



Intermountain®
Primary Children's Hospital



HEALTH
UNIVERSITY OF UTAH

INCREASING PUMP THERAPY ADOPTION IN PATIENTS WITH TYPE 1 DIABETES

Allison Smego MD, Fadi Asfour MD, Janet Sirstins RN, BSN, CDCES, Corinne Loizos MS, RD,
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PRIMARY CHILDREN'S HOSPITAL DIABETES CLINIC

- Salt Lake City, UT
- 2300 type 1 diabetes patients
- Approx 300+ new onset yearly
- 77% private insurance
- 23% public insurance

Multidisciplinary Team

- 11 physicians
- 4 NPs
- 3 fellows
- 10 RN (CDCES)
- 2 RD (CDCES)
- 2 social workers
- 0.25 psychologist

Contacts

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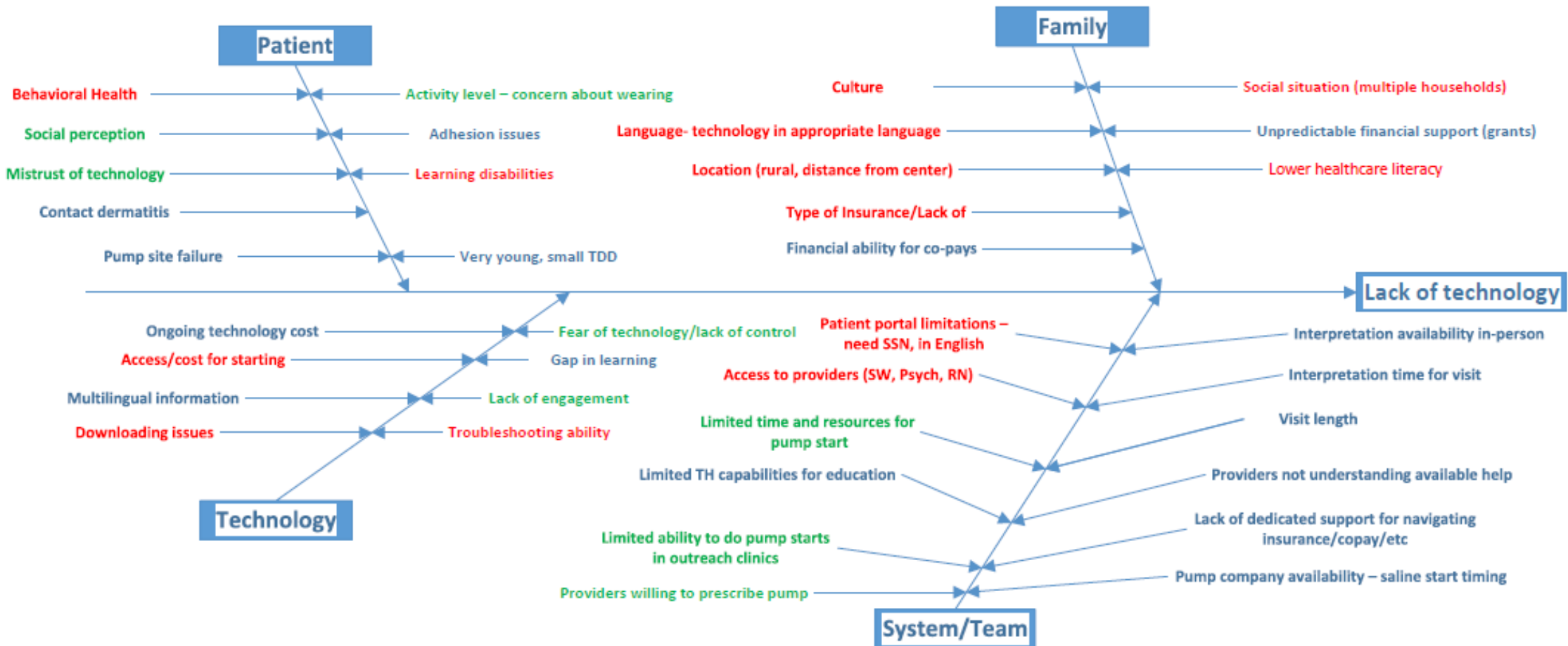
BACKGROUND

- Insulin pump therapy improves glycemic outcomes and quality of life in pediatric patients with type 1 diabetes
- Historically, our pump initiation process was long and complex
 - Monthly pump class typically at least 6 months from diagnosis
 - A1c must be $\leq 9.5\%$ for pump eligibility

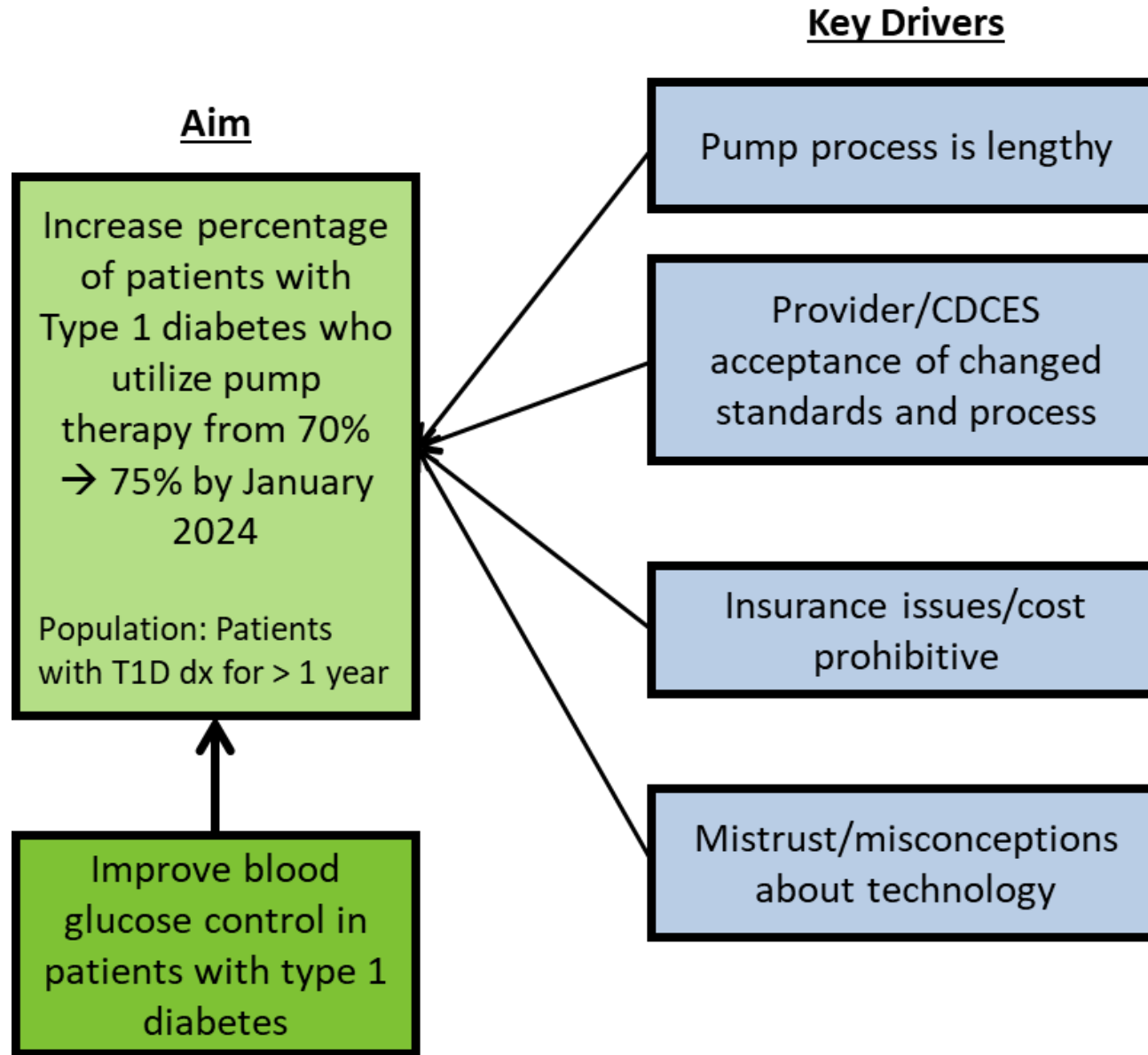
AIM

- Global aim was to improve glycemic control in patients with type 1 diabetes
- Specific project aim: Increase pump therapy adoption in patients with type 1 diabetes from nearly 70% in January 2023 to 75% by December 2023

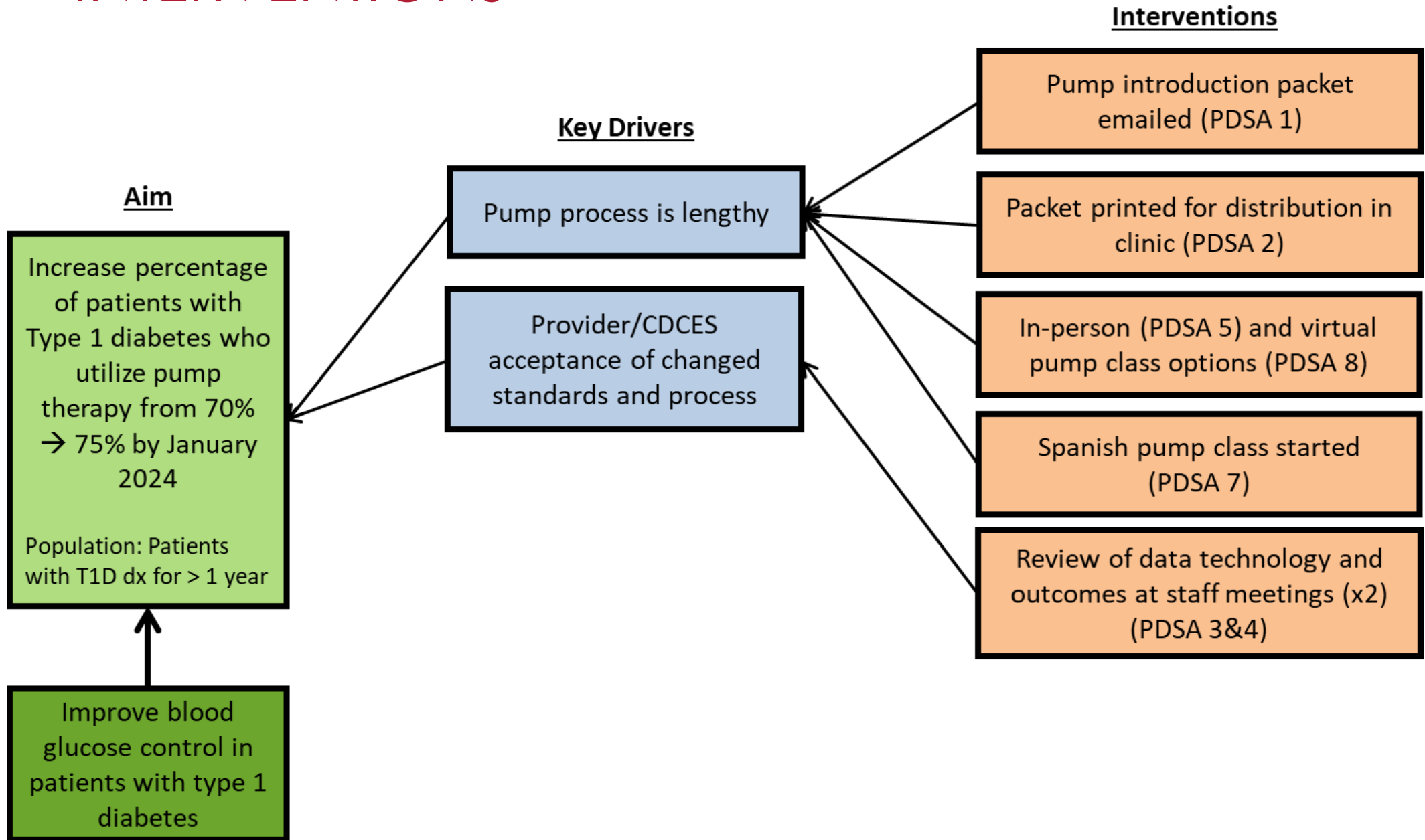
FISHBONE



KEY DRIVER DIAGRAM



INTERVENTIONS



INTERVENTIONS

Aim

Increase percentage of patients with Type 1 diabetes who utilize pump therapy from 70% → 75% by January 2024

