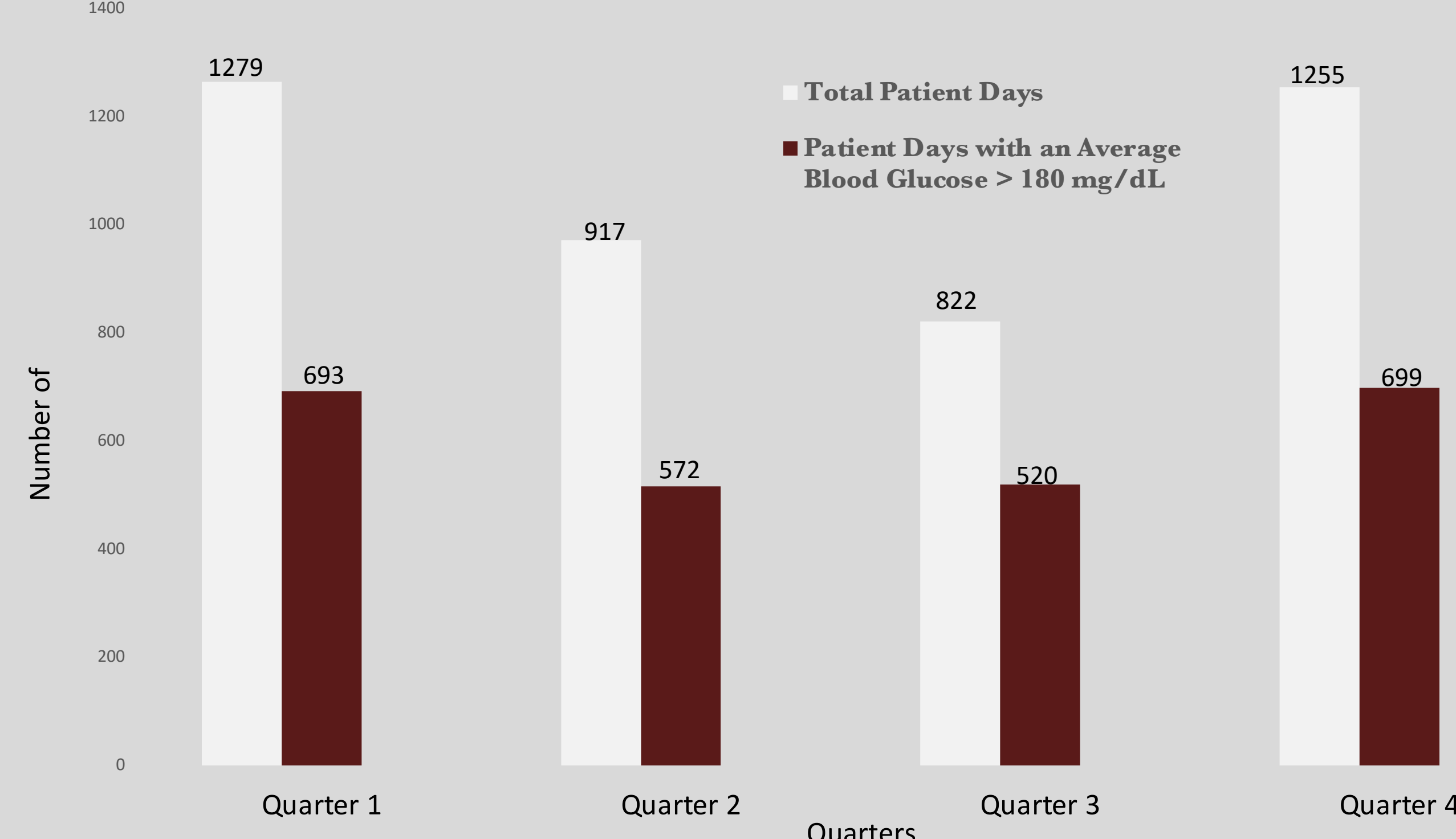
Results

Pre-Intervention

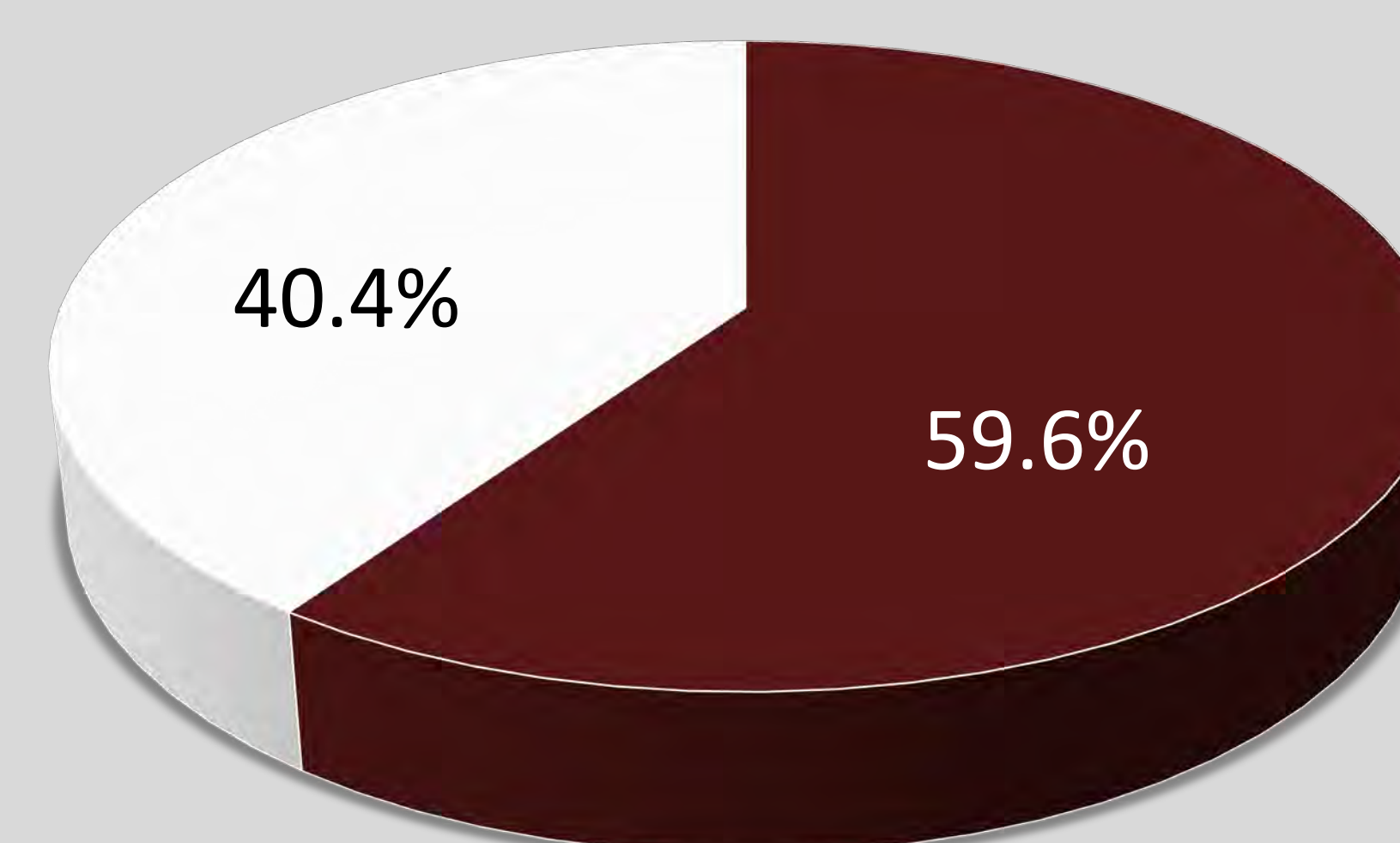


■ % of Patient Days with an Average Blood Glucose > 180 mg/dL
 ■ % of Patient Days with an Average Blood Glucose < 180 mg/dL

Pre- and Post-Intervention



Post-Intervention



■ % of Patient Days with an Average Blood Glucose > 180 mg/dL
 ■ % of Patient Days with an Average Blood Glucose < 180 mg/dL

Protocols and Education

- The new insulin drip protocol was introduced on July 6th, 2020. It provides clear instructions and guidelines for starting and titrating an insulin drip, preventing overcorrection, and treating hypoglycemia.
- Education will be given to nurses, physicians, and pharmacists regarding the new insulin drip protocol as well as other glycemic aspects involved in ICU patient care.

Data Analysis

- When combining data from Quarter 1 and Quarter 2, patients spent 53.7% of total patient days with an average blood glucose \geq 180 mg/dL.
- Data from Quarter 3 has shown 520 patient days were spent with a blood glucose \geq 180 mg/dL out of 822 total patient days. Data from Quarter 4 has shown 699 patient days were spent with a blood glucose \geq 180 mg/dL out of 1255 total patient days.
- When combining data from Quarter 3 and Quarter 4, patients spent 59.6% of total patient days with an average blood glucose \geq 180 mg/dL.

Discussion

