# BRIDGE Project: Barrier Reduction in Insulin Delivery for Greater Equity

*Samantha Goldklang ARNP,*
November 2024

# About our Clinic

**Patient Information**

~2400 patients with type 1 diabetes

~375 new-onsets per year

**Language of Care**

English: 93%

Spanish: 3.5%

Somali: 1%

Russian: 0.06%

Amharic: 0.04%

**Staff**

21 Physicians

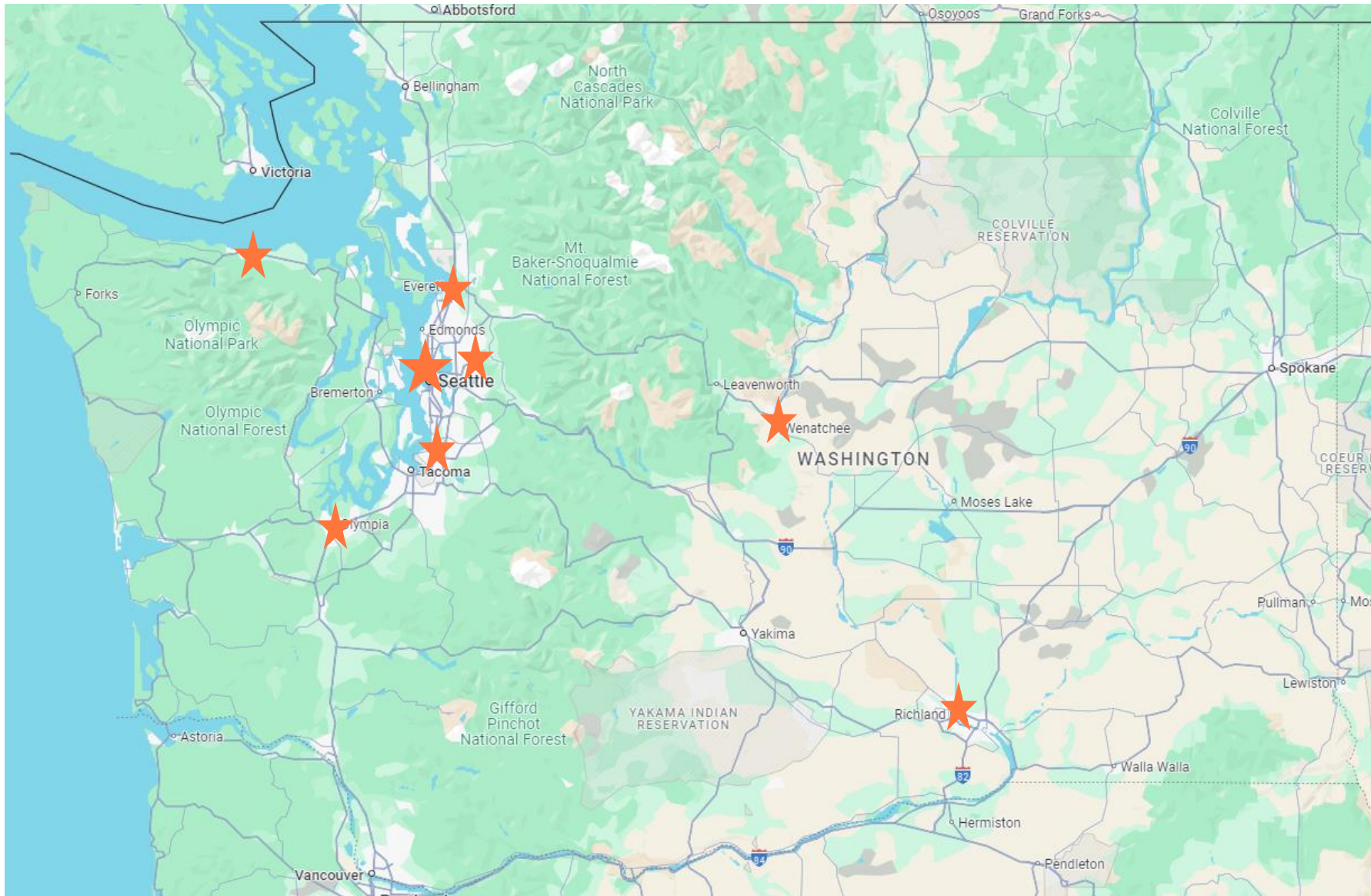12 Advanced Practice Providers

20 Nurses

8 Dieticians

2 Social Workers

4 Medical Assistants

2 Certified Nursing Assistants

1 Clinical Psychologist

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# Locations



★ In-Person Clinics

- Provide care to patients from Washington, Alaska, Idaho and Montana

- Telehealth offered to patients living anywhere in WA, MT or AK

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# Background

- The use of insulin pumps for management of type 1 diabetes (T1D) in youth is associated with improvement in clinical outcomes such as hemoglobin A1c, time in range, and hypoglycemia.

- However, there are significant inequities in diabetes technology use by language of care.
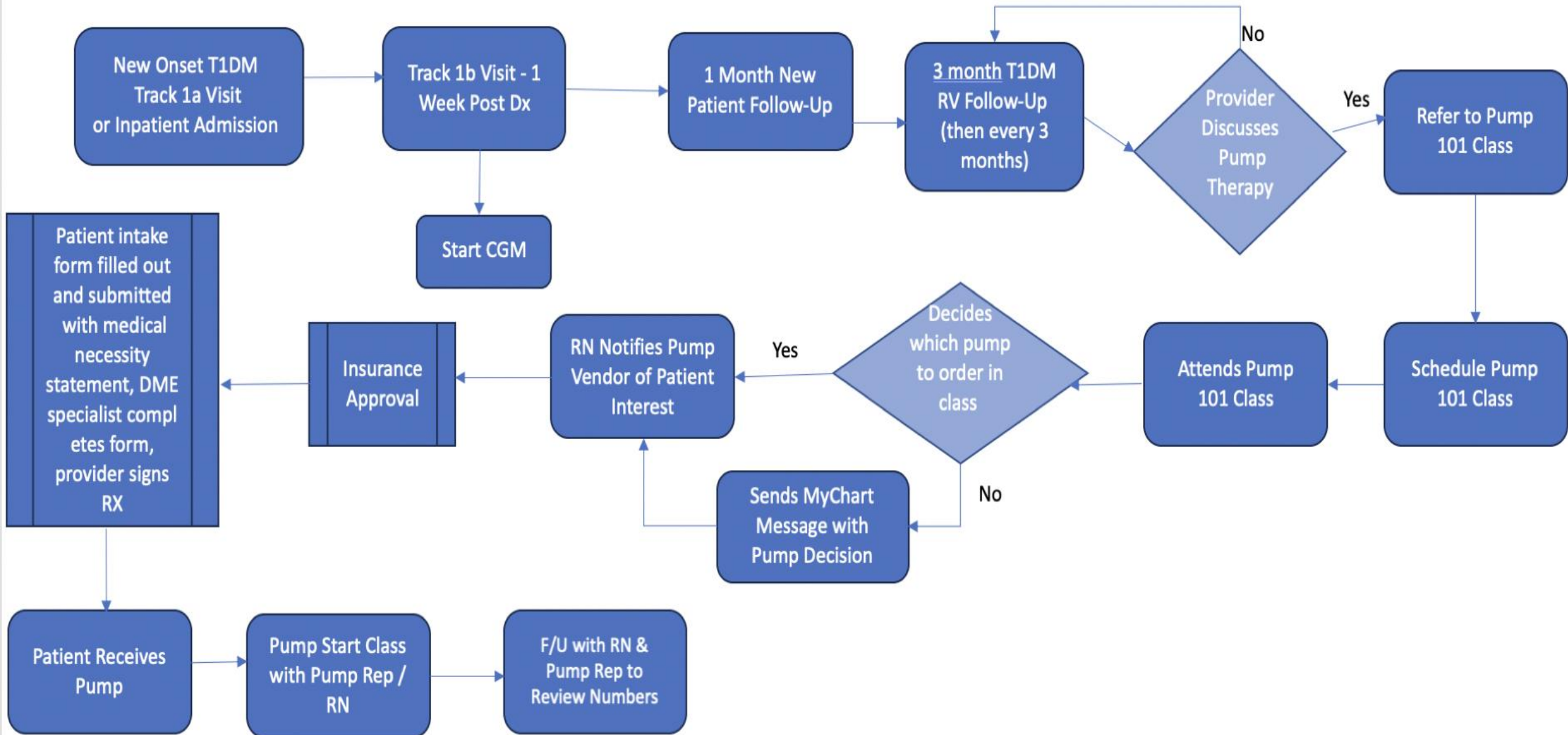
# SMART AIMs

- Increase insulin pump use in pediatric patients with type 1 diabetes at Seattle Children's Hospital from 53% to 70% by January 2025.

- Increase insulin pump use in patients with language of care other than English (LOE) from 21% to 50% by January 2025.
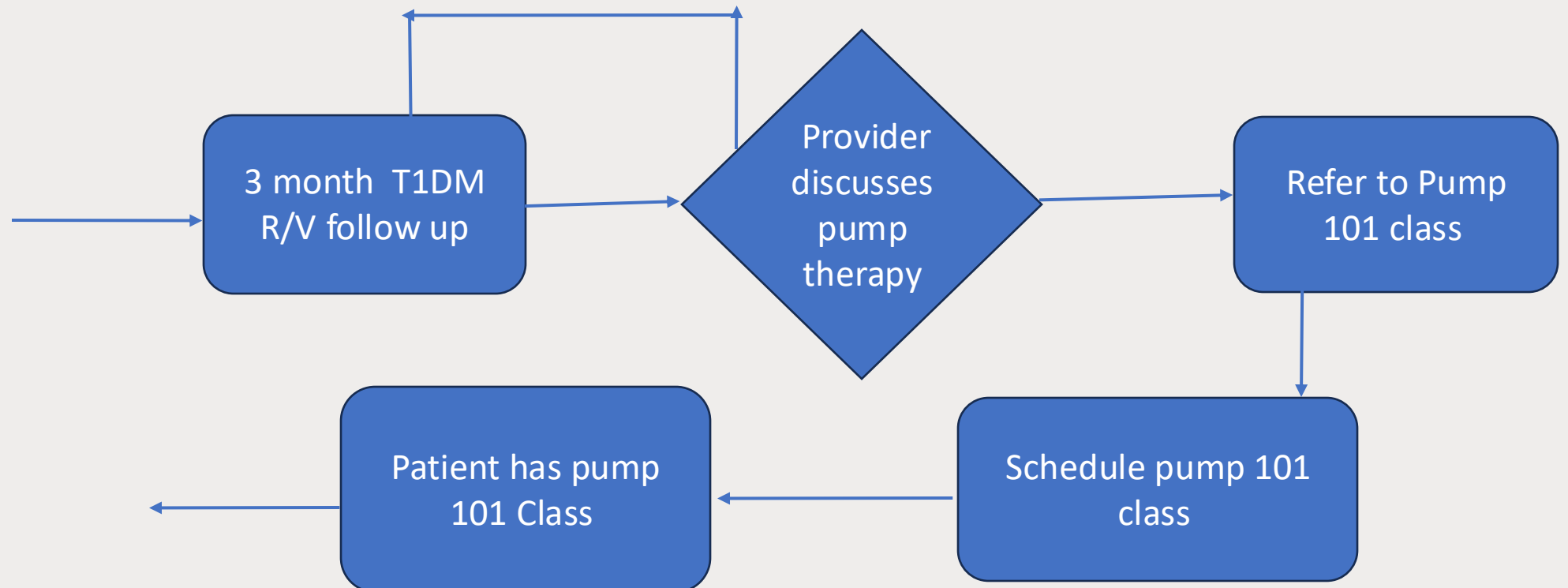
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# Where we started:

## Process Map for youth with Type 1 Diabetes to start an Insulin Pump

# Opportunities for improvement:

1. **Discussion of diabetes technology:** No standard pathway for the timing of the conversation. Typically occurred 4 + months after diagnosis.

2. **Pump 101 class:** Only offered in English. Many barriers including transportation, RN staffing, room availability, longer waits for youth and families with LOE, and written materials only available in English.

# Key Driver Diagram

## Secondary Drivers

## Primary Drivers

Increase insulin pump use in youth with type 1 diabetes at Seattle Children's Hospital from 53% to 70% by September 2024 while increasing insulin pump use in patients with LOE from 21% to 50%

**Provider bias/knowledge.**

- Provider education on insulin pumps/ talking points.
- EPIC smart phrase to put in note/prompt providers to talk about tech.
- RN education for more RNs to provide pump education
- Standard time for providers to intro tech. (1b visit, 1 month follow up)

**Patient bias/knowledge.**

- Barriers hand out filled out by patients not currently on an insulin pump at the start of visit
  RN/provider to address barriers at visit (target patients with LOE)
- Low health literacy handout for patients to compare different pumps to be given at standard time

**Pump initiation process .**

- Introduction to diabetes technology at track 1b visit with RN
- CGM initiation at track 1b visit for all patients
- Patients receive pump 101 info at any visit, starting with 1st NV follow
- Virtual option for patients needing more pump education than we have time for day of visit .
- Pump RX provided at clinic visit
- 2-3 week pump initiation follow up with APP via telemed.
- No Hemoglobin A1c requirement for pump initiation.
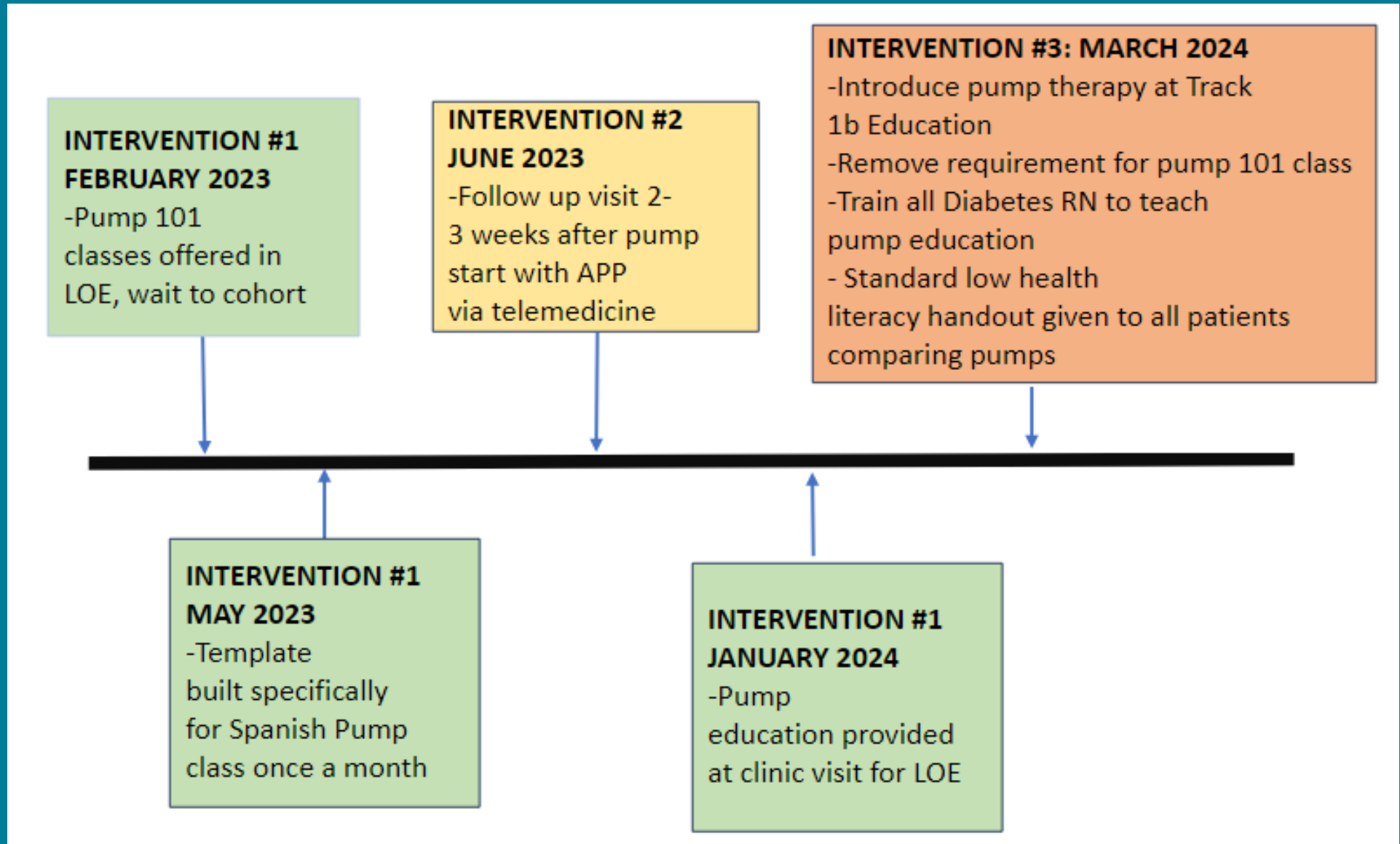
**Equity/health disparity.**

- Pump class offered in LOE
- RN to follow up with youth with LOE after pump start
- Request in person interpreters for visit
- Handouts available in LOE

# Timeline of interventions



**INTERVENTION #1**
**FEBRUARY 2023**
-Pump 101
classes offered in
LOE, wait to cohort

**INTERVENTION #2**
**JUNE 2023**
-Follow up visit 2-
3 weeks after pump
start with APP
via telemedicine

**INTERVENTION #3: MARCH 2024**
-Introduce pump therapy at Track
1b Education
-Remove requirement for pump 101 class
-Train all Diabetes RN to teach
pump education
- Standard low health
literacy handout given to all patients
comparing pumps

**INTERVENTION #1**
**MAY 2023**
-Template
built specifically
for Spanish Pump
class once a month

**INTERVENTION #1**
**JANUARY 2024**
-Pump
education provided
at clinic visit for LOE

# Timeline of interventions



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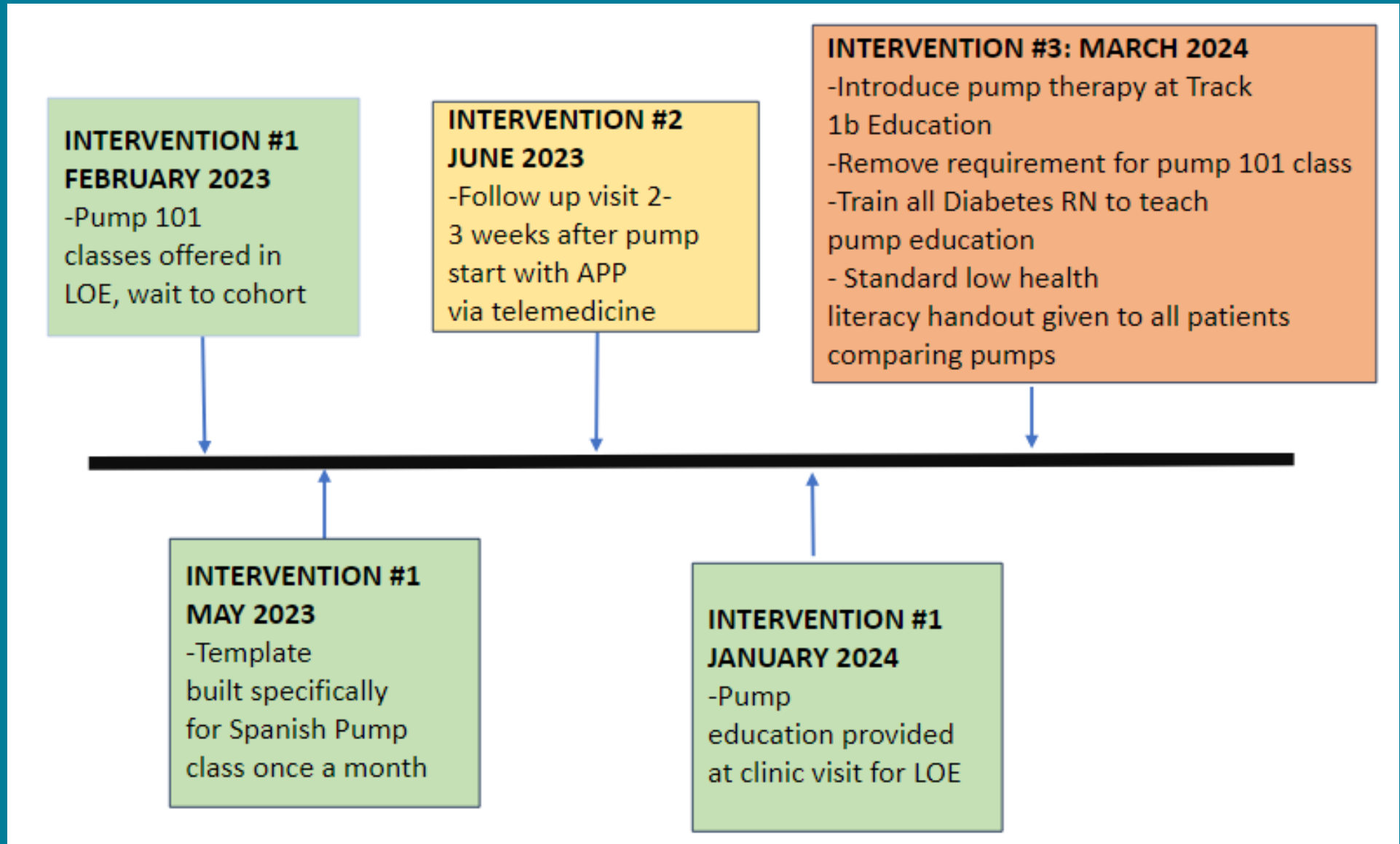# Intervention #1:
# Pump 101 Class offered in LOE

PDSA 1: February 2023: Pump 101 class offered in LOE

- youth wait to be cohorted by language

PDSA 2: May 2023: Monthly scheduled Spanish class

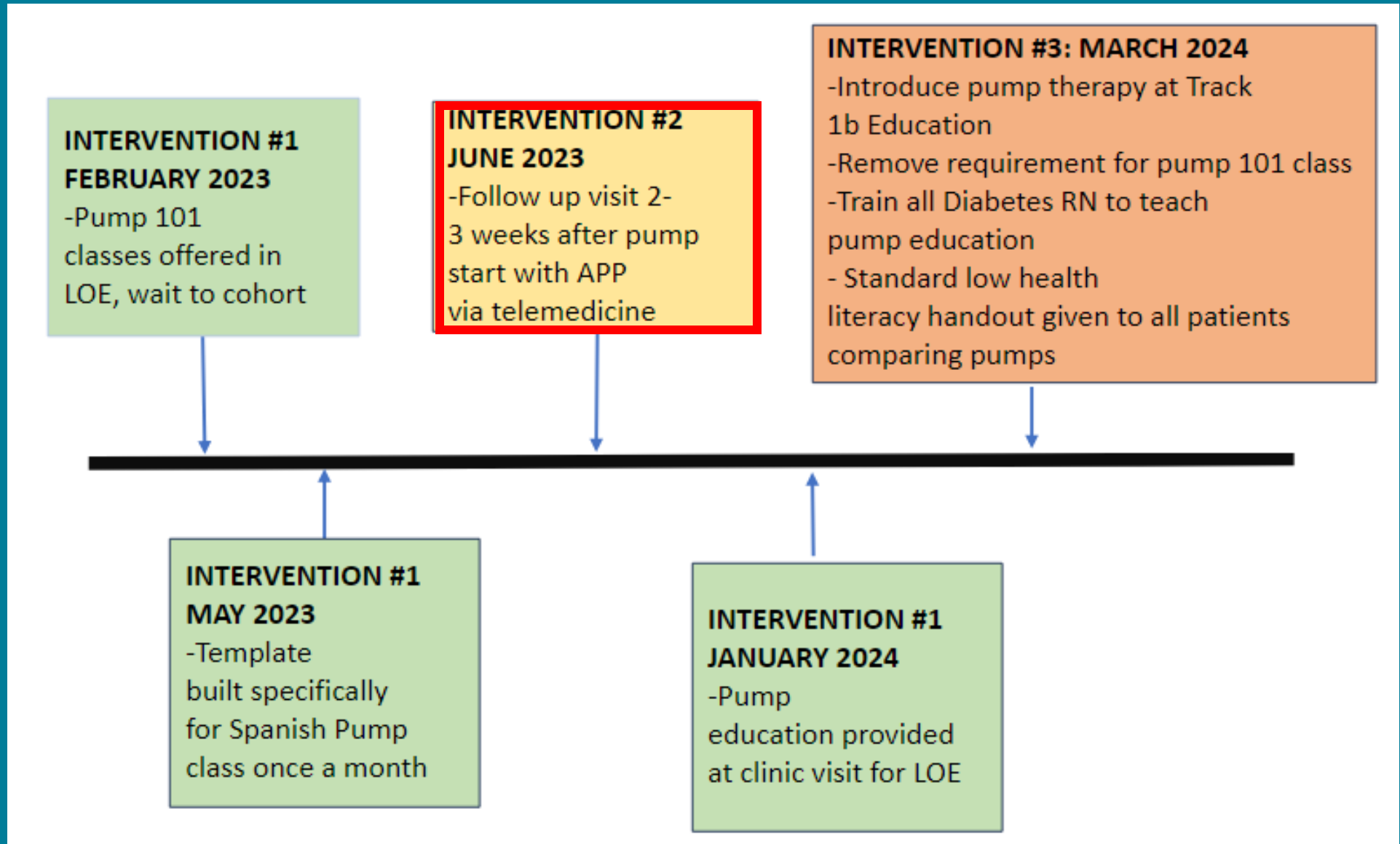- youth with other LOE continue to be cohorted

PDSA 3: January 2024: Pump education provided at scheduled clinic visit for patients with LOE who have been waiting to be cohorted