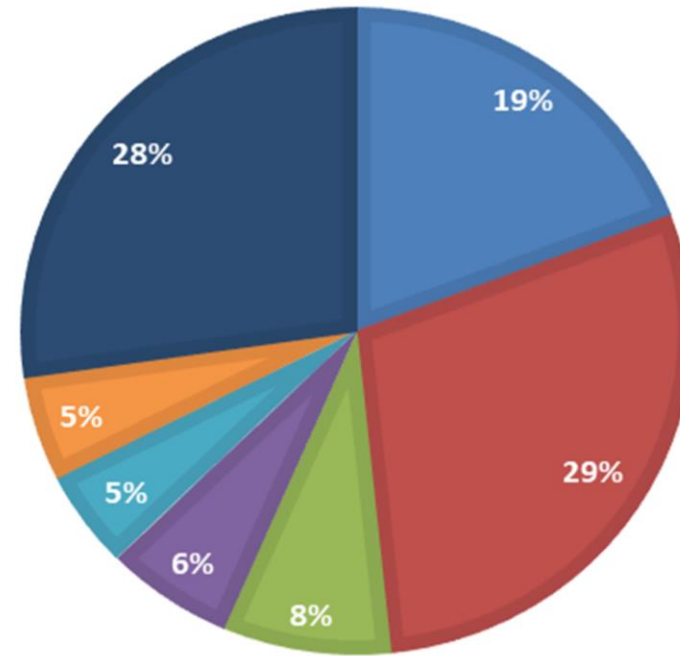
Population: Patients with T1D dx for > 1 year

Improve blood glucose control in patients with type 1 diabetes

Mistrust/misconceptions about technology

Pump misconceptions/concerns handout (PDSA 6)

Interventions
PUMP ADOPTION CONCERNS

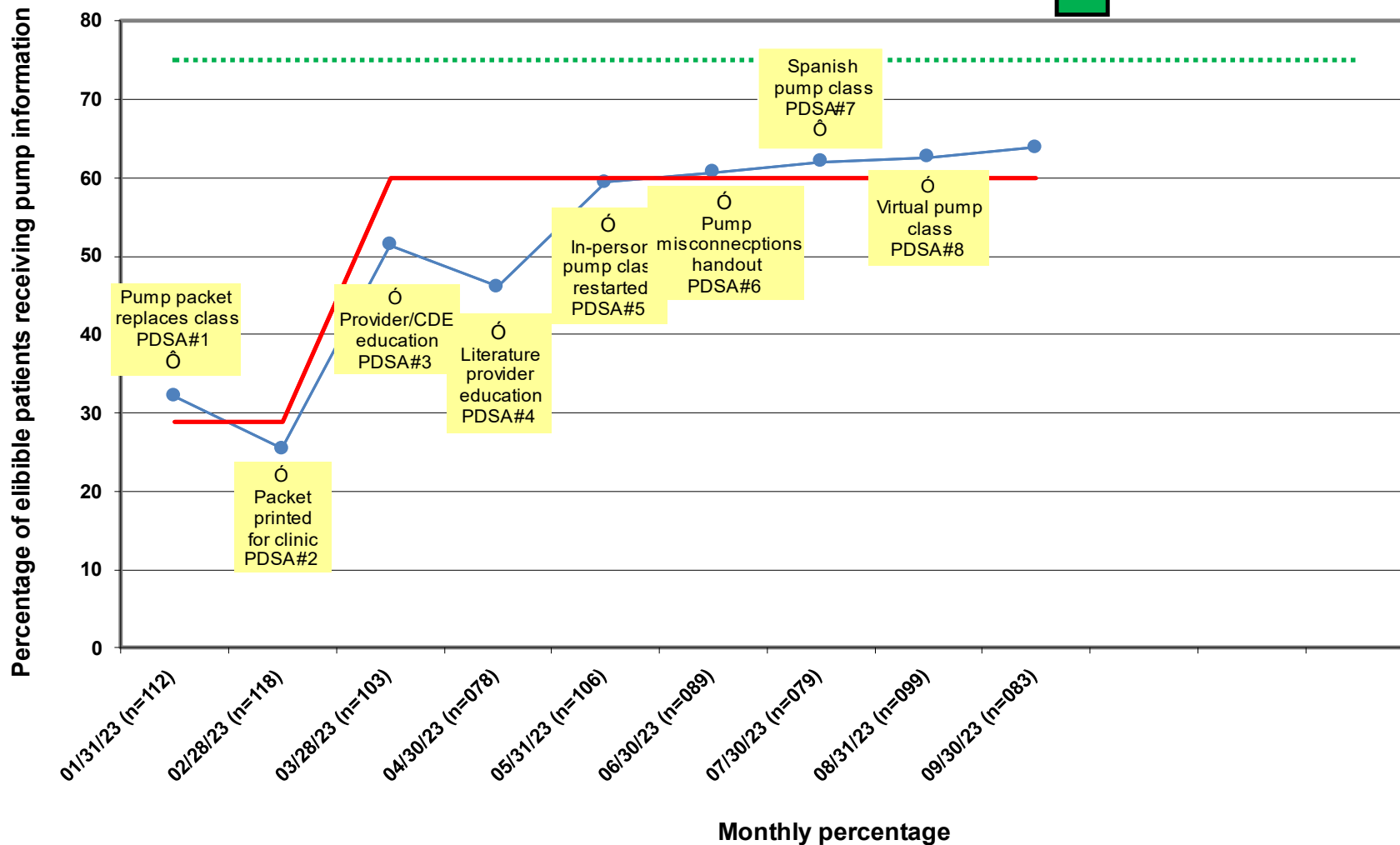


- Sports/site or tubing concerns
- Insurance coverage/cost issues
- Age or body size
- Social concerns/visibility
- School dosing issues
- Painful insertion/sites
- Other (free text space)

PROGRESS

PERCENT RECEIVING PUMP INFORMATION

Pump Information Distribution
Diabetes Clinic 2023



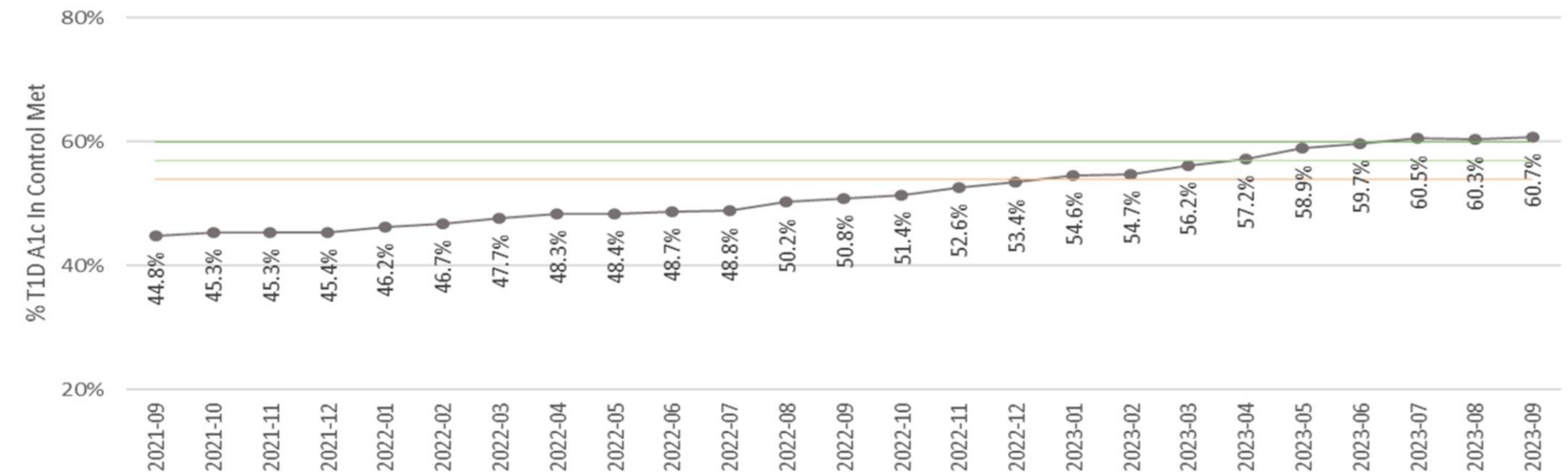
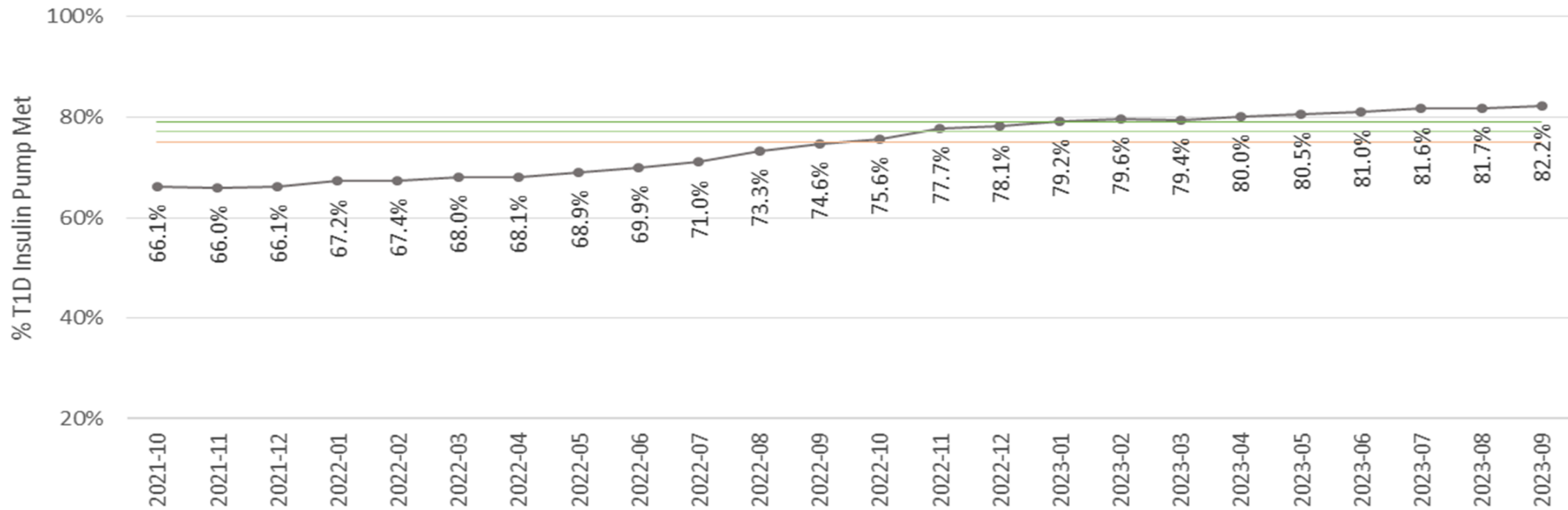
— Percentage getting pump information

..... Goal

— Percentage trend

PROGRESS

PERCENT OF PATIENTS UTILIZING PUMP THERAPY THERAPY



CONCLUSIONS

- Interventions to improve our pump start process led to increased insulin pump adoption by our patients
 - Improving access to pump information based on family's availability and learning styles
 - Provider buy-in for universal adoption of pump technology
 - Addressing common pump concerns among patients and families
- Percent of patients with A1c in goal range has increased by about 6% since project initiation
- Future Directions
 - QR code for pump quiz & waiver
 - Real time feedback on incorrect answers for family/patient
 - Investigating funding/grant options for portion of patients who cannot afford pump technology
 - Assessing percentage of patients utilizing hybrid-closed loop technology

QUESTIONS?



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Identifying barriers for Smart Insulin Pen Connectivity in Patients with Poor Glycemic Outcomes

Veronica Figueredo, MD; Janine Sanchez, MD

University of Miami Miller School of Medicine
Jackson Health System
Miami, FL

Background & Objective

- Smart insulin pens (SIP) offer remote monitoring capability with the potential to improve glycemic management.
- This project aimed to identify barriers for successful SIPs sharing data with medical providers in our high-risk patients with T1D.





Methods

Identified patients using
SIPs with A1c >8%.



Reviewed how often
patients were sharing
SIPs reports between
visits compared with our
recommendation to send
monthly.



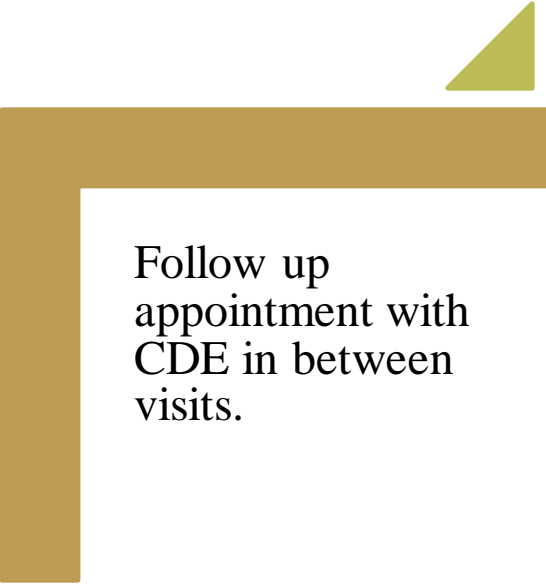
Interventions tested in
several PDSA cycles.

Interventions

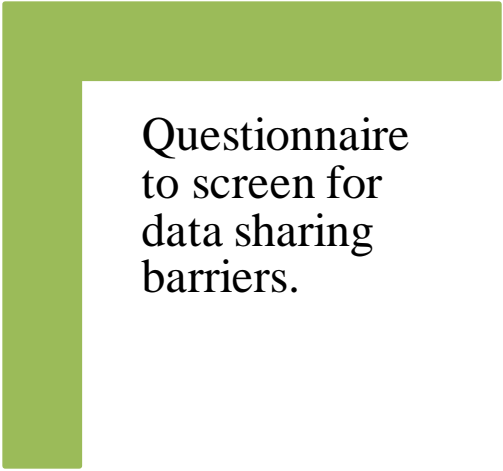
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Reminders during visits.



Follow up appointment with CDE in between visits.



Questionnaire to screen for data sharing barriers.



1. Do you have an InPen?

Yes No

2. Do you know how to share the InPen report with your doctor?

Yes No

3. How often do you send your InPen report to your doctor?

Every month Every 2-3 months Every 4-6 months Never

4. Please indicate if any of this option applies to you:

- I don't understand how to send report
- I don't know how to refresh report
- I don't think is helpful to share the report
- I forget to refresh report before sending
- I am not using InPen to calculate dose (just using to give dose)
- I am using InPen to calculate dose but forget to save
- I only use InPen occasionally
- I don't have Internet connection to send report
- Not using InPen (lost, battery died)
- Language barrier
- I don't have the InPen app because I don't have enough space in my phone
- I feel embarrassed to share data
- I don't want to share my InPen report with my parents
- I don't want to share my InPen report with my doctor
- Other, please explain: _____

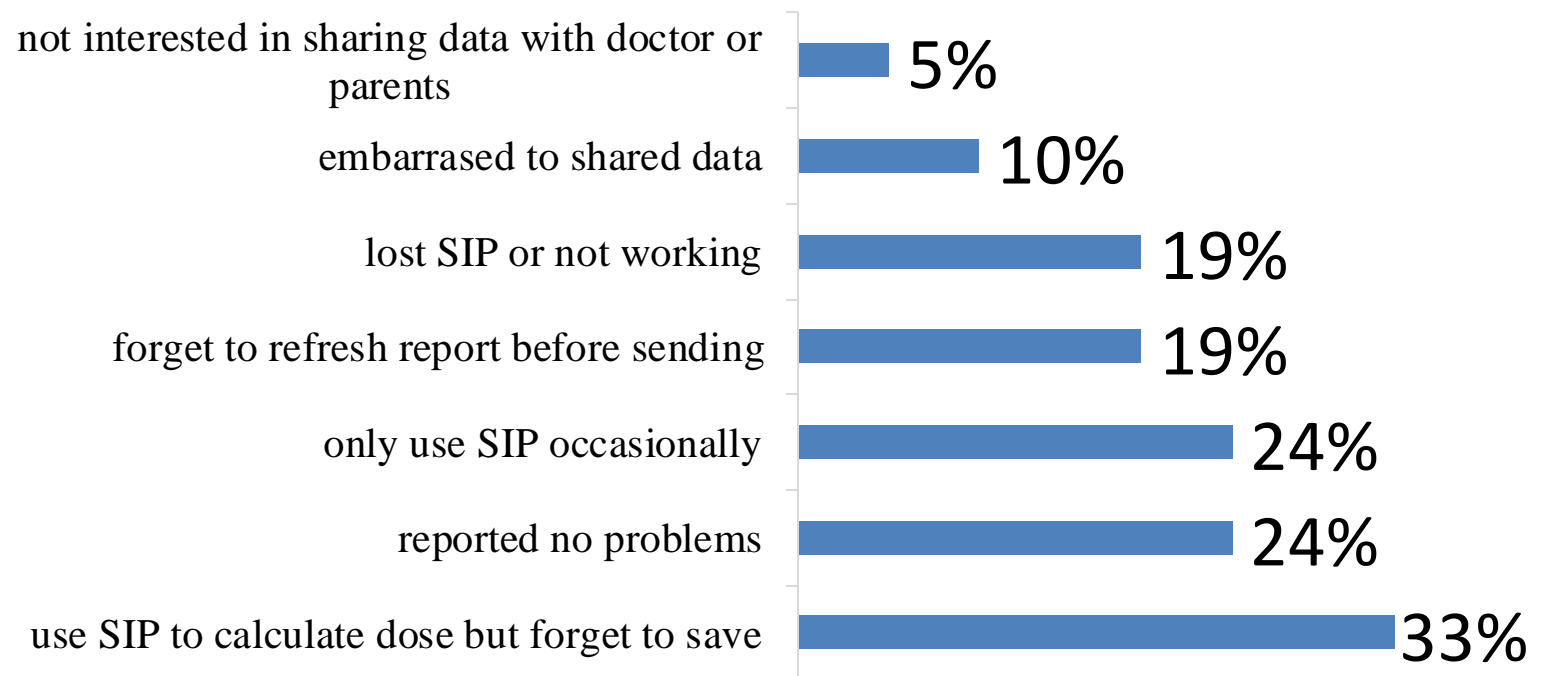


Results

- We identified 29 patients with A1c $>8\%$.
- 43% of these patients shared reports monthly as recommended.
- 21 families completed SIP questionnaire.
- 7 patients with A1c $>12\%$ were selected to meet with CDE
→ 43% missed visit.

Results

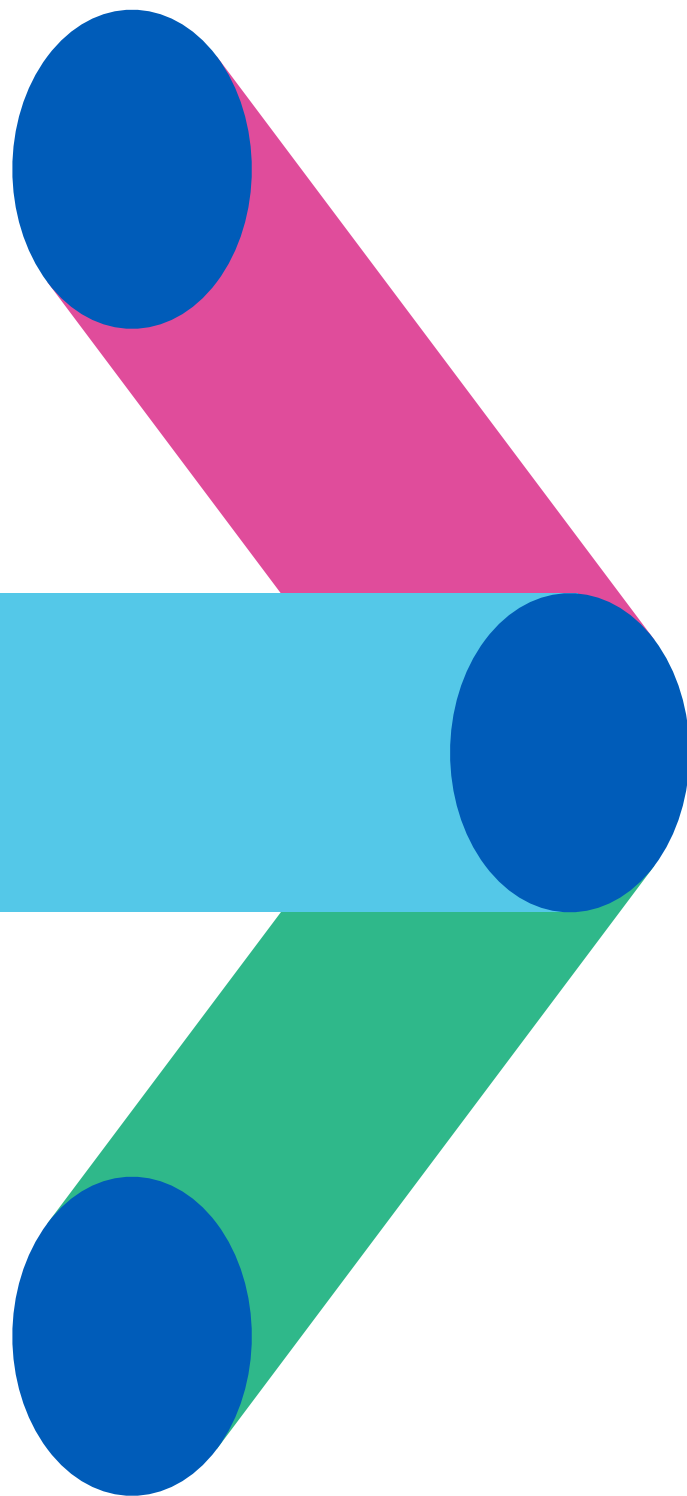
- All patients reported they knew how to share report.
- Not all patients were reporting data.



Conclusions

- We learned that reminding patients at visits about sending reports or scheduling CDE visits was not sufficient.
- We identified specific difficulties patients were experiencing and addressed barriers during visits.
- Longer follow up is needed to determine if addressing barriers will facilitate data transmission between clinic visits and improvement in glucose outcomes.





Increasing Pump Use by Adapting Pump Enrollment Process

Stephanie Ogburn RN, BSN, CDCES,
Candice Williams NP, CDCES, Susan
Hsieh MD, Luke Cielonko DO

November 15, 2023

Background and Objective

There is evidence that insulin pump use vs. MDI in youth contributes to:

- moderate improvement in A1c
- decreased hypoglycemia
- decreased DKA risk
- decreased risk of complications

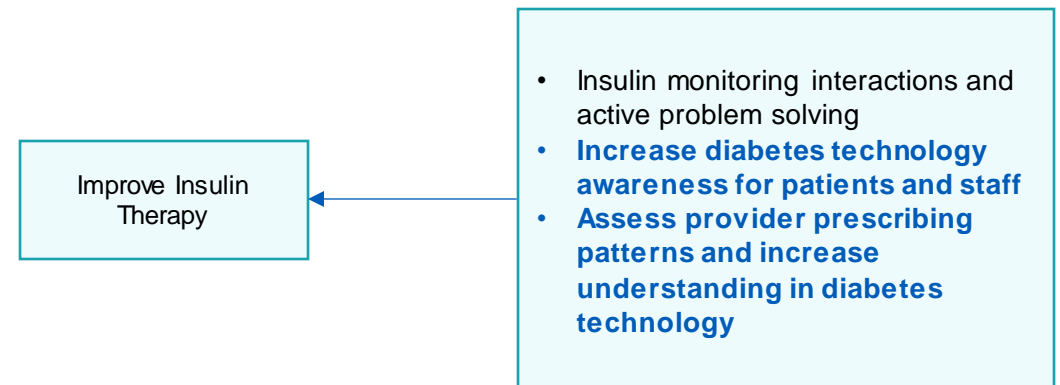
Evidence suggests the use of automated insulin delivery systems (AIDs)

- reduces A1C
- improves TIR
- lowers risk of exercise-related hypoglycemia
- reduces diabetes burden, therefore contributing to psychosocial benefits

**At baseline insulin pump use at Cook Children's is
38% of our population**

The objective of this project is to increase pump use by 15% by July 2023, with a secondary objective to decrease the time of pump interest to pump start to less than 100 days at the Cook Children's Endocrinology and Diabetes Clinic by the end of the year

Primary Driver from Cook Children's KDD



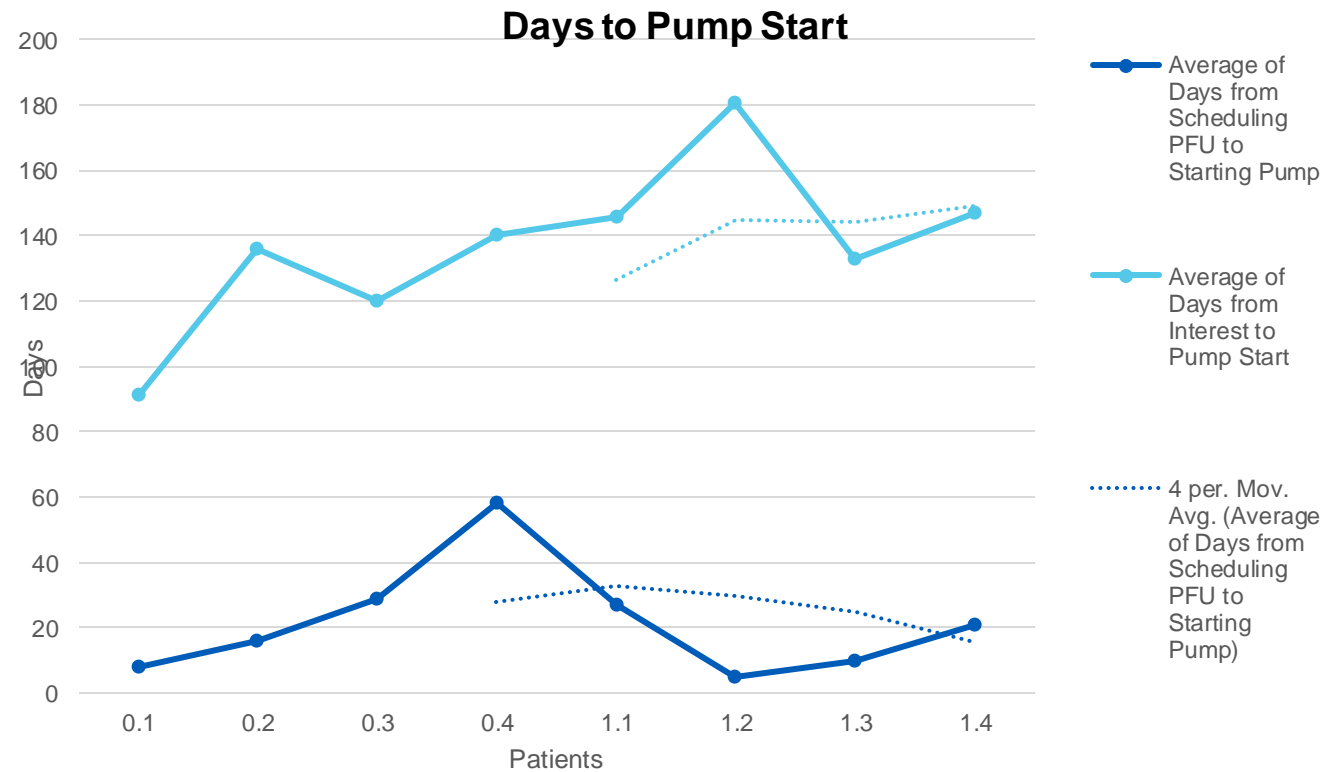
AIM Shorten timeframe from pump interest to pump follow up

Intervention:

- Group pump training with pump company trainer
- Group pump follow up with Cook diabetes educator and provider

Barriers encountered:

- Classroom space
- Insurance
- Provider availability

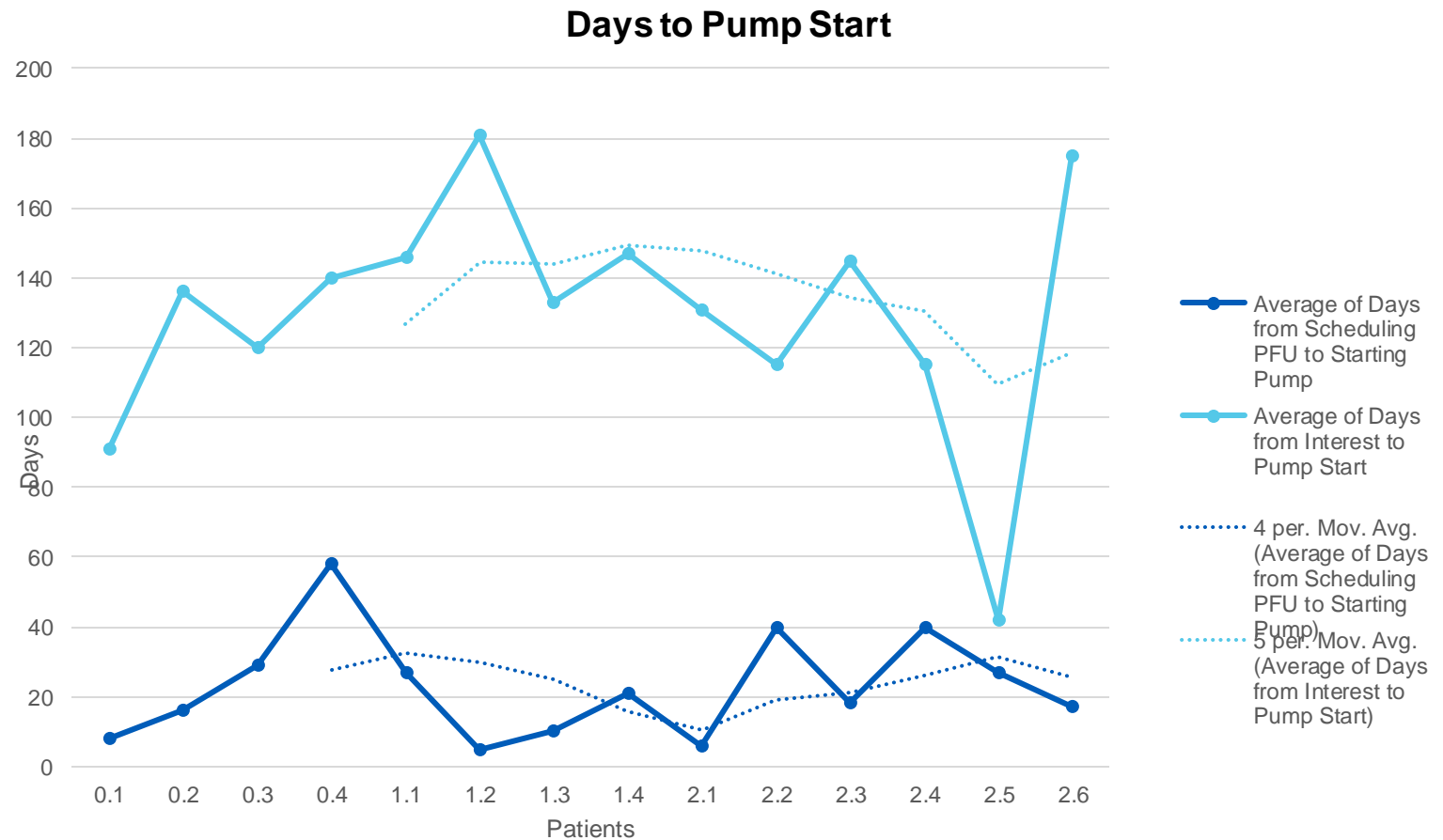


Intervention:

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- Classroom space
- Insurance
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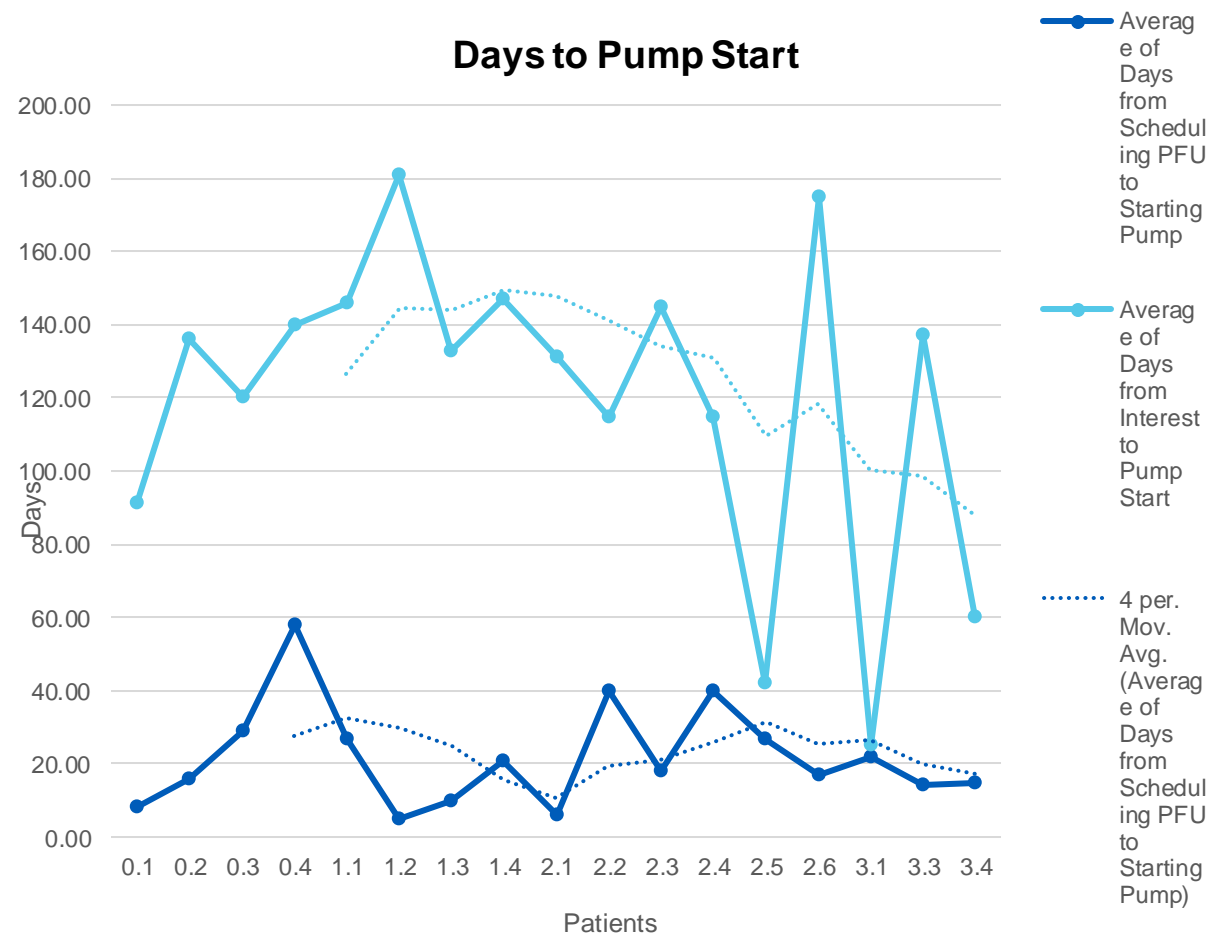
PDSA 3

Intervention:

- Pump training by pump company trainer
- Diabetes educator contacts with family the Friday following training as well as the next Friday (2 calls)

Barriers:

- Family unsure of which pump they wanted



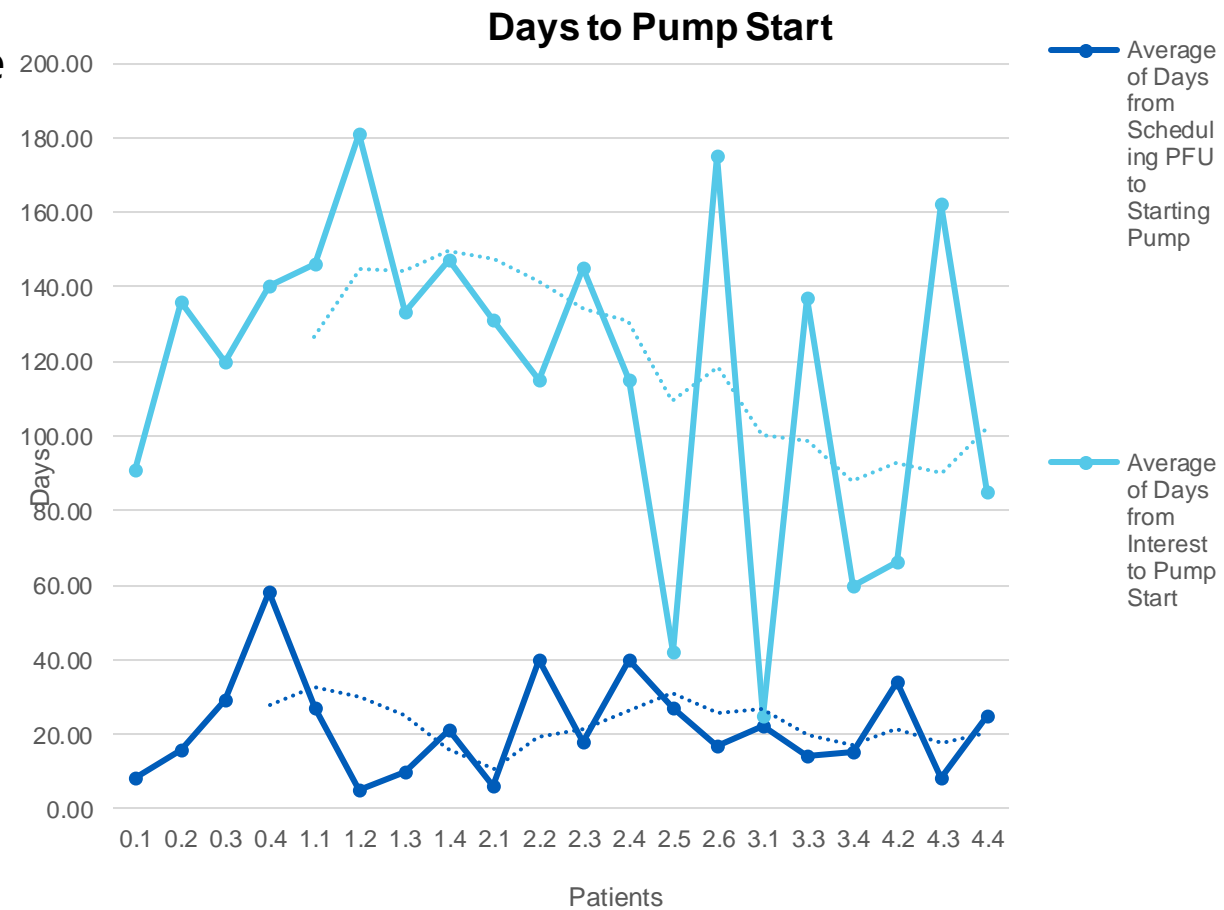
PDSA 4

Intervention:

- Pump training by pump company trainer
- Diabetes educator contact family by phone the Friday following training (1 call)

Barriers:

- Family rescheduled class due to family schedule



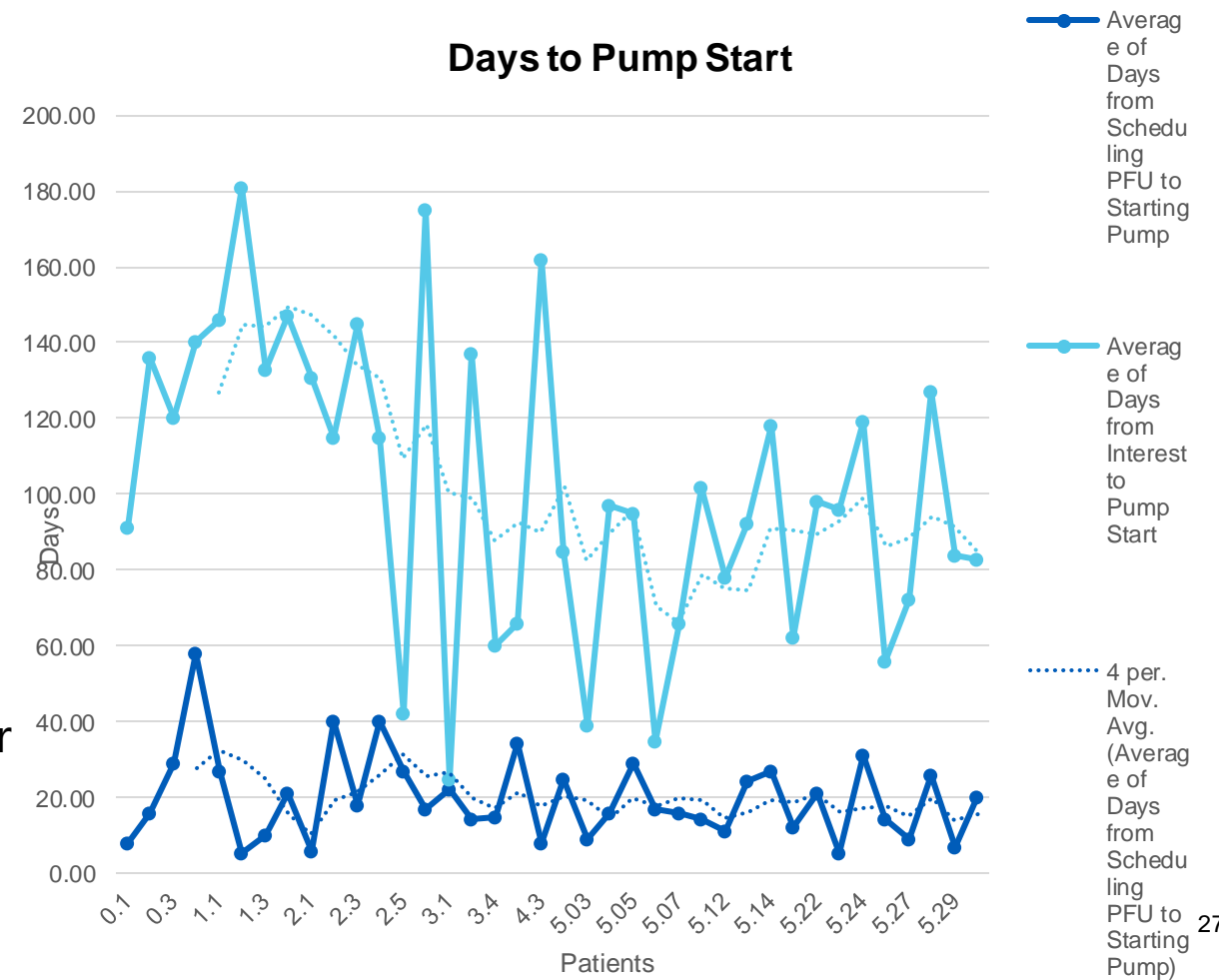
PDSA 5

Intervention:

- Pump training done by pump company trainer
- Diabetes educator contact family by phone the Friday following training (1 call)
- Increase amount of patients for sustainability concern

Barriers:

- Family undecided on pump, insurance issues, family reschedules, family not wanting to start pump therapy until summer, training delays due to pump trainer out unexpectedly



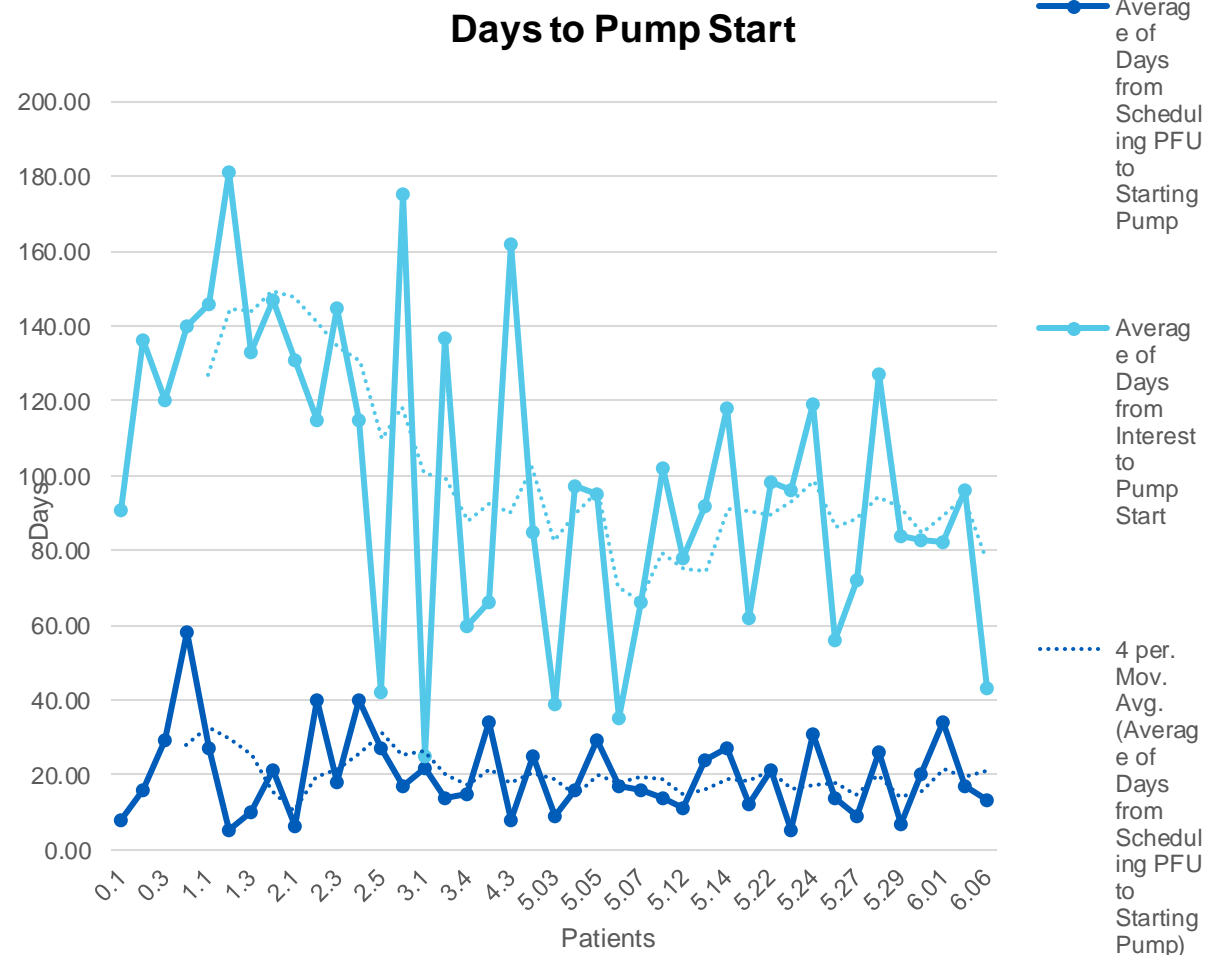
PDSA 6

Intervention:

- Diabetes educator schedules pump training from dates provided by pump company trainer and schedules phone pump follow up call same day
- Pump training done by pump company trainer
- Diabetes educator contact family by phone the Friday following training (1 call)

Barriers:

- No shows delayed pump start, family cancelled pump training due to family emergency, insurance issues



Discussion

Outliers

- Family rescheduling pump class due to family schedule conflict
- Family unsure of which pump they wanted
- Pharmacy and insurance issues
- Trainer availability
- Cancellation, no-shows, and rescheduling
- Family waiting to start pump for summer

Next Steps

- Standardize insulin pump initiation
- Provider initiating conversation on pump use
- Provider bias survey
- Module based pump class allowing multiple languages and improved patient experience

Reference: ElSayed NA, Aleppo G, Aroda VR, et al., American Diabetes Association. 7. Diabetes technology: *Standards of Care in Diabetes—2023*. *Diabetes Care* 2023;46(Suppl. 1):S111–S127



OUR TEAM

- Doctors: 14 (12 FTE)
- APP: 4 (3 CDCES)
- Diabetes RN/CDCES: 11 (9.2 FTE)
- Registered Dieticians: 4 (3 FTE)
1 RD CDCES
- Clinical Therapists: 4 (3 FTE)
- Social Worker: 1
- Child Life Specialist: 2 (inpatient and outpatient)

POPULATION

- Total Patient <18yo with T1D and 2 or more visits per year : 1,010
 - Newly diagnosed annually: ~300
 - Payor Mix: 37% Medicaid

Contact

Stephanie Ogburn BSN, RN, CDCES

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Transitioning Children and Adolescents to HCL Insulin Pumps

Emily Coppedge, CPNP, CDCES

Isabel Reckson, RD, CDCES

Zoltan Antal, MD

November 15, 2023

WCM Peds Endocrine/ NYP-Cornell

- Located in NYC on the Upper East Side
- Practice Make Up
 - 5 MDs
 - 3 Fellows
 - 2 Nurse Practitioners (1 CDCES)
 - 2 RNs
 - 1 RD, CDCES
 - Social Worker
- 184 T1D, 35 T2D
- Type 1: 42% Medicaid/58% Private

WCM/NYP-Cornell



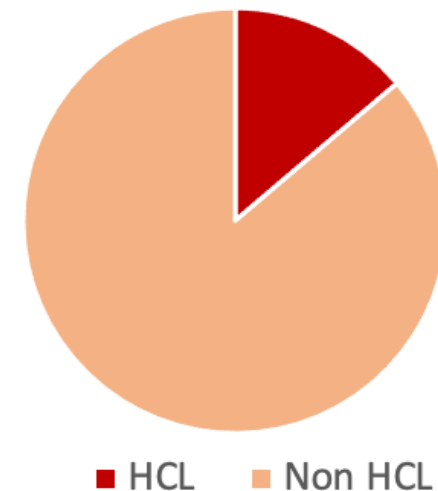
Where you are
right now



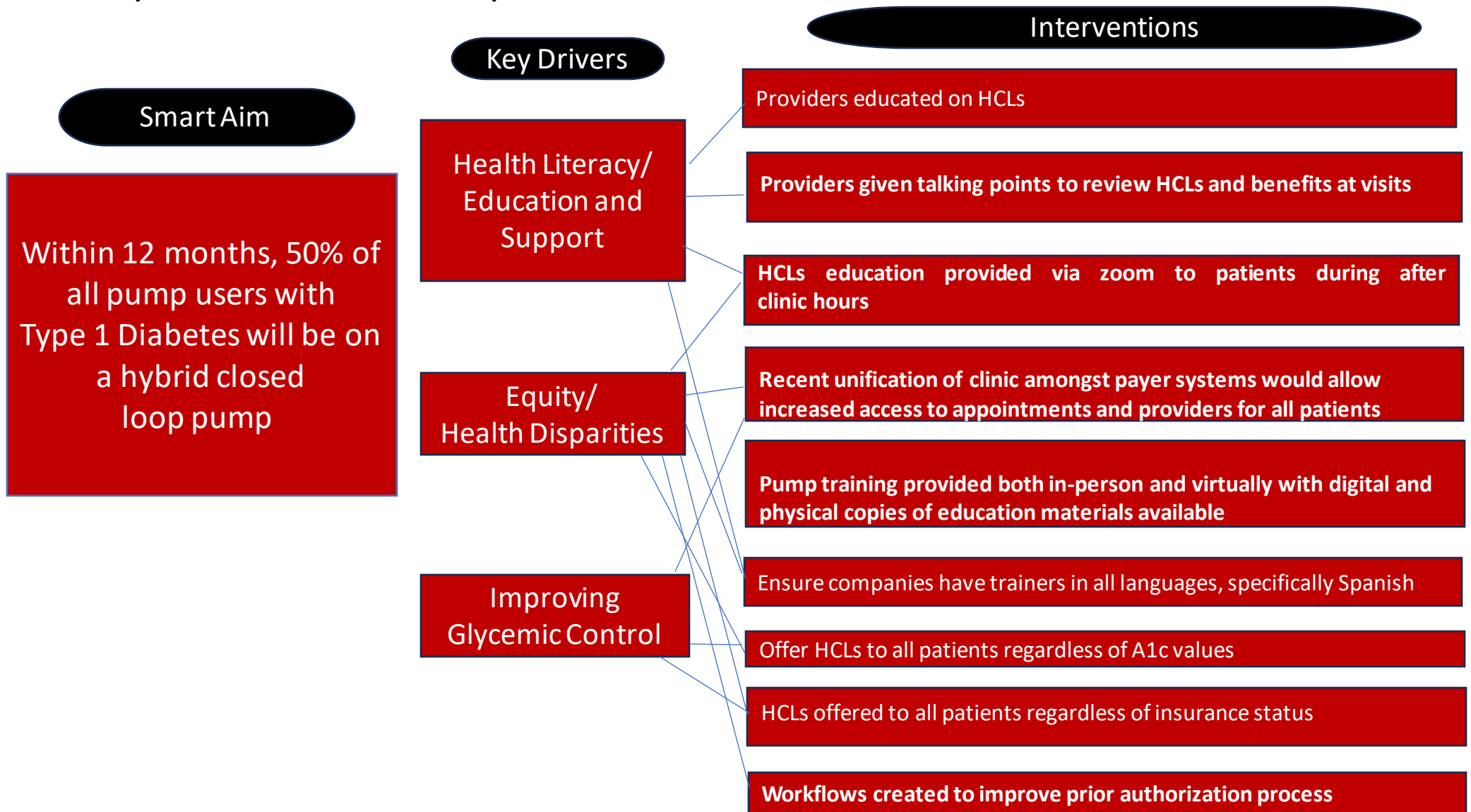
Background

- In children with T1DM, use of Hybrid Closed Loop Systems (HCLS) are associated with
 - Increased time in range (TIR)
 - Reductions in HbA1c
 - Decreased rates of hypoglycemia
- **Problem:**
 - A small percentage of our pump users are on HCLs (14%)
- **Aim:**
 - Within 12 months, 50% of all pump users will be on a HCLs

of Pump Users on HCLs at Baseline



PDSA Cycles Focused on 3 Key Drivers



Methods

PDSA 1

- Educate patients on benefits of HCLs
- Feb 2022

PDSA 2

- Educate staff on how to present and encourage HCLs
- March 2022

PDSA 3

- Target existing pump users to upgrade to existing HCLs, specifically Tandem or Medtronic
- April 2022- ongoing

PDSA 4

- Encourage patients with HbA1c > 10% to transition to HCLs
- April 2022

PDSA 5

- Omnipod 5 upgrades
- May 2022-ongoing

DIABETES NEWSLETTER



Winter 2022



Hybrid Closed-Loop Pumps:

What is a hybrid closed loop pump?

Hybrid closed loop (HCL) pumps are insulin pumps that communicate with continuous glucose monitors (or sensors). These pumps have a special calculator, or algorithm, that can automatically deliver basal insulin every few minutes based on your blood sugars readings and trends to keep levels in range. Some versions of the hybrid closed loop pumps give automatic corrections. HCL pumps do NOT replace bolusing for food.

What are the benefits?

Hybrid closed-loop pumps make diabetes management easier by reducing the number of diabetes decisions we have to make in a day. They have been shown to improve blood sugar control, including hemoglobin A1c and time in range, as well as decrease hypoglycemic episodes. In short, better control with less effort!

What are my options?

We recommend hybrid closed-loop pumps for all patients with Type 1 Diabetes! For a hybrid closed-loop system to work, you will need be on a pump as well as a sensor. Talk to your diabetes provider about which system may be right for you.

Methods

5
 Policy change-
 All patients must attend Intro to Technology Pump Class prior to pump order
 This will become standard of care
 2022-ongoing



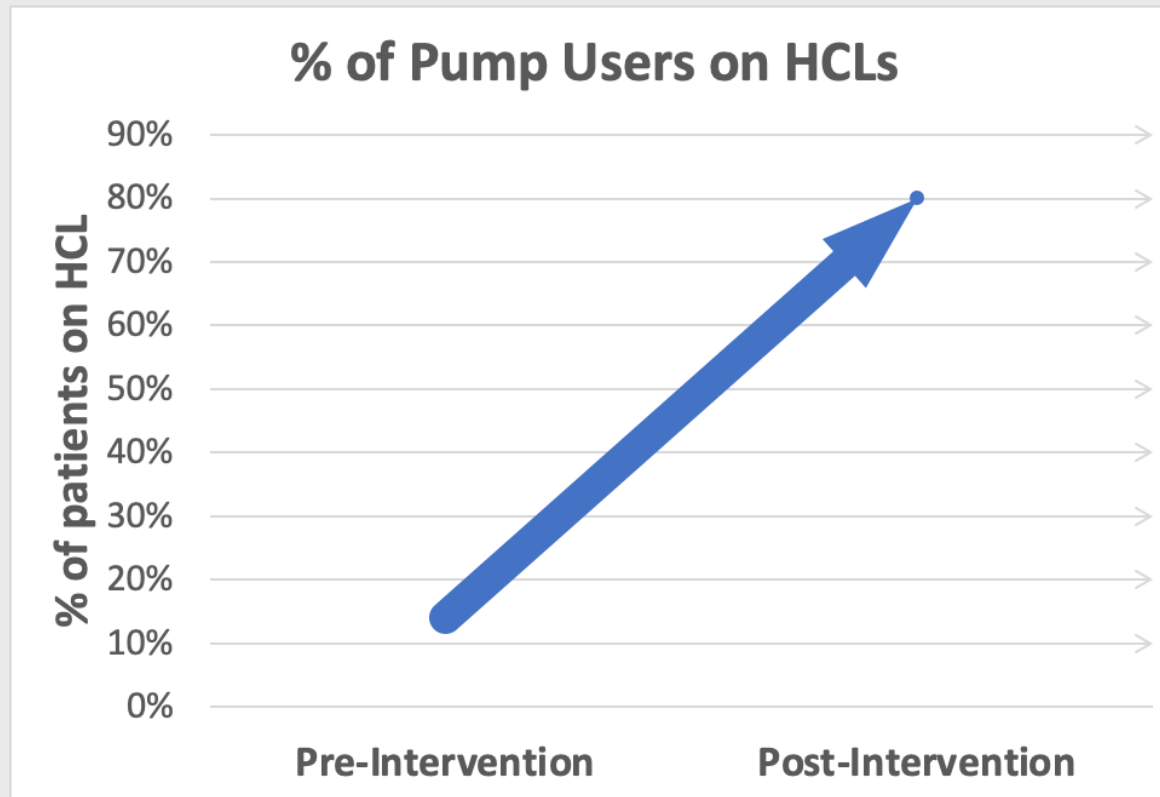
Identifying the 'best fit' HCLs
 Updated pump class to discuss patient behaviors and features of each HCLs
 Patients to review choice with provider
 November 2023- ongoing

COMPARISON OF FEATURES

21

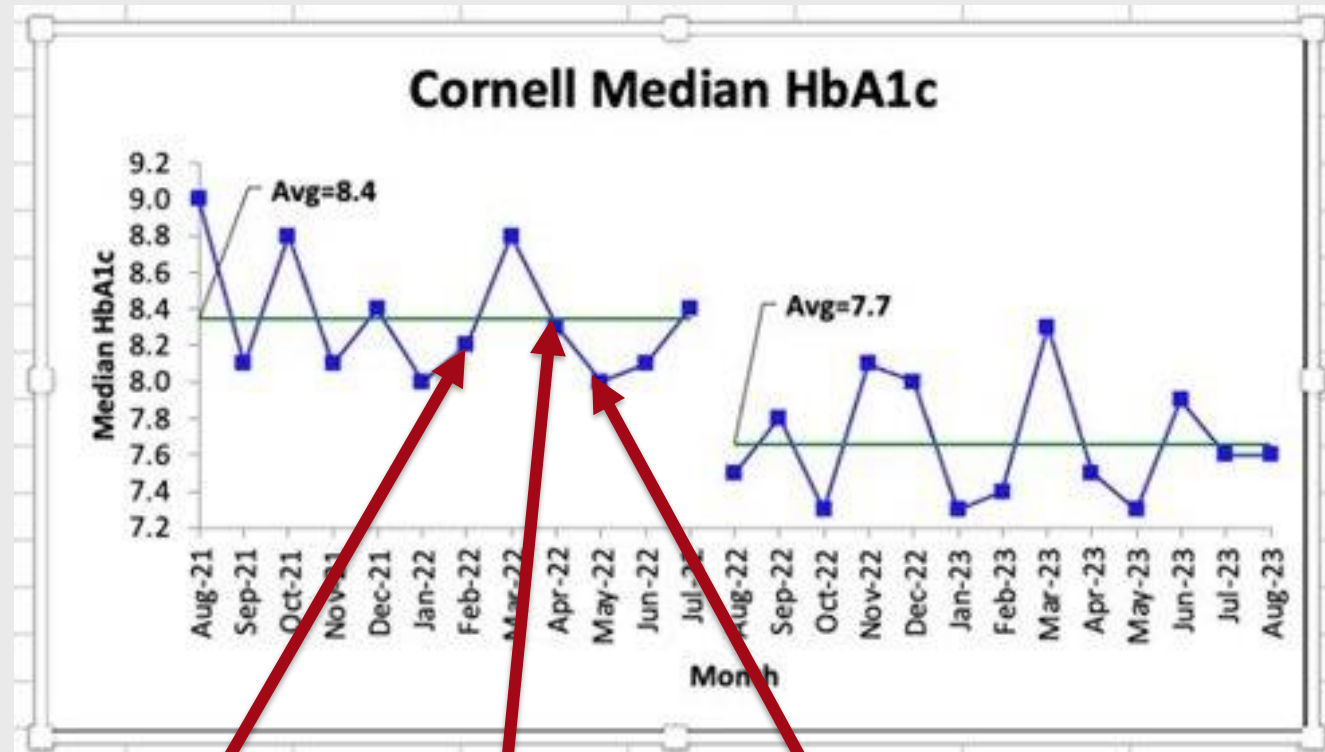
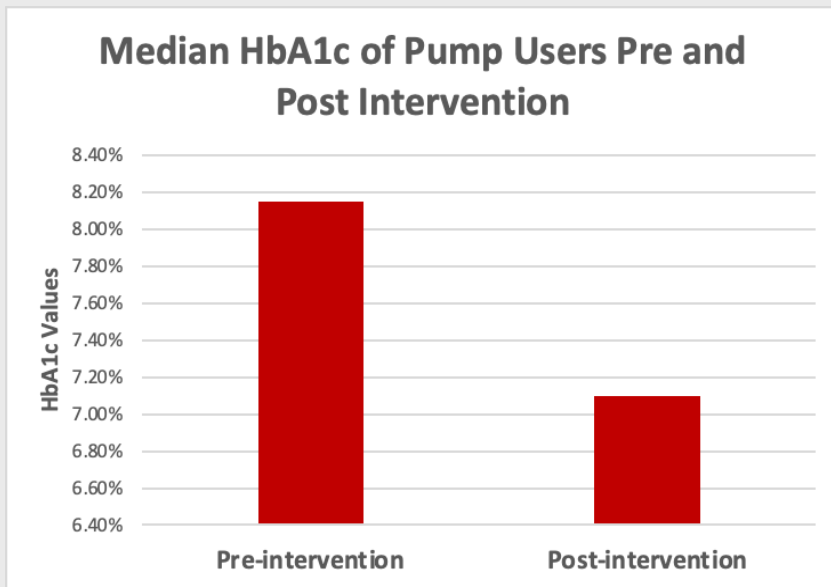
	Beta Bionics Ilet	Medtronic 780G	Omnipod 5	T: Slim X2	Tandem Mobi
Hybrid closed loop	✓	✓	✓	✓	✓
No carb counting	✓	✗	✗	✗	✗
Auto-corrections	✓	✓	✗	✓	✓
Manual corrections	✗	✓	✓	✓	✓
iPhone bolusing	✗	✗	✗	✓	✓
Tubeless	✗	✗	✓	✗	✗
Dexcom G6 compatible	✓	✗	✓	✓	✓
Frequency of site changes	48-72 hours	48-72 hours	72 hours	48-72 hours	48-72 hours
Insulin capacity	165 units	300 units	200 units	300 units	200 units

Results



Increase in HCL technology use from 14% of all pump users in Feb 2022 to 80% of all pump users by July 2023

Results- Median HbA1c



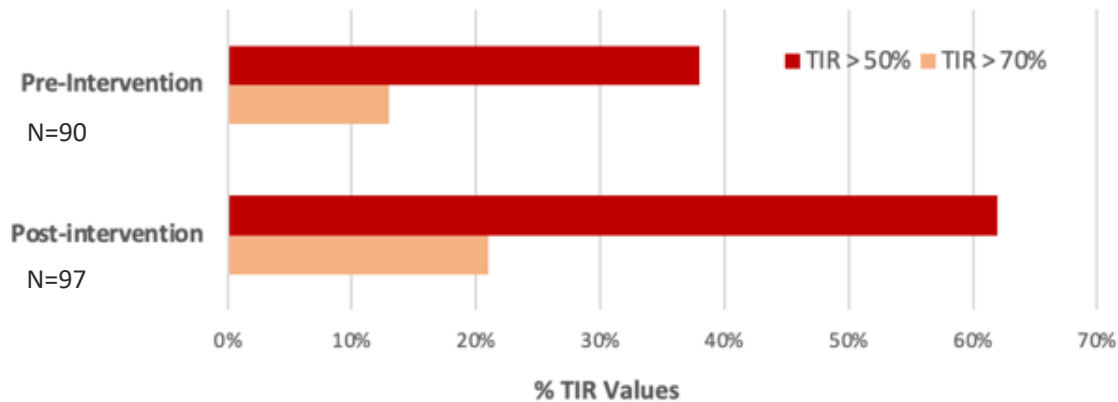
Intervention Started

PDSA # 3 & 4: Tandem and Medtronic pump upgrades

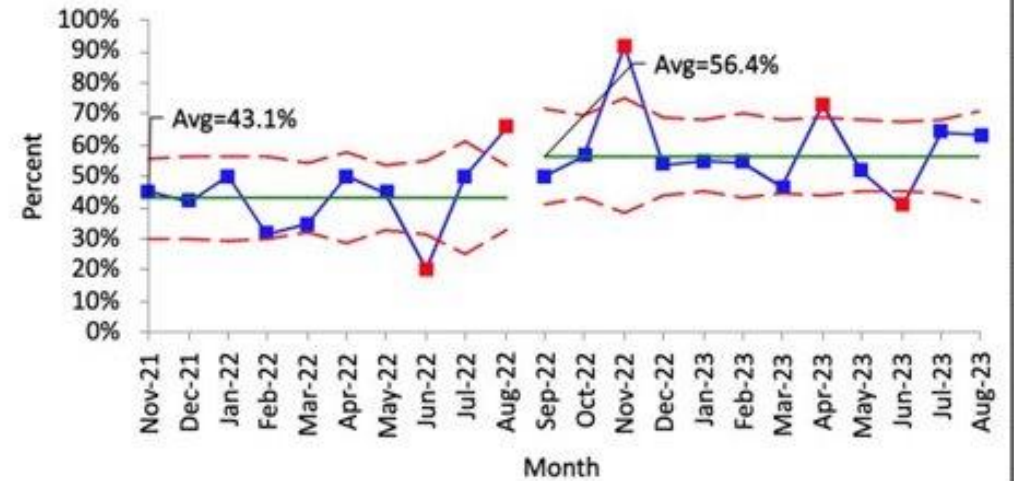
PDSA #5: Omnipod Upgrades

Results TIR

TIR of all Pump Users Pre and Post Intervention



Cornell % of patients with TIR > 50%



Conclusions and Next Steps

- **Equal insurance access to HCL pumps across all payer systems allowed for a change in the ENTIRE practice**
- 'Technology Night' monthly pump class key to streamline pump process
- HCLs changed our appointments
 - Increased ability for telehealth visits
 - Patient centered appointments with goal of decreasing diabetes burden
 - Able to focus on other aspects of diabetes care with improved overall control
- Moving forward, we will incorporate provider-patient shared decision making to help patients make the best pump choice



Weill Cornell Medicine
Pediatrics

NewYork-Presbyterian
Komansky Children's Hospital

IMProving Access to Closed-loop Technology (IMPACT)- a case study

Kristina Cossen MD¹, Sobenna George MD¹, Sandra Larish PA², Anna Albritton MS RD CDE², Kristine Jaknke MSN RN CDCES², Alison Higgins MA RD LD CDCES², Pat Tatro², and Angela Bryant Curry RN, BSN, MA, CDCES²

¹Division of Endocrinology, Department of Pediatrics, Emory+ Children's Pediatric Institute

²Children's Healthcare of Atlanta



Background

- In 2016, CHOA developed the Diabetes Support Program (DSP) with independent aims to reduce acute diabetes complications in “high-risk” patients.

2022	Non-DSP N 3134	DSP N 276
Average HbA1c (%)	8.5%	10.7%
Medicaid	47%	75%
% White	51%	34%
% pump use	42%	24%*

- Despite documented benefits in diabetes technology, the utilization inequalities continue



FISHBONE

Policies & Procedures

- Multiple steps for pump prep
- Inconsistency in rep training (safety concerns)
- Safety starts available but not required
- Limited access for training

Devices

- Insurance coverage issues (OP5 & Medicaid)
- Patient desire/willingness to use specific device
- Limited staff training on device

Environment

- Limited location/access
- Limited space at site
- No walk in options
- No evening/weekend
- Limited telemed options

Process

- No follow up for pump class no shows
- Complicated steps to get pump
- No flag in EMR for high-risk patients to provide additional support

Patients – Not informed about technology at visits, told by team members that they are not eligible, not interested, no trust in provider (no consistency in team members)

Providers – fear of noncompliance, follow up concerns, bias

Support staff – limited time with patient to assess needs

Low numbers of high risk/at risk type 1 diabetes patients moving to AID pumps



IMPACT

- **Objectives**
 - To safely transition patients in the DSP to insulin pump
 - To reduce HbA1c
 - To improve equality of insulin pump use
- **Step 1:** Create a team
- **Step 2:** Define our target population
- **Step 3:** DSP CDE education



IMPACT

- Step 4: Create protocol and timeline for enrollment**

	Baseline	Month 1	+ 3 days ³ (Virtual)	+ 14 days ³ (Virtual)	Month 2	+ 14 days ³ (Virtual)	Month 3
Subject interest	x						
Introduction to pump technology (in person or virtual)	x						
Pump selection (options must provide closed loop technology)	x						
Manual mode pump start ¹		x					
1 st Pump site change			x				
Manual mode pump start follow up				x			
Switch to hybrid closed loop pump ²					x		
Hybrid closed loop pump start follow up						x	
Return to routine clinic care							x

¹Manual pump mode: CGM is NOT connected to pump. There is no augmentation of insulin outside of what the patient is inputting into the pump. In this setting, patient will be administered 30% basal insulin through pump and 70% basal insulin as a subcutaneous injection.

²Hybrid closed loop pump: Continuous glucose monitor (CGM) communicates with insulin pump and augments basal and bolus insulin based on CGM information.

³Additional virtual appointments may be required based on individual needs

IMPACT

- **Step 5: Patient pump specific handouts**

Today I Learned: Omnipod 5

How to unlock my pump:

1. Tap power button on side
2. Swipe up
3. Enter PIN, tap green arrow

How to deliver a bolus:

1. Tap the blue circle with vial inside
2. Enter carbs. Tap check mark. If not consuming carbs, skip this step
3. Tap USE CGM
 - a. If CGM is not available, enter BG and tap ADD TO CALCULATOR
4. Confirm dosing is correct and tap CONFIRM
5. Tap START

How to switch between manual and auto-mode:

NOTE: to use AUTOMATED MODE, you must have an active Dexcom CGM that is connected to your pump. Be sure your pod is in the same line of site as your Dexcom.

1. Unlock pump
2. Tap the menu button
3. Tap SWITCH MODE
4. Tap SWITCH

How to stop insulin delivery (may only stop insulin in manual mode):

1. Unlock pump
2. Tap menu
3. Tap PAUSE INSULIN
4. Choose the length of time desired (up to 2 hours)
5. Tap PAUSE
6. Confirm by tapping YES

How to manage notifications:

1. Unlock pump
2. Read the alert on screen and complete task as appropriate
3. Tap OK
4. Tap the bell on the menu bar
5. Read the notification and respond as appropriate

Today I Learned: T-Slim x2

How to unlock my pump:

1. Press silver button on top of your pump
2. Tap 1, 2, 3

How to deliver a bolus:

1. Unlock pump
2. Tap BOLUS
3. If BG is above or below target, tap check mark. If BG is in target range, skip this step
4. Tap CARBS.
5. Enter carbs. Tap check mark
 - a. If not consuming carbs, skip this step
6. Tap check mark
7. Confirm Request? Tap check mark
8. Deliver ____u bolus? Tap check mark

How to switch between manual and Control-IQ:

NOTE: to use CONTROL-IQ, you must have an active Dexcom CGM that is connected to your pump. Be sure your pump is in the same line of site as your Dexcom.

1. Unlock pump
2. Tap OPTIONS
3. Tap MY PUMP
4. Tap CONTROL-IQ
5. Toggle Control-IQ ON/OFF
6. Tap check mark

How to stop insulin delivery:

1. Unlock pump
2. Tap OPTIONS
3. Tap STOP INSULIN
4. Choose when you'd like to be alerted that you have STOPPED insulin (up to 1 hour)
5. Tap check mark

How to resume insulin delivery:

6. Unlock pump
7. Tap OPTIONS
8. Tap RESUME INSULIN
9. Tap check mark

Notification in EMR

- In order to identify patients in the program, a NOTIFICATION in the EMR was created
- This would ideally prompt providers to consider additional follow up or support for these individuals
- Once the 3 months was completed, this notification is removed

The screenshot shows the Epic EMR interface. At the top, there is a navigation bar with the 'Epic' logo, a 'Chart' button, and several icons for home, calendar, and other functions. Below the navigation bar is a search bar with the text 'Search (Ctrl+Space)'. Underneath the search bar, there are several status indicators: 'None', 'COVID-19 Vaccine: Unknown', and a prominent yellow notification box with a warning icon that reads 'Diabetes High Risk Pump Patient'. Below the notification box, there is a section for the 'Ref Provider (PCP)' with a profile picture icon, 'Primary Cvg:', and 'Allergies: No Known Allergies'. At the bottom of the interface, there is a blue banner with the text 'SINCE LAST CHILDREN'S PHYSICIAN GROUP - ENDOCRINOLOGY AT CENTER FOR ADVANCED PEDIATRICS VISIT' and a 'No visits' indicator.

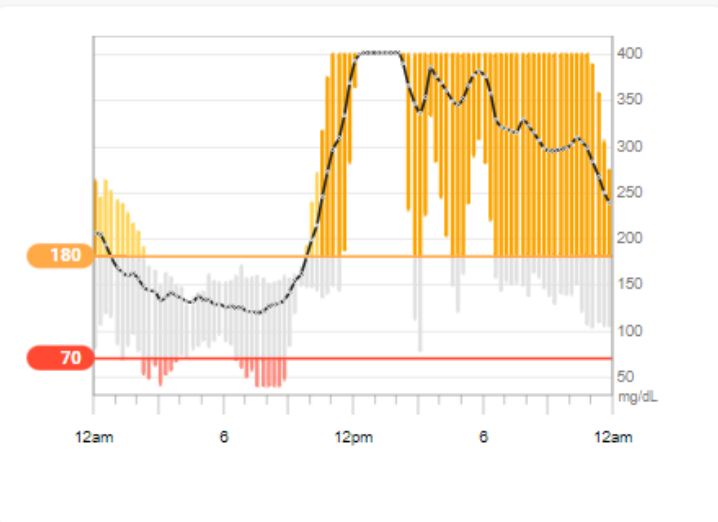


Subject 1

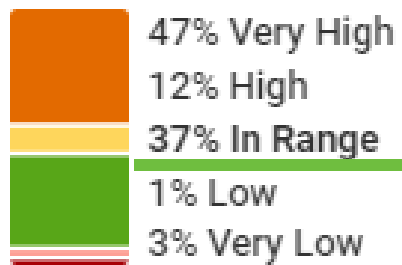
PRE PUMP

MA

15 Days Mon Jun 5, 2023 - Mon Jun 19, 2023



Time in Range



Target Range:
70-180 mg/dL

Observations & next steps

- We anticipated challenges with site changes: **there were none**
- Even in manual mode, **NOCTURNAL HYPOGLYCEMIA improved**
- Adherence to scheduled appointments were **GREAT**, virtual check-ins were less so for patient 1
- Patient specific issues:
 - Loss of dexcom and adhesion issues
 - Ongoing meal entry issues (carried over from before)
- Recruitment opened to all providers
 - 2nd participant as of Oct 9th 2023 started pump
 - 3rd participant Oct 20th 2023
 - 2 additional patients referred Oct 23rd and starting program



Thank you

