Sugar Crash! Time to Insulin Administration in the Emergency Department for Diabetic Ketoacidosis

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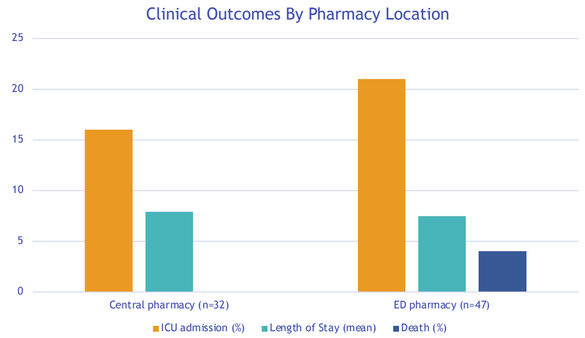
Background

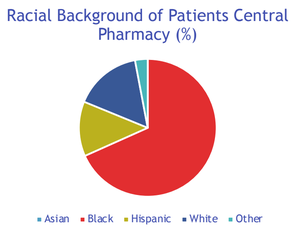
- **Problem Statement:** DKA and HHS are life-threatening but preventable complications of diabetes for which insulin infusion is the treatment. Insulin infusion in the TJUH ED is prone to delay resulting in potential poorer patient outcomes.
- One potential cause of delay is that insulin formulations are not readily available in the ED pharmacy. Thus improving the availability of compounded insulin infusion in the ED pharmacy may prevent delays in treatment.
- **Project AIM:** The time to insulin administration from ordering through JIIP protocol has been delayed in the Emergency Department. We have established a way to store prepared insulin infusions in the Emergency Department so they are readily available for administration. We anticipate to see a decrease in time to administration with our intervention of about 30 minutes.

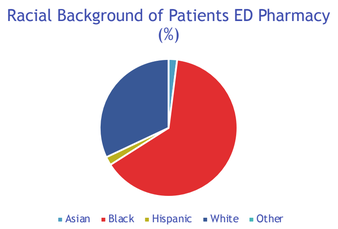
Baseline Metrics

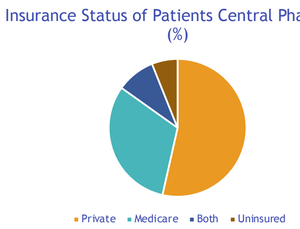
Table 1. Baseline characteristics.

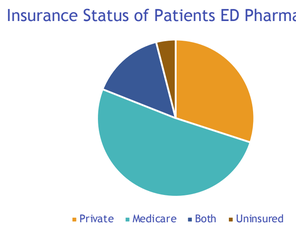
Characteristic	Central pharmacy (n=32)	ED pharmacy (n=47)	P-value
Age in years, mean (SD)	47.6 (17.1)	54.0 (17.2)	0.11
Female sex, no. (%)	18 (56%)	20 (43%)	0.23
Diabetes mellitus type I, no. (%)	8 (25%)	13 (28%)	0.79



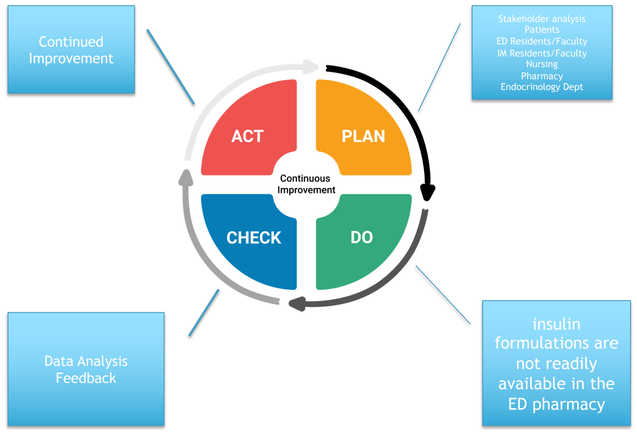


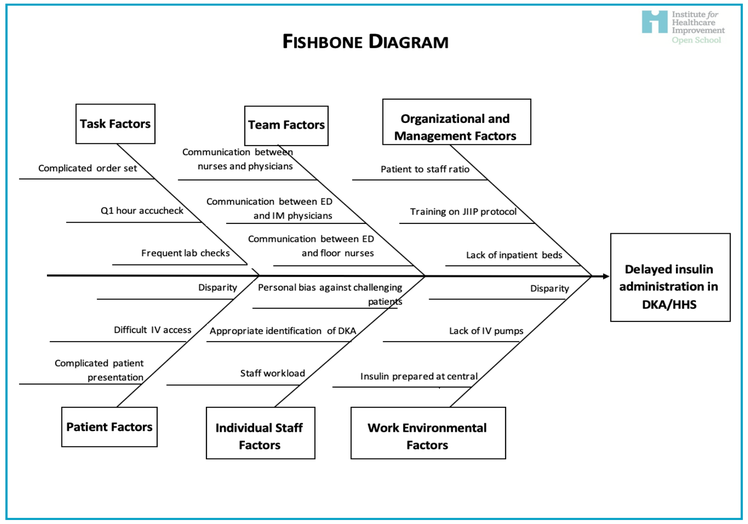






Interventions





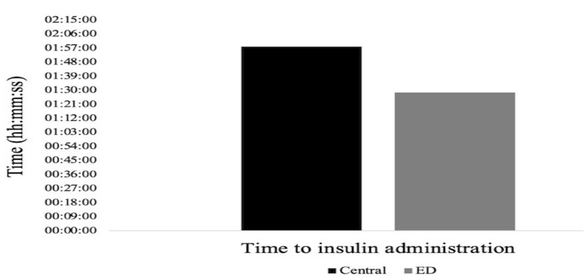
Results & Discussion

TJUH serves a racially and socio-economically diverse catchment area, and diabetes is a prevalent disease among the patients that we treat. The diabetes complications of DKA and HHS are common presenting illnesses in the ED and ensuring appropriate medication is administered quickly and effectively is of the utmost importance.

Our intervention was enacted and the ability to compound insulin drips in both the central TJUH pharmacy and the ED pharmacy, as compared to before our intervention when insulin was only compounded centrally and delivered to the ED.

While our p-values comparing clinical outcomes as defined by ICU admissions, length of hospitalization, and death for patients who were treated before and after our intervention were none significant at p = 0.53, p = 0.88, and 0.24, respectively, data does suggestion that the time to insulin administration was improved. (Figure 1)

Figure 1. Time to insulin administration.



Central pharmacy: 118.1 (70.0) minutes
ED pharmacy: 88.7 (109.9) minutes

Linkage to Healthcare Disparities

Numerous studies have demonstrated that access to affordable insulin, fresh foods, an appropriate tools such as glucose monitoring devices improves glycemic control and reduces diabetes-related hospitalizations and emergency room service utilization. Lack of access to such necessities in persons with diabetes treated with intensive insulin regimens disproportionally impacts those of lower socioeconomic status and racial minorities.

Next steps for TJUH could entail studying catchment population on the issues of access and need to see if disparities among our own patient community are revealed.

Scan here for References ➡️

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