Reducing hospital readmissions in youth with high risk of Diabetic Ketoacidosis

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Background

- Diabetic ketoacidosis (DKA) is a life-threatening yet avoidable complication of diabetes.
- Approximately, 10% of youth with Type 1 diabetes (yT1D) experience at least one DKA event per year. [1,2]
- Key risk factors of DKA include high HbA1c, low socio-economic status, public insurance, and prior DKA hospitalization.[3]
- At our diabetes center, providers have manually maintained lists of patients with high HbA1c and frequent DKA admissions to provide support and regular follow-ups.
- However, this manual process for identifying high-risk patients is time-consuming and prone to missed communications.

Objectives

- Therefore, the aim of this quality improvement (QI) initiative is to **reduce DKA admissions by 15%**

1. by developing **a high-risk dashboard** with an automated risk score and
2. by providing a **wraparound program** for patients admitted in DKA.

Methods

High-risk DKA score and dashboard: initiated in September 2024

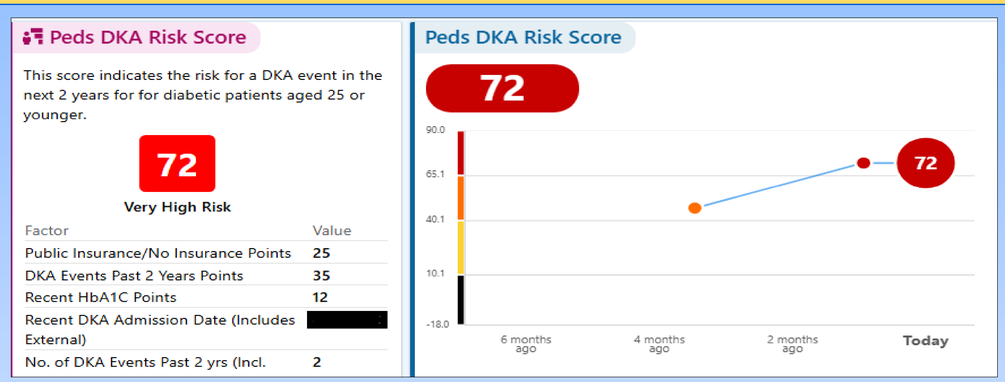
- A DKA risk score was created and validated using known risk factors captured in the EMR: **prior DKA admissions, insurance type and HbA1c**.
- The **score ranges from -10 to 100** with **higher score** representing **higher risk of DKA**.
- Creation of risk score and validation of the dashboard were implemented and tested in Plan-Do-Study-Act (PDSA) cycles.

High-risk DKA wraparound program: initiated in March 2025

- In this program, we enroll patients who are hospitalized for DKA.
- Our team of nurses and social workers provide **6 months of intensive clinical and social support.**
- Outreach is provided weekly in month 1, biweekly in months 2–3, and monthly in months 4–6, alternating between social work and nurses.
- PDSA cycles are ongoing for the wraparound program.
- Bar charts show number of monthly DKA admissions, stratified by DKA readmissions.

Results

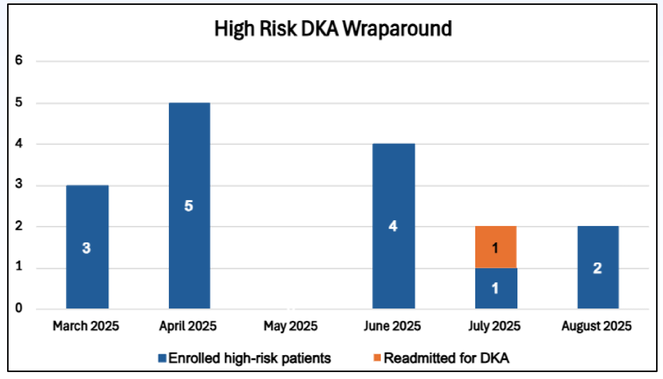
HIGH-RISK DKA DASHBOARD



- The dashboard validation **scored 822 yT1D** seen in the 2 years before February 2024.
- Of these, **5% were at very high-risk, 9% at high-risk**, 34% at medium-risk and 53% at low-risk of DKA.
- During the follow-up period (2/2024 -1/2025), **26% of the very high-risk patients experienced DKA**. Additionally, 9% of high-risk, 4% of medium-risk, and 1% of low-risk patients developed DKA.
- The score will be available to clinicians in the EMR in the patient schedule, reports, and patient lists. It is generated for>99% of yT1D.

HIGH-RISK DKA WRAPAROUND PROGRAM

- 15 high-risk yT1D who were admitted for DKA were enrolled in the high risk DKA wraparound program.
- The mean age was 11.4 years, 66.7% identified as non-Hispanic black, 13.4% as Hispanic, and 93.3% had public insurance.
- Mean baseline Hemoglobin A1c was 12.0%.



Patient characteristics	(N=15)
Female sex, n (%)	7 (46.7%)
Age (y), Mean (SD)	11.4 (4.5)
Race/ethnicity, n (%)	
Non-Hispanic Black	10 (66.7%)
Non-Hispanic White	2 (13.3%)
Hispanic	2 (13.3%)
Unknown	1 (6.7%)
Public insurance, n (%)	14 (93.3%)
Baseline HbA1c (%), Mean (SD)	12.0 (2.1)

Of the 15 patients currently in the program, one patient was readmitted in DKA.

Conclusions

- The DKA risk score provides an accurate and efficient solution for the care team to identify highest-risk patients.
- Through the wraparound program, patients receive regular blood sugar checks, insulin dose adjustments, and assistance with diabetes technology, transportation, insurance, and other family needs.
- The proactive clinical and social support provided in the wraparound program improves patient outreach and communication.
- Together, the dashboard and wraparound program have the potential to reduce DKA-related admissions amongyT1D.
- The final dashboard was deployed in the EHR system on September 9th, 2025.
- In the future, the wraparound program will be expanded to patients in the highest risk category to prevent DKA admissions.
- Ongoing assessments will be conducted to determine long term benefits of these QI initiatives.

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