- Post-intervention data did not reflect well on the protocols and education that were implemented for this study.
- This could be in part due to the COVID-19 pandemic and an increased percentage of diabetics admitted to the ICU. It is known that the diabetic population has an increased risk of becoming severely ill from COVID-19. The post-intervention study population included a large percentage of COVID ICU patients.
- Another possibility could be the reluctance to initiate insulin drips in order to prevent unnecessary exposure and save PPE.

References

1. The NICE-SUGAR Study Investigators. "Intensive versus Conventional Glucose Control in Critically Ill Patients." *New England Journal of Medicine*, vol. 360, no. 13, 2009, pp. 1283-1297. doi:10.1056/nejmoa0810625.
2. Brunkhorst FM, Engel C, Bloos F, et al. Intensive insulin therapy and pentastarch resuscitation in severe sepsis. *N Engl J Med* 2008; 358:125.
3. Preiser JC, Devos P, Ruiz-Santana S, et al. A prospective randomised multi-centre controlled trial on tight glucose control by intensive insulin therapy in adult intensive care units: the Glucontrol study. *Intensive Care Med* 2009; 35:1738.
4. Corsino L, Dhatariya K, Umpierrez G. Management of Diabetes and Hyperglycemia in Hospitalized Patients. [Updated 2017 Oct 1]

Disclosures

Reagan King, PharmD: No Disclosures
 Ryan Meadows, PharmD, BCCCP, BCIDP, BCPS: No Disclosures
 Clifford Cornett, PharmD, BCPS: No Disclosures
 Amanda Hall, PharmD: No Disclosures