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# Timeline of interventions

# Timeline of interventions

# Intervention #2
## Standard post pump start provider visit

Aim: to have a touchpoint 2-3 weeks following pump initiation to help adjust pump settings and troubleshoot issues for long term success on pump therapy
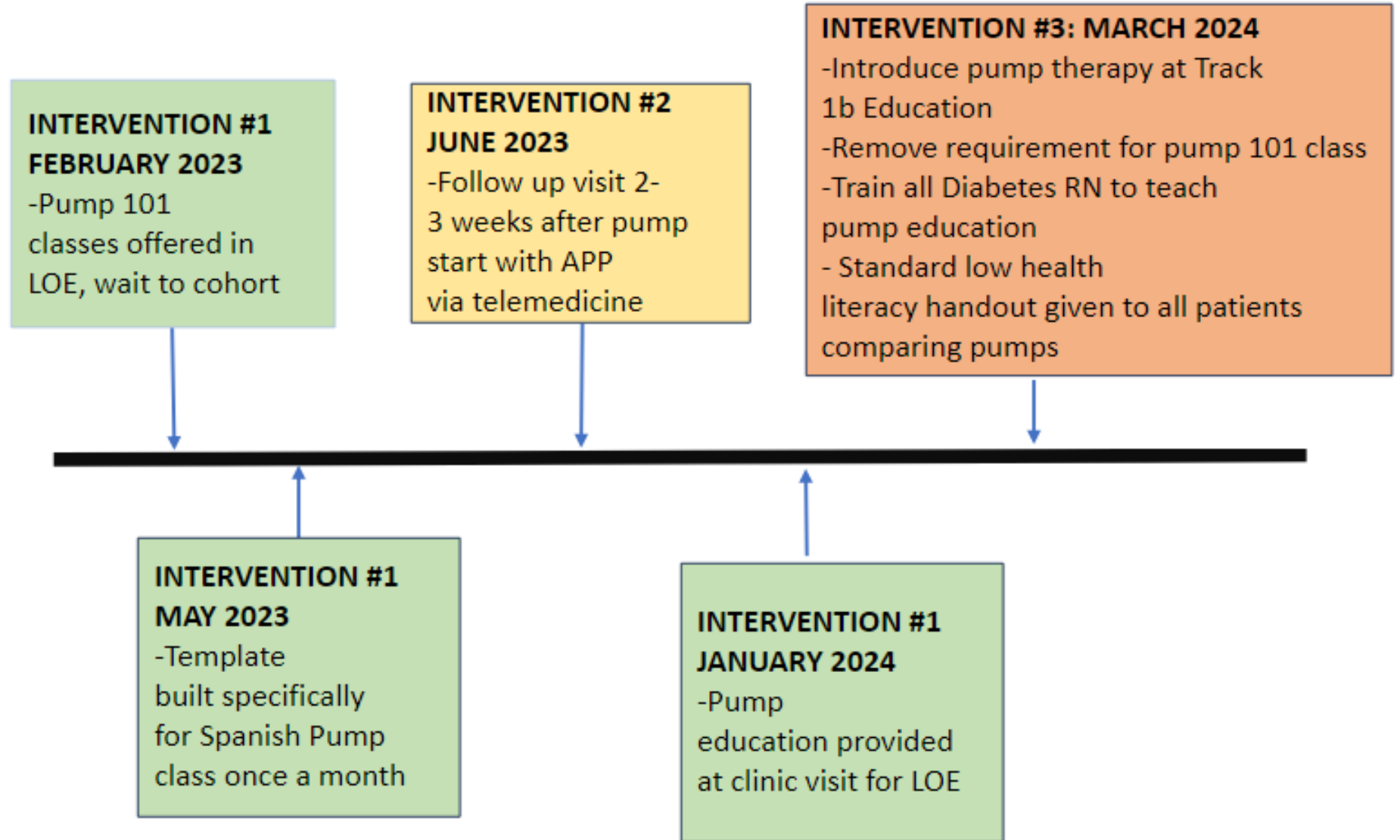
June 2023: Implemented via telemedicine with one APP who saw youth with diabetes 2-3 weeks following initiation of pump
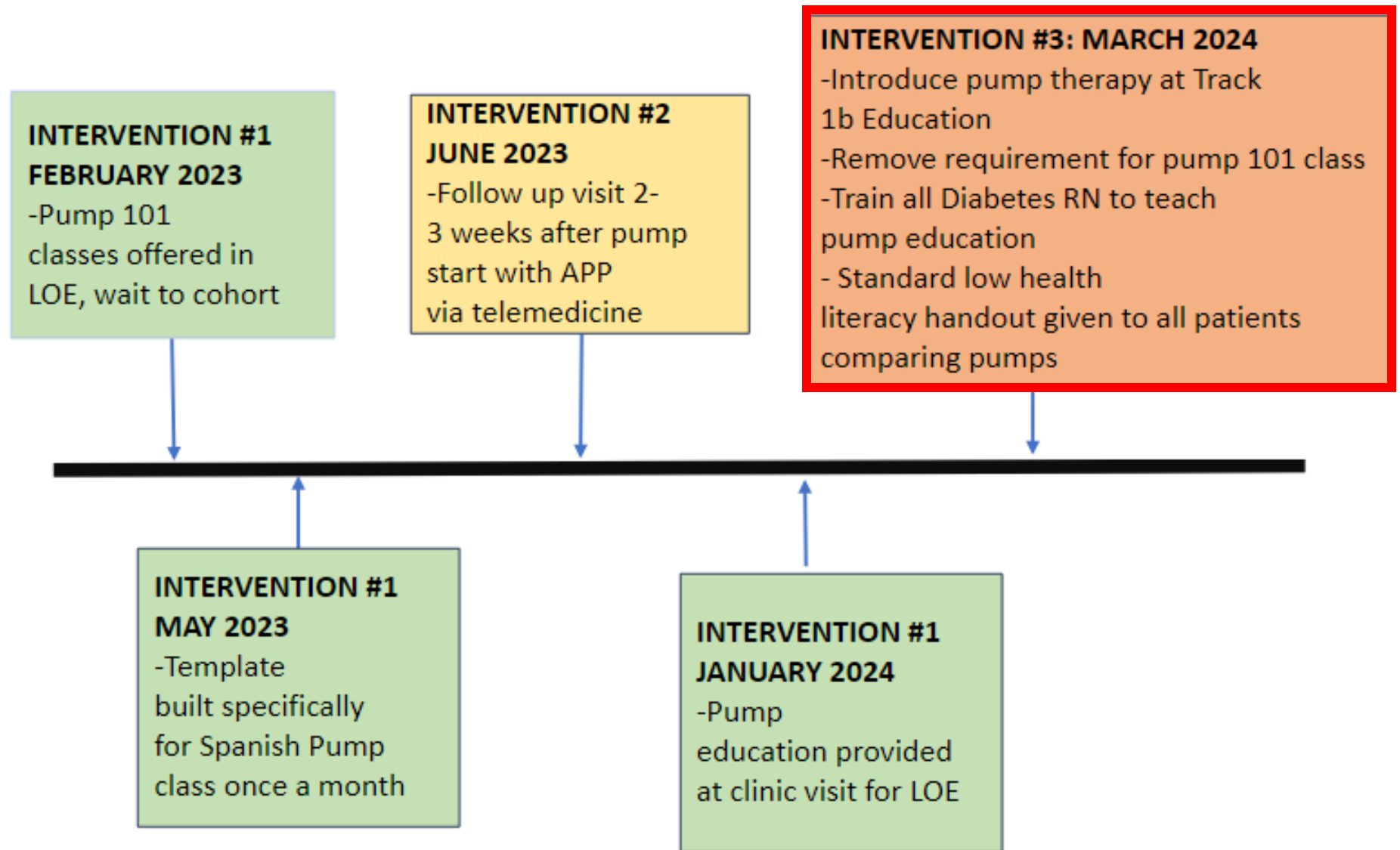
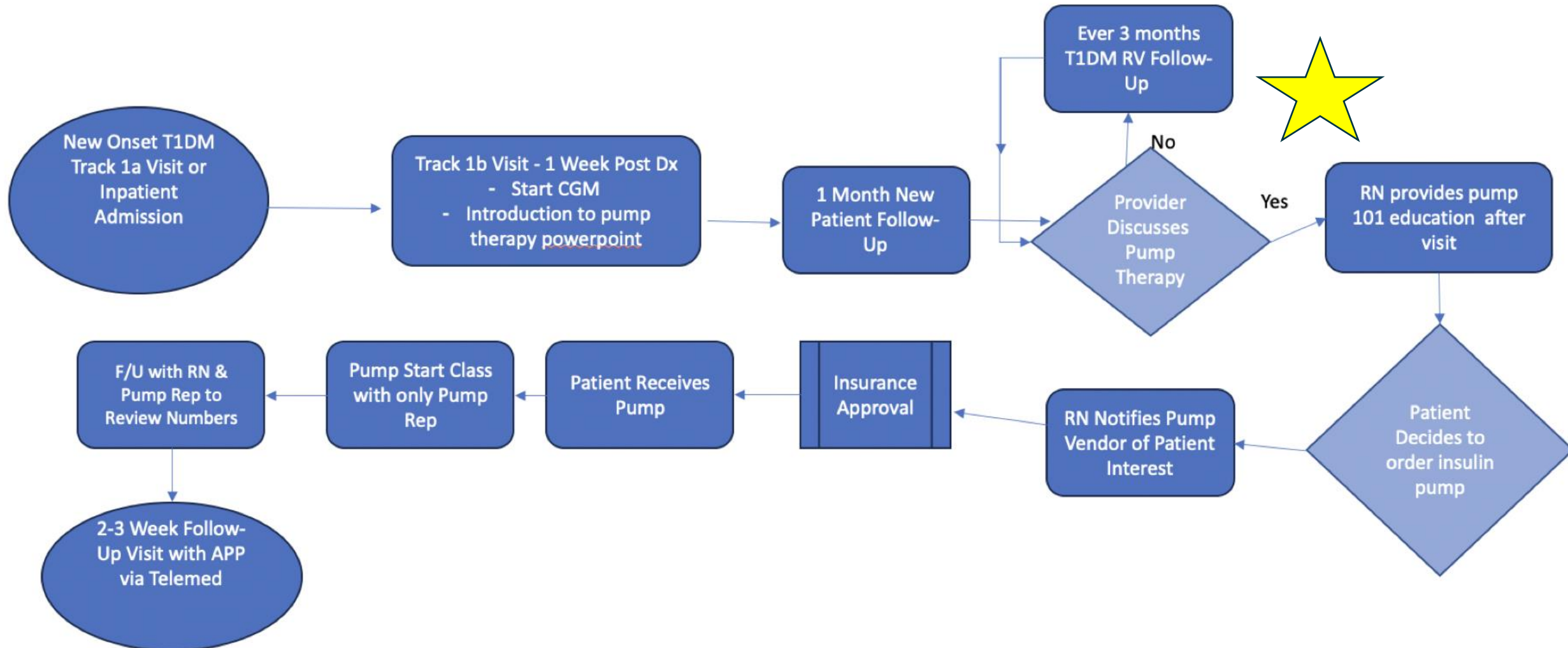September 2023: Expanded to all providers to try to keep continuity of care

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# Timeline of interventions



**INTERVENTION #1 FEBRUARY 2023**
-Pump 101 classes offered in LOE, wait to cohort

**INTERVENTION #2 JUNE 2023**
-Follow up visit 2-3 weeks after pump start with APP via telemedicine

**INTERVENTION #3: MARCH 2024**
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-Remove requirement for pump 101 class
-Train all Diabetes RN to teach pump education
- Standard low health literacy handout given to all patients comparing pumps

**INTERVENTION #1 MAY 2023**
-Template built specifically for Spanish Pump class once a month

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-Pump education provided at clinic visit for LOE

# Timeline of interventions



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# Intervention #3
# Revised insulin pump start process

Low health literacy pump comparison handout to be given to all patients at track 1b visit

| | Beta bionics ilet | Medtronic 780g | Omnipod 5 | Tandem T:Slim X2 | Tandem Mobi |
|---|---|---|---|---|---|
| Adjusts background insulin based on CGM data | ✚ | ✚ | ✚ | ✚ | ✚ |
| Carb counting | 🚫 Meal announcements only | Forgiveness for guesstimates ✚ | ✚ | Forgiveness for guesstimates ✚ | Forgiveness for guesstimates ✚ |
| Auto corrections given by pump | ✚ | ✚ | 🚫 | ✚ | ✚ |
| corrections can be given by user | 🚫 | ✚ | ✚ | ✚ | ✚ |
| Can bolus from iPhone and some Android models | 🚫 | 🚫 | Some Android models ✚ | Both ✚ | Both ✚ |
| Tubeless | 🚫 | 🚫 | ✚ | 🚫 | Tubling but can wear on body ✚ |
| Frequency of site changes | 2-3 days | 2-3 days OR 7 day infusion set available | 2-3 days | 2-3 days | 2-3 days |
| Insulin capacity | 180 units | 300 units | 200 units | 300 units | 200 units |
| CGM compatibility | Dexcom G6 Dexcom G7 | Medtronic Guardian | Dexcom G6 | Dexcom G6 Dexcom G7 Freestyle Libre 2 plus | Dexcom G6 Dexcom G7 Freestyle Libre 2 plus |

Adapted from Cornell University Pediatric Endocrinology (presented at T1DX 2023)
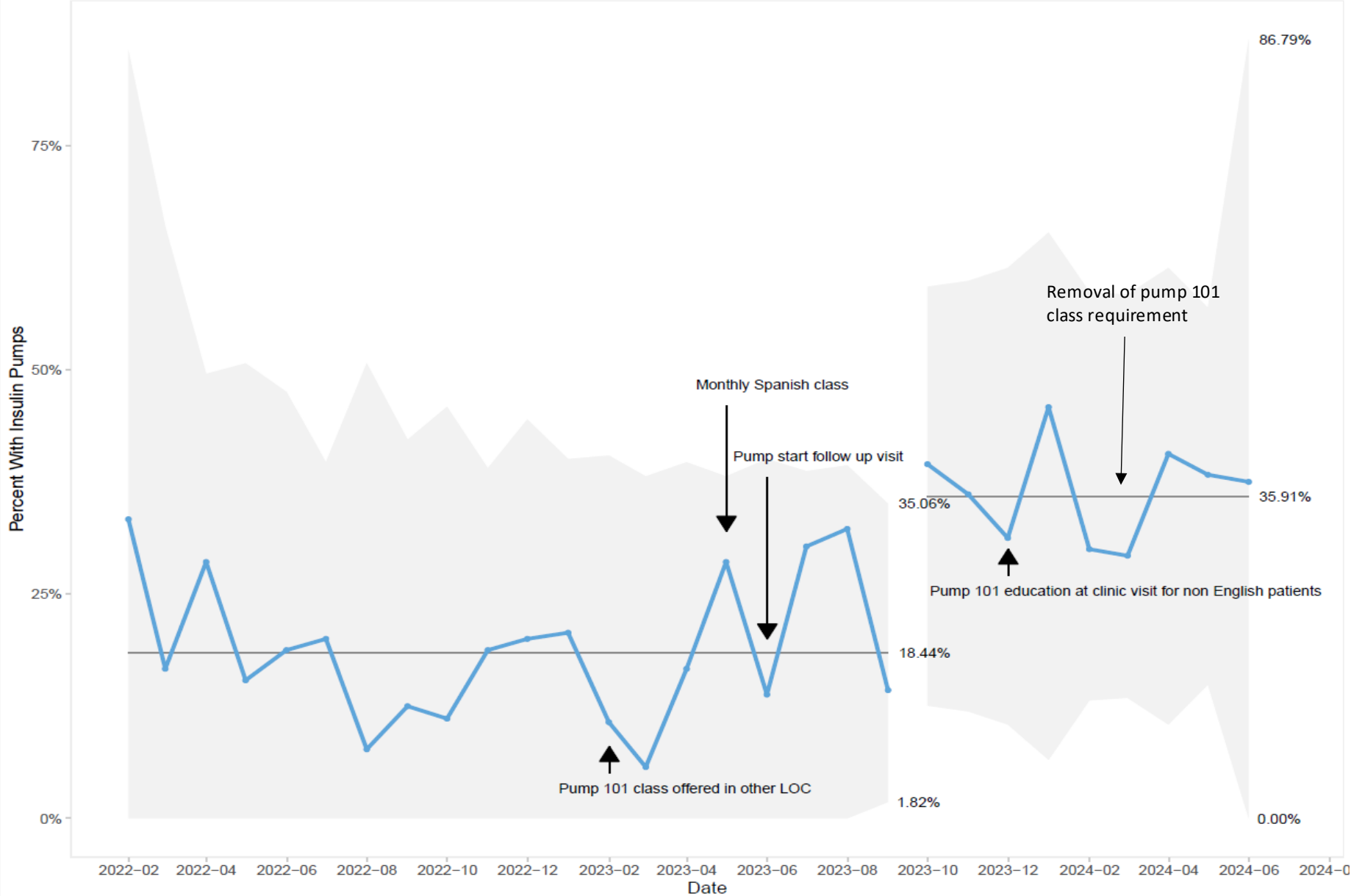
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# Results

## Study Characteristics

- **165 youth with T1DM and LOE**
- **Mean age 12.4 (4.2 SD) years**
- **Mean A1c 10.0 (2.5 SD) %**
- **Most common LOE**
    - Spanish: 53.9%
    - Somali: 10.9%
    - Russian: 6.7%
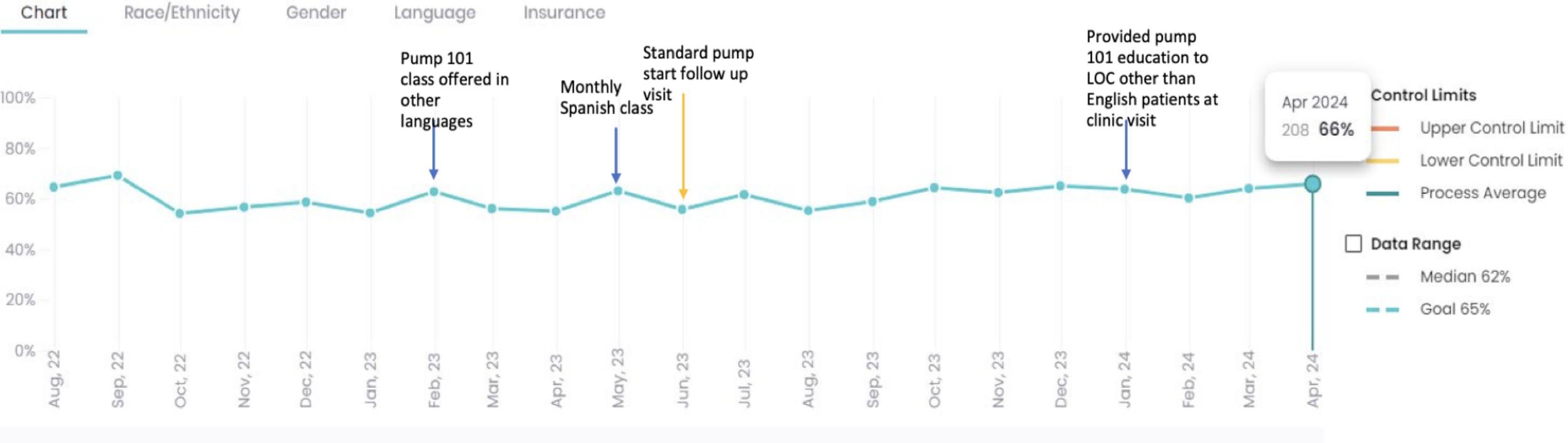- **Baseline rate of pump use: 19% (February 2022)**

Median Insulin Pump use in LOE as of June 2024

# Median Insulin Pump use in all youth with T1D as of June 2024

# Conclusion

- **Implementation of the BRIDGE project doubled insulin pump utilization in youth with T1D with LOE over a 2-year period**

- **Further interventions have been implemented and are ongoing**

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# Median pump use in patients with primary LOC other than English as of August 2024

November 11, 2024

# Reducing Disparities in Continuous Glucose Monitor Adoption and Use Among Children and Adolescents with Type 1 Diabetes

*Ashley Garrity, MPH, Jacqueline Fisher, MD, Inas Thomas, MD & Joyce Lee, MD, MPH*

# U-M Pediatric Diabetes
## C.S. Mott Children's Hospital, University of Michigan

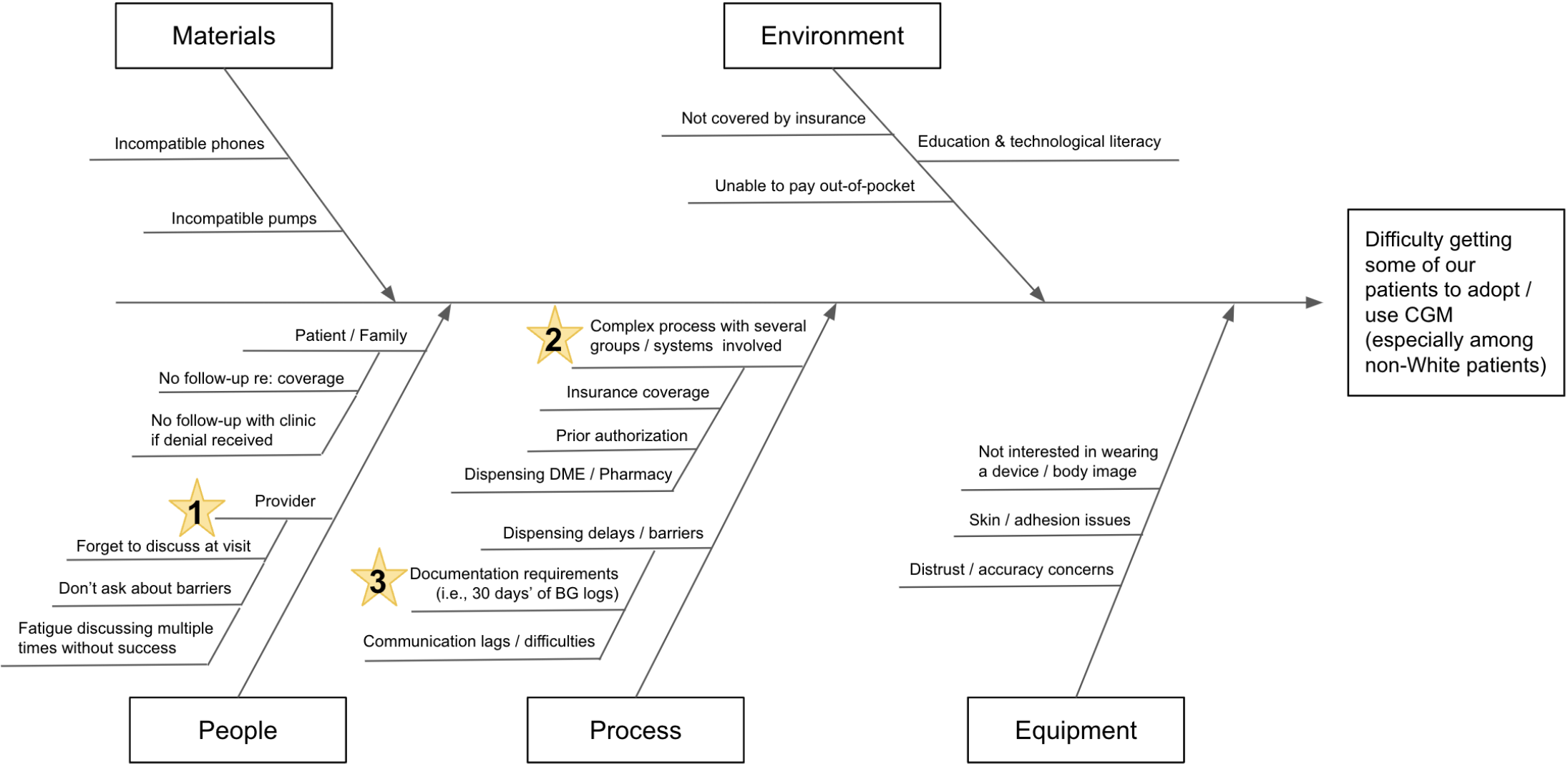| Multidisciplinary Team | Patient Volume & Demographics | Contacts |
|---|---|---|
| <ul><li>12 endocrinologists</li><li>3 fellows</li><li>2.0 dietitians</li><li>5.6 RNs (4.6 w/CDCES)</li><li>2.0 social workers</li><li>1.0 psychologist</li></ul> | <ul><li>Main clinic at academic medical center + 1 satellite clinic</li><li>100-150 new onsets annually</li><li>~1300 established T1D patients</li><li>30% publicly insured</li></ul> | **Site PI**<br>Joyce Lee, MD, MPH<br>joyclee@med.umich.edu<br><br>**Site Coordinator**<br>Ashley Garrity, MPH<br>ashleyna@med.umich.edu |

# Baseline Data (February 2022)

- Proportion of all patients with T1D who have a CGM: **85%**
  - Non-Hispanic White Patients with T1D who have a CGM: **87%**
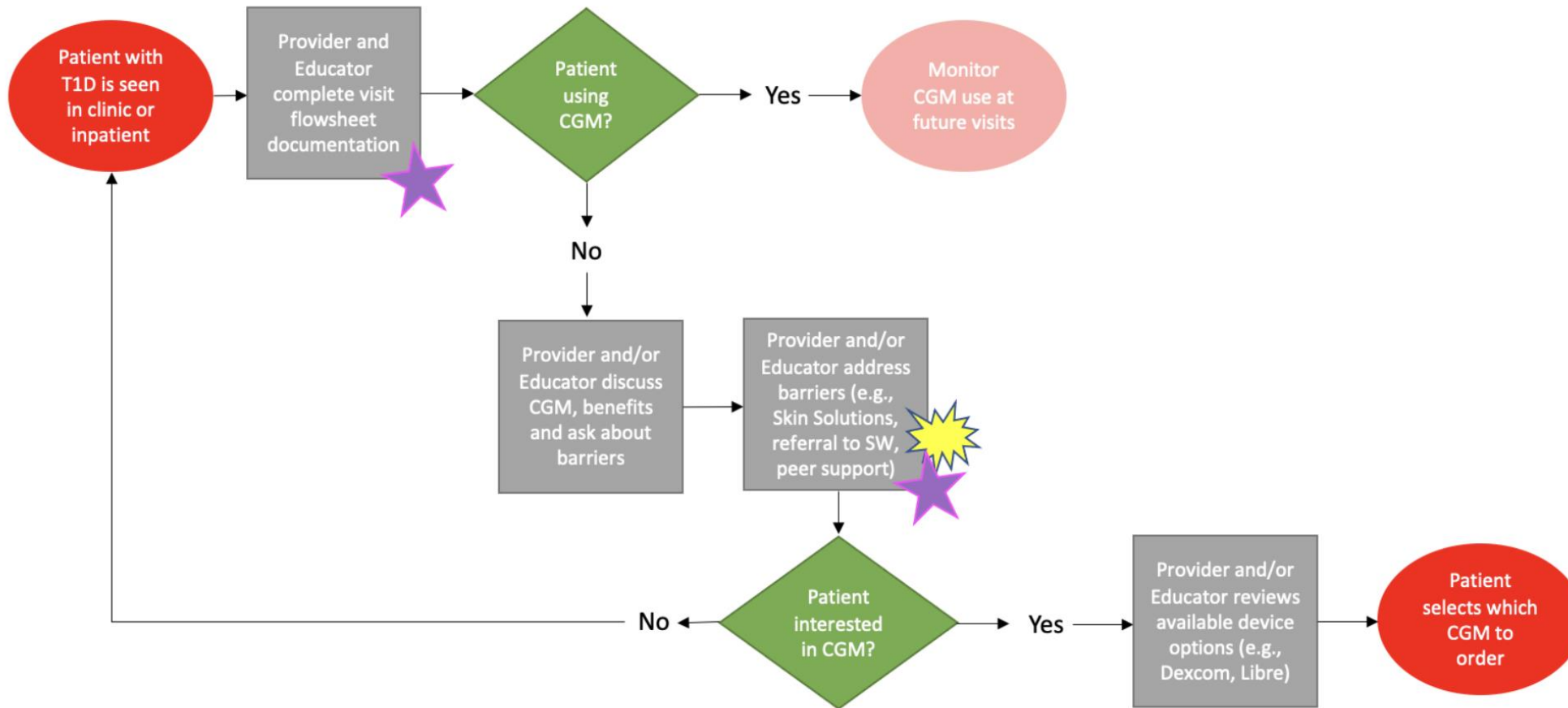  - Non-White Patients with T1D who have a CGM: **75%**

# SMART Aims

To:
1. Increase the proportion of all patients with T1D who have a CGM by 5% (goal: 90%)
2. Increase the proportion of all patients with T1D who use CGM ≥70% of the time
3. Close the gap in CGM adoption and use between White and non-White patients with T1D by December 31, 2023.

# U-M Peds Diabetes
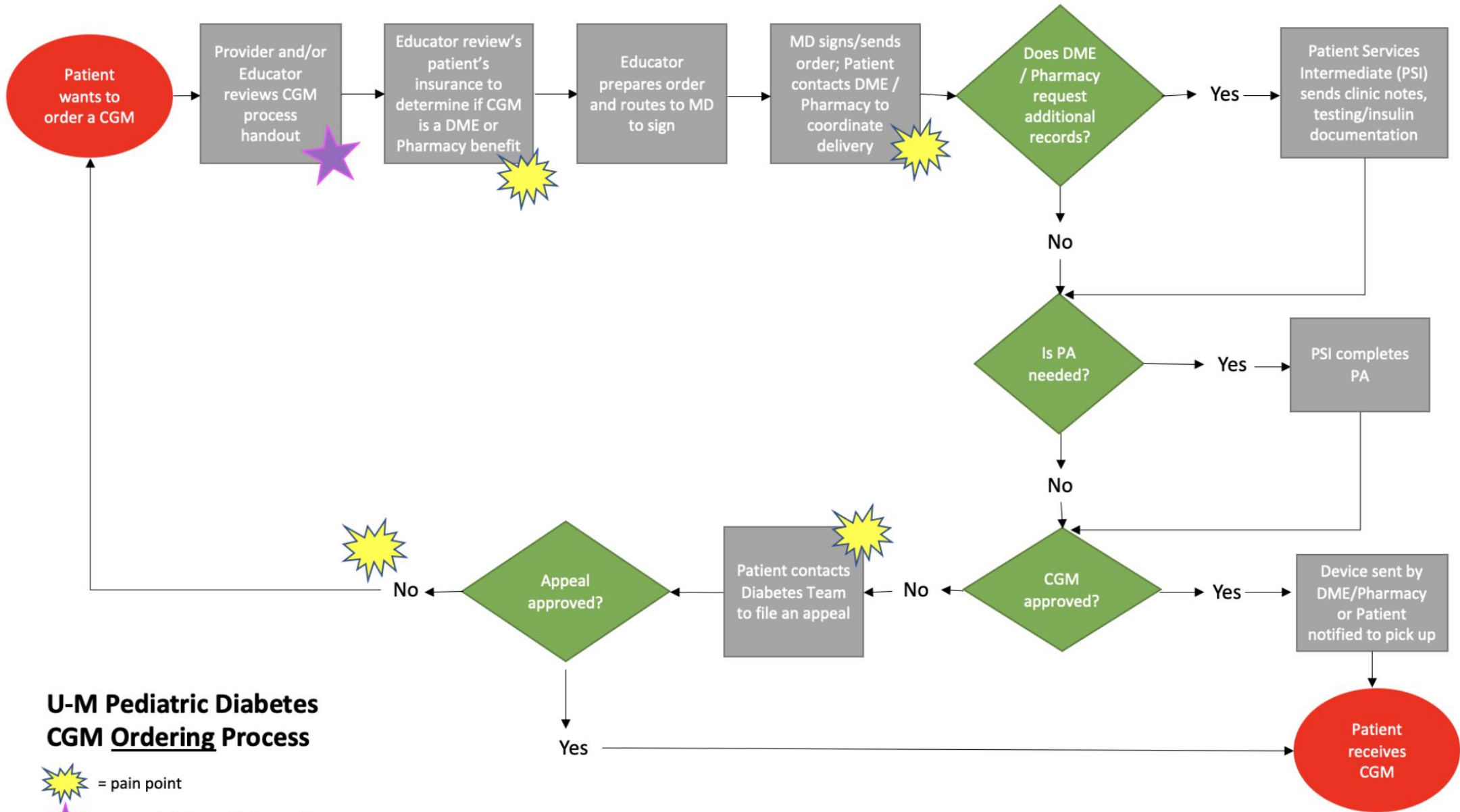# Fishbone Diagram (Cause & Effect Diagram)



**Materials**
- Incompatible phones
- Incompatible pumps

**Environment**
- Not covered by insurance
- Education & technological literacy
- Unable to pay out-of-pocket

**People**
- Patient / Family
  - No follow-up re: coverage
  - No follow-up with clinic if denial received
- ★1 Provider
  - Forget to discuss at visit
  - Don't ask about barriers
  - Fatigue discussing multiple times without success

**Process**
- ★2 Complex process with several groups / systems involved
- Insurance coverage
- Prior authorization
- Dispensing DME / Pharmacy
- Dispensing delays / barriers
- ★3 Documentation requirements (i.e., 30 days' of BG logs)
- Communication lags / difficulties

**Equipment**
- Not interested in wearing a device / body image
- Skin / adhesion issues
- Distrust / accuracy concerns

**Difficulty getting some of our patients to adopt / use CGM (especially among non-White patients)**

**U-M Pediatric Diabetes CGM Discussion Process**

Flowchart:

- **Patient with T1D is seen in clinic or inpatient** (red oval) →
- **Provider and Educator complete visit flowsheet documentation** (gray box, with purple star) →
- **Patient using CGM?** (green diamond)
  - **Yes** → **Monitor CGM use at future visits** (pink oval)
  - **No** ↓
    - **Provider and/or Educator discuss CGM, benefits and ask about barriers** (gray box) →
    - **Provider and/or Educator address barriers (e.g., Skin Solutions, referral to SW, peer support)** (gray box, with yellow star and purple star) →
    - **Patient interested in CGM?** (green diamond)
      - **No** → (returns to Patient with T1D is seen in clinic or inpatient)
      - **Yes** → **Provider and/or Educator reviews available device options (e.g., Dexcom, Libre)** (gray box) → **Patient selects which CGM to order** (red oval)

Legend:
- ★ (yellow starburst) = pain point
- ★ (purple star) = current / planned intervention

U-M Pediatric Diabetes CGM Ordering Process

Flowchart:

- Patient wants to order a CGM →
- Provider and/or Educator reviews CGM process handout (★) →
- Educator review's patient's insurance to determine if CGM is a DME or Pharmacy benefit (pain point) →
- Educator prepares order and routes to MD to sign →
- MD signs/sends order; Patient contacts DME / Pharmacy to coordinate delivery (pain point) →
- Does DME / Pharmacy request additional records?
  - Yes → Patient Services Intermediate (PSI) sends clinic notes, testing/insulin documentation →
  - No → Is PA needed?
- Is PA needed?
  - Yes → PSI completes PA →
  - No → CGM approved?
- CGM approved?
  - Yes → Device sent by DME/Pharmacy or Patient notified to pick up → Patient receives CGM
  - No → Patient contacts Diabetes Team to file an appeal (pain point) → Appeal approved?
- Appeal approved?
  - Yes → Patient receives CGM
  - No (pain point) → Patient wants to order a CGM

Legend:
- (yellow star burst) = pain point
- (purple star) = current / planned intervention

```
┌──────────┐      ┌──────────────┐      ┌──────────────┐      ┌──────────────┐      ┌──────────┐
│ Patient  │ ───▶ │ Patient      │ ───▶ │ Patient      │ ───▶ │ Patient      │ ───▶ │ Patient  │
│ receives │      │ reviews      │      │ inserts      │      │ notifies     │      │ uses     │
│ CGM      │      │ materials    │      │ CGM and sets │      │ Diabetes     │      │ CGM      │
│          │      │ that came    │      │ up account   │      │ Team that    │      │          │
│          │      │ with CGM,    │      │ (e.g.,       │      │ CGM is       │      │          │
│          │      │ online       │      │ Clarity,     │      │ active;      │      │          │
│          │      │ videos/      │      │ LibreView)   │      │ Educator     │      │          │
│          │      │ instructions │      │              │      │ reviews      │      │          │
│          │      │ for getting  │      │              │      │ how to share │      │          │
│          │      │ started      │      │              │      │ data with    │      │          │
│          │      │              │      │              │      │ clinic       │      │          │
└──────────┘      └──────────────┘      └──────────────┘      └──────────────┘      └──────────┘
```

**U-M Pediatric Diabetes**
**CGM Initiation/Use Process**

✸ = pain point

# PDSA #1: Patient Instruction Handouts

- **Plan:** Print out CGM instruction form and DME phone numbers and give to patients who order a new CGM.

- **Do:** Dr. Fisher to test during March-June 2022 clinics.

- **Study:** Handouts were given to two patients who ordered CGM, but neither called DME to confirm shipment; one patient has since no-showed to clinic.

- **Act:** Adopt; Consider scaling by adding handouts to the New Onset Guide (vs. individual POC delivery).

# PDSA #2: In-Clinic Support for CGM Initiation

- **Plan:** 1:1 time with diabetes educator at clinic visit to provide support in CGM placement, onboarding, etc.

- **Do:** Dr. Lee selected one patient (with many significant barriers) and asked them to bring CGM equipment to visit so CDCES could help with insertion and placement.

- **Study**: Patient forgot to bring equipment.

- **Act:** Abandon.

# PDSA #3: Flowsheet Revisions

- **<u>Plan</u>:** Using Lurie Children's flowsheet as an example, revise flowsheet to standardize discussions about CGM, capture CGM adoption and use at point-of-care, and address barriers.

- **<u>Do</u>:** QI Team to collaboratively discuss and decide on flowsheet items (Nov 2022); Joyce to build (Dec 2022 – Jan 2023).

- **<u>Study</u>:** Updated flowsheet items went live 2/8/2023; Revised items allow use to better understand which patients do/do not have CGM and which patients are/are not using CGM ≥70% of them, plus collecting information about barriers helps us know how we might best intervene.
    *Top barriers*: Resistance to wearing device, insurance coverage, and technology issues

- **<u>Act</u>:** Adopt.

Does the individual have or own a CGM? This does not imply that they are using it, just that they have the equipment or the supplies for it. (*Carries Forward but please review at each visit and update as appropriate.)

Select all relevant barriers for why the patient does not have a CGM or was not using CGM in the last 10-14 days. Skip the question if the pt was using CGM for the last 10-14 days.

Select if the patient used CGM 10-14 days, 0-9 days, or 0 days in the last 14 days (per download).

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**Pediatric Endocrinology**

Responsible    Create Note                                   ☑ Show Last Filed Value  ☑ Show A

Self-management behaviors

Does Patient Have a CGM?
Dexcom G6 ◄◄ taken 3 days ago

| Does Not Have CGM | Dexcom G6 | Dexcom G7 | Medtronic Guardian Sensor 3 | Medtronic Enlite | Freestyle Libre | Freestyle Libre 2 | Freestyle Libre 3 |

| Other |

---

If Not Using CGM 10-14 days what are the Barriers? (Select all that apply)
Insurance coverage ◄◄ taken 4 days ago

☐ Wants CGM Break  ☐ Cost  ☐ Insurance coverage  ☐ Distrust  ☐ Skin/adhesion issues  ☐ Technological issues  ☐ Alarm fatigue  ☐ Self-image
☐ Resistance to wearables  ☐ Refill delay  ☐ Lack of education  ☐ Other

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CGM Use in the last 14 days
CGM Use 1-9 days ◄◄ taken 4 days ago

| CGM Use 10-14 days | CGM Use 1-9 days | None 0 days |

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# PDSA #4: Change Data Downloads to Ensure BG Logs on File for CGM Orders

- **Plan:** At intake, if patient is only using a glucometer, MAs will download 30 days of data (instead of 14) to ensure adequate BG logs are on file if patient opts to proceed with CGM order at visit.

- **Do:** MAs to test with next 5 patients using only glucometer, beginning 4/6/2023.

- **Study**: MAs successfully switched from downloading 14 days of meter day to 30 days; First patient ordered CGM at same visit (previously used Dexcom but discontinued due to discomforted and opted to try Libre).
    Michigan Medicaid revised CGM policy (effective 6/1/2023), no longer requiring BG log documentation for CGM order approval (team was involved in advocacy efforts), but some private insurance plans may still require documentation.

- **Act:** Adopt.

# PDSA #5: Share Resources & Reminder via Newsletter

- **Plan:** Share resources for patients/families getting started with CGM or new type of device and reminder: "As always, whether you are a new or experienced CGM user, please don't hesitate to contact your U-M Pediatric Diabetes care team with any diabetes device questions."
- **Do:** Ashley to share information and links to 'Getting Started' videos in August 2023 newsletter (sent 8/18/2023).
- **Study**: 6 parents clicked links to Dexcom 'Getting Started' videos.
- **Act:** Adopt.



**Getting Started with a CGM**

Are you new to using a continuous glucose monitor (CGM)? Did you recently switch to a new device? Check out these resources to learn how to get started!

- Dexcom G6
- Dexcom G7
- Abbott FreeStyle Libre (2 and 3)
- Medtronic Guardian Connect

As always, whether you are a new or experienced CGM user, please don't hesitate to contact your U-M Pediatric Diabetes care team with any diabetes

# PDSA #6: Discuss CGM During Basic Education Class

- **Plan:** Add CGM slide to Basic Education class regarding all types of CGM and let patients know that if they need assistance with putting on CGM, it's okay to bring to basic class.

- **Do:** Iris & Christina to add slide for teaching; Kelly to tell patients about bringing CGM to Basic Education, if needed, at discharge.

- **Study**: Find that most patients who order CGM at diagnosis are already using CGM by the time they attend Basic Ed.

- **Act:** Adapt; Still helpful to promote CGM use during Basic Ed for patients/families who weren't ready to order during admission.

# PDSA #7: Inpatient CGM Onboarding

- **Plan:** Onboard patient/family to Dexcom apps (G6/G7, Clarity, Follow) including helping set up account and connect to clinic for sharing.

- **Do:** Kelly to test with next new onset patient/family who orders a Dexcom prior to discharge.

- **Study**: Tested with 1 patient in October 2023 who ordered a Dexcom G6 while inpatient; Successfully helped patient/family install apps and create account; Kelly also notified diabetes educators who sent a sharing invitation.

**Act**: Adopt* *(*will tailor offering based on patient/family readiness).*

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# Patients with T1D who <u>Have</u> a CGM, by Race/Ethnicity (Feb 2022 – Jun 2024)
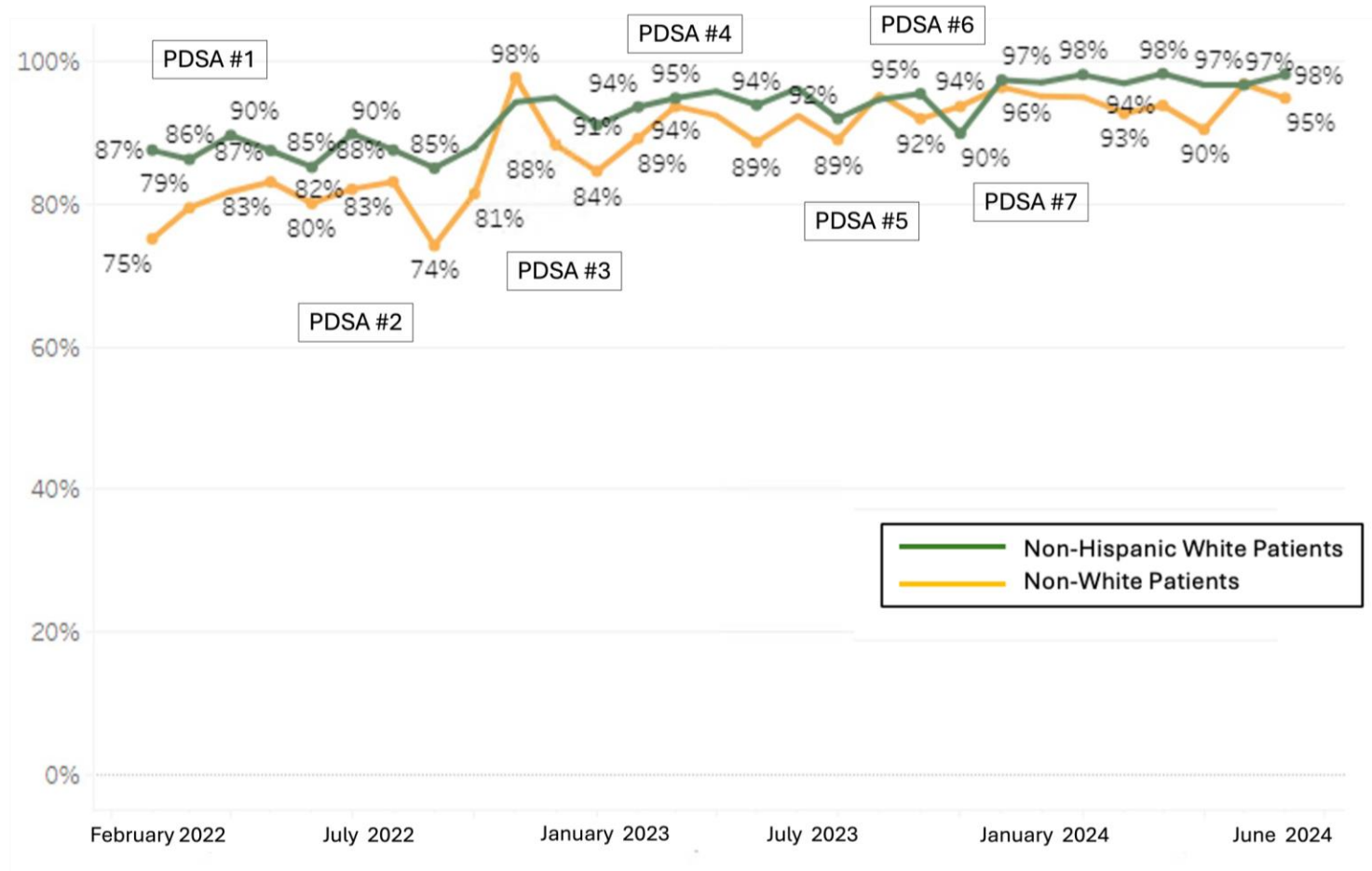


Proportion of all patients with T1D who **have a CGM**: 85% → 97%

- Non-Hispanic White Patients with T1D who **have a CGM**: 87% → 98%

- Non-White Patients with T1D who **have a CGM**: 75% → 95%

# Patients with T1D who Have a CGM and <u>Use</u> It, by Race/Ethnicity (Feb 202**3** – Jun 2024)
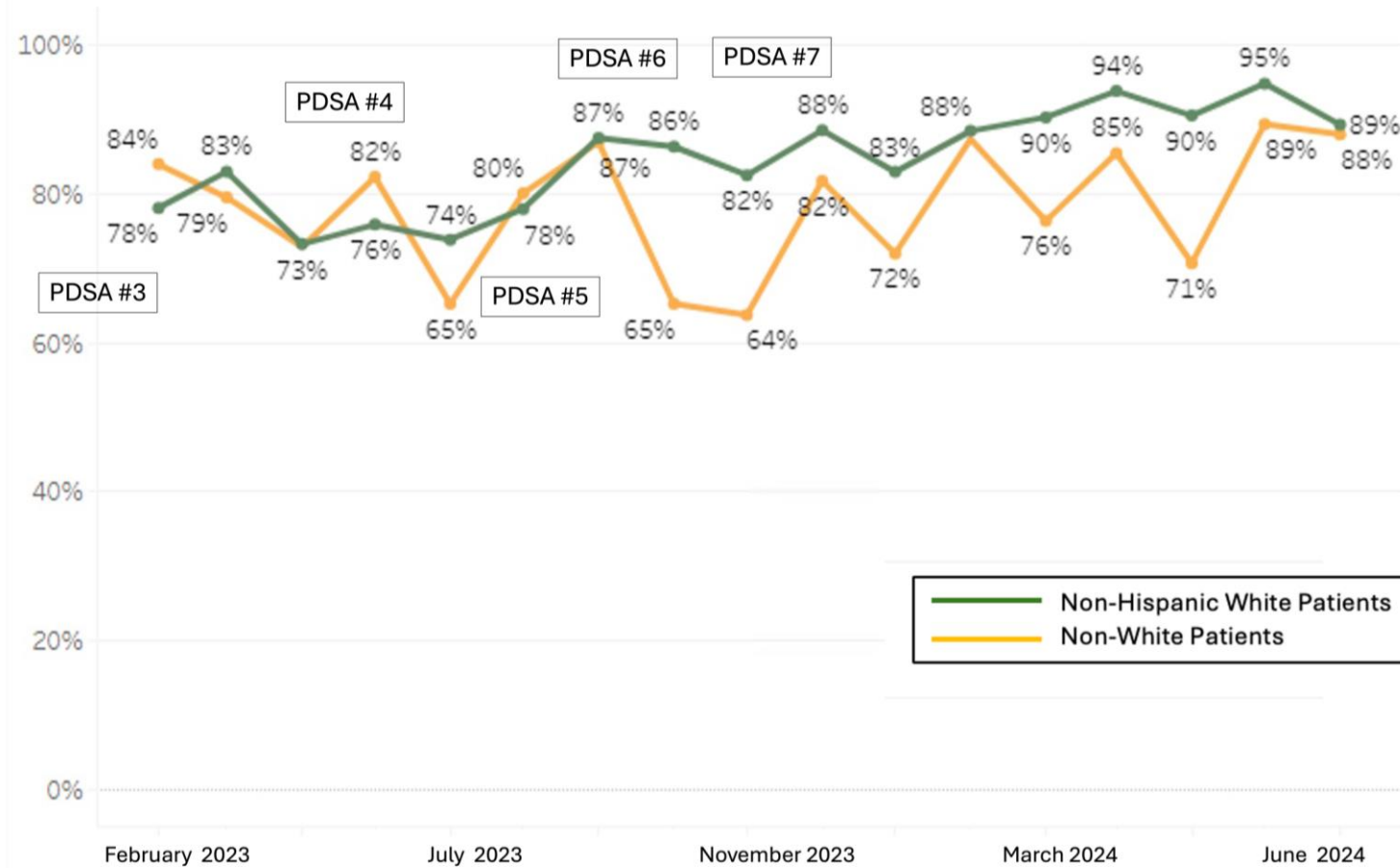


Proportion of all patients with T1D who have a CGM and **<u>use it ≥70% of the time</u>**:
**79%** → **89%**

- Non-Hispanic White Patients with T1D who have a CGM and **<u>use it</u>**: **78%** → **89%**

- Non-White Patients with T1D who have a CGM and **<u>use it</u>**: **84%** → **88%**

# Thank You!

**For questions:**
**Contact Joyce Lee, MD, MPH**
**joyclee@med.umich.edu**

**Visit our website!**
**www.UMPedsDiabetes.com**

# CDCES Clinical Workflows Can Address Challenges and Barriers to Equitable Care in New Onset T1D

Jeannine Leverenz, Shannon Lin, Anjoli Martinez-Singh, Barry Conrad, Annette Chmielewski,
Ian Chan, Erica Pang, Franziska K Bishop, Priya Prahalad, David M Maahs

# Disclosures

- I have no disclosures

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- SDRC (1P30DK 11607401)
- LPCH Auxiliaries
- National Science Foundation (2205084)
- Stanford HAI
- Stanford Maternal & Child Health Research Institute
- Stanford REDCap Platform (UL1 TR003142)
- Dexcom provided the first month of CGM supplies

# Background

- The 4T Program (Teamwork, Targets, Technology, and Tight control) at Stanford Children's aims to intensify equitable new-onset type 1 diabetes (T1D) education to improve outcomes.

- The Certified Diabetes Care and Education Specialist (CDCES) team has been pivotal in creating standardized workflows to improve access and tailor care to an individual's needs.

# Methods

- Youth with new-onset T1D start on continuous glucose monitoring (CGM) in the first month of diabetes diagnosis

- CDCES reviews CGM data monthly

- Families are directed to attend a pre-Automated Insulin Delivery (AID) class between 1-3 months post-T1D diagnosis

- To promote equity, the CDCES team created workflows to decrease barriers for families, which include offering diabetes technology to all patients regardless of insurance status or language spoken (Table 1)

## Table 1: Standardized CDCES Workflows for Equitable New Onset T1D Care

1. During Diabetes Self-Management Education (DSME) at diagnosis, families spend the day with the CDCES and need lunch. The CDCES team works with the social work team to provide food delivery gift cards for the family to order lunch

2. CGM and AID systems are introduced by CDCES for anyone with T1D regardless of provider referral, language spoken, and/or insurance status

3. Offer pre-AID classes and trainings in Spanish with our bilingual CDCES

4. Offer pump/AID software upgrades in the clinic for youth who may not be comfortable with technology, have inadequate Wi-Fi, and/or have literacy barriers

## Table 1- Cont: Standardized CDCES Workflows for Equitable New Onset T1D Care

5. Provide iOS devices to families without compatible smart devices for CGM data flow for remote patient monitoring

6. Provide CGM supplies for gaps in insurance coverage

7. Electronic health record message pool with the CDCES team and study/program coordinators so they can help with any connectivity issues, supply gaps, etc.

# 4T Study Timeline



CGM Start    CGM Follow-up

Baseline Research Visit
Telehealth or in-person

Diabetes Diagnosis | *Month 1 | *Month 2 | *Month 3 | *Month 4 | *Month 5 | *Month 6 | *Month 7 | *Month 8 | *Month 9 | *Month 10 | *Month 11 | *Month 12 | *Month 13

Pre-Pump Class

---

 = Continuous Glucose Monitoring (CGM)

 = Patient Reported Outcomes (PROs) Survey: *~15 minutes to complete*

\* = Remote Monitoring: Regular CGM data review from diabetes educator

 = Systematic pump exposure in months 1-3 – *in English and Spanish*
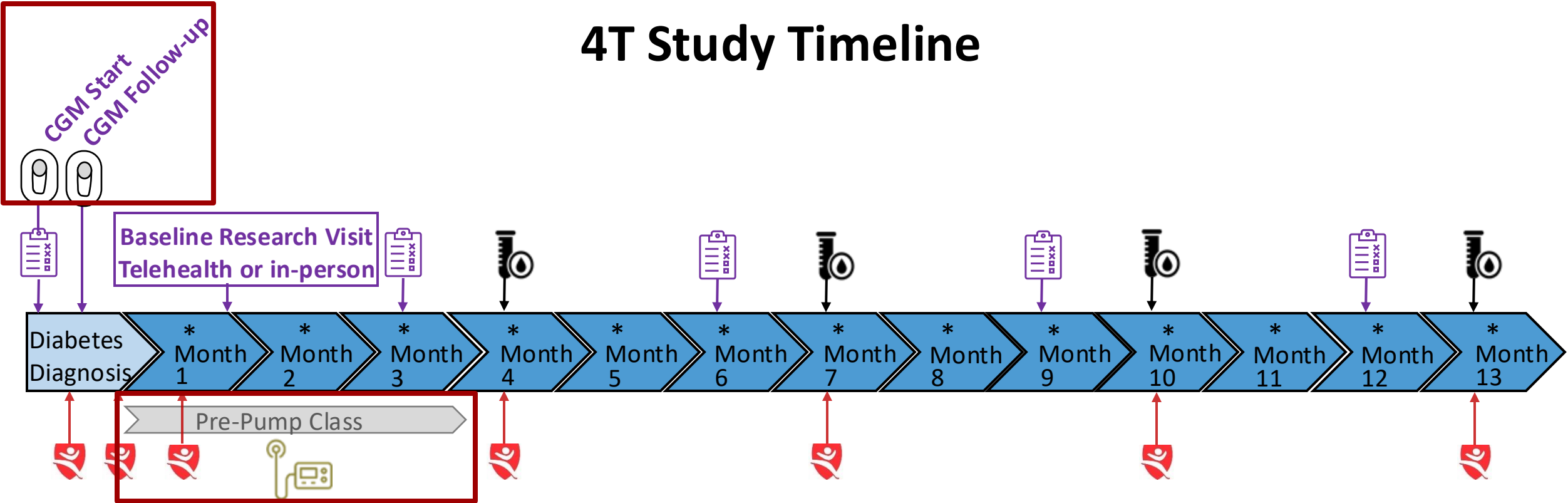
 = Hemoglobin A1c (HbA1c) test: *In-clinic or at-home test*

 = Stanford Children's Diabetes Clinic Visit: *Historic/Standard of Care*

**Table 1. Characteristics of the Historical, Pilot 4T, 4T Study 1, and 4T Study 2 Cohorts**

| Characteristic | Historical | Pilot 4T | 4T Study 1 | 4T Study 2 |
|---|---|---|---|---|
| N | 272 | 135 | 133 | 183 |
| Baseline characteristics | | | | |
| Age (years) at T1D diagnosis, median (Q1, Q3) | 10 (7, 13) | 10 (7, 13) | 11 (6, 14) | 11 (7, 13) |
| Sex, n (%) | | | | |
| Male | 137 (50.4) | 71 (52.6) | 74 (55.6) | 85 (46.4) |
| Female | 135 (49.6) | 64 (47.4) | 59 (44.4) | 98 (53.6) |
| Race/ethnicity, n (%) | | | | |
| Non-Hispanic White | 120 (44.1) | 53 (39.3) | 52 (39.1) | 64 (35.0) |
| Non-Hispanic Black | 5 (1.8) | 0 (0) | 1 (0.8) | 1 (0.5) |
| Hispanic | 69 (25.4) | 29 (21.5) | 49 (36.8) | 70 (38.3) |
| Asian or Pacific Islander | 25 (9.2) | 19 (14.1) | 11 (8.3) | 22 (12.0) |
| American Indian or Alaska Native | 1 (0.4) | 0 (0) | 0 (0) | 2 (1.1) |
| Other | 21 (7.7) | 19 (14.1) | 17 (12.8) | 23 (12.6) |
| Unknown / Declined to state | 31 (11.4) | 15 (11.1) | 3 (2.3) | 1 (0.5) |

# Table 1. Characteristics of the Historical, Pilot 4T, 4T Study 1, and 4T Study 2 Cohorts – Continued

| Characteristic | Historical | Pilot 4T | 4T Study 1 | 4T Study 2 |
|---|---|---|---|---|
| N | 272 | 135 | 133 | 183 |
| **Baseline characteristics** | | | | |
| DKA at diagnosis, n (%) | 94 (34.7) | 67 (49.6) | 72 (54.1) | 98 (53.6) |
| HbA1c (%) at diagnosis, mean (SD) | 10.9 (2.5) | 12.3 (2.1) | 12.2 (2.4) | 11.6 (2.6) |
| Insurance type, n (%) | | | | |
| Private | 197 (73.0) | 104 (77.0) | 83 (62.4) | 110 (60.1) |
| Public | 73 (27.0) | 31 (23.0) | 47 (35.3) | 73 (39.9) |
| Both | 0 (0) | 0 (0) | 2 (1.5) | 0 (0) |
| No Insurance | 0 (0) | 0 (0) | 1 (0.8) | 0 (0) |
| Primary language, n (%) | | | | |
| English | 245 (90.1) | 117 (86.7) | 112 (84.2) | 158 (86.3) |
| Non-English | 27 (9.9) | 18 (13.3) | 21 (15.8) | 25 (13.7) |

# Table 2
# Follow-up Characteristics

| | Historical | Pilot 4T | 4T Study 1 | 4T Study 2 |
|---|---|---|---|---|
| N | 272 | 135 | 133 | 183 |
| **Follow-up characteristics** | | | | |
| CGM initiation within 1 year, n (%) | 102 (37.5) | 132 (97.8) | 133 (100) | 182 (99.5) |
| Initiated CGM <= 30 days, n (%) | 6 (2.2) | 124 (91.9) | 131 (98.5) | 182 (99.5) |
| Days to CGM initiation, median (Q1, Q3) | 100 (50, 172) | 7 (5, 11) | 10 (6, 18) | 6 (4, 13) |
| CGM wear time* (%), median (Q1, Q3) | N/A | 90.7 (55.8, 96.0) | 96.4 (89.3, 97.9) | 96.8 (91.7, 98.4) |
| Insulin pump use within 1 year, n (%) | 89 (32.7) | 48 (35.6) | 66 (49.6) | 106 (57.9) |
| Predictive Low-Glucose Suspend | 2 (0.7) | 2 (1.5) | 2 (1.5) | 0 (0) |
| Open loop | 66 (24.3) | 30 (22.2) | 34 (25.6) | 5 (2.7) |
| Automated Insulin Delivery (AID) | 21 (7.7) | 17 (12.6) | 33 (24.8) | 105 (57.4) |
| None | 183 (67.0) | 87 (64.4) | 67 (50.4) | 77 (42.1) |
| Days to pump initiation, median (Q1, Q3) | 178 (111, 250) | 142 (91, 256) | 162 (86, 255) | 85 (61, 170) |

*Percentage of time CGM is worn out of eligible hours of device wear.

- For study 2 – 183 participants enrolled
- 122 participants ≥ 1 year in the study
- 50 participants in the study between 6-12 months
- 11 participants in the study between 3-6 months

**Data Collection Ongoing**

# Conclusions

- Standardized workflows created by the CDCES team and tailored to patient needs decreased the barriers to technology uptake, increased the use of CGM and AID, and shortened the initiation time in the year after T1D diagnosis.

# Acknowledgements: Teamwork, Targets, Technology and Tight Control in Newly Diagnosed Pediatric T1D: 4T Study

**Investigators:**

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  - *PI of exercise study*
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# ConnecT1D Data Visualization:

Informing Interventions and Equitable Improvement in Outcomes for Type 1 Diabetes (T1D) Patients

*Amanda Howell, MPH, CPH; Nana-Hawa Yayah Jones, MD; Patrick W. Brady, MD, MSc; Michelle I. Knopp, MD; Amy Grant, DNP, RN, CPN; Laura Smith, PhD, CDCES; Amanda Riley, MS, RD, LD, CDCES, Marissa Town, BSN, RN, CDCES; Sarah Corathers, MD*

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# Cincinnati Children's Diabetes Center

- **Academic Diabetes Center**
  - T1D registry 2300 patients
  - Average ~200 new onset/year

- **Our Team**
  - 19 Physicians, 9 APRNs
  - 19 CDCES - 7 RNs, 12 RDs
  - 6 Social Workers
  - 1 PhD, CDE Psychologist
    - Additional Psychologists from Behavioral Medicine & Psychology Dept
  - 1 Administrative Care Coordinator
  - 1 Clinical Quality Specialist
  - 2 Data Analysts
  - Community Health Workers/Community Psychiatric Support Team
  - Community partnerships
  - Patients & Families



- **Patient Population**
  - 85% White
  - 10% Black
  - 4% Hispanic
  - 1% Asian
  - 67% Private Insurance
  - 33% Public Insurance

BEST CHILDREN'S HOSPITALS
U.S. News & WORLD REPORT
DIABETES & ENDOCRINOLOGY
2024-2025

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# HealthVine │ OVERVIEW

Cincinnati Children's
changing the outcome together

## Mission & Vision

**HealthVine** is a network of pediatric care providers and organizations [backed by Cincinnati Children's] that connect to help children be healthier, more effectively and affordably. Through the power of collaboration, and using our combined expertise, we coordinate care and support services for families that enable children to thrive by living their healthiest lives.

## Patient Population

130,000+ CareSource-covered youth up to age 19 as well as young adults ages 19 to 21 in the Aged Blind and Disabled (ABD) program who reside in eight counties in Southwest Ohio including Adams, Brown, Butler, Clermont, Clinton, Hamilton, Highland and Warren.

## Delegated Services

HealthVine is assuming accountability for **care management**, **utilization management,** and **quality improvement**. Member services and programs through CareSource will not change.
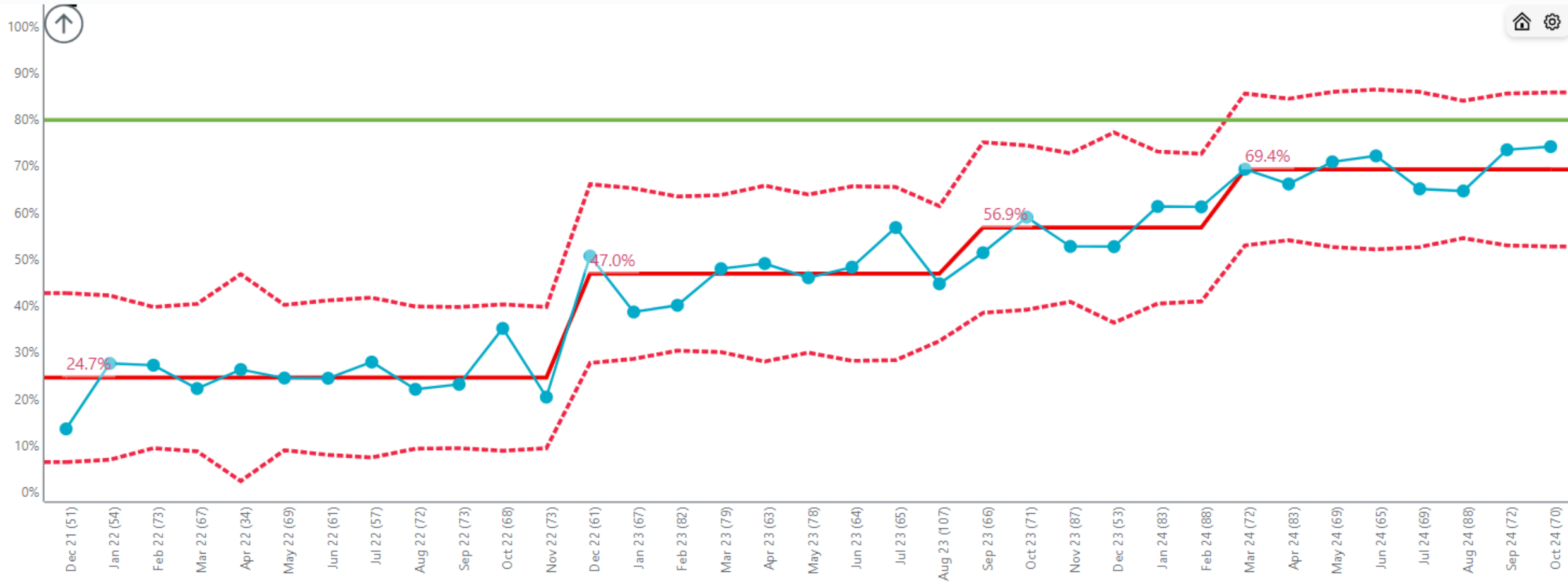
# Background/Objective

- ConnecT1D
  - Diabetes Clinic innovation project supported by the Helmsley Charitable Trust
  - Focusing on patients within the HealthVine population that have Type 1 Diabetes (<19 yrs)

- Data visualization
  - Dynamic
  - Near-real time
  - Equity focused

# Methods



Patients with Encounter During Reporting Month on Automated Insulin Delivery System: HealthVine

**Reporting Month**

| 1/1/2021 | 10/1/2024 |

Updated through
**October 2024**

| Status | Measure | HealthVine Goal | HealthVine Current Centerline | Non-HealthVine Current Centerline | T1D HealthVine with Encounter in Reporting Month* | Desired Direction | Details |
|--------|---------|-----------------|-------------------------------|-----------------------------------|--------------------------------------------------|-------------------|---------|
| ▲ | Patients with Consistent Clinic Visits (%) | 95% | 89% *Latest Reporting Month* | 90% *Latest Reporting Month* |  *Full Population | ↑ | → |
| ▲ | Percentage of Patients on CGM | 90% | 94% Shift up 3% | 97% |  | ↑ | → |
| ▲ | Percent of Patients on Automated Insulin Delivery System | 80% | 69% | 75% Shift up 5% |  | ↑ | → |
| ▲ | Average % Time in Range of Patients on CGM | TBD | 50% | 54% |  | ↑ | → |
| ▲ | Percentage of Patients on Insulin Pump | 75% | 63% | 75% |  | ↑ | → |
| ▲ | Patients with Psychology and/or Social Work Visit... | 80% | 77% | 58% |  | ↑ | → |
| ▼ | Mean Hemoglobin A1C | 8.2 | 8.8 | 7.9 |  | ↓ | → |

# ConnecT1D Time Series ⓘ

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**Reporting Month**

1/1/2021     10/1/2024

Updated through
**October 2024**

| Status | Measure | HealthVine Goal | HealthVine Current Centerline | Non-HealthVine Current Centerline | T1D HealthVine with Encounter in Reporting Month* | Desired Direction | Details |
|--------|---------|-----------------|-------------------------------|-----------------------------------|---------------------------------------------------|-------------------|---------|
| ▲ | Patients with Consistent Clinic Visits (%) | 95% | 89% *Latest Reporting Month* | 90% *Latest Reporting Month* | *Full Population* | ↑ | → |
| ▲ | Percentage of Patients on CGM | 90% | 94% Shift up 3% | 97% | | ↑ | → |
| ▲ | Percent of Patients on Automated Insulin Delivery System | 80% | 69% | 75% Shift up 5% | | ↑ | → |
| ▲ | Average % Time in Range of Patients on CGM | TBD | 50% | 54% | | ↑ | → |
| ▲ | Percentage of Patients on Insulin Pump | 75% | 63% | 75% | | ↑ | → |
| ▲ | Patients with Psychology and/or Social Work Visit... | 80% | 77% | 58% | | ↑ | → |
| ▼ | Mean Hemoglobin A1C | 8.2 | 8.8 | 7.9 | | ↓ | → |

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## Percent of Patients on Automated Insulin Delivery System

**Stratified by:**

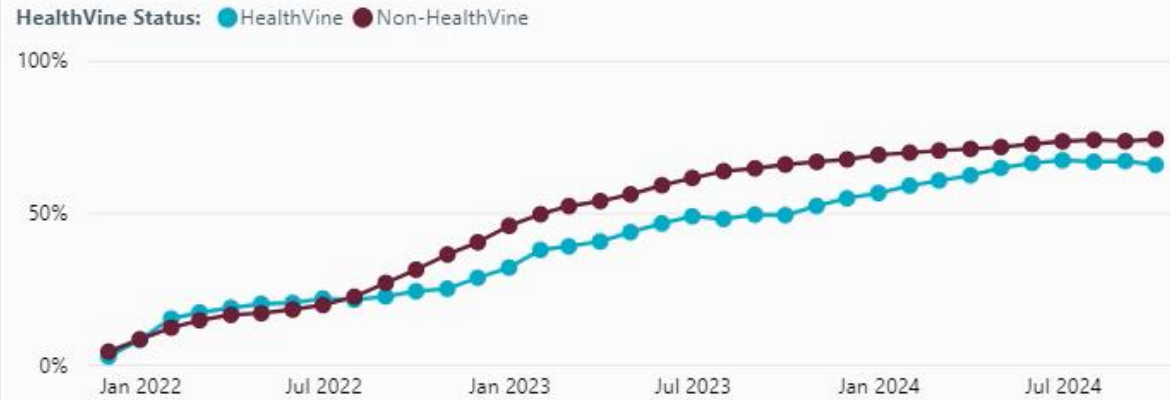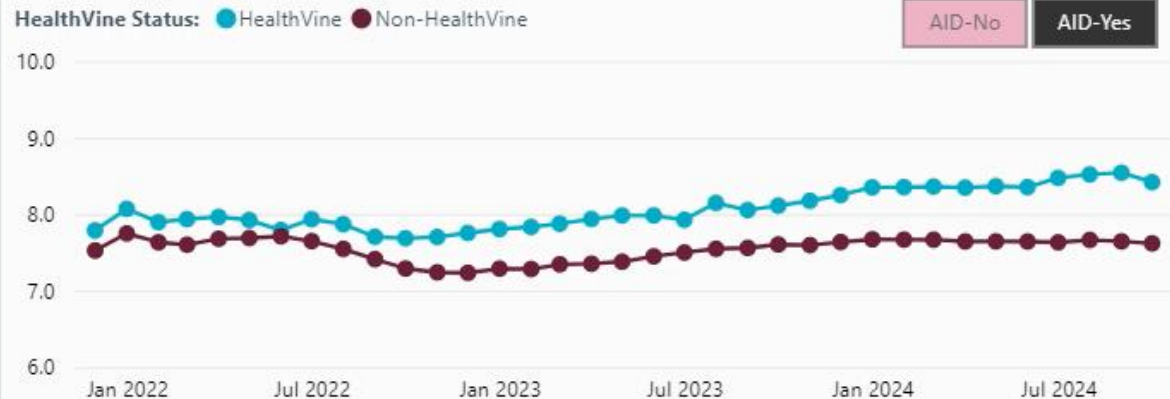| Age | Duration of Diabetes | Ethnicity/Race |

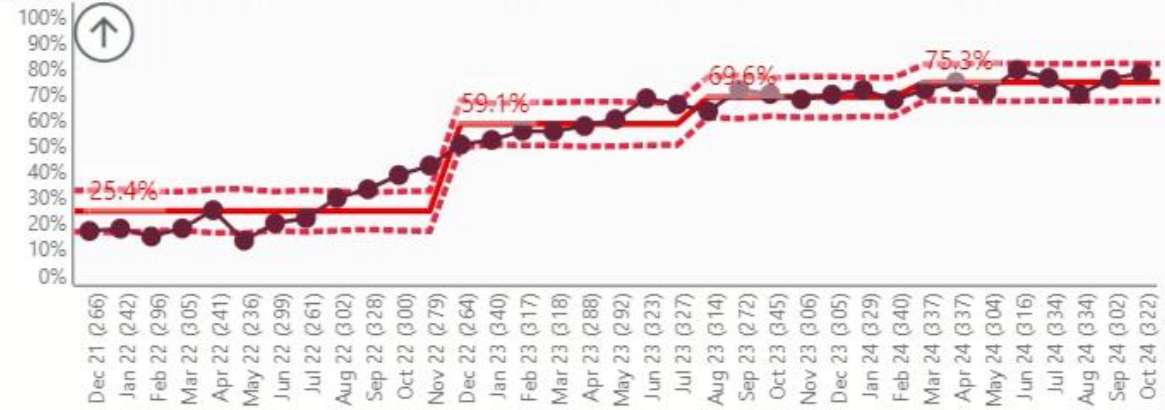**Reporting Month**
12/1/2021 — 10/1/2024

**Updated through**
## October 2024

### T1D Population Over Time: % Automated Insulin Delivery System

HealthVine Status: ● HealthVine ● Non-HealthVine



### T1D Population on Automated Insulin Delivery System Over Time: Average A1C

HealthVine Status: ● HealthVine ● Non-HealthVine

AID-No | AID-Yes



### Patients with Encounter During Reporting Month on Automated Insulin Delivery System: Non-HealthVine



59.1%
25.4%
69.6%
75.3%

### Patients with Encounter During Reporting Month on Automated Insulin Delivery System: HealthVine



47.0%
24.7%
56.9%
69.4%

Measure includes all patients in their respective populations, calculated with their last eligible encounter

Measure includes all patients with an **encounter during the reporting month**

# ConnecT1D Time Series ⓘ

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## Percent of Patients on Automated Insulin Delivery System

**Stratified by:**

| Age | Duration of Diabetes | Ethnicity/Race |

**Reporting Month**

| 1/1/2021 | 10/1/2024 |

Updated through
**October 2024**

| Ages (0-18) & All D... | Asian | Hispanic/Latino | Multi-racial | **Non-Hispanic Black** | **Non-Hispanic White** | Not Reported | Other |

### Percent of Patients on Automated Insulin Delivery System: HealthVine Patients
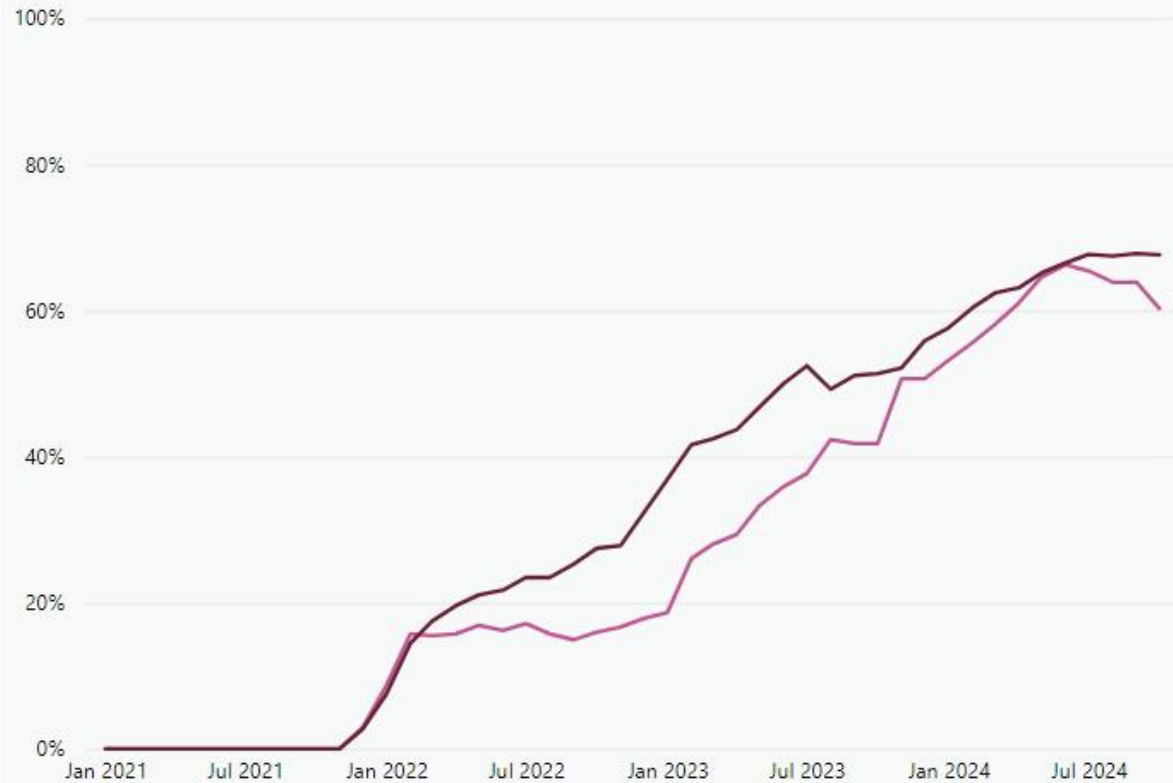
**Strata** ● Non-Hispanic Black ● Non-Hispanic White



### Percent of Patients on Automated Insulin Delivery System: Non-HealthVine Patients
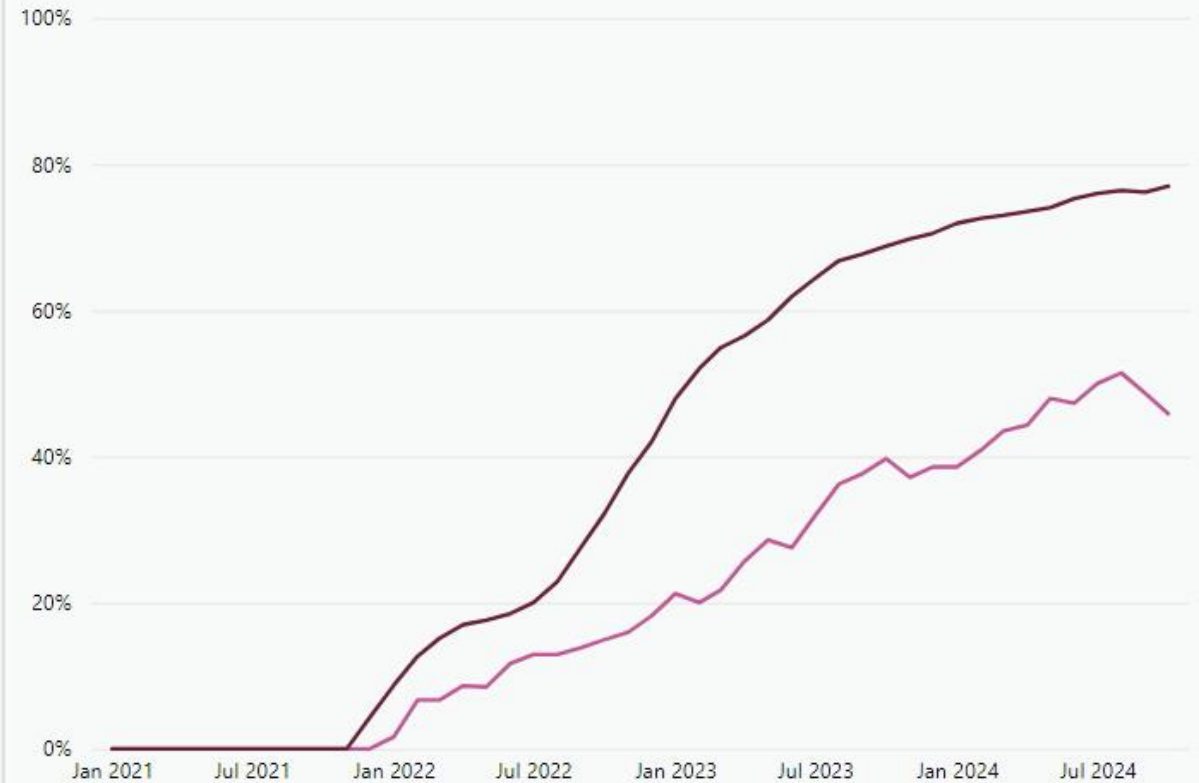
**Strata** ● Non-Hispanic Black ● Non-Hispanic White

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## Percent of Patients on Automated Insulin Delivery System

**Stratified by:**

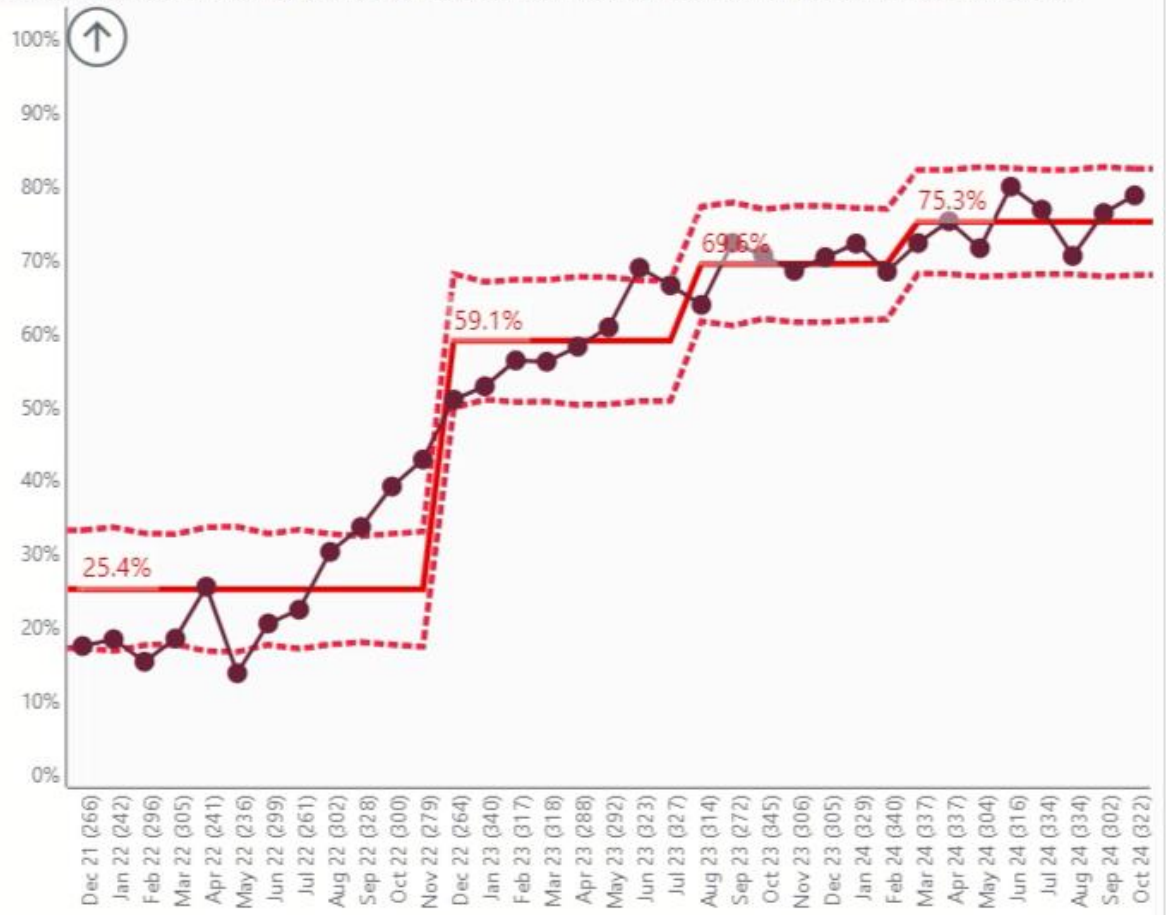| Age | Duration of Diabetes | Ethnicity/Race |

**Reporting Month**
12/1/2021    10/1/2024

**Updated through**
October 2024

### Patients with Encounter During Reporting Month on Automated Insulin Delivery System: Non-HealthVine



Key values shown: 25.4%, 59.1%, 69.6%, 75.3%

### Patients with Encounter During Reporting Month on Automated Insulin Delivery System: HealthVine



Key values shown: 24.7%, 47.0%, 56.9%, 69.4%

Measure includes all patients in their respective populations, calculated with their last eligible encounter

Measure includes all patients with an **encounter during the reporting month**

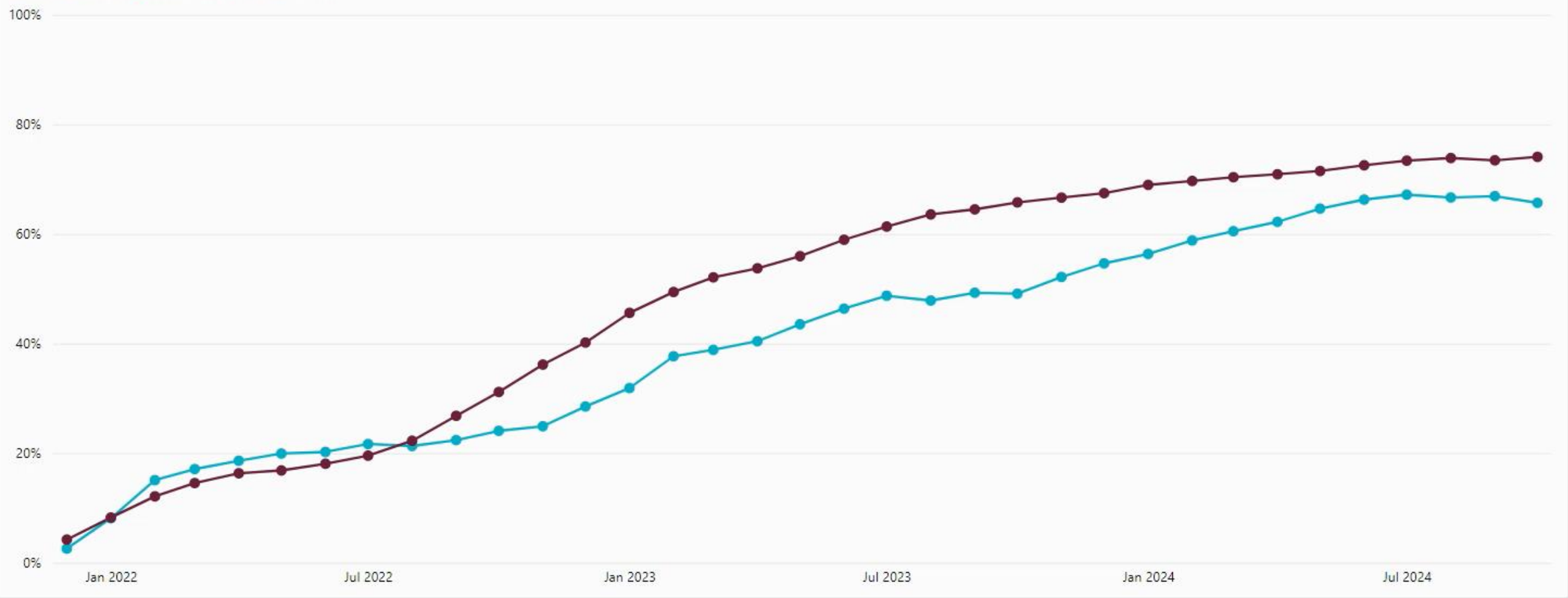## Percent of Patients on Automated Insulin Delivery System

Stratified by:

| Age | Duration of Diabetes | Ethnicity/Race |

**Reporting Month**
12/1/2021    10/1/2024

Updated through
**October 2024**

### T1D Population Over Time: % Automated Insulin Delivery System

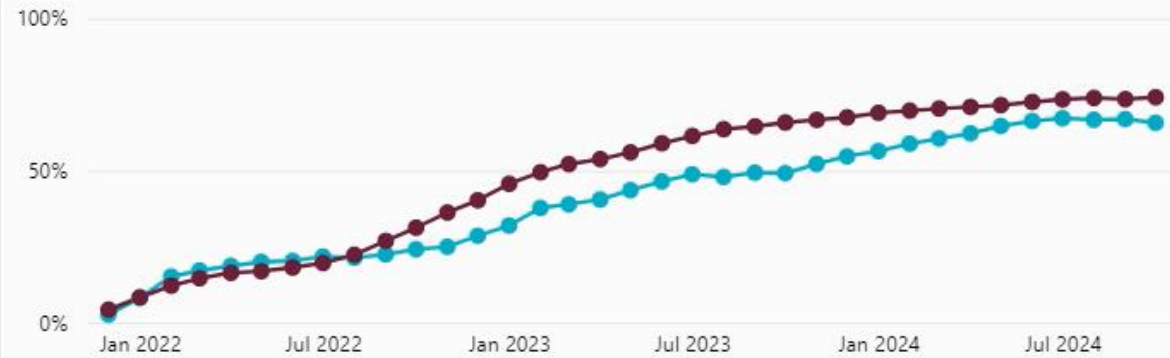**HealthVine Status:** ● HealthVine ● Non-HealthVine

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## Percent of Patients on Automated Insulin Delivery System

**Stratified by:**

| Age | Duration of Diabetes | Ethnicity/Race |

**Reporting Month**
1/1/2021    10/1/2024

**Updated through**
October 2024

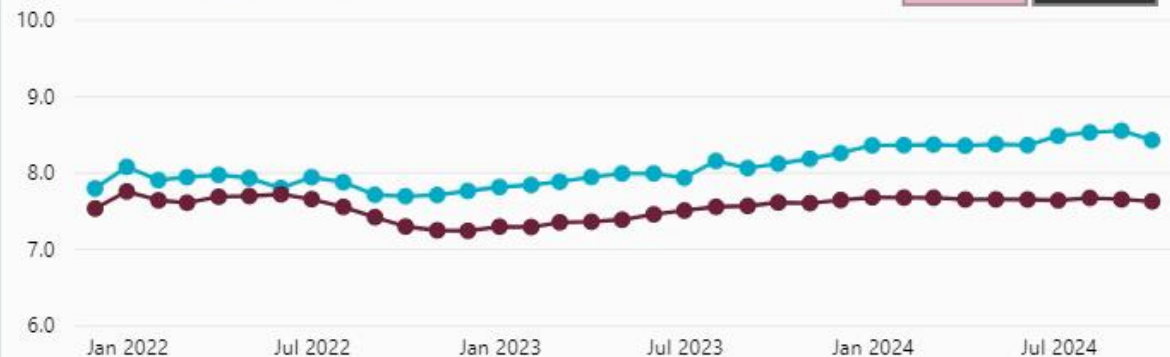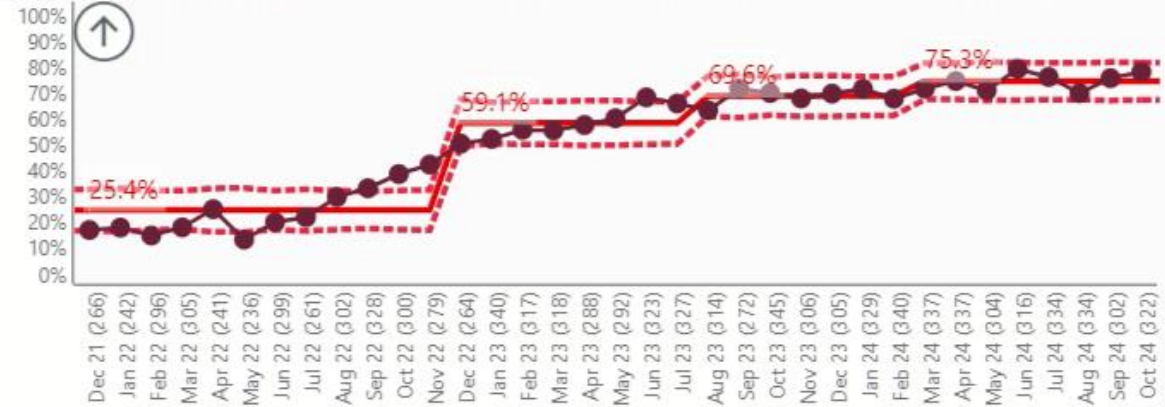### T1D Population on Automated Insulin Delivery System Over Time: Average A1C

**HealthVine Status:** ● HealthVine  ● Non-HealthVine

AID-No    AID-Yes

# ConnecT1D Time Series ⓘ

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## Percent of Patients on Automated Insulin Delivery System

**Stratified by:**

| Age | Duration of Diabetes | Ethnicity/Race |

**Reporting Month**

12/1/2021  10/1/2024

**Updated through**

## October 2024

### T1D Population Over Time: % Automated Insulin Delivery System

**HealthVine Status:** ● HealthVine  ● Non-HealthVine



### Patients with Encounter During Reporting Month on Automated Insulin Delivery System: Non-HealthVine



25.4% · 59.1% · 69.6% · 75.3%

### T1D Population on Automated Insulin Delivery System Over Time: Average A1C

**HealthVine Status:** ● HealthVine  ● Non-HealthVine

AID-No   AID-Yes



### Patients with Encounter During Reporting Month on Automated Insulin Delivery System: HealthVine
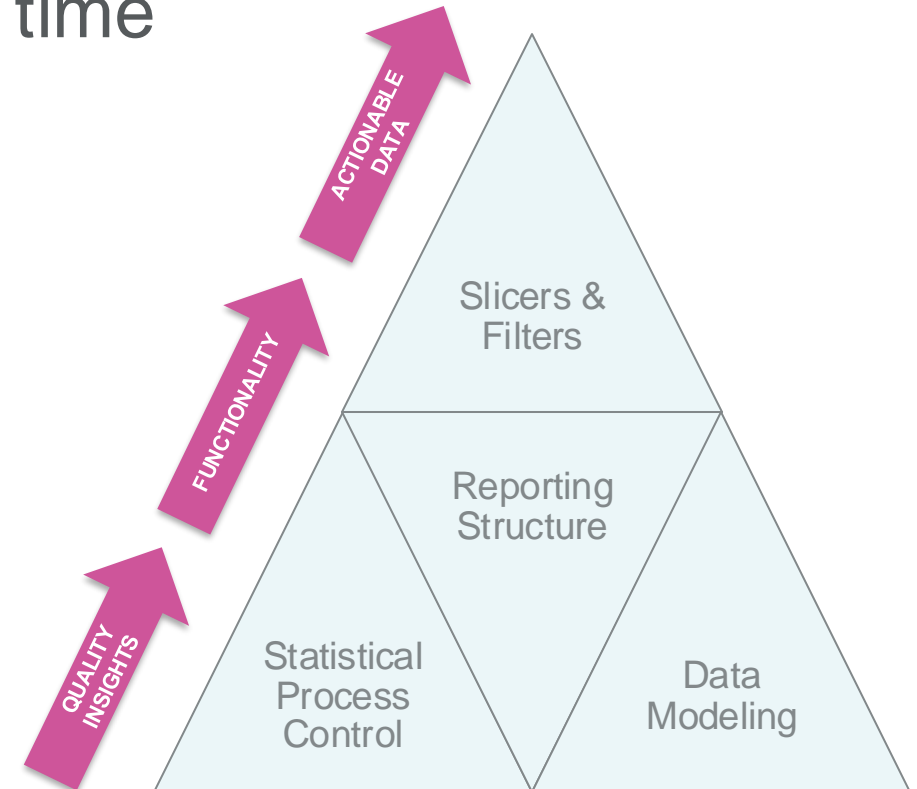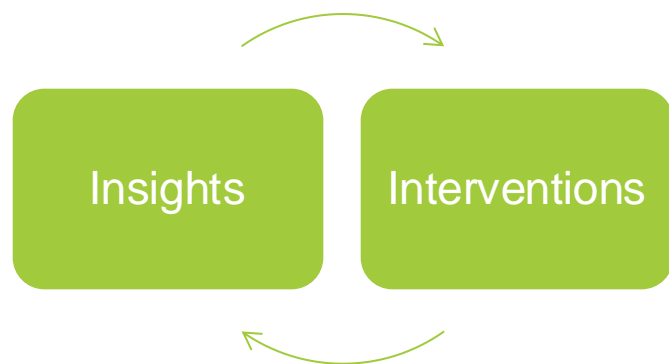


24.7% · 47.0% · 56.9% · 69.4%

Measure includes all patients in their respective populations, calculated with their last eligible encounter

Measure includes all patients with an **encounter during the reporting month**

# Conclusions

- Demonstrates population changes over time
  - Effective report building
- Stratification to monitor gaps & identify opportunities
- Continuous feedback loop

# Discussion / Questions?