Reducing Requirements for Pump Referral Improves Pump Initiation for Publicly Insured Patients

Brian Miyazaki[1], Jennifer Baldwin[1], James Connard[1], Jose Aceves[1], Casey Berman[1], Jessica Ferris[1], Rebecca O. L. Barber[2], Debbie Miller[1], Lily C. Chao[1]

[1]The Center for Endocrinology, Diabetes, and Metabolism, Children's Hospital Los Angeles (CHLA), [2]Institute for Nursing and Interprofessional Research, CHLA

BACKGROUND

- Insulin pump therapy lowers HbA1c and has the potential to reduce long-term diabetes related complications
- Conventional process (CP) for insulin pump referral strives to optimize insulin doses prior to obtaining insurance authorization.
- Median time to pump initiation in 2020: 136 days
- Privately insured patients (2.5x) and English speakers (1.7x) have higher odds of starting pump

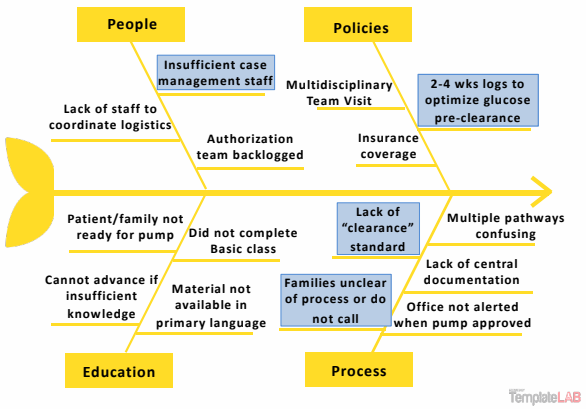
HYPOTHESIS

We hypothesize that reducing requirements for insulin pump initiation will improve pump access and reduce health inequity.

METHODS

- Barriers to insulin pump initiation was identified using fishbone diagram
- New pathway (NP) for pump referral was created
- Data was collected for pump referrals between 9/1/22 to 3/31/23 from a large urban children's hospital
- We compared time to pump initiation and insurance status between patients in the CP and NP. Fisher's exact test, Mann Whitney test, and student t-test were used for analysis, with $p<0.05$ considered significant.

Figure 1. Pump Referral Improvement Fishbone Diagram

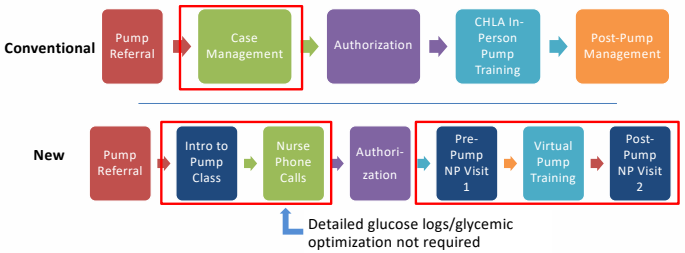


METHODS

Table 1. Summary of Interventions Developed to Improve Pump Referral

Key Driver	Intervention	PDSA	Progress Note	Next Steps
Policy	Eliminated requirement for detailed glucose logs and repeated phone calls for insulin dose adjustment	3	More patients completed clearance. Reduced time spent per patient	Eliminate logging requirement for all pump referral pathways
	Need only basics of carbohydrate counting	1		
	Family must understand when to check ketones	1		
Education	Created "Intro to Pump" hybrid class	1, 4	English only. Class became hybrid starting cycle 4	Translate into Spanish
	Post Intro to Pump Class quiz	1	English only	Translate into Spanish
	Referral road map for families	1, 2	Edited for clarity	Translate into Spanish
	Recorded Medical Management class as video	1	Recording delayed when hospital changed HIPAA platforms	
	Medical Management Quiz	1	English only	
People	Started with 1 nurse champion	1	Workflow modified based on nurse champion experience	Bringing all nurses into this process
	Coordinator sends invitations to Intro to Pump classes, schedules calls with nurse	1,5	Scheduling calls improved efficiency in connecting nurse with family	
	NP: pre-pump virtual appt to determine dosing, sends insulin Rx, coordinates training with pump trainers, and conduct post-pump assessment	1	Reduces nurse discomfort at determining doses without detailed glucose logs	
Process	Coordinated with vendors to do virtual pump training	1		
	Created central documentation location	1, 5		

Figure 2. Pump Referral Process Map



Summary of Major Interventions

- Intro to Pump class (English)
- 2 weeks of glucose levels required (CGM OK; removed requirement for insulin/carb logging)
- 2 scheduled phones with diabetes nurse
- Medical management portion of pump class recorded for asynchronous viewing by family
- Post-class quizzes created to assess patient/family knowledge deficits
- Insulin pump training conducted virtually by company trainer

RESULTS

Table 2. Patient Demographics

	Conventional	New	p value
N	83	33	*NA*
% Male	55	58	*0.83*
% Public Insurance	71	68	*0.81*
Age (yr)	12.2 (4.6)	11.9 (4.1)	*0.73*
Diabetes (yr) Duration (SD)	2.8 (2.7)	3.0 (3.3)	*0.84*
Race/Ethnicity (%)			*0.99*
White	27	26	
Latino	19	20	
Other	38	40	
Unknown	16	14	

Table 3. Outcomes of New Pump Referral Process

	Conventional	New	P Value
Overall	22.6%	54.8%	***0.0026***
Insurance			
Public	11.4%	57.1%	***0.0002***
Private	50.0%	50.0%	*>0.99*
Days to pump start, median (95% CI)	87 (36-150)	91 (54-124)	*0.84*
Medical Management Quiz, mean (SD)	76% (10%)	68% (14%)	*0.062*
30 day % time in range (SD)	Pre 59 (22) / Post 70 (15)	Pre 45 (20) / Post 61 (15)	*CP: 0.17* ***New: 0.021***

CONCLUSIONS

- New pump referral process improves pump initiation rate for publicly insured patients
- Median time to pump start did not differ between the two pathways
- Medical knowledge comparable between the two pathways

IMPLICATIONS FOR PRACTICE

- Reducing requirements to pump start improves pump access and reduce health inequity
- Optimizing glycemia is not essential for automated insulin delivery systems
- Future process developments are needed to reduce pump start time
- Develop workflow for families that prefer in-person training
- Expand and test workflow for Spanish-speaking patients