

## **Quality Improvement Initiative to Reduce Severe Hyperglycemia in Hospitalized Patients Receiving High-dose Glucocorticoids**

Lindsay Carafone, MD<sup>1</sup>, Yumiko Esaki, MD<sup>1</sup>, Chandni Bheeman, DO<sup>1</sup>, Neesha Desai, MD<sup>1</sup>, Tony Sun, MD<sup>1</sup>, Tania Arous, MD<sup>2</sup>, Heidi Kipp, NP<sup>1</sup>, Danielle Frumusa, PAC<sup>1</sup>,

Renee Davis, RD,CDCEs<sup>1</sup>, Sean McMahon MBA, BS, BA<sup>1</sup>, Sara Rose MacLeod, DO, MPH<sup>1</sup>, Marilyn Augustine, MD<sup>1</sup>

<sup>1</sup>Division of Endocrinology, Diabetes, and Metabolism, University of Rochester Medical Center, Rochester, NY, <sup>2</sup>Division of Endocrinology, Loma Linda University Health, Loma Linda, CA

Inpatient hyperglycemia is associated with poor outcomes, including increased length of stay, and higher morbidity and mortality. Glucocorticoids are associated with increased risk of hyperglycemia and the development of diabetes. However, the detection and management of steroid-induced hyperglycemia can be challenging. The aims of this quality improvement project were to improve detection of hyperglycemia related to administration of high-dose glucocorticoids in hospitalized patients, and to aid the primary managing team with hyperglycemia treatment. The target population consisted of patients admitted to Wilmot Cancer Center, a high-level cancer care facility in a large academic medical center, who were receiving high dose glucocorticoids and had a blood glucose >180 mg/dL. There were three interventions: 1) Best Practice Alert (BPA) to alert the provider of hyperglycemia, 2) Insulin management guide, and 3) Patient education tool. The first intervention was to create the BPA to make providers aware of patients at risk of ongoing hyperglycemia. The BPA was programmed to alert the provider when a patient had a blood glucose > 180 mg/dl while on high-dose glucocorticoids (e.g., dexamethasone 4 mg daily, prednisone 20 mg daily, or methylprednisolone 16 mg daily). The BPA prompted the provider to monitor glucose with point-of-care testing (POCT) glucose with an option to click to order the POCT glucose. The second intervention was the creation of an insulin management guide for oncology providers to use for inpatient hyperglycemia management. The BPA was linked to an order set in which the provider received insulin recommendations depending on the steroid (e.g. for a patient who is on daily prednisone, NPH would be suggested). Initiation dosing instructions and titration recommendations were provided. The guideline was also posted on the hospital PolicyStat. The third intervention was access to a patient education tool on hyperglycemia. These handouts were curated by a registered dietician for this project and contain information about hypoglycemia, hyperglycemia, and carbohydrate counting. Outcome measures included the percentage change in patients identified with hyperglycemia and continue to be collected at the present time. After 12 months of the intervention, the percentage of patients identified with hyperglycemia and subsequently with POCT ordered increased from 48% to 59%. Some providers did not order POCT glucose because hyperglycemia was only found in one POCT glucose and self-resolved. The BPA has improved the percentage of patients identified with hyperglycemia following high-dose glucocorticoid initiation. In the next step, we will measure how the other two interventions have been utilized to manage hyperglycemia.