

Hawai'i Pacific Health

Core Metric: Glycemic Control

Executive Brief

About

Hawai'i Pacific Health is a not-for-profit health care network of hospitals, clinics, physicians and care providers dedicated to the mission of improving the health and well-being of the people of Hawai'i and the Pacific Region. Anchored by its four hospitals - Kapi'olani, Pali Momi, Straub and Wilcox – Hawai'i Pacific Health includes more than 50 convenient locations and service sites statewide.

Results

- Increased CDIDS utilization to more than 90% of titratable IV insulin infusions
- Increased normal range glucose values from 59% to 83% of critical care patients

Overview

In 2013, Hawai'i Pacific Health (HPH) identified the need to reduce surgical complications and length of stay (LOS). Having recognized that poorly managed blood glucose is a known contributing factor in both areas, HPH targeted glycemic control for improvement. They implemented a computer-directed insulin dosing system (CDIDS), developed new EHR tools, created and standardized inpatient glycemic management processes and integrated glucose devices. In addition, HPH created a reliable way to measure outcomes.

In the 18 months following staggered adoption of the new tools in HPH critical care units, CDIDS utilization increased to more than 90 percent of titratable IV insulin infusions. In addition, 83 percent of glucose values for patients placed on CDIDS were within the recommended normal glucose range, compared to only 59 percent of glucose values experienced by patients placed on usual care (paper based protocols).

Situation

HPH wanted to close the gap between their diabetic and non-diabetic patient populations with regard to surgical morbidity and complication rates, with a need to make improvements in the diabetic population. This goal served as HPH's fuel to prioritize glycemic control system wide. Aside from its contribution to surgical complications, HPH also identified poor glucose control during acute medical or surgical illness being independently associated with increased LOS and total hospitalization cost. HPH's data showed about a two-day increase in LOS for patients diagnosed with diabetes compared to those without diabetes.

HPH drove three primary health IT initiatives in their glycemic control efforts: implementing a CDIDS, developing EHR order sets to support basal-bolus subcutaneous insulin dosing for patients who weren't candidates for the CDIDS, and integrating wireless glucometers. HPH also developed a system-wide hypoglycemia management protocol and provided staff and physician education. Intended outcomes of the project were to reduce variation in inpatient glucose management across the health system, improve patient outcomes and reduce costs.

HPH's initial plan was to simultaneously implement IV and subcutaneous CDIDS modules at each site over the course of 6-9 months. However, they encountered significant clinical practice and technical challenges after the first go-live at two sites, causing them to halt subcutaneous insulin dosing module implementation for six months. The implementation 'time out' gave HPH the opportunity to make additional improvements to protocols, education and technology. HPH was then able to successfully continue the rollout throughout its hospitals.

Outcomes

HPH's CDIDS and standardized ordering and administration for titratable insulin infusions improved workflow, reduced medication errors and improved outcomes.

- ❖ From December 2014 through June 2016, HPH increased system-wide utilization of the CDIDS for titratable insulin infusions from 28.8 percent to 90 percent.
- ❖ Improved glycemic control in intensive care unit (ICU) patients placed on CDIDS. The results include all glucose values across the health system from December 2014 through June 2016 (although two HPH hospitals didn't have this system until October 2015). While rates of below one percent of hypoglycemia existed prior to CDIDS implementation, these low rates continued since the tool was introduced.
- ❖ Achieved superior glucose control and improved normoglycemia and hyperglycemia rates for critically ill patients on IV insulin infusions: 82.5 percent of glucose values for patients placed on CDIDS were within the recommended normal glucose range of 70-180 mg/dl, compared to 59.2 percent of glucose values for patients placed on usual care.
- ❖ Improved glucose control with CDIDS, with the hyperglycemia rate representing 16.6 percent of all glucose values compared to 39.8 percent of all glucose values in the ICU setting above the recommended limit with usual care.
- ❖ Although HPH had lower adoption of the subcutaneous CDIDS tool with only 20% of potential patients using the tool for insulin, and a shorter period of time to evaluate success for patients who require subcutaneous insulin, HPH still demonstrated more normoglycemic days for patients where subcutaneous CDIDS was used.
- ❖ Increased adoption of non-CDIDS basal-bolus insulin dosing as a result of the focused attention, training and tools provided to HPH's clinicians.

Financial Considerations

HPH saved \$420,000 by decreasing ICU LOS, which was partially offset by fees and ICU nurse and pharmacist training costs. HPH anticipates \$240,000 annual savings from IV CDIDS utilization in critical care units.

Lessons Learned

Hawai'i Pacific Health shared lessons learned from their stated biggest challenges.

- ❖ **Concomitant rollout of principles of glycemic management and new insulin dosing tools.** During initial CDIDS introduction, we discovered a knowledge gap in glycemic management among staff and physicians. We'd assumed they knew the principles of glycemic management, so trainers provided only a brief review with the primary focus on workflow and how to use the electronic tools. An interruption in CDIDS implementation gave us time to re-educate staff and physicians.
- ❖ **Timing of wireless glucometer integration.** When we first began to update glycemic management at Straub Clinic and Hospital and Pali Momi Medical Center, our glucometers were stand-alone devices with no integration. This required nurses to double document the glucose value in the EHR and in the CDIDS. There was also opportunity for manual transcription error. We delayed the restart of the subcutaneous insulin dosing module at Straub and at Pali Momi until we integrated glucometers. Integrated glucometers were in place at Wilcox Memorial Hospital and Kapi'olani Medical Center for Women and Children before CDIDS implementation.
- ❖ **Technical issues with a cloud based product hosted thousands of miles away.** Soon after initial go-live, clinicians reported technical problems with freezing episodes. These were significant, interfering with the ability to provide prompt care, and caused a time out in CDIDS rollout. We lacked confidence the issues were resolved, so our second go-live attempt began on a single unit. When we proceeded again to a full hospital go-live, there were additional slow-down issues that would have led us to halt the project entirely. But, by that time, physicians at the pilot site were convinced that care had improved significantly for this patient population, encouraging us to continue to move forward. The freezing was only resolved once the vendor provided a hosted version of the software in our geographic area.
- ❖ **Ownership and accountability issues.** During go-live, the sites became so heavily reliant on the project team, it became difficult for the team to leave. Each hospital required stronger nursing, pharmacy and physician support within their own walls. Since go-live, we've made significant progress and continue to build site clinical leadership and structure support so that optimal glycemic control is a priority and an integral part of daily workflow.

Since 1994, the HIMSS Nicholas E. Davies Award of Excellence has recognized outstanding achievement of organizations who have utilized health information technology to substantially improve patient outcomes while achieving return on investment. The Davies Awards program promotes EHR-enabled improvement in patient outcomes through sharing case studies and lessons learned on implementation strategies, workflow design, best practice adherence, and patient engagement.

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