T1D Exchange

T1DX-QI Combined Collaborative Call

4/18/24

Agenda

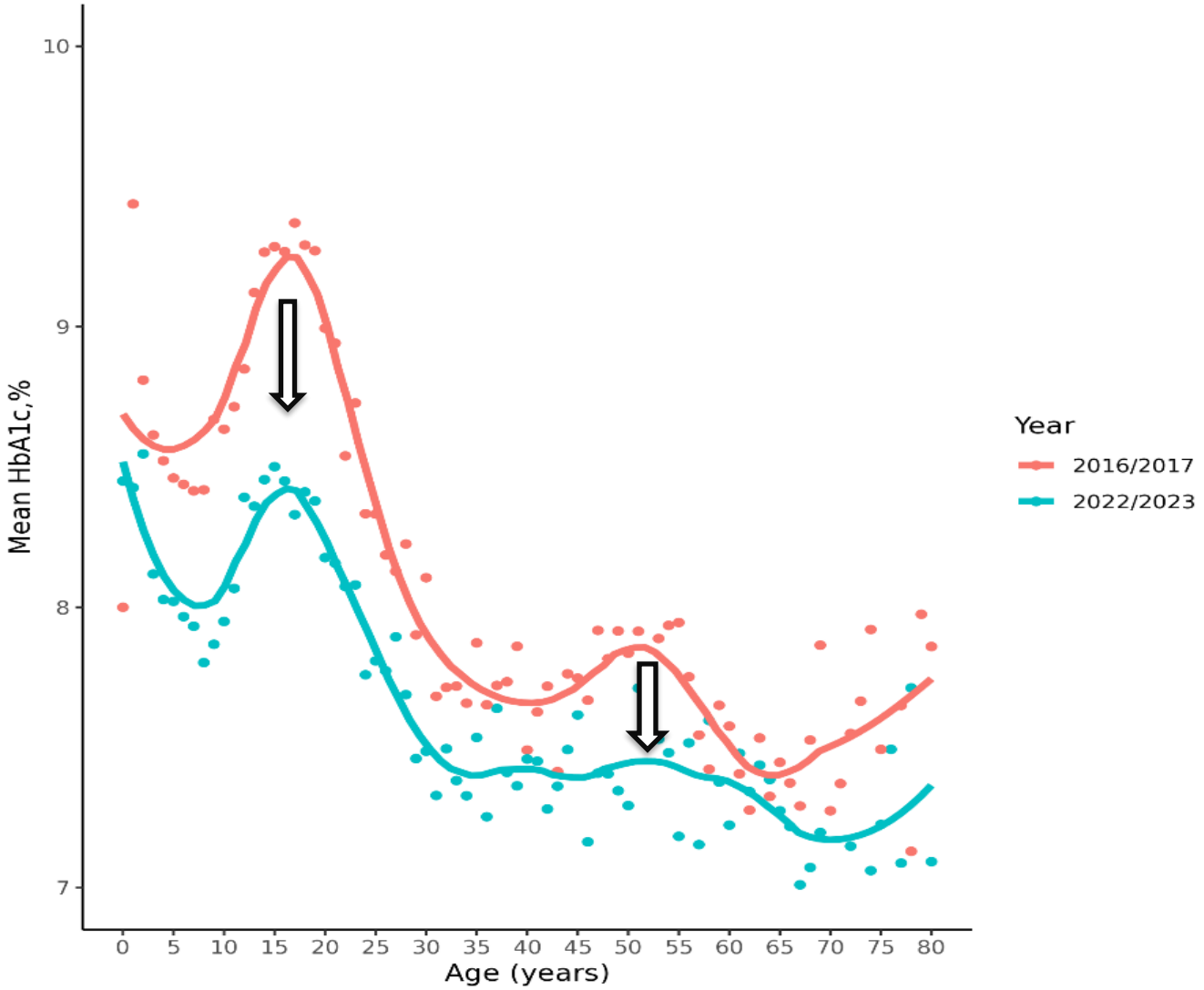
- Collaborative updates, Osagie Ebekozien, MD, MPH, CPHQ
  - oAdult Centers Network Performance, Ann Mungmode, MPH, CPHQ
  - oPediatric Centers Network Performance, Ori Odugbesan, MD, MPH, CPHQ
- Member presentations:
- Nestoras Mathioudakis, MD, MHS, Johns Hopkins Medicine
- Shivani Agarwal, MD, MPH, Montefiore
- Risa Wolf, MD, Johns Hopkins Medicine

T1DX-QI centers contributing EMR PwT1D Data (N=87,320)

	Total	<6 years	6-13 years	13-18 years	19-26 years	26-50 years	50-65 years	>65 years
	87320	2658	15222	31876	19272	11097	4450	2619
Male	44712 (51)	1406 (53)	7603 (50)	16923 (53)	10000 (52)	5332 (48)	2140 (48)	1239 (47)
Race/Ethnicity								
Non-Hispanic White	53763 (62)	1597 (60)	9012 (59)	19296 (61)	12442 (65)	6678 (60)	2765 (62)	1867 (71)
Non-Hispanic Black	11510 (13)	319 (12)	2074 (14)	4569 (14)	2229 (12)	1414 (13)	627 (14)	270 (10)
Hispanic	10770 (12)	290 (11)	1802 (12)	3955 (12)	2249 (12)	1576 (14)	644 (14)	246 (9)
Asian	1755 (2)	77 (3)	390 (3)	653 (2)	355 (2)	169 (2)	50 (1)	61 (2)
Other	9522 (11)	375 (14)	1944 (13)	3403 (11)	1997 (10)	1260 (11)	364 (8)	175 (7)
Private Insurance	42959 (49)	1256 (47)	7186 (47)	15834 (50)	10497 (54)	5738 (52)	2087 (47)	276 (11)

[a] Missing data; column totals may not add up to 100%; [b] Device information available on a subset of the population

Meaningful and Significant Improvement HbA1c Improvement for T1DX-QI Cohort 2016/2017 vs 2022/2023



Ebekozien O. Improving Outcomes for people with diabetes through collaboration. Endo Clinics 2023
Ebekozien O. Longitudinal Trends in Glycemic Outcomes and Technology Use for Over 48,000 People with Type 1 diabetes (2016-2022) from the T1D Exchange Quality Improvement Collaborative. Diabetes Technology and Therapeutics 2023

Upcoming Conferences

8th Annual T1D Exchange Learning Session 2024
November 11, 2024
Chicago, IL

2024 ADEPT CONFERENCE
ACHIEVING DIABETES EQUITY IN PRACTICE TODAY
American Diabetes Association. + T1D Exchange

Achieving Diabetes Equity in Practice Today
November 12-13, 2024
Chicago, IL

QI Adult Centers Network Performance

Quarterly Collaborative Call
4/18/24

Core QI Measures – Adult centers

Jan – Dec 2023

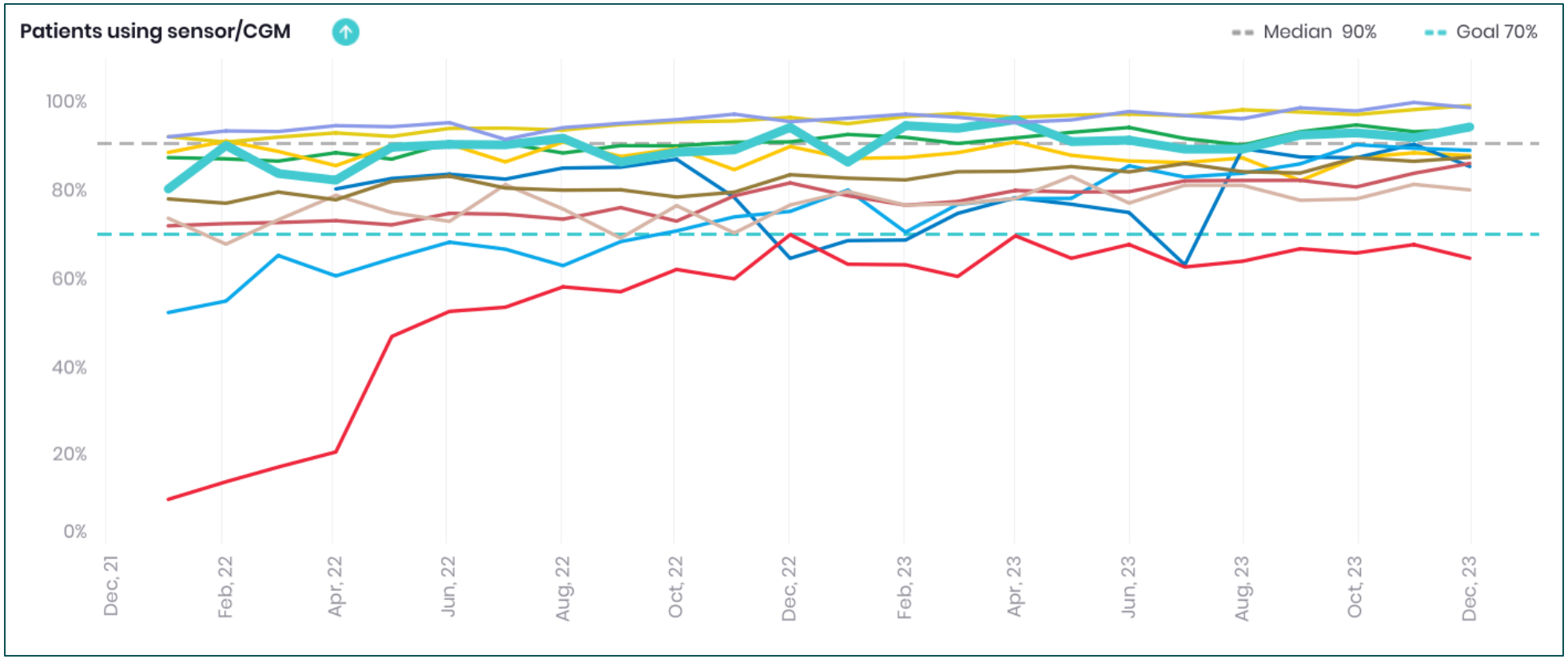
Measures reported as of April 2024	Measure	# of adult centers reporting	# of adult centers presented (no QA)
Outcome Measures	HbA1c < 8%	**12** (75%)	**10** (63%)
	Median A1c	**13** (81%)	**11** (69%)
	Time in Range > 50%	**2** (13%)	**1** (6%)
Process Measures	CGM use	**13** (81%)	**7** (44%)
	Insulin Delivery System use	**11** (69%)	**9** (56%)
	Depression screening	**7** (44%)	**3** (19%)
	Social Determinants of Health screening	**4** (25%)	**3** (19%)
	DKA events	**9** (56%)	**6** (38%)
	Severe Hypo events	**8** (50%)	**4** (25%)

Adult Centers are meeting and/or have seen improvement in 67% of reported measures

Adult Centers Improvement Scorecard April 2024 (data from Jan - Dec 2023)								
Metric	**A1c < 8%**	**CGM use**	**Insulin Delivery Sys use**	**TIR > 50%**	**Dep Scrn**	**SDOH**	**DKA Events**	**Severe Hypo Events**
T1DX-QI Goal	Greater than 50%	Greater than 70%	Greater than 65%	Greater than 50%	Greater than 80%	Greater than 10%	Less than 6.3%	Less than 6.3%
T1DX-QI Rank	**64.9%**	**75.6% [+5.1%]**	**46.4% [+7.2%]**	**60% [+13%]**	**13.1% [+4.8%]**	**50.9% [-4.4%]**	**4.7%**	**3.1%**
1	Center #39 - 80%	Center #22 - 86%	Center #1 - 74% [+4%]	Center #3 - 61%	Center #40 - 81%	Center #40 - 54% [-21%]	Center #21 - 0.5%	Center #30 - 0.1%
2	Center #1 - 80%	Center #1 - 82%	Center #22 - 68%		Center #14 - 18%	Center #3 - 38%	Center #30 - 2.0%	Center #1 - 2.4%
3	Center #22 - 80%	Center #3 - 81%	Center #30 - 47%		Center #30 - 1%	Center #14 - 11% [-24%]	Center #40 - 2.6%	Center #59 - 6.7% [+2.9%]
4	Center #30 - 76%	Center #57 - 72%	Center #40 - 37%				Center #1 - 3.6%	Center #14 - 17.4%
5	Center #50 - 72%	Center #39 - 71%	Center #3 - 35%				Center #59 - 5.9%	
6	Center #59 - 69%	Center #40 - 65% [+15%]	Center #21 - 22% [+7%]				Center #14 - 20.1%	
7	Center #40 - 55%	Center #59 - 64%	Center #59 - 19% [+5%]					
8	Center #3 - 55%	Center #21 - 62%						
9	Center #21 - 54%	Center #14 - 58%						
10	Center #14 - 13% [-13%]							

Legend	Favorable Change and/or Above T1DX-QI Goal	Unfavorable/No Change and/or Below T1DX-QI Goal

QI Portal Benchmarking



Benchmarking on the QI Portal Compare tab is **available to everyone, right now!**

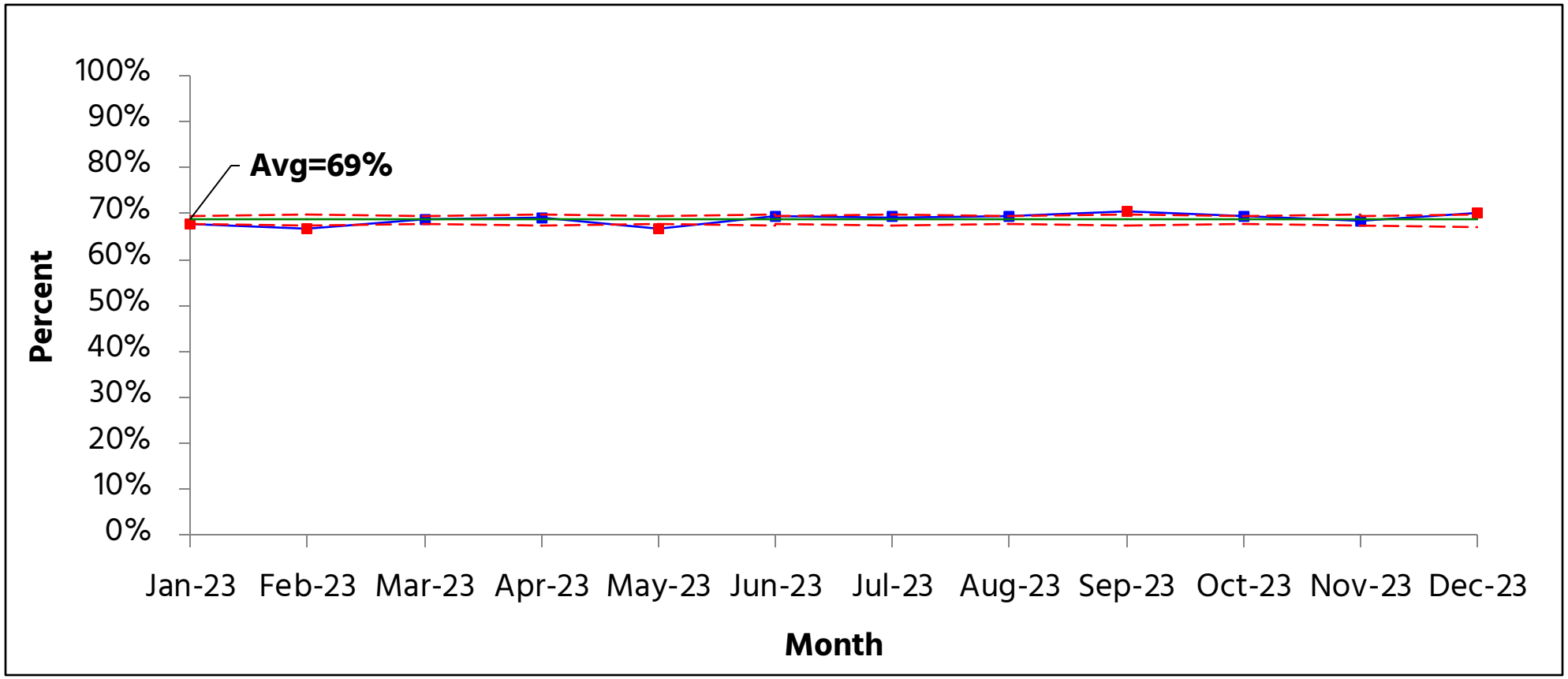
OTHER FEATURES AVAILABLE TO ALL TODAY:

Documenting QI projects and PDSA cycles on Improve tab

Referencing T1DX-QI resources, QI tools, guides, and change packages on Library tab

T1D Exchange

HbA1c <8% is stable at 69%



Lahey-P chart favorable direction

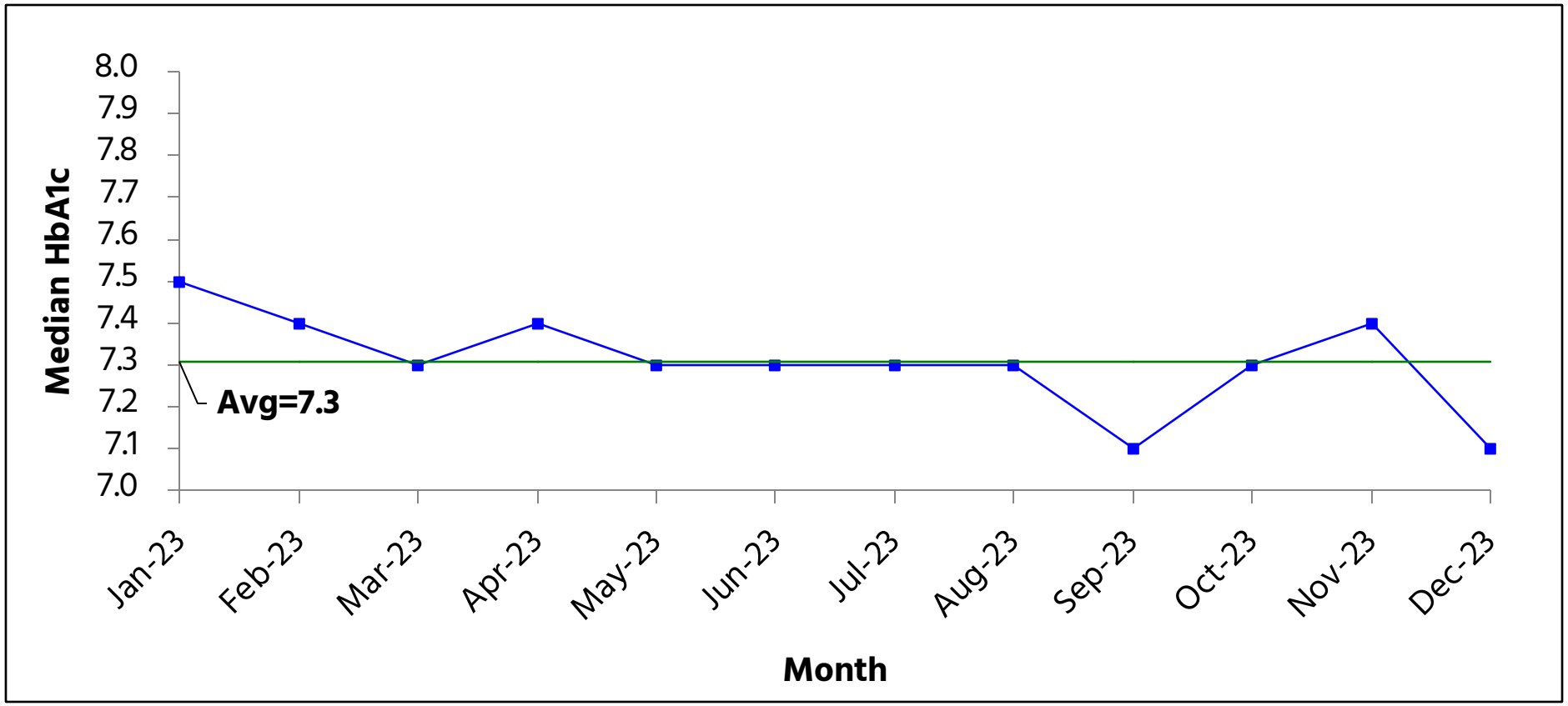
High performing centers:

1. Stanford/BDC/ Mt. Sinai (80%)

2. Northwestern (76%)

	2023											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
T1D Population	2361	2184	2316	2049	2151	2066	1886	2136	1715	1814	1688	1571
A1c < 8%	1596	1460	1593	1414	1435	1433	1307	1481	1211	1257	1154	1102

Median HbA1c is stable at 7.3%



Run chart favorable direction

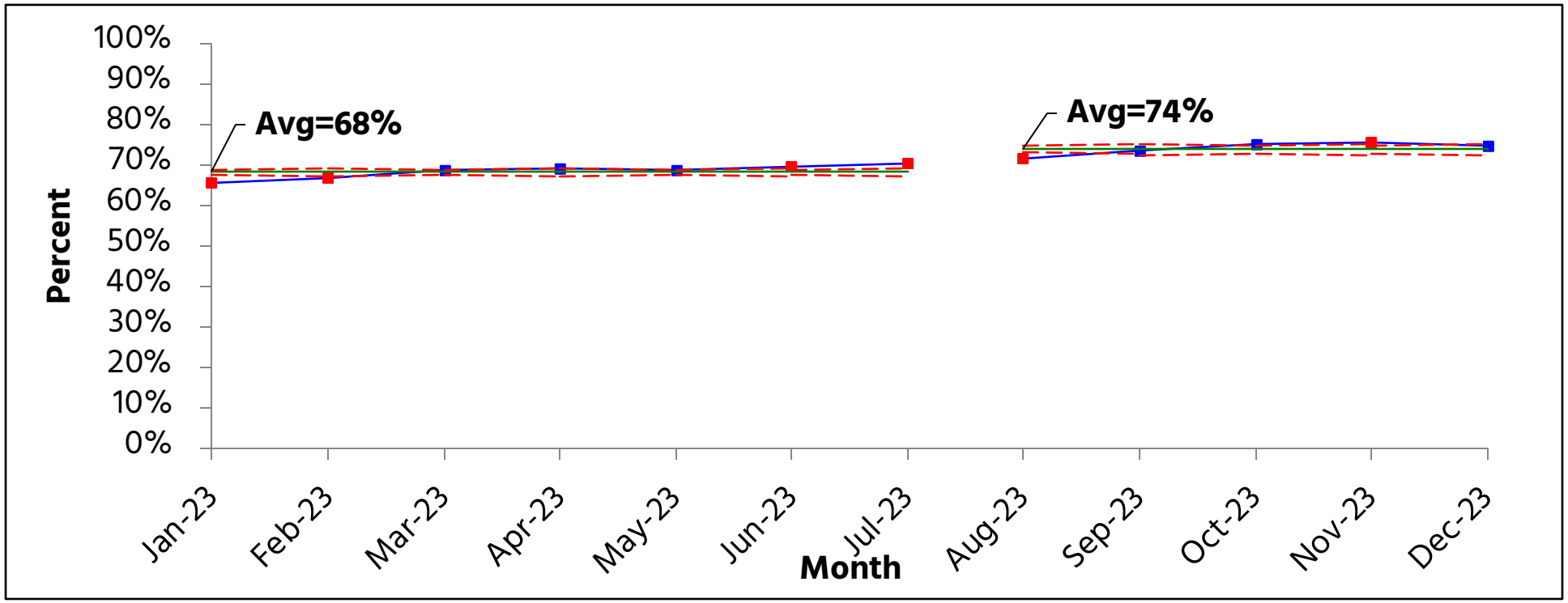
High Performing Centers

(1) BDC/Stanford/Mt. Sinai, 6.9%;

(2) UMiami, 7.1%

	2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Median HbA1c	7.5	7.4	7.3	7.4	7.3	7.3	7.3	7.3	7.1	7.3	7.4	7.1

CGM use increased by 6%



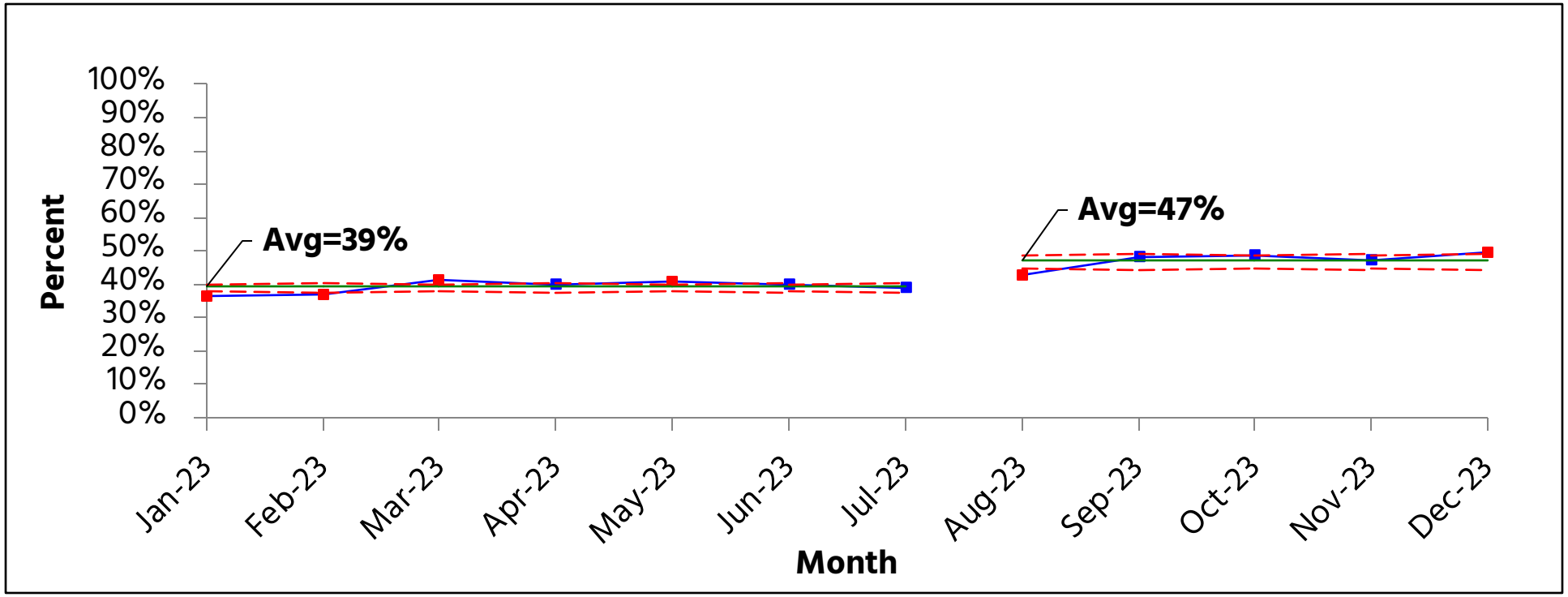
Lahey-P chart favorable direction

High performing centers

(1) Mt. Sinai – 86%
(2) BDC – 82%
(3) BMC – 81%

	2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
T1D Population	2274	2074	2200	1947	2017	1944	1802	2017	1599	1680	1593	1528
CGM use	1490	1386	1510	1342	1384	1351	1267	1444	1174	1261	1204	1141

Insulin Delivery System Use increased by 6%



Lahey-P chart favorable direction

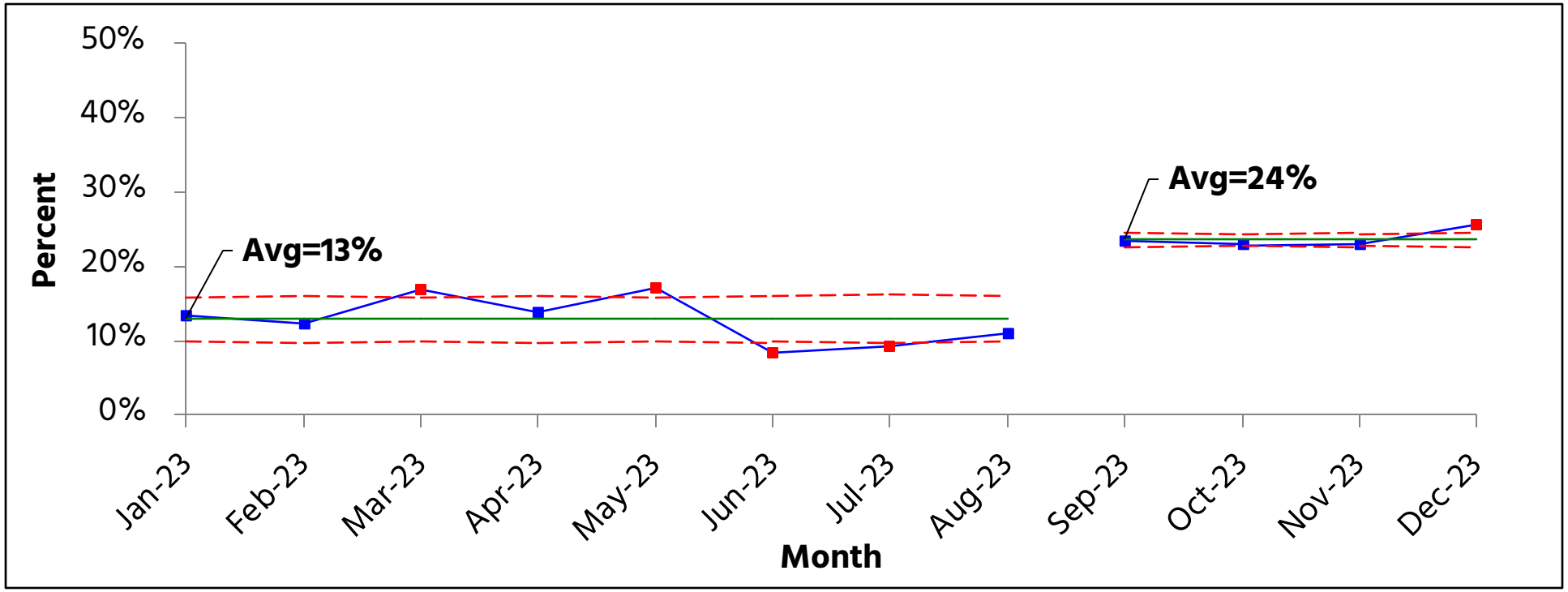
High performing centers:

(1) BDC 74%

(2) Mt. Sinai 68%

	2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
T1D Population	2007	1842	1908	1676	1775	1750	1586	1818	1439	1514	1446	1338
IDS use	733	679	788	669	722	702	621	780	691	734	679	664

Depression screening has improved by 11%



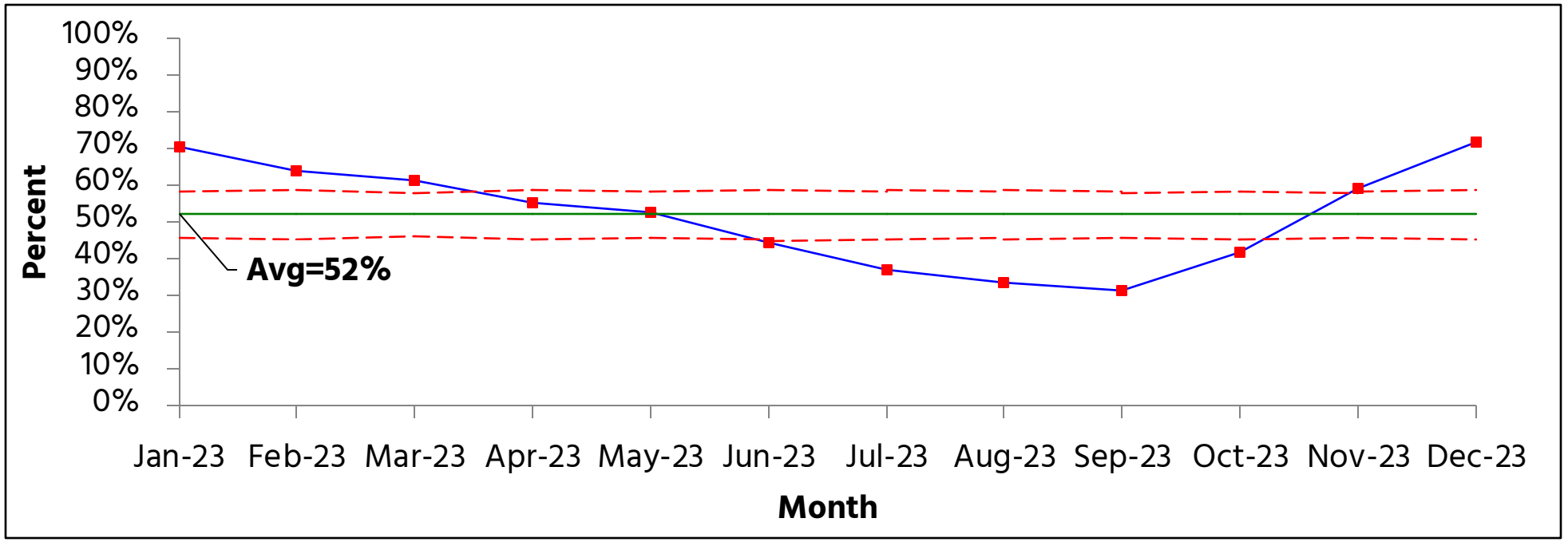
Lahey-P chart favorable direction

High performing center:

(1) SUNY 81%

	2023											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
Patients eligible for screening	626	592	637	562	582	566	504	589	346	362	326	321
Eligible patients who were screened	84	73	108	78	100	47	47	65	81	83	75	82

SDOH screening fell in the late summer but has since returned to earlier levels



Lahey-P chart favorable direction

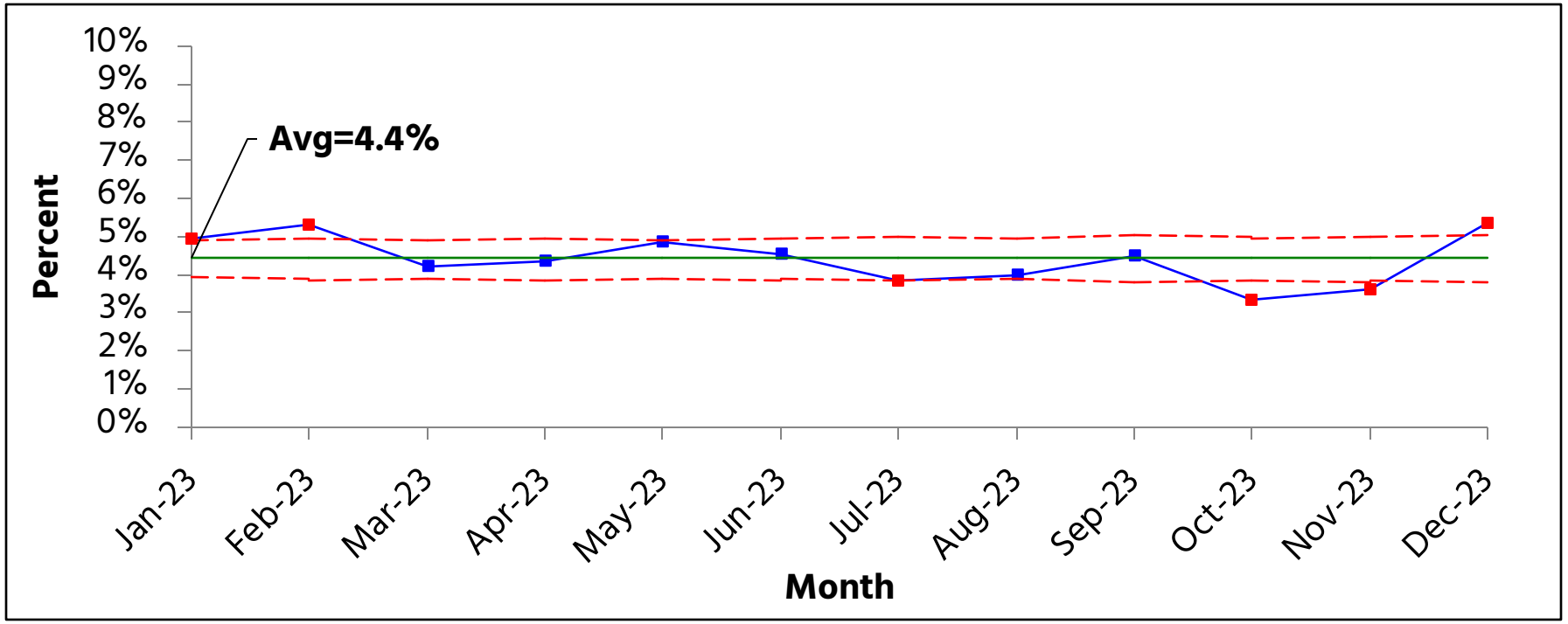
High performing centers:

(1) SUNY, 54%

(2) BMC, 38%

	2023											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
T1D Population	444	389	513	424	489	393	418	434	449	448	450	432
Patients screened for SDOH	313	249	314	234	258	175	155	145	140	187	267	311

DKA hospitalizations remains steady at 4.4%



Lahey-P chart favorable direction

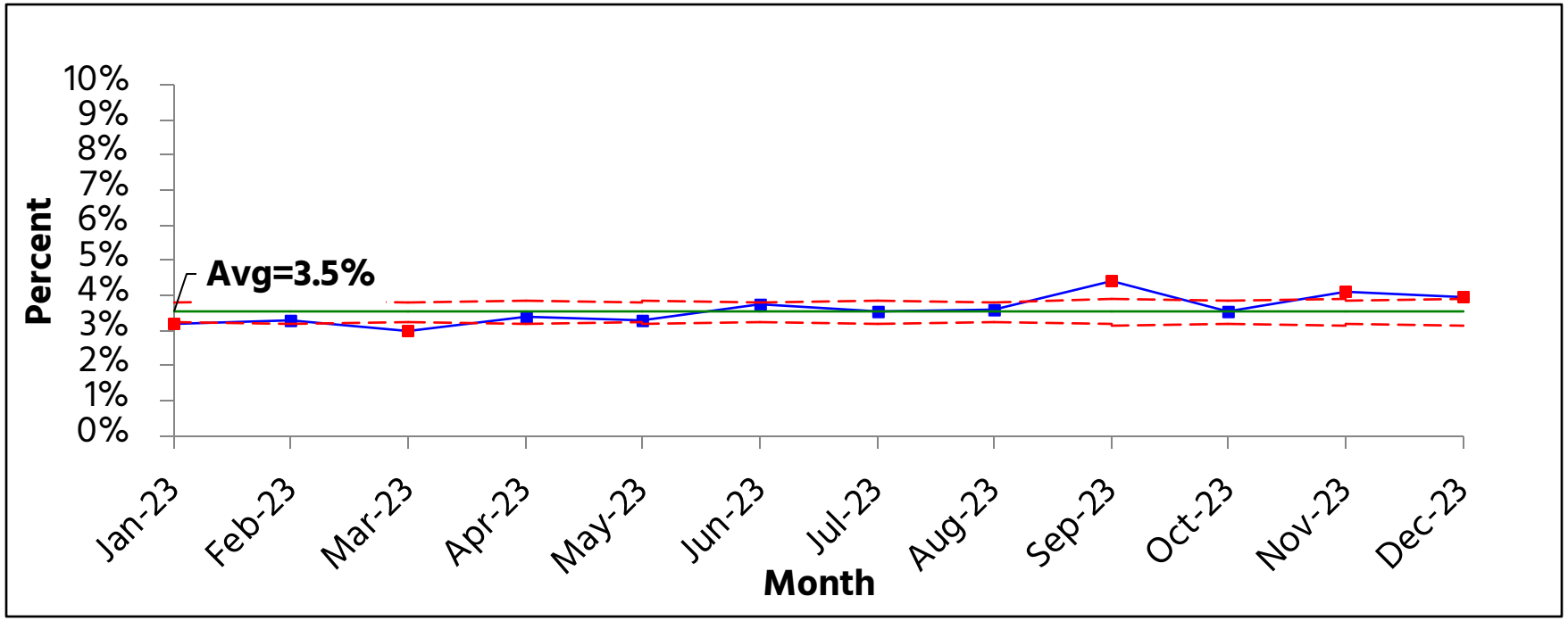
High performing centers:

(1) Montefiore, 0.5%

(2) Northwestern, 2.0%

	2023											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
T1D Population	1820	1700	1741	1563	1629	1591	1437	1700	1252	1313	1270	1171
DKA Hospitalizations	90	90	73	68	79	72	55	68	56	44	46	63

Severe hypo events remains stable at 3.5%



Lahey-P chart favorable direction

High performing centers:

(1) Northwestern – 0.1%

(2) BDC – 2.4%

	2023											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
T1D Population	1325	1241	1437	1308	1352	1351	1220	1424	1004	1053	1016	964
SHE	38	36	39	40	39	48	37	45	36	31	34	30

T1D Exchange

QI Collaborative Pediatric Centers Dashboard Review

April 2024

61% of Centers Meeting T1DX-QI Goals

Pediatric Clinics Improvement Scorecard May 2024 [Data from January 2023-December 2023]							
Metric	A1c <7%	CGM Use	Insulin Delivery System	TIR >70%	DKA Events	Documented Transition	SDOH Screening
T1DX-Q	>25%	>70%	>65%	>25%	<6.3%	>10%	>50%
T1DX- QI	26%	85%	53%	19%	5.30%	20%	84%
1	Center #32 [44%]	Center #36 [95%]	Center #32 [85%]	Center #32 [34%]	Center #32 [0.6%]	Center #6 [21%]	Center #6 [88%]
2	Center #38 [38%]	Center #26 [94%]	Center #20 [77%]	Center #38 [22%]	Center #56 [1%]	Center #60 [17%]	Center # 32 [86%]
3	Center #36 [31%]	Center #32[94%]	Center #6 [76%]	Center #2 [20%]	Center #33 [1.4%]	Center #32 [14%]	Center #60 [14%]
4	Center #33 [31%]	Center #38 [93%]	Center #38 [74%]	Center #60 [19%]	Center #4 [2%]		
5	Center #60 [31%]	Center #4 [92%]	Center #13 [73%]	Center #6 [18%]	Center #20 [4.2%]		
5	Center #20 [29%]	Center #2 [92%]	Center #33 [63%]	Center #20 [16%]	Center #5 [5%]		
7	Center #5 [27%]	Center #20 [91%]	Center #36 [60%]	Center #56 [15%]	Center #60 [5.5%]		
8	Center #26 [26%]	Center #37 [88%]	Center #48 [59%]	Center #7 [12%]	Center #2 [6%]		
9	Center #1 [26%]	Center #6 [86%]	Center #37 [57%]		Center #38 [6%]		
10	Center #7 [25%]	Center #13 [85%]	Center #56 [55%]		Center #13 6%		
12	Center #23 [25%]	Center #60 [84%]	Center #20 [55%]		Center #36 [6%]		
13	Center #42 [24%]	Center #48 [82%]	Center #7 [51%]		Center #26 [7%]		
14	Center #56 [23%]	Center #56 [79%]	Center #42 [48%]		Center #42 [8%]		
15	Center #48 [22%]	Center #42 [77%]	Center #26 [45%]		Center #6 [8%]		
16	Center #37 [22%]	Center #23 [70%]	Center #4 [43%]				
17	Center #6 [21%]	Center #5 [64%]	Center #2[43%]				
18	Center #13 20%]	Center #33 [55%]	Center #23 [25%]				
19	Center #4 [19%]						
20	Center #12 [17%]						
Legend	Meeting T1DX QI Goals	Below T1DX-QI Goals					

Core QI – Pediatrics Centers

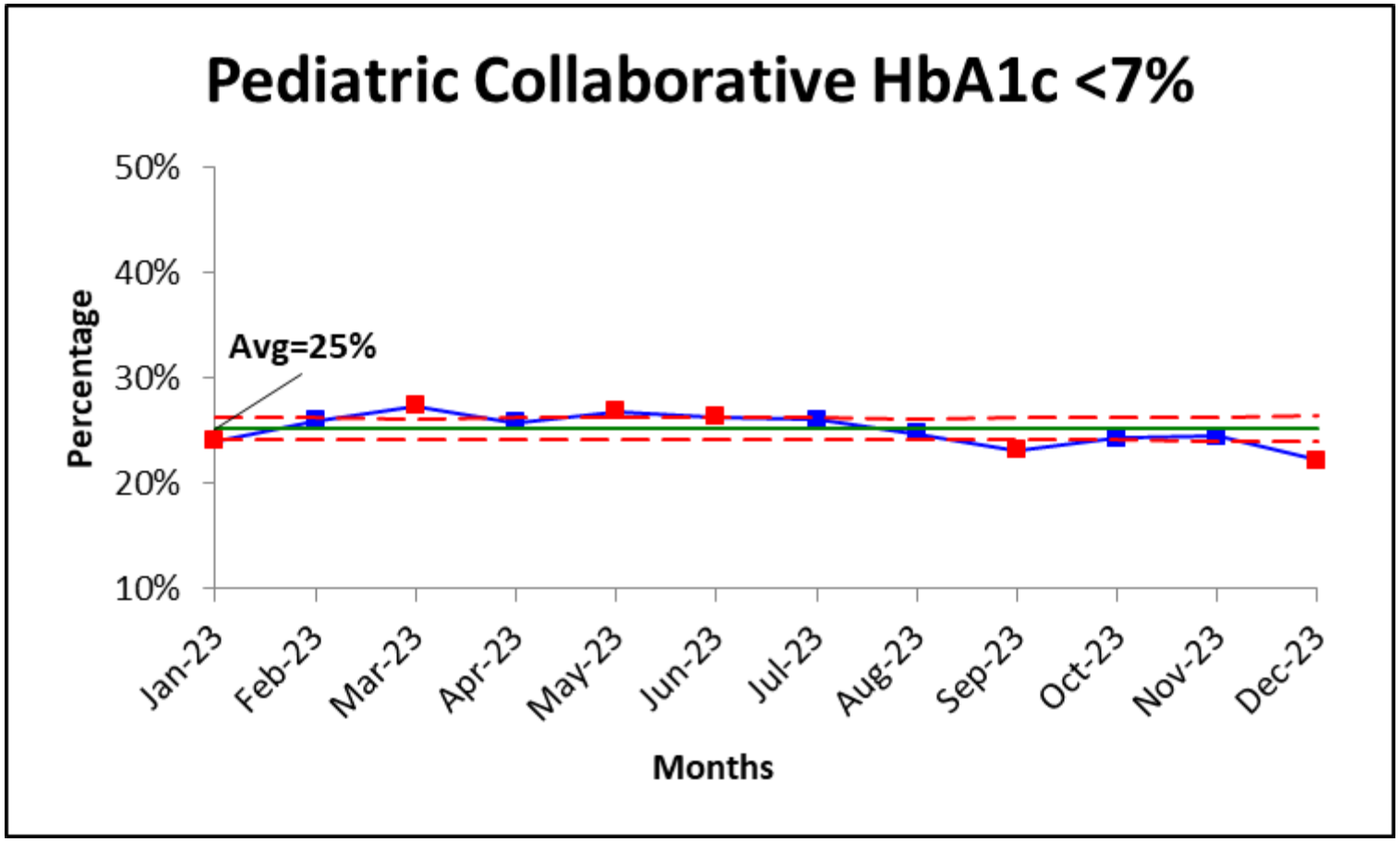
January 2023 – December 2023

Measures reported as of April 2024	Measure	# of Pediatrics Centers reporting
Outcome Measures	HbA1c >7%	**22 Centers**
	Median HbA1c	**22 Centers**
Process Measures	CGM use	**21 Centers**
	Insulin Delivery system	**21 Centers**
	DKA events	**17 Centers**
Other Measures	Time in Range	**9 Centers**
	Documented Transition	**3 Centers**
	Social Determinants of Health screening	**3 Centers**

T1D Exchange

HbA1c < 7% Stable at 25%

Data from 22 centers

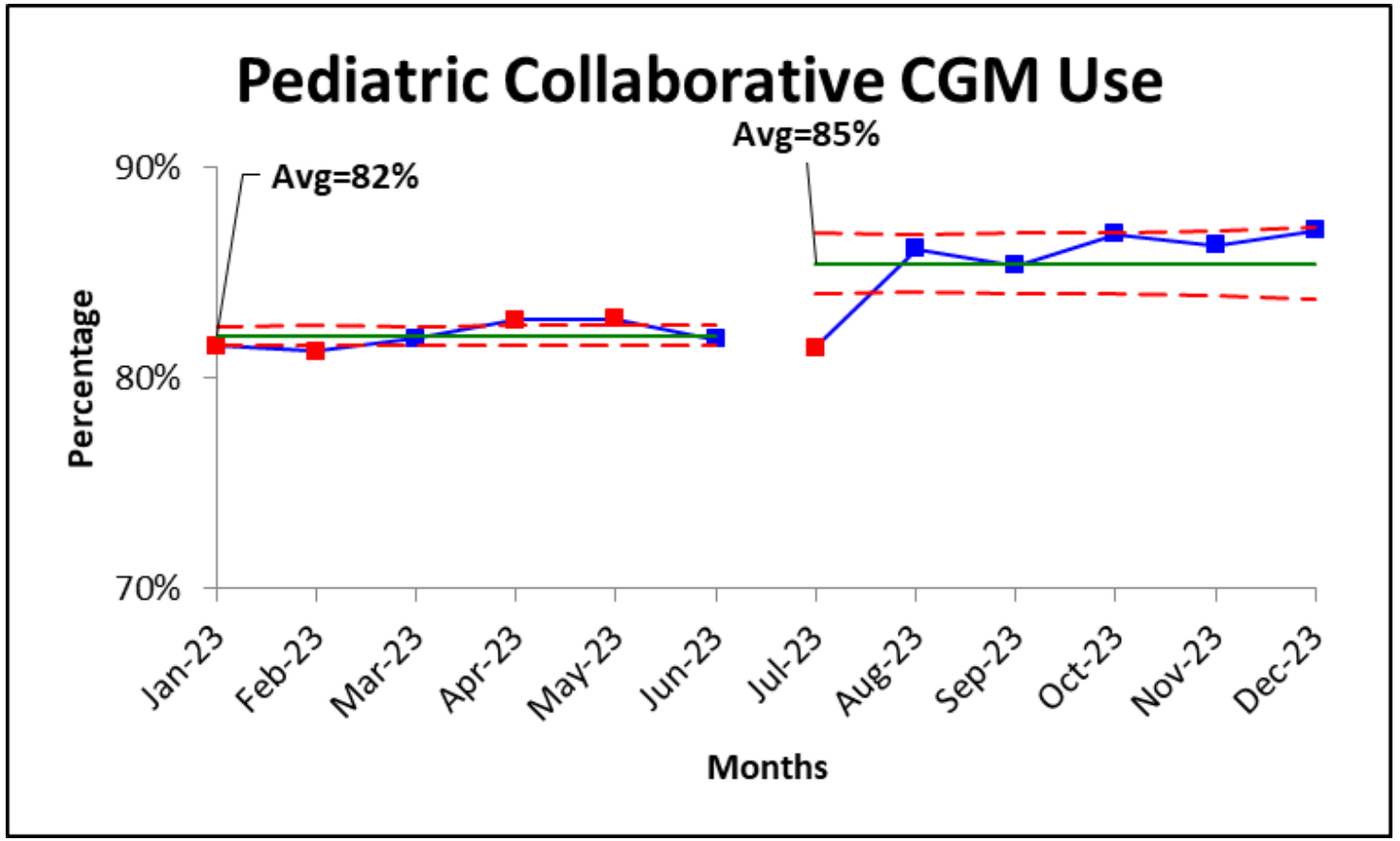


- **High performing Centers**
  1. Hassenfeld (44%)
  2. Lurie (29%)

Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
6571	5979	6899	6137	6189	5813	5733	6611	5686	5899	5573	4591
1579	1551	1888	1582	1662	1529	1493	1633	1319	1433	1362	1018

Collaborative CGM Use Increased by 3%

Data from 21 centers



Run chart favorable direction

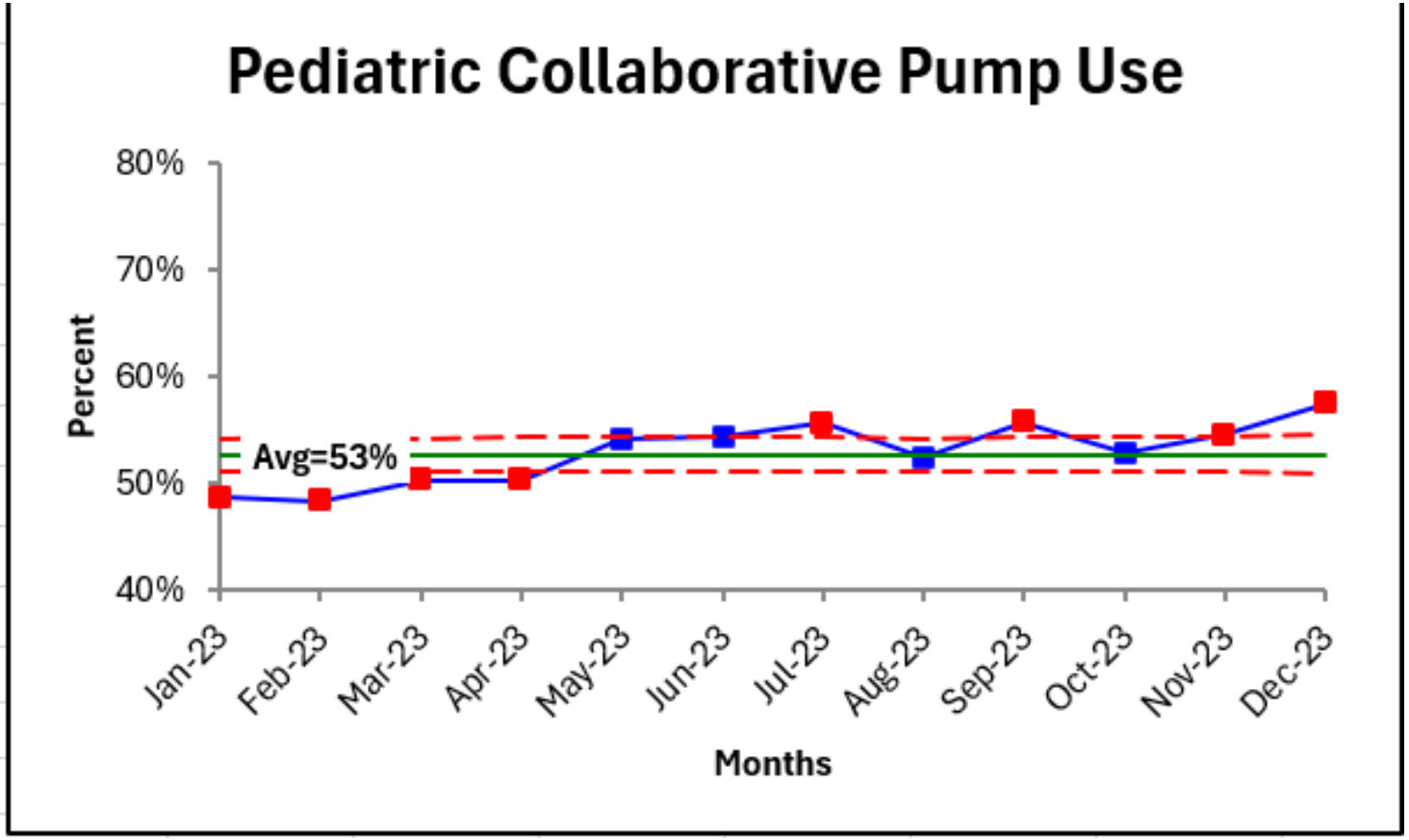
- **High Performing Centers**

1. Rady Children's 95%
2. Hassenfeld 94%
3. Nationwide 94%

Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
6451	5856	6760	6017	6054	5680	*5605*	6474	5554	5767	4958	4189
5261	4761	5535	4980	5013	4649	4566	5577	4740	5008	4281	3646

Collaborative Pump Use Stable at 53%

Data from 21 centers



Run chart favorable direction

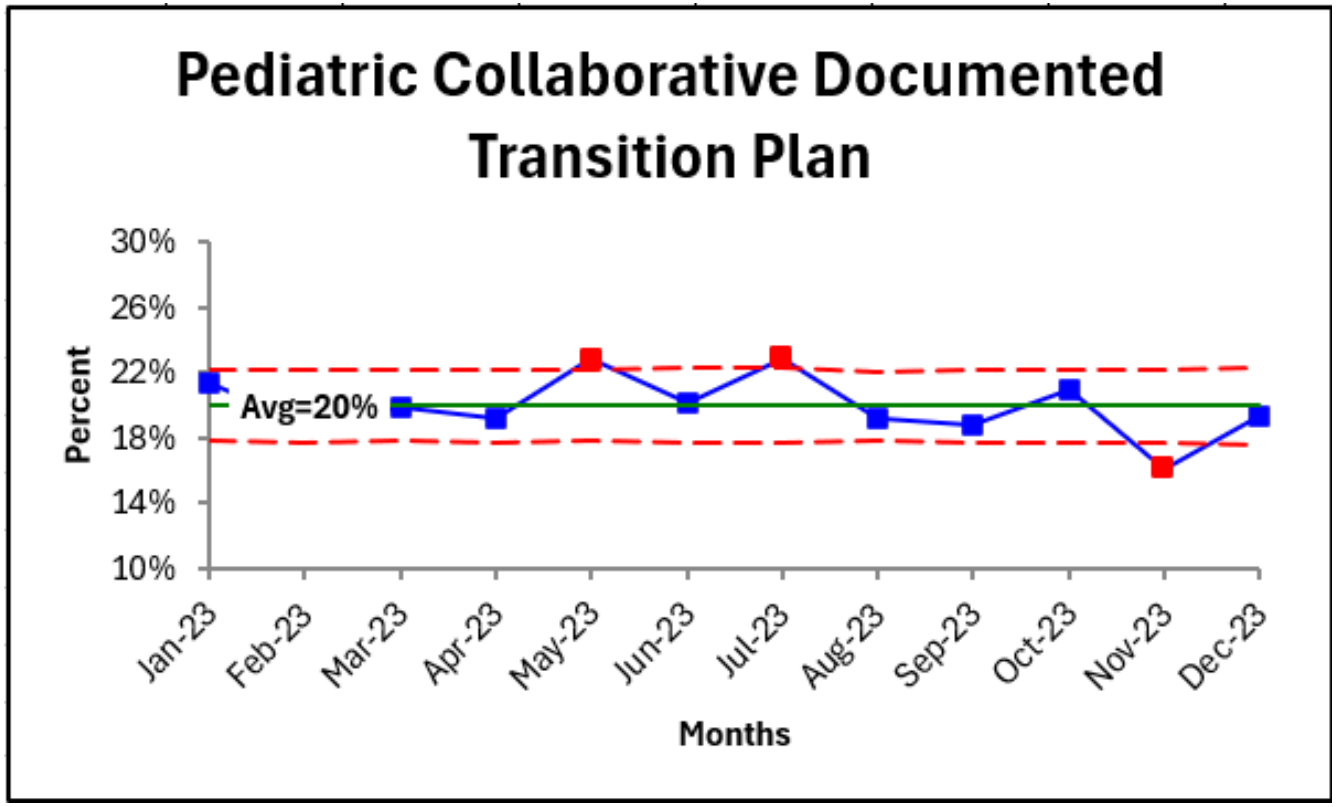
- **High Performing Centers**

1. Hassenfeld 85%
2. Weil Cornell 77%

Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
5673	5156	5921	5326	5245	4909	4911	5643	4983	5151	4889	4067
2754	2491	2971	2677	2832	2664	2726	2954	2773	2721	2664	2332

Documented Transition Stable at 20%

Data from 3 centers



Run chart favorable direction

- **High performing Centers**

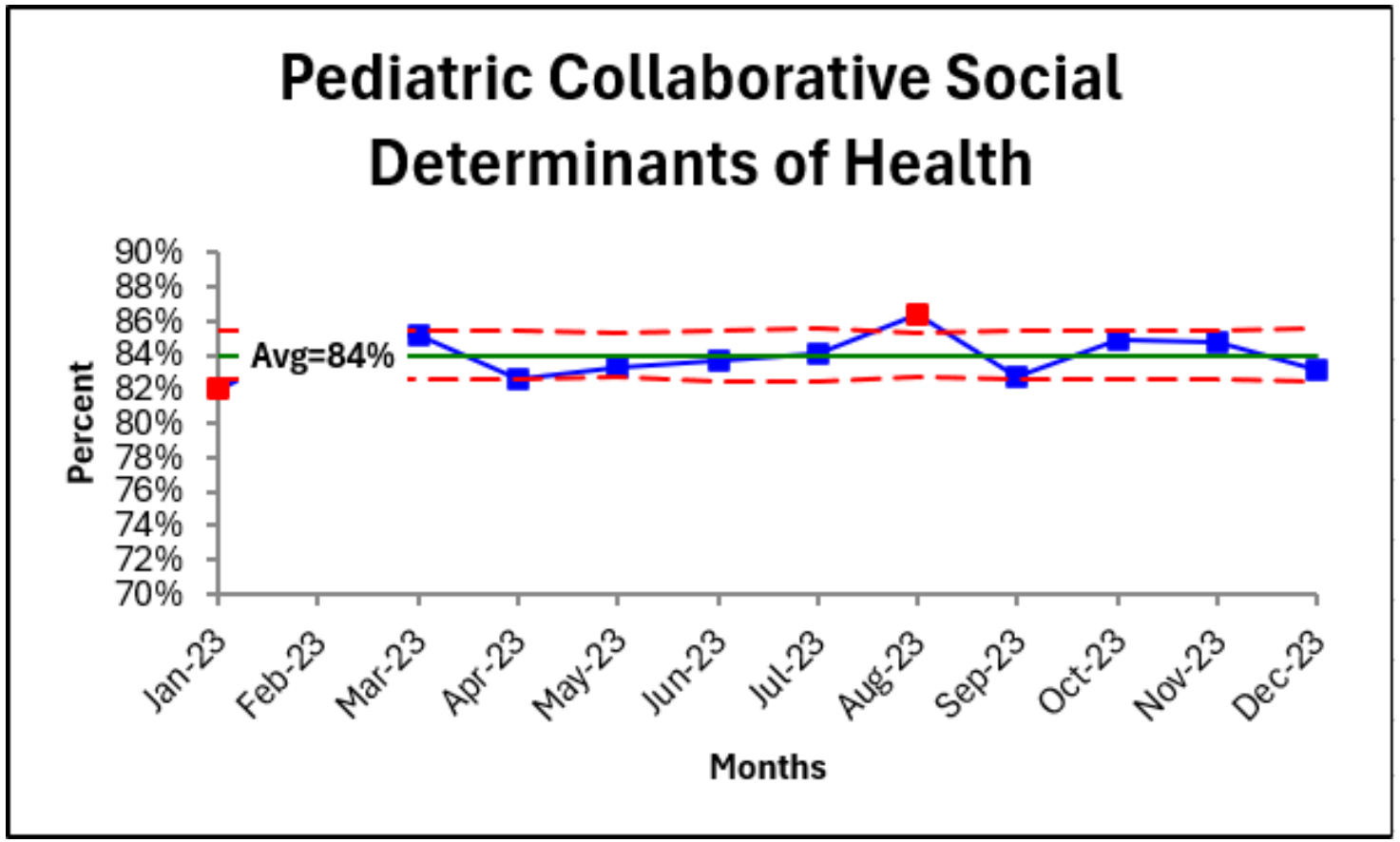
(1) Children's Mercy: 21%

(2) Weil Cornell: 17%

Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
800	744	788	761	802	706	700	845	766	768	764	678
171	141	157	146	183	142	160	162	144	161	123	131

SDOH Screening Stable at 84%

Data from 7 centers



Run chart favorable direction

- **High performing Centers**

(1) Children's Mercy: 88%;
(2) Hassenfeld: 86%

Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
676	666	689	668	717	587	578	745	653	663	670	580
554	566	587	552	597	491	486	643	540	563	568	482

Standardizing Clinical Documentation to Ensure Equitable Care in T1D

Nestoras Mathioudakis, MD MHS
Associate Professor of Medicine

Situation

Racial disparities in discussions, prescribing, and use of diabetes technologies in T1D

Variations in clinical documentation made it difficult to ensure adherence to standard of care

Background

56 Diabetes Care Volume 46, January 2023

Racial Disparities in Access and Use of Diabetes Technology Among Adult Patients With Type 1 Diabetes in a U.S. Academic Medical Center

Sarah Kanbour,[1] Marissa Jones,[1] Mohammed S. Abusamaan,[1] Caitlin Nass,[1] Estelle Everett,[2] Risa M. Wolf,[3] Aniket Sidhaye,[1] and Nestoras Mathioudakis[1]

Diabetes Care 2023;46:56–64 | https://doi.org/10.2337/dc22-1055

- Manual chart review

https://podcasts.apple.com/us/podcast/diabetes-care-on-air/id1667378162?i=1000596165720

Standards of Care - 2024

- Diabetes devices should be offered to people with diabetes
- CGM should be offered to people with T1D early in disease, even at time of diagnosis
- AID should be offered to youth and adults with T1D who are capable of safely using them

Background

JHU Joined T1D Exchange in fall 2022

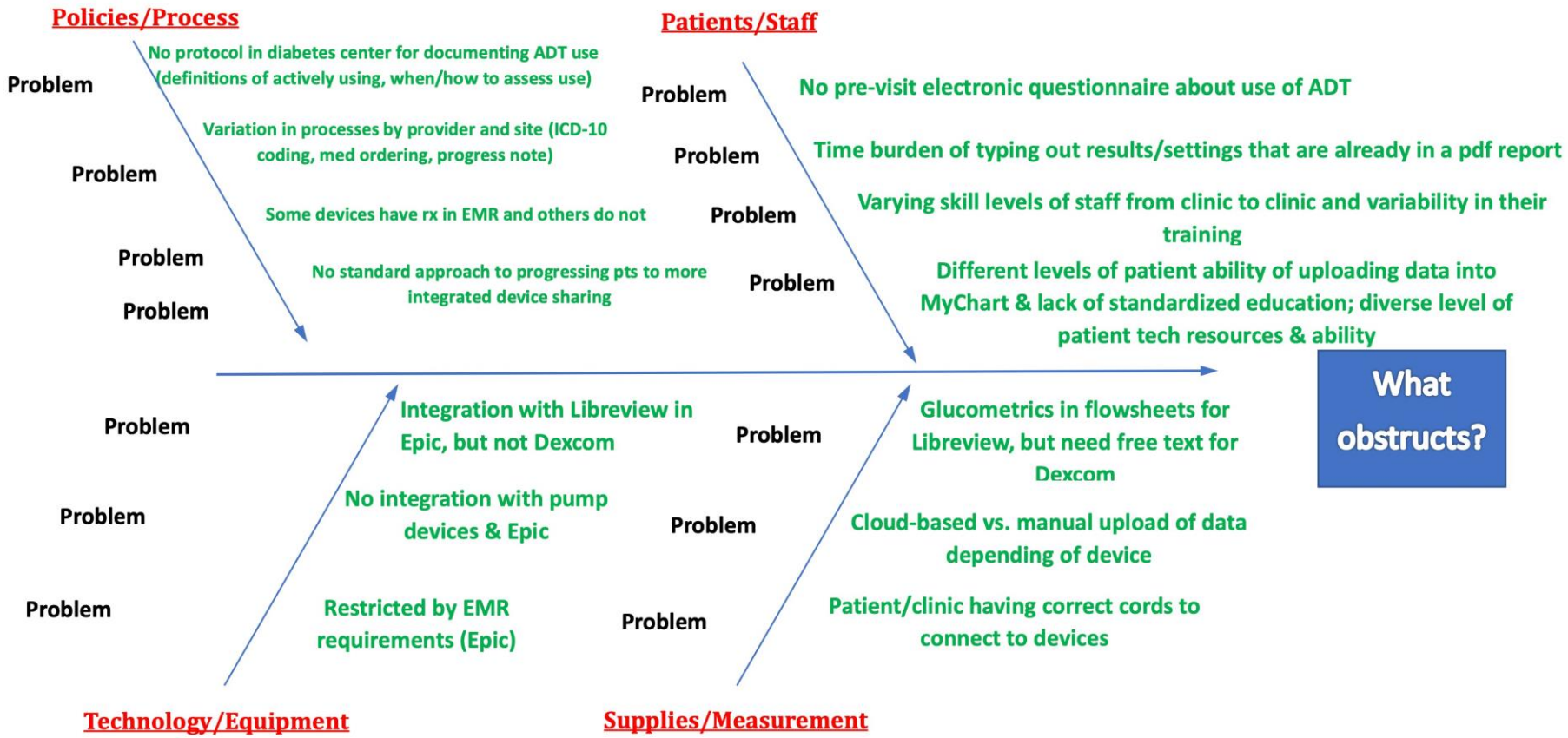
4 physicians, 2 RNs, 1 CDCES, 1 Epic builder

Initial QI project focused on standardizing clinical documentation around diabetes tech use in adult diabetes center

Two goals:

- Allow for more seamless data mapping w/ T1D Exchange
- Allow our clinic to conduct internal QI work to ensure care is aligned with best practices

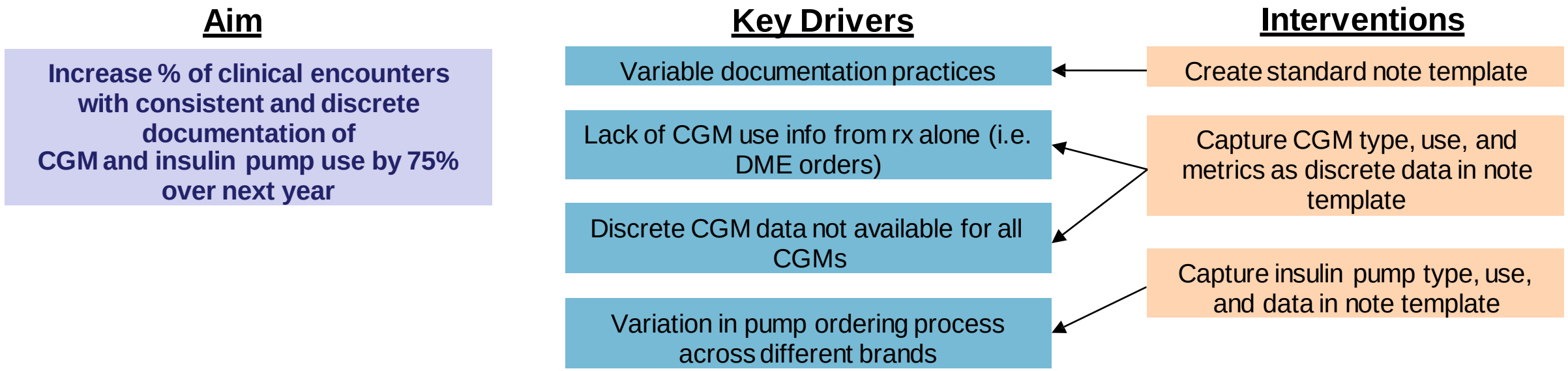
Fish bone diagram



Key Drivers: People, Processes, Policies, Equipment, Supplies, Measurements

Key Drivers Diagram

Standardized Diabetes Documentation to Facilitate QI Work Around Equitable Care



Assessment

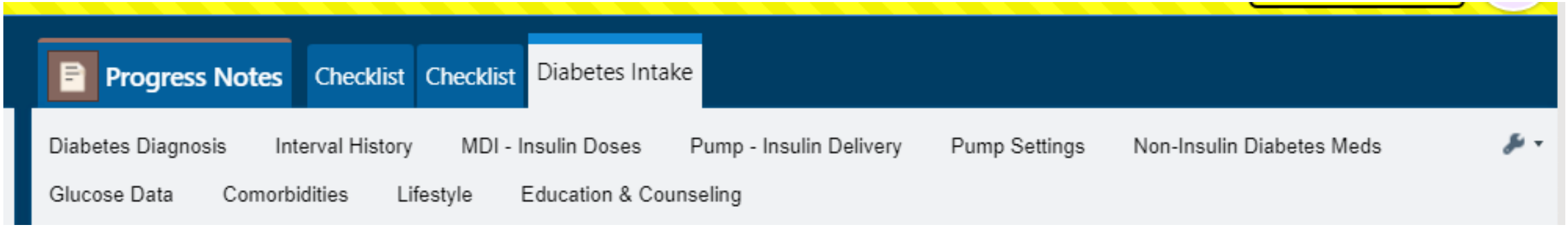
	Prioritize INTERVENTIONS		Effort L/H	Impact L/H
1	Diabetes smartform	1	H	H
2	ICD-10 coding for CGM/pump	2	L	L
3	Rx for CGM/pump	3	L	L
4	Manual chart review	4	H	L
5	Provider training	5	H	L
6	Patient pre-visit questionnaire	6	L	H
7		7		
8		8		
9		9		
10		10		

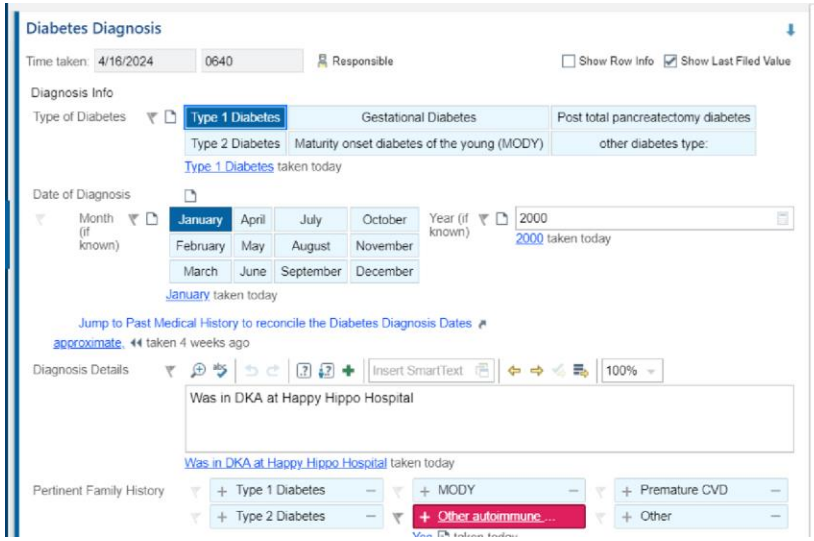
	Effort Impact Matrix	
	Low Effort	High Effort
High Impact	Patient pre-visit questionnaire	Diabetes smartform
Low Impact	Rx for CGM/pump ICD-10 coding for CGM/pump	Provider training Manual chart review

Recommendation

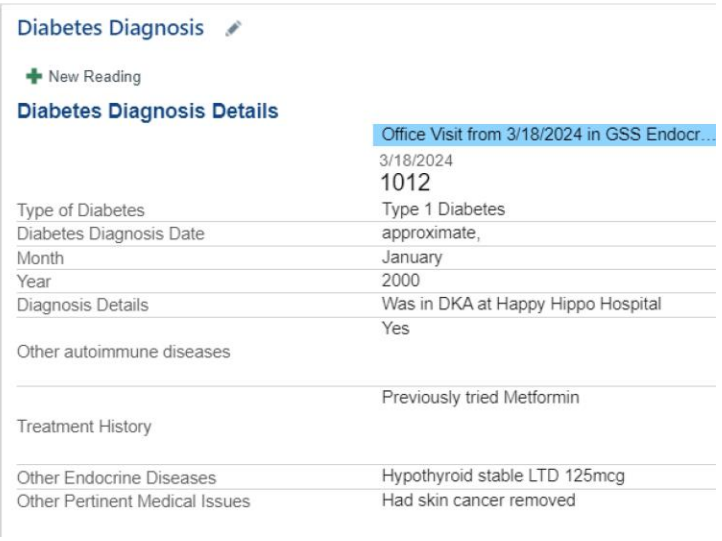
- Developed flowsheet-based smartform
- Adapted from peds endo
- Automatic progress note generation in 3 templates:
  - MDI
  - Insulin Pump
  - Non-Insulin Meds

Diabetes Note Template

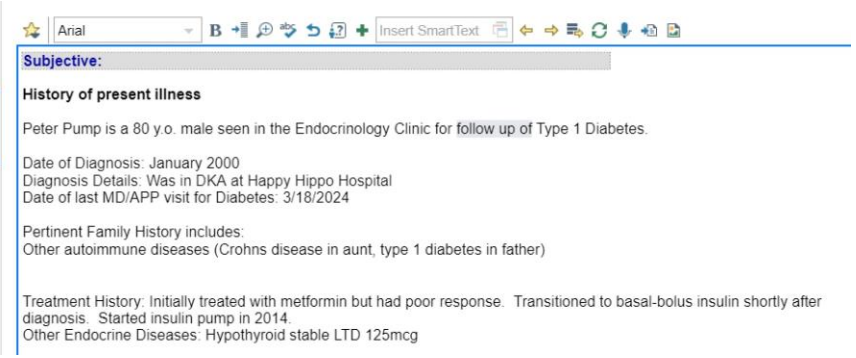




Smartform



Files to Flowsheets



Automatically generates note

April 17, 2024

Glucose Data

- Monitoring method
- Glucometric data
- Hypoglycemia history/ sx

Glucose Data

New Reading

Flowsheets

Glucose Data

	Office Visit from 3/18/2024 in GSS ...	Office Visit from 4/16/2024 in G...
	3/18/2024 1020	4/16/2024 0655
Glucose Monitoring Method	CGM	CGM
Continuous Glucose Monitor Device	Dexcom G6	Dexcom G6
Number of days	14	14
% of Time CGM active	87 %	87 %
Average Glucose	145 mg/dL	145 mg/dL
GMI (%)	7 %	7 %
Standard Deviation	30	30
Coefficient of Variation	29 %	29 %
% of Time Very High (>250 mg/dL)	0 %	0 %
% of Time High (181-250 mg/dL)	15 %	15 %
% of Time in target range (70-180 mg/dL)	84 %	84 %
% of Time Low (54-69 mg/dL)	1 %	1 %
% of Time Very low (<54mg/dL)	0 %	0 %
Blood Glucose Range(s)	40-400	40-400
Blood Glucose Patterns	Post prandial hyperglycemia	Post prandial hyperglycemia
Has unexpired glucagon	No, but has active prescription on file	No, but has active prescription on file
Glucagon administration since last appointment?	No	No
Hypoglycemia unawareness	No	No
Hypoglycemia Symptoms	No symptoms	No symptoms
How low does your blood sugar have to be for you to feel symptoms?	60	60
Awakens to CGM alerts	Always	Always
Has ketone test strips	No	No

Pump – Insulin Delivery

- Pump type
- Pump delivery history data (TDD, basal, bolus, carb entries, etc.)

Pump - Insulin Delivery

New Reading

Flowsheets

Pump - Insulin Delivery

	Office Visit from 3/18/2024 in GSS Endocrinology
	3/18/2024
	1015
Injection/Insertion Sites	arms
Problems with injection/insertion sites	none
Frequency of changing pump site?	Every 2-3 days
Insulin given before or after meals?	Sometimes Before, Sometimes After
How long before?	10 minutes
Missed prandial doses	0-1 per week
Insulin Delivery Method	Tandem
Pump Type	Mobi
Type of Infusion Set	TruSteel
Insulin Concentration	U-100
Insulin Delivery Reporting Period (Days)	14
% of Time Spent in Automation	87 %
Total daily insulin dose (Units/day)	30 Units/day
Average daily basal insulin (Units/day)	14 Units/day
Average daily basal insulin percentage of total daily dose	46.67 %
Average daily bolus insulin (Units/day)	16 Units/day
Average daily bolus insulin percentage of total daily dose	53.33 %
Average daily bolus insulin for food (Units/day)	10 Units/day
Average daily bolus for food insulin percentage of total daily dose	33.33 %
Average daily bolus insulin for correction (Units/day)	6 Units/day
Average daily bolus for correction insulin percentage of total daily dose	20 %
Overrides (%)	0 %
Bolus doses/day	5
Carb entries/day	4
Average daily carbs	15 grams/day

Pump Settings

- Basal rates
- ICR
- ISF
- BG Target
- Active insulin time

Pump Settings

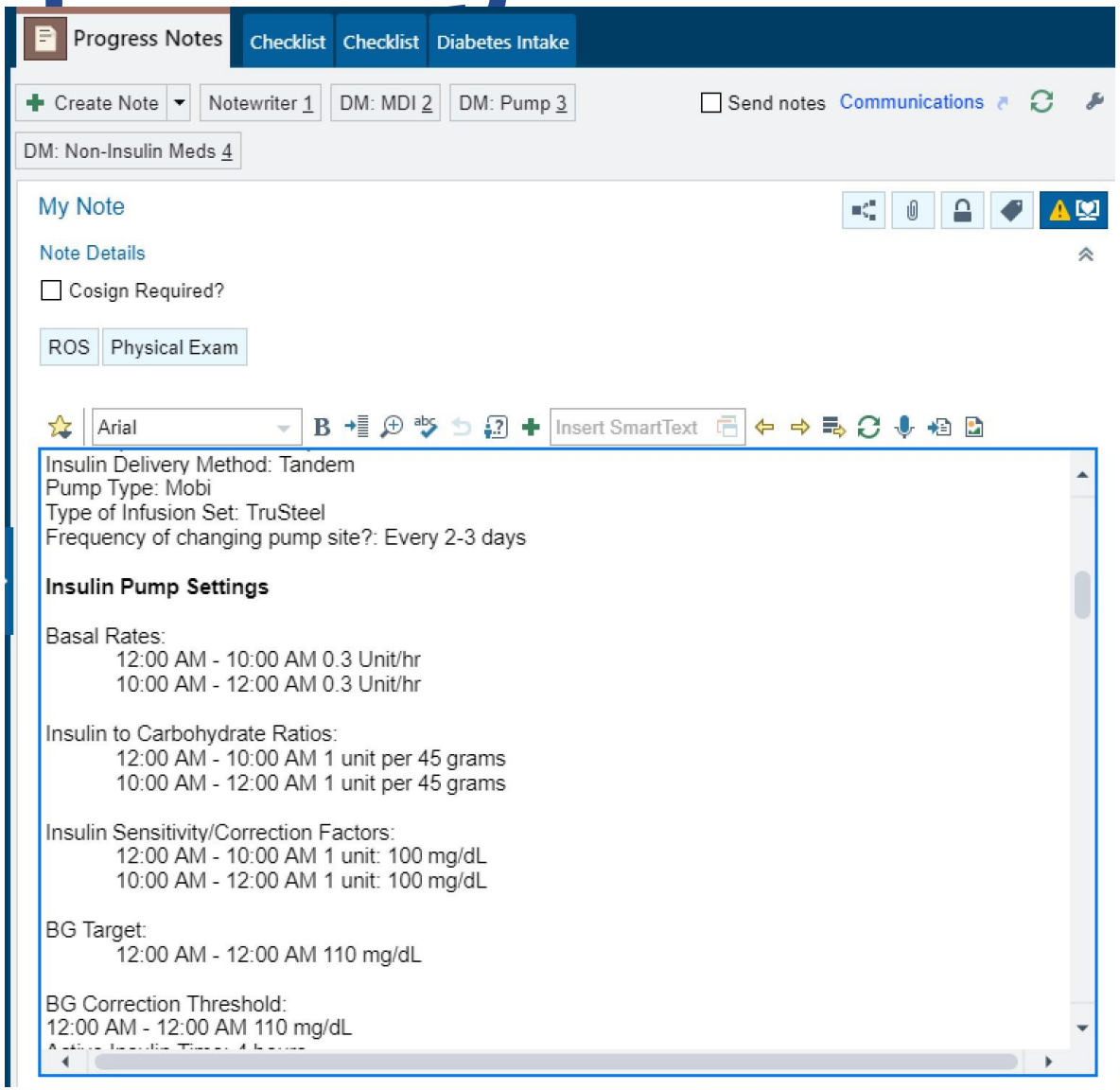
New Reading

Flowsheets

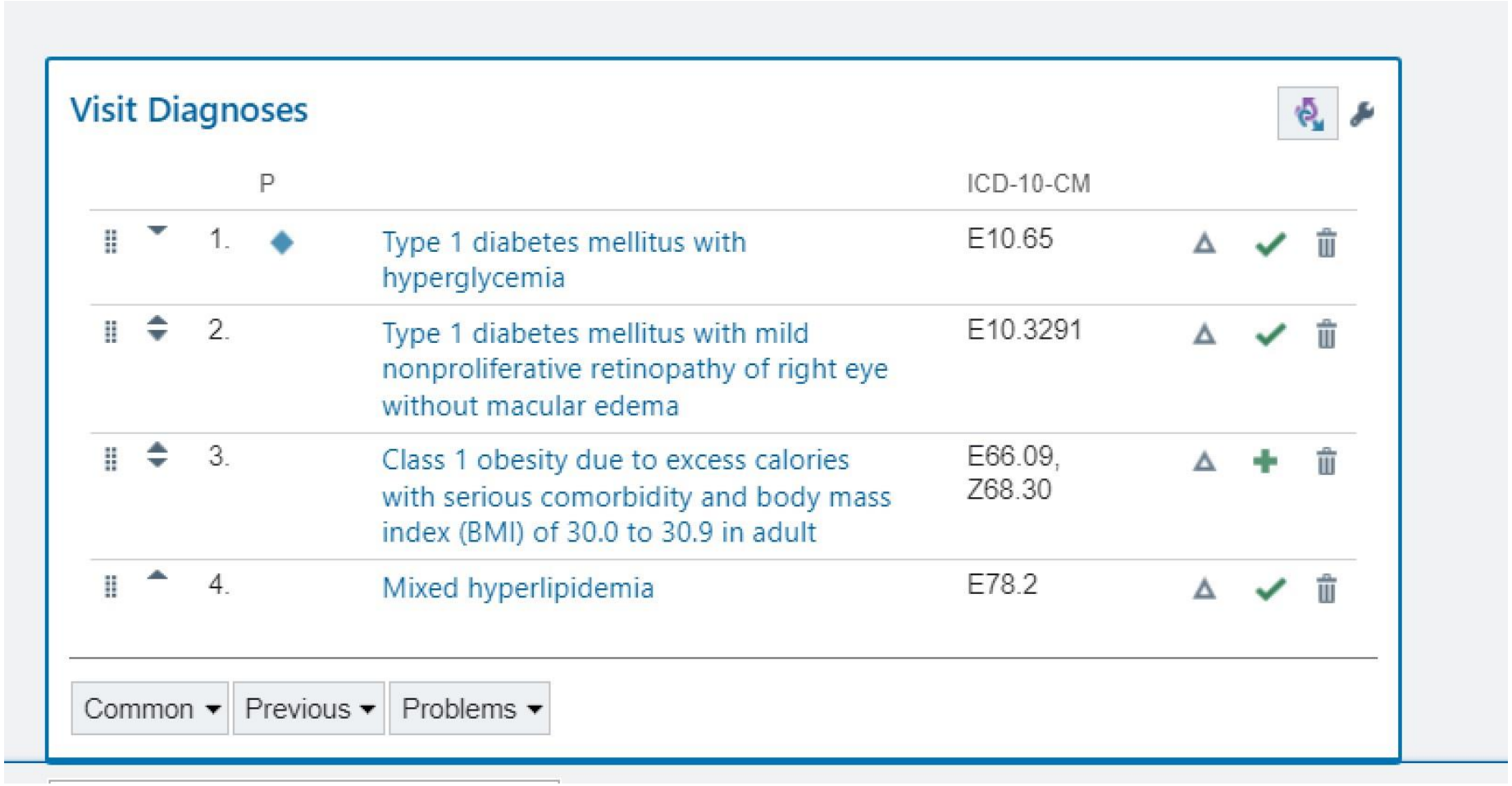
Pump - Insulin Doses

	Office Visit from 3/18/2024 in GSS Endocrinology	
	3/18/2024	
	1019	1039
Insulin Basal Rates - Pump: Intervals	2	2
Start time 1	12:00 AM	12:00 AM
End time 1/Start time 2	10:00 AM	10:00 AM
Value 1	0.2 Unit/hr	0.3 Unit/hr
End time 2/Start time 3	12:00 AM	12:00 AM
Value 2	0.2 Unit/hr	0.3 Unit/hr
Number of Intervals	2	2
Start time 1	12:00 AM	12:00 AM
End time 1/Start time 2	10:00 AM	10:00 AM
Value 1	45	45
End time 2/Start time 3	12:00 AM	12:00 AM
Value 2	45	45
Number of Intervals	2	2
Start time 1	12:00 AM	12:00 AM
End time 1/Start time 2	10:00 AM	10:00 AM
Value 1	100	100
End time 2/Start time 3	12:00 AM	12:00 AM
Value 2	100	100
Number of Intervals	1	1
Start time 1	12:00 AM	12:00 AM
End time 1/Start time 2	12:00 AM	12:00 AM
Value 1	110 mg/dL	110 mg/dL
Number of Intervals	1	1
Start time 1	12:00 AM	12:00 AM
End time 1/Start time 2	12:00 AM	12:00 AM
Value 1	110 mg/dL	110 mg/dL
Active Insulin Time	4	4
Max bolus	10	10
Max basal	2	2

Corresponding note..



Enter visit diagnoses



A&P

"GLIADINIGA", "GLIADINIGG", "IGA", "ENDOMYSIGA"

Assessment & Plan:

Diagnosis & Meds (Optional)

- DIAGMED
- DIAGMEDREFRESH
- Antihyperglycemic Meds(113769)

Updated Pump Settings as of

Basal Rates:
12:00 AM - 5:00 AM 0.9 Unit/hr
5:00 AM - 9:00 AM 1.1 Unit/hr
9:00 AM - 12:00 AM 0.8 Unit/hr
Insulin to Carbohydrate Ratios:
12:00 AM - 12:00 AM 1 unit per 9 grams

Insulin Sensitivity/Correction Factors:
12:00 AM - 12:00 AM 1 unit: 35 mg/dL

BG Target:

BG Correction Threshold:
12:00 AM - 12:00 AM 110 mg/dL

Active Insulin Time: 4 hours
Reverse Correction?: Off

There are no preventive care reminders to display for this patient.

Return for follow up in (Expected:)

ENDOMYSIGA

Assessment & Plan:

1. Type 1 diabetes mellitus with hyperglycemia
A1C 8.0% with goal <7.0%. Pump setting adjustments as below.

2. Type 1 diabetes mellitus with mild nonproliferative retinopathy of right eye without macular edema
Reminded to schedule eye exam.

3. Class 1 obesity due to excess calories with serious comorbidity and body mass index (BMI) of 30.0 to 30.9 in adult
Will try off-label use of Ozempic to help with weight management and insulin resistance.

4. Mixed hyperlipidemia
On statin therapy.

Updated Pump Settings as of 1/22/2024

Basal Rates:
12:00 AM - 5:00 AM 0.9 Unit/hr
5:00 AM - 9:00 AM 1.1 Unit/hr
9:00 AM - 12:00 AM 0.8 Unit/hr
Insulin to Carbohydrate Ratios:
12:00 AM - 12:00 AM 1 unit per 9 grams

Insulin Sensitivity/Correction Factors:
12:00 AM - 12:00 AM 1 unit: 35 mg/dL

BG Target:

BG Correction Threshold:
12:00 AM - 12:00 AM 110 mg/dL

Active Insulin Time: 4 hours
Reverse Correction?: Off

There are no preventive care reminders to display for this patient.

Return for follow up in (Expected:)

Timeline

- Launched note in mid-March 2024
- Initial feedback from stakeholders
- Requiring use for patients with type 1 diabetes
- Optional for type 2 diabetes
- Goal is 75% of type 1 diabetes encounters using template by 9/2024

Thank you

- Feedback?

Dissemination of CGM QI Initiatives at Montefiore

SHIVANI AGARWAL, MD MPH

JUSTIN MATHEW, MD

MICHAEL GREENBERG, NP, CDCES

JOVAN MILOSAVLJEVIC, MD

Learning Objectives

- Review Background of CGM QI Initiative in Montefiore Endocrinology
- Outline expansion of CGM QI Initiative to Montefiore Primary Care and Obstetrics
- Analyze lessons learned in dissemination

Montefiore Einstein

Institution	Multidisciplinary Team Members	T1DM Panel (2021-2023)
Albert Einstein College of Medicine **Montefiore Medical Center** (2,059 beds) **Fleischer Institute for Diabetes and Metabolism** (4 clinic sites) **Bronx, NY** (26% poverty) (med inc $40.8K)	• 18 Attending Physicians • 3 Diabetes Nurse Practitioners/CDE • 8 Endocrinology Fellows • 1 Dieticians • 1.5 Psychologists • 3 inpatient nurses	**Endocrine division:** 1565 PWT1D (total DM 5,320) **SEAD program (18-35 yo):** 474 patients **New-onset T1D:** 80 per year **Race-Ethnicity** • Hispanic: 42%; NH Black:26%; NH White: 25%, Asian: 2%, Other: 5% **Insurance** • Medicaid: 43%, Medicare 37%, Private: 10%, Other: 10%

Endocrinology CGM QI Initiative

INTERVENTIONS

SEAD
Supporting Emerging Adults with Diabetes

Diabetes TECH Talks

1. **Specialty clinic** for emerging adults with type 1 diabetes (18-35 years) and expanding diabetes expertise in staff
2. **Training nursing staff** on CGM placement, downloads, patient education
3. **Social needs and technology prescriptions coordinator**
4. Improved **prescribing** workflows, **device trials**
5. Expanded **provider awareness** of inequity and training in CGM

2019

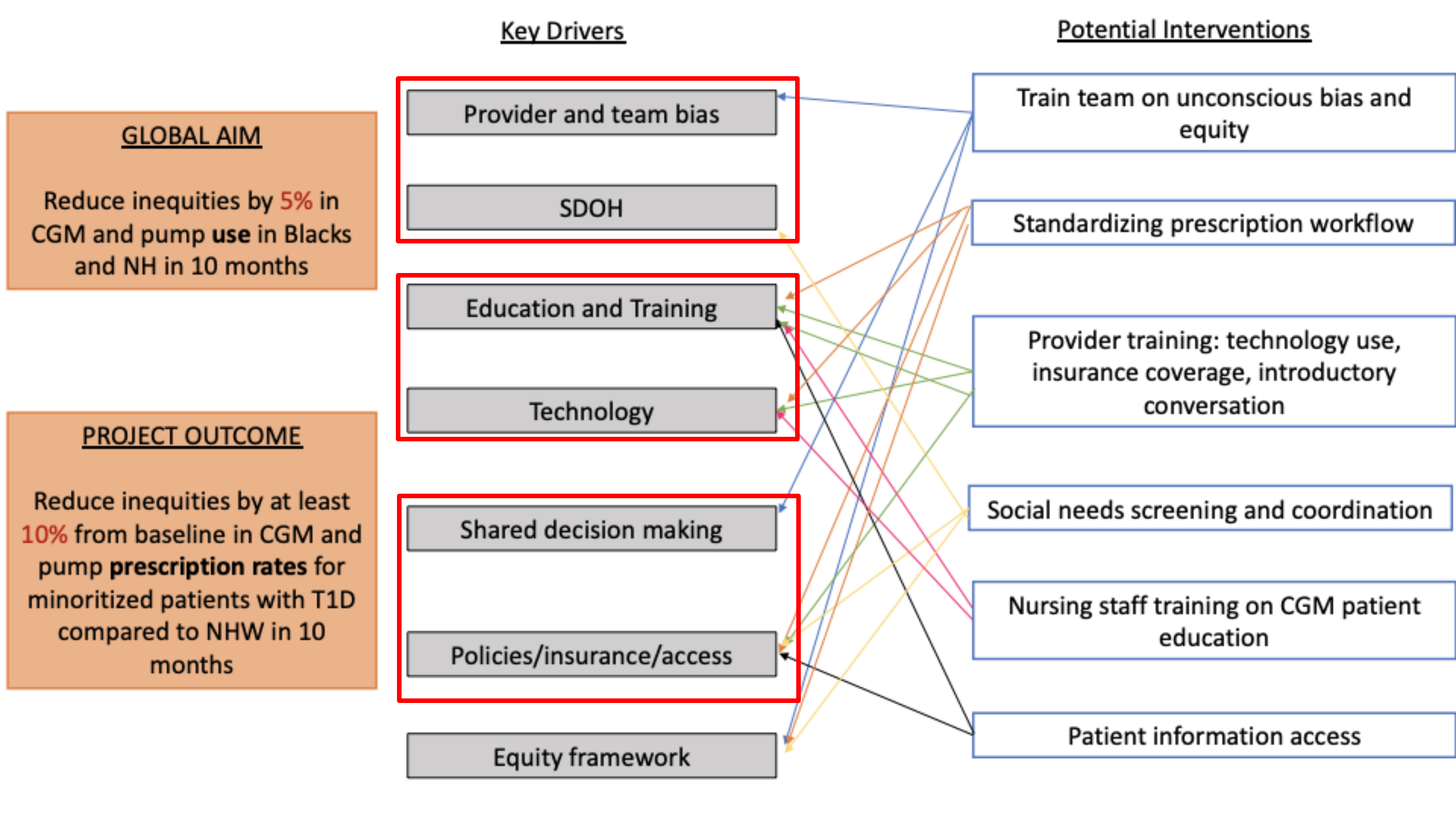
2020

2021

Joined the T1D Exchange QI collaborative in 2021

Mid stage evaluation of our clinical interventions over the past two years

Collaborated with IT for data mapping


Key Drivers
Potential Interventions
GLOBAL AIM
Reduce inequities by 5% in CGM and pump **use** in Blacks and NH in 10 months
PROJECT OUTCOME
Reduce inequities by at least 10% from baseline in CGM and pump **prescription rates** for minoritized patients with T1D compared to NHW in 10 months
Provider and team bias
SDOH
Education and Training
Technology
Shared decision making
Policies/insurance/access
Equity framework
Train team on unconscious bias and equity
Standardizing prescription workflow
Provider training: technology use, insurance coverage, introductory conversation
Social needs screening and coordination
Nursing staff training on CGM patient education
Patient information access

Success of Endocrine CGM Project

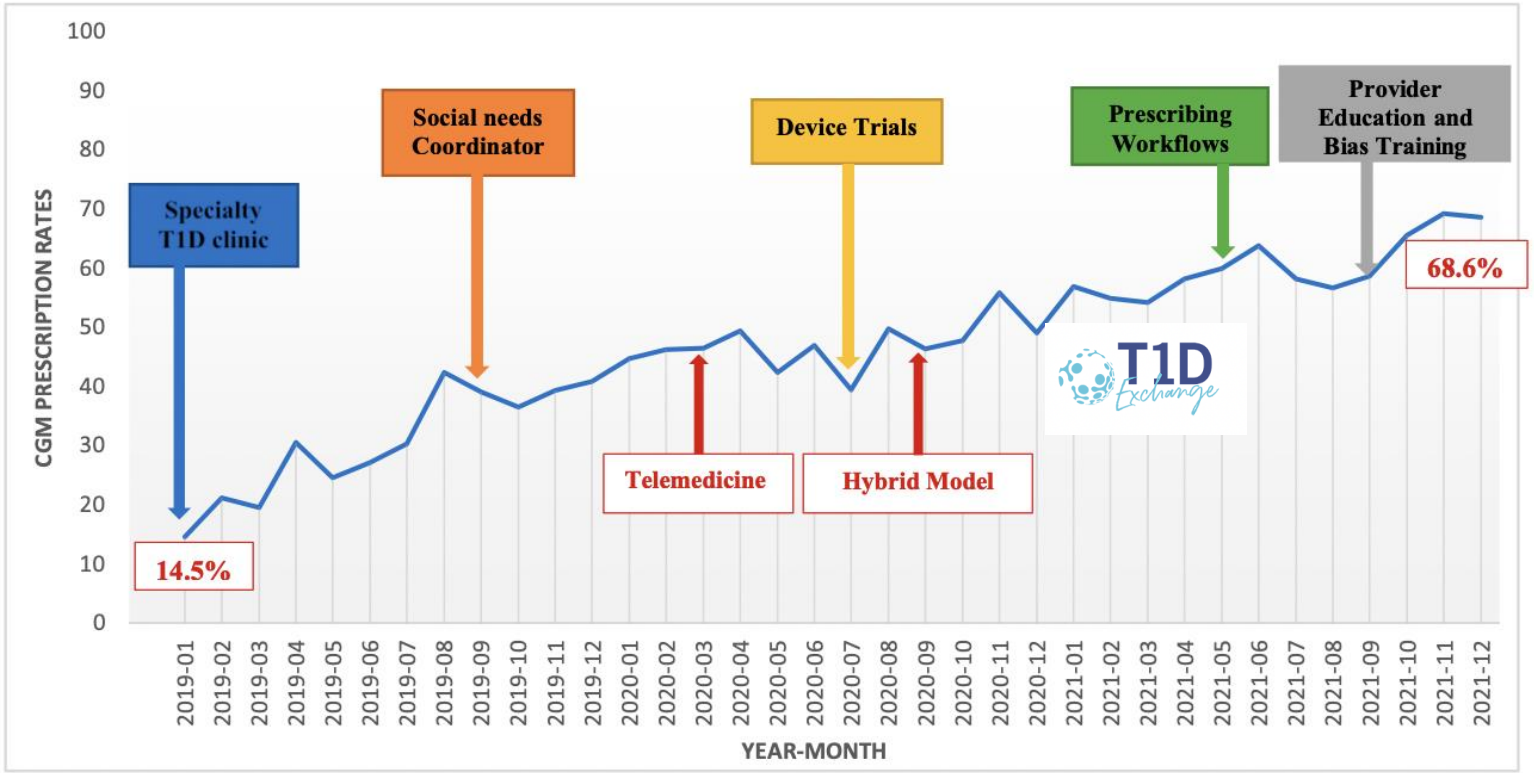


Figure 1—Practice transformations and CGM prescriptions in adult type 1 diabetes cohort from January 2019 to December 2021 (*n* = 1, 357). T1D, type 1 diabetes.

Mathias…Agarwal. Diabetes Care, 2022.

Lessons Learned

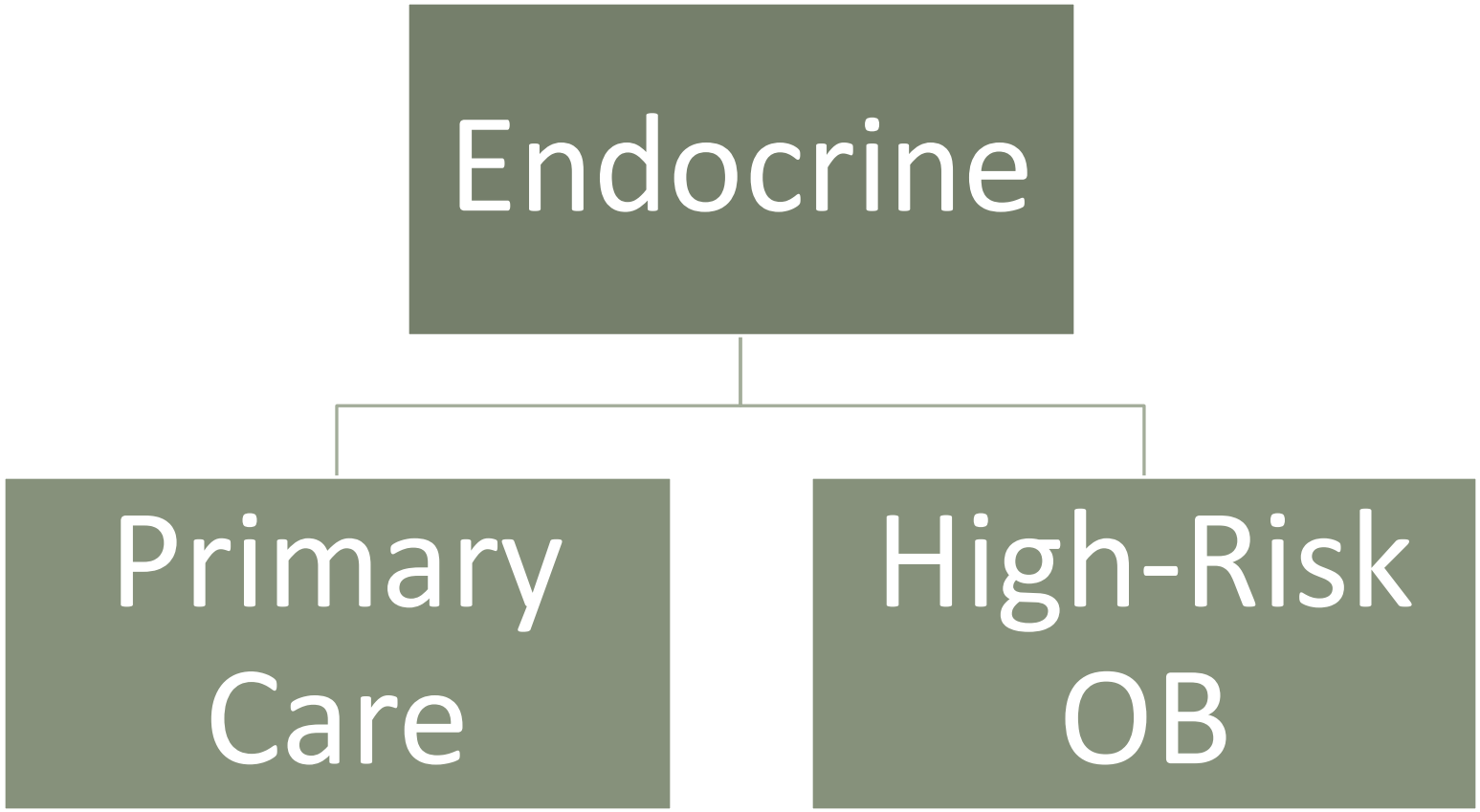
Co-design enhanced acceptability

Multidisciplinary collaboration is needed

Infrastructure change is needed

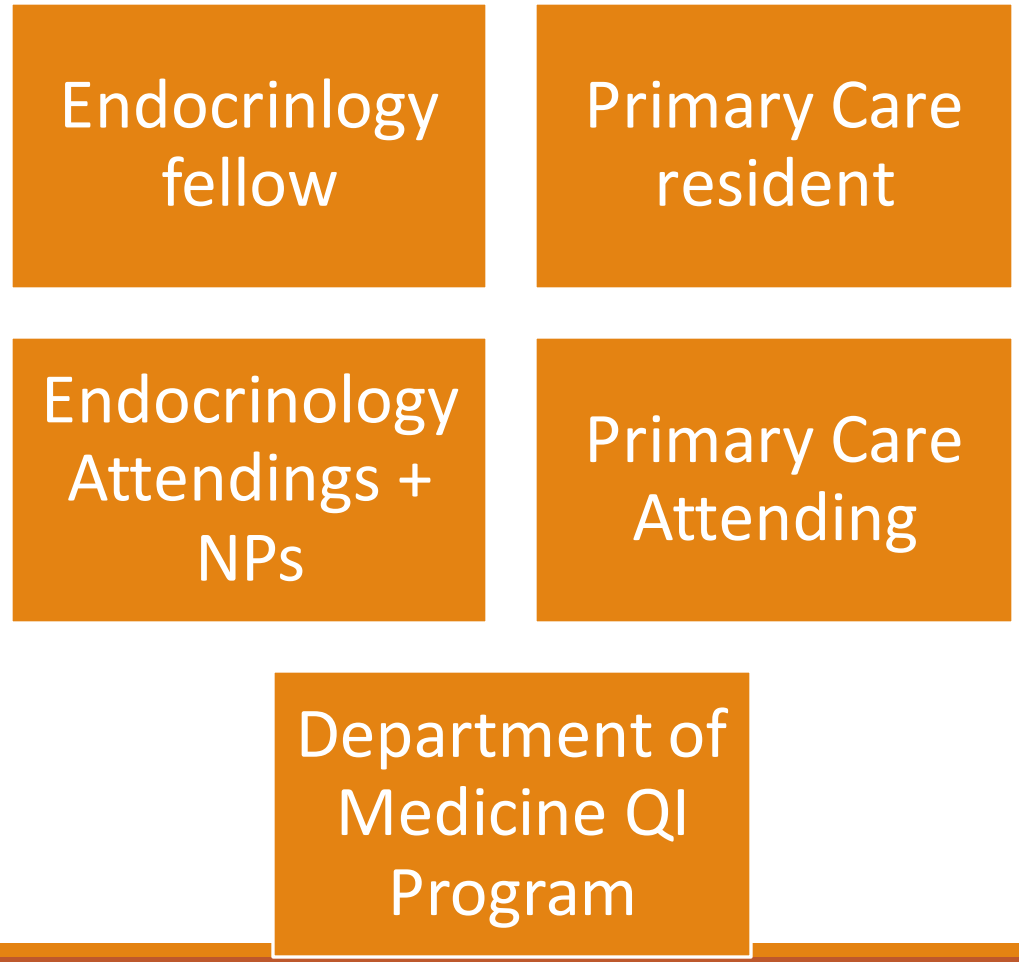
Health Equity lens helps everyone

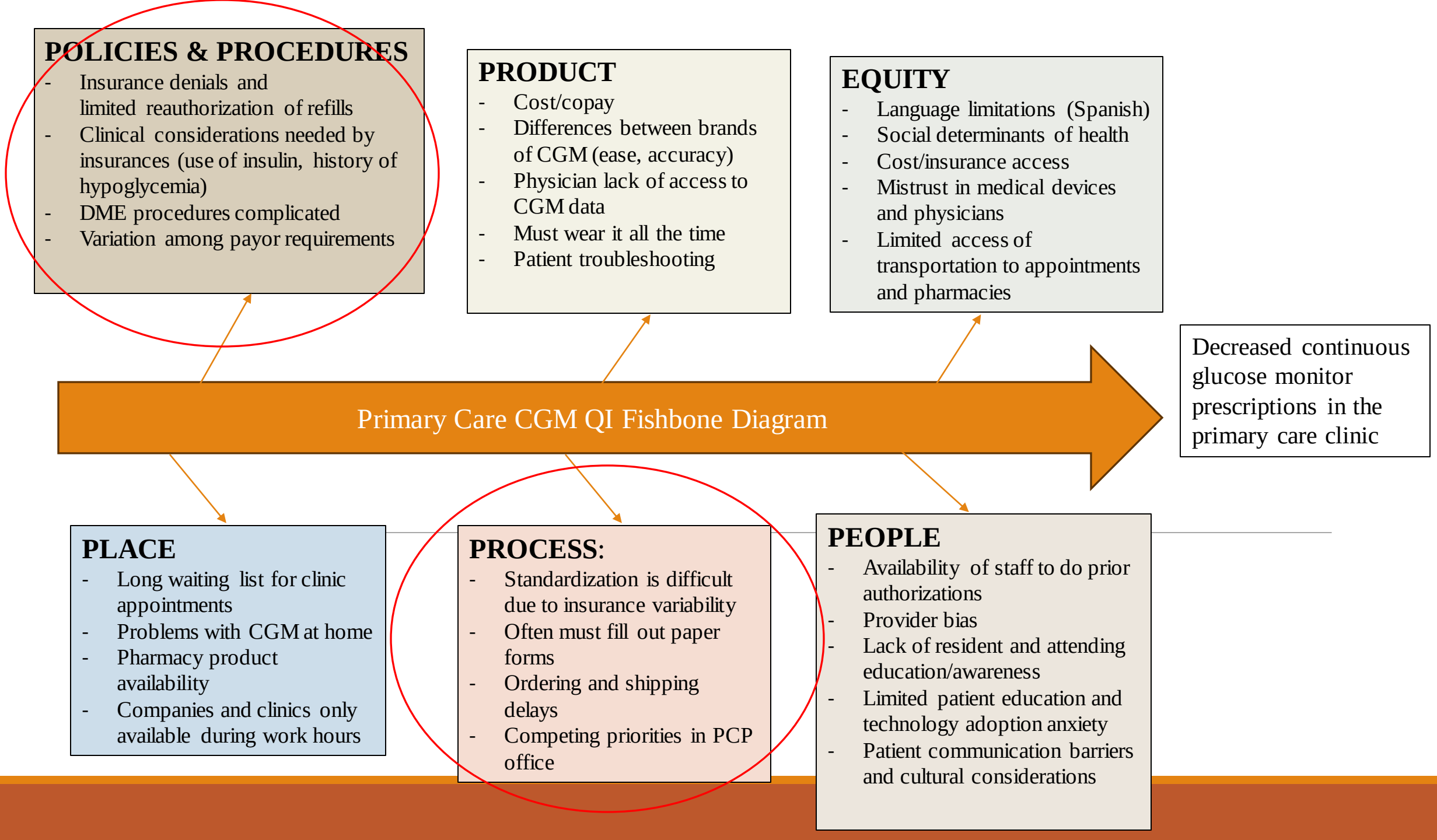
CGM QI Initiative Expansion



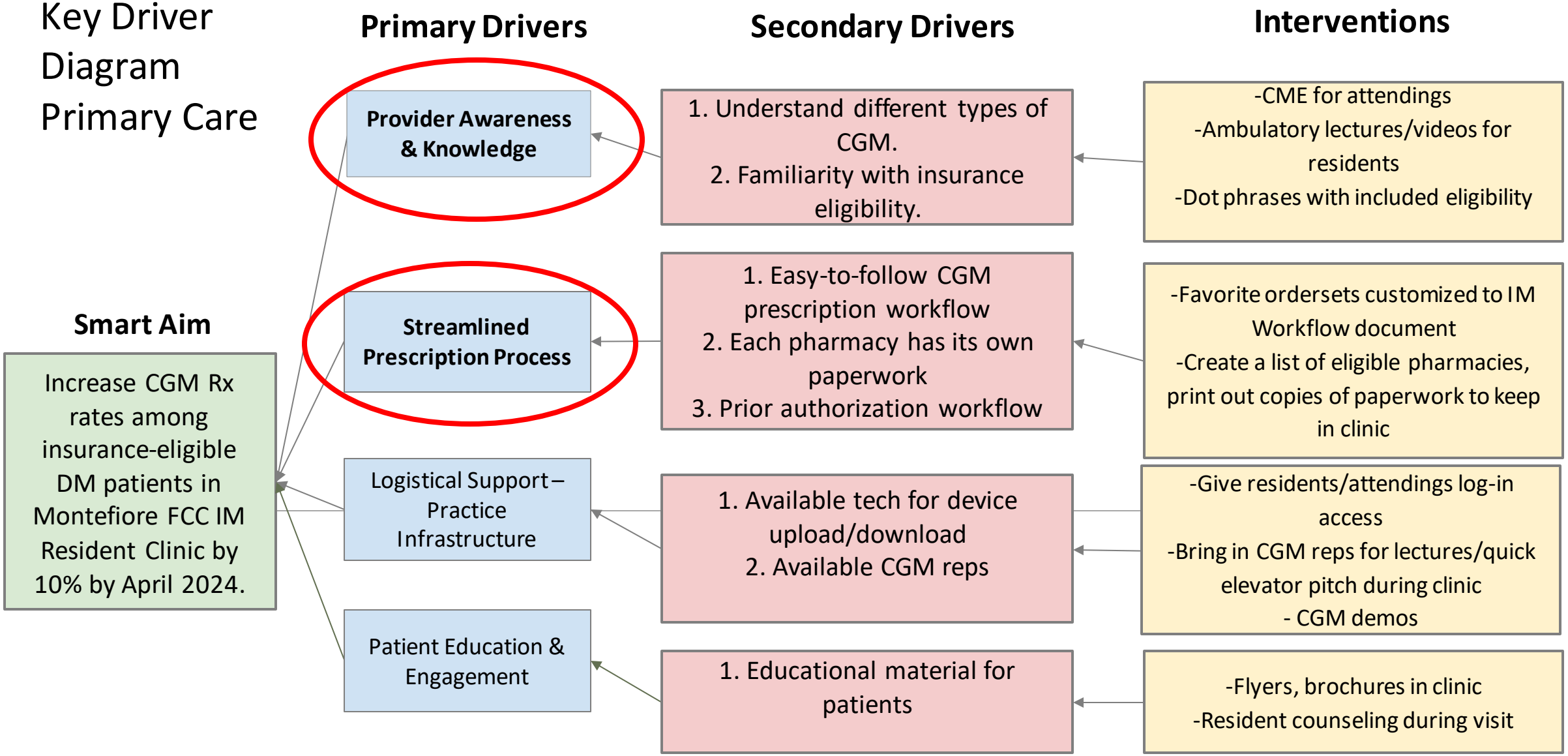
Primary Care Expansion

Primary care team



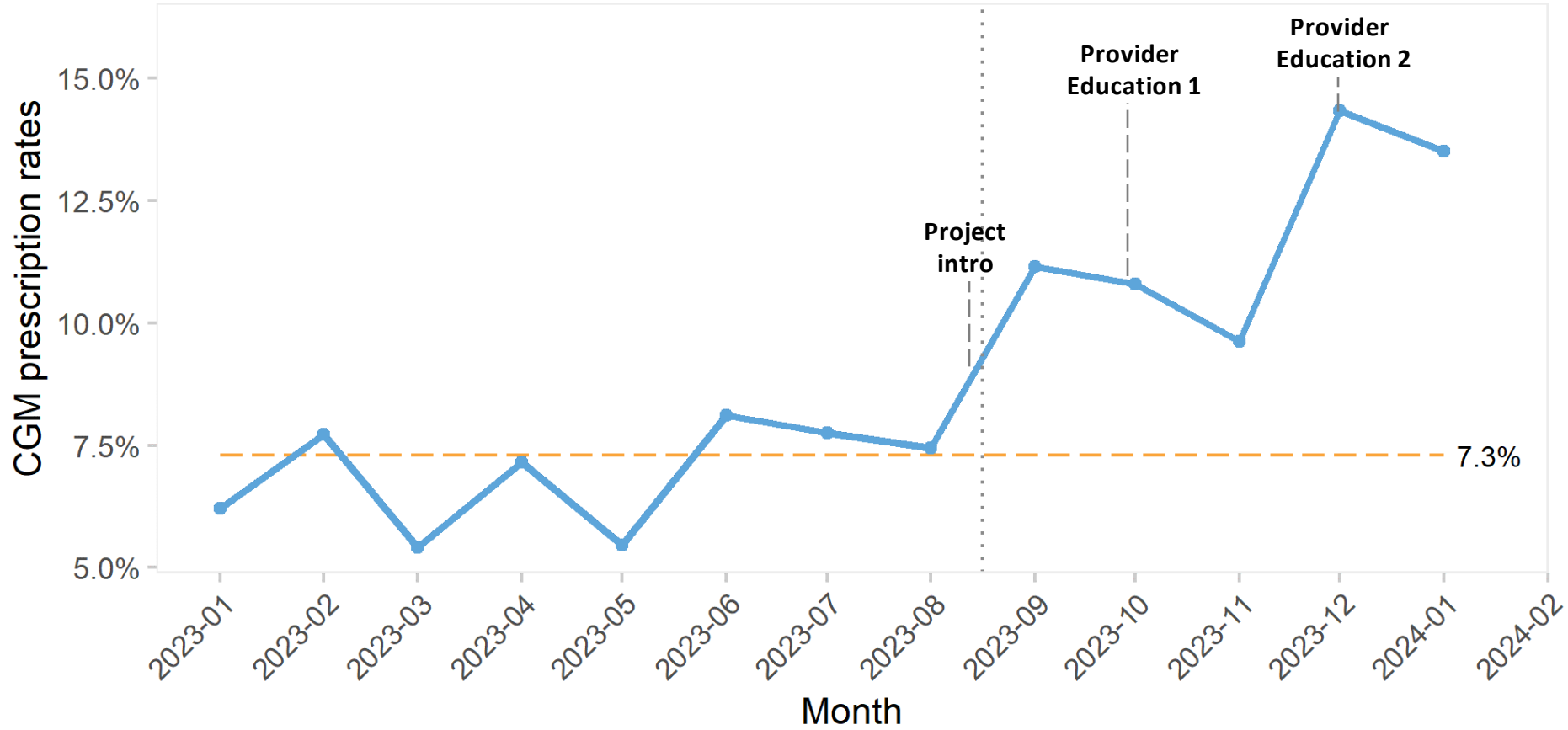

POLICIES & PROCEDURES
- Insurance denials and limited reauthorization of refills
- Clinical considerations needed by insurances (use of insulin, history of hypoglycemia)
- DME procedures complicated
- Variation among payor requirements
PRODUCT
- Cost/copay
- Differences between brands of CGM (ease, accuracy)
- Physician lack of access to CGM data
- Must wear it all the time
- Patient troubleshooting
EQUITY
- Language limitations (Spanish)
- Social determinants of health
- Cost/insurance access
- Mistrust in medical devices and physicians
- Limited access of transportation to appointments and pharmacies
Primary Care CGM QI Fishbone Diagram
Decreased continuous glucose monitor prescriptions in the primary care clinic
PLACE
- Long waiting list for clinic appointments
- Problems with CGM at home
- Pharmacy product availability
- Companies and clinics only available during work hours
PROCESS:
- Standardization is difficult due to insurance variability
- Often must fill out paper forms
- Ordering and shipping delays
- Competing priorities in PCP office
PEOPLE
- Availability of staff to do prior authorizations
- Provider bias
- Lack of resident and attending education/awareness
- Limited patient education and technology adoption anxiety
- Patient communication barriers and cultural considerations

Key Driver Diagram Primary Care

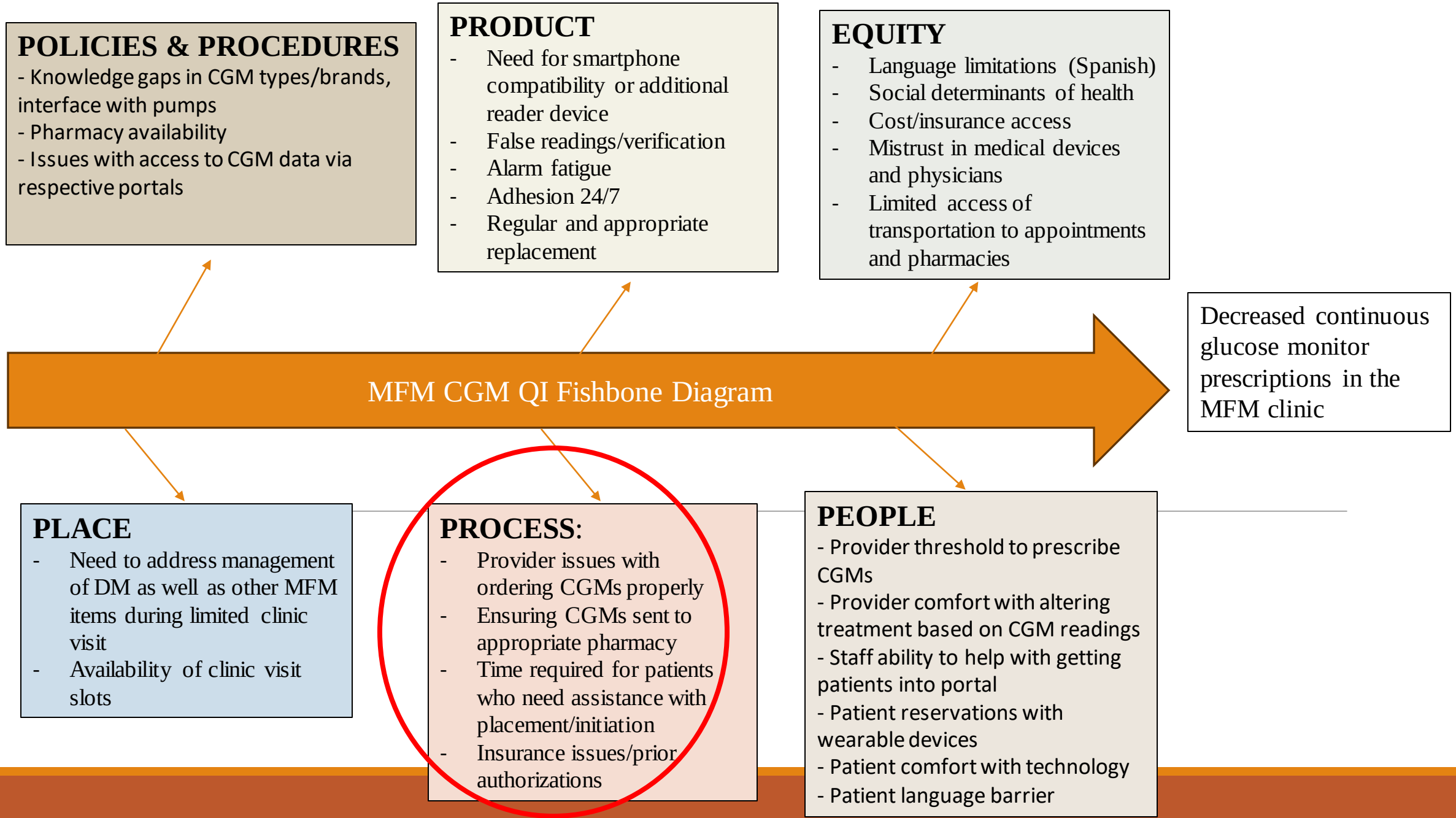


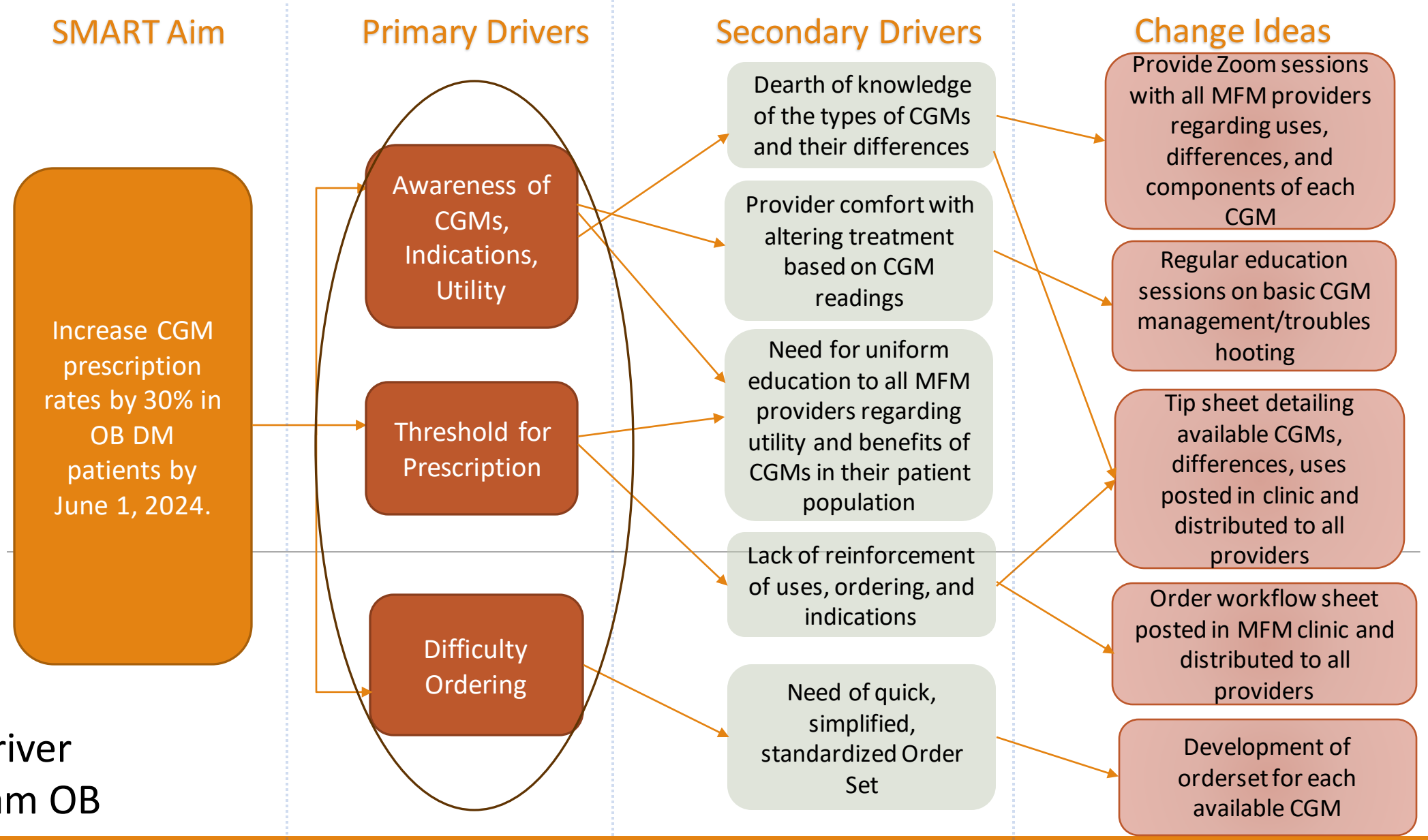
CGM prescription rates per month

Denominator = number of patients with office visits and insulin prescription in the reporting month
Numerator = number of denominator patients with a CGM prescription in the reporting month



HIGH-RISK OB EXPANSION

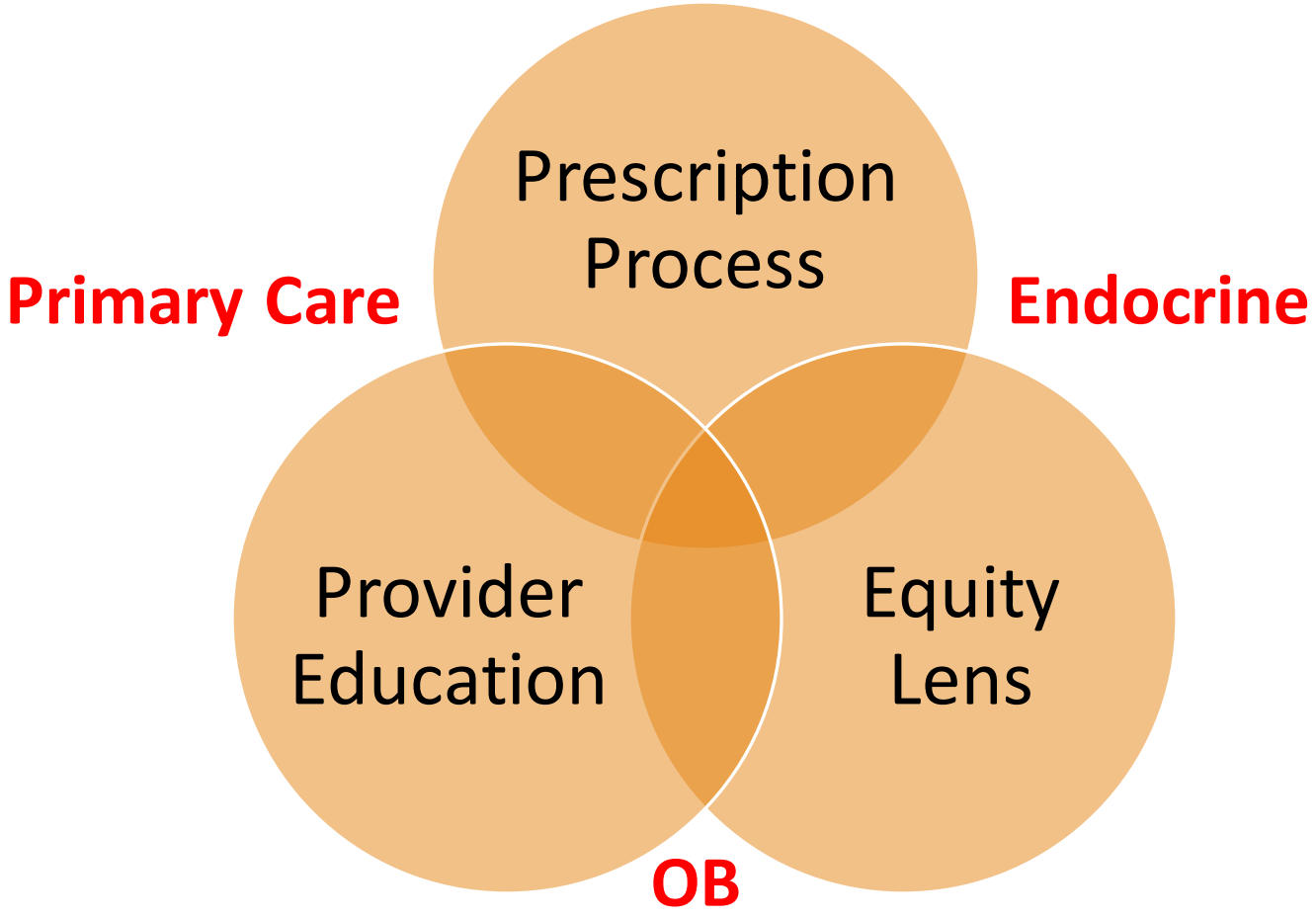

POLICIES & PROCEDURES
- Knowledge gaps in CGM types/brands, interface with pumps
- Pharmacy availability
- Issues with access to CGM data via respective portals
PRODUCT
- Need for smartphone compatibility or additional reader device
- False readings/verification
- Alarm fatigue
- Adhesion 24/7
- Regular and appropriate replacement
EQUITY
- Language limitations (Spanish)
- Social determinants of health
- Cost/insurance access
- Mistrust in medical devices and physicians
- Limited access of transportation to appointments and pharmacies
MFM CGM QI Fishbone Diagram
Decreased continuous glucose monitor prescriptions in the MFM clinic
PLACE
- Need to address management of DM as well as other MFM items during limited clinic visit
- Availability of clinic visit slots
PROCESS:
- Provider issues with ordering CGMs properly
- Ensuring CGMs sent to appropriate pharmacy
- Time required for patients who need assistance with placement/initiation
- Insurance issues/prior authorizations
PEOPLE
- Provider threshold to prescribe CGMs
- Provider comfort with altering treatment based on CGM readings
- Staff ability to help with getting patients into portal
- Patient reservations with wearable devices
- Patient comfort with technology
- Patient language barrier



Key Driver Diagram OB

Lessons for Dissemination

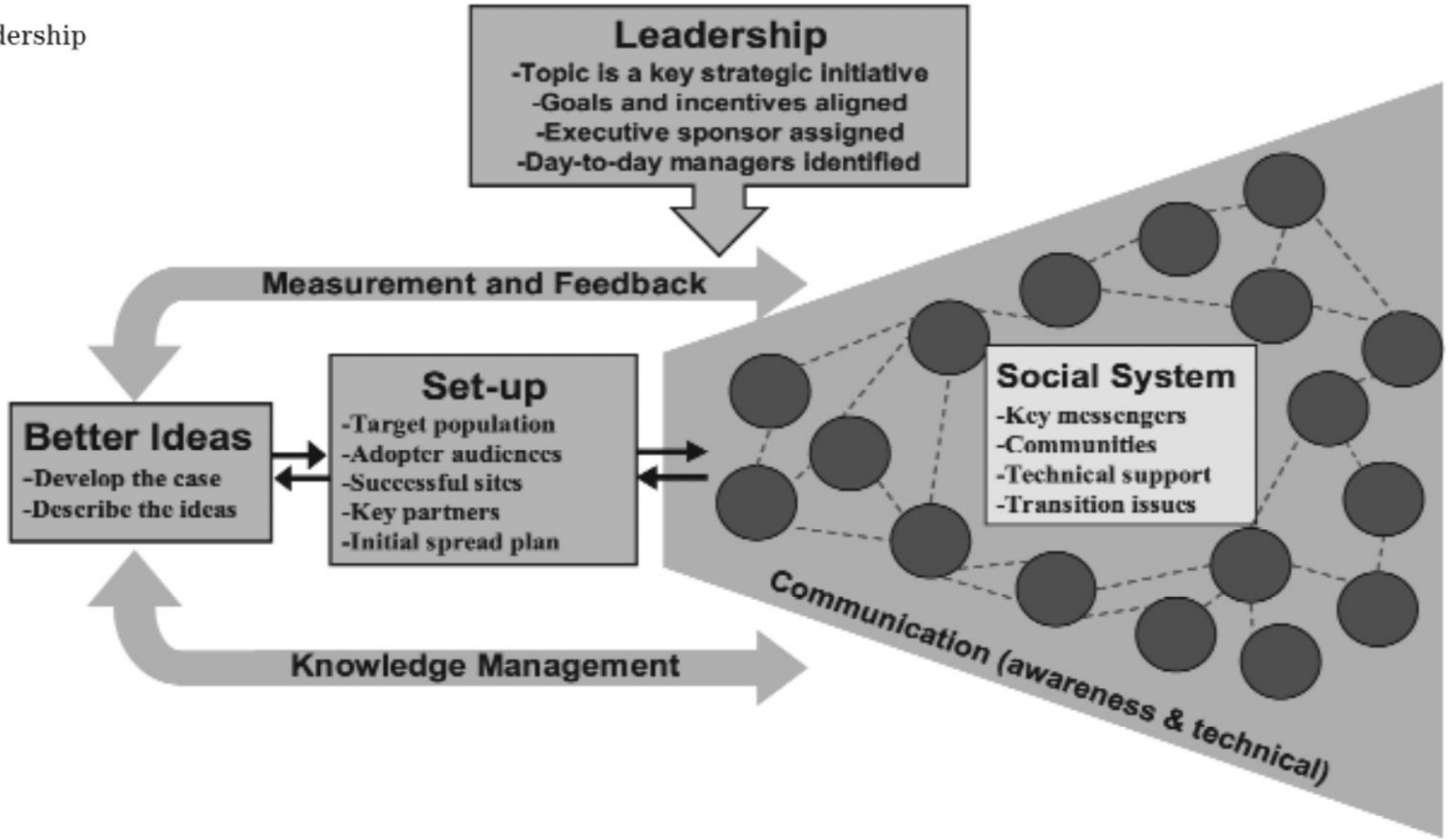
Commonality in QI Initiatives



Institute *for* Healthcare Improvement

A Framework for Spread

- The responsibilities of leadership (including set-up)
- Identification of better ideas
- Communication
- Strengthening the social system
- Measurement and feedback
- Knowledge management



Massoud MR, Nielsen GA, Nolan K, Schall MW, Sevin C. *A Framework for Spread: From Local Improvements to System-Wide Change.* IHI Innovation Series white paper. Cambridge, MA: Institute for Healthcare Improvement; 2006. (Available at ihi.org)

Lessons for Spread

- Don’t reinvent the wheel!
  - Similar processes tailored to different settings
- Early conversations with stakeholders to understand unique needs and barriers
  - May need to emphasize different parts of the process
- Buy-in is key
  - Need multi-discipline champions
- What stays is education and infrastructure
  - What goes is specialty care

THANK YOU!

Montefiore Einstein

Increasing uptake of CGM in pediatric diabetes care: the JHU Peds journey

Risa Wolf, MD

Johns Hopkins Pediatric Diabetes Center

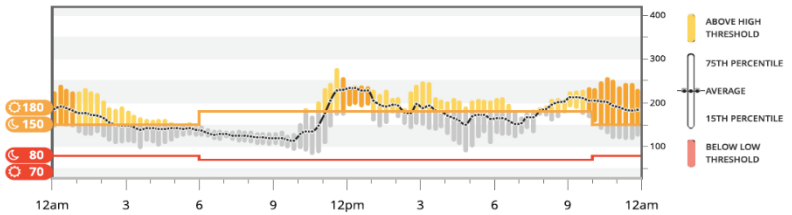
JOHNS HOPKINS
CHILDREN'S CENTER

Objectives

- Review rationale for promoting CGM use in T1D
- Describe 2 initiatives to increase uptake of CGM in pediatric diabetes care
- Addressing persistent disparities in CGM use with the implementation of a diabetes navigator
- Future QI initiatives to improve CGM and technology usage

Benefits of CGM use in T1D

- Real-Time Monitoring



- Tight Glucose Control/Improved A1c
- Reduced risk of complications– hypoglycemia and DKA
- Improved quality of life

JDRF CGM Study group. Diab Care 2009; Laffel et al JAMA 2020

JOHNS HOPKINS CHILDREN'S CENTER

Disparities in pediatric diabetes

PEDIATRICS

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Pediatrics. 2015 Mar; 135(3): 424–434.

doi: 10.1542/peds.2014-1774

Racial-Ethnic Disparities in Management and Outcomes Among Children W

Diabetes

Prevalence of and Disparities in Barriers to Care Experienced by Youth with Type 1 Diabetes

Jessica M. Valenzuela, PhD • Michael Seid, PhD • Beth Waitzfelder, PhD • ... Joyce Yi-Frazier, PhD •

behalf of the SEARCH for Diabetes in Youth Study Group * •

es

OI: https://doi.org/10.1016/j.jpeds.2014.01.035

PEDIATRICDIABETES

ISPAD International Society for Pediatric and Adolescent Diabetes

CLINICAL CARE AND TECHNOLOGY | Full Access

Racial disparities in treatment and type 1 diabetes

Terri H Lipman, Jennifer A Smith, O

First published: 08 October 2020 |

Citations: 26

A Decade of Disparities in Diabetes Technology Use and HbA_{1c} in Pediatric Type 1 Diabetes: A

Ananta Addala,[1] Marie Auzanneau,[2,3] Kellee Miller,[4] Werner Maier,[3,5] Nicole Foster,[4] Thomas Kapellen,[6] Ashby Walker,[7] Joachim Rosenbauer,[3,8] David M. Maahs,[1,9] and Reinhard W. Holl[2,3]

JAMA Netw Open. 2018 Sep; 1(5): e181851.

Published online 2018 Sep 7. doi: 10.1001/jamanetworkopen.2018.1851: 10.1001/jamanetworkopen.2018.1851

PMCID: PMC6203341

NIHMSID: NIHMS989226

PMID: 30370425

Association of Race and Ethnicity With Glycemic Control and Hemoglobin A_{1c} Levels in Youth With Type 1 Diabetes

Anna R. Kahkoska, BS,[1] Christina M. Shay, PhD,[2] Jamie Crandell, PhD,[3,4] Dana Dabelea, MD, PhD,[5] Giuseppina Imperatore, MD, PhD,[6] Jean M. Lawrence, ScD,[7] Angela D. Liese, PhD,[8] Cate Pihoker, MD,[9] Beth A. Reboussin, PhD,[10] Shivani Agarwal, MD,[11] Janet A. Tooze, PhD,[10] Lynne E. Wagenknecht, PhD,[10] Victor W. Zhong, PhD,[12] and Elizabeth J. Mayer-Davis, PhD[1,13]

JHU Peds

Race

White	494	61.8%
Black/African Am.	203	25.4%
Other Race	45	5.6%
Multi-race	33	4.1%
Asian	14	1.8%
Unknown	9	1.1%
Hawaiian/Pacific Islander	2	0.3%

Ethnicity

NonHispanic or Latino	729	91.1%
Hispanic or Latino	37	4.6%
Unknown	34	4.3%

Age

13 - <18	383	39.1%
6 - <13	317	32.4%
18 - <26	223	22.8%
<6	50	5.1%
26 - <31	6	0.6%

Insurance

Private	532	66.5%
Medicaid	161	20.1%
Other	80	10.0%
Military	23	2.9%
None, self pay	3	0.4%
Medicare	1	0.1%

800 patients

JOHNS HOPKINS CHILDREN'S CENTER

Initial CGM data leading to next initiatives (2018-2019)

254 patients with T1D
63% using CGM

CGM users
A1c 8.4%

Non-CGM users
A1c 9.8%

Black/Hispanic youth had higher HbA1c, and were less likely to use CGM ($p<0.01$)

Diabetes Technology & Therapeutics > VOL. 25, NO. 1 | Original Articles

normal

Improving Continuous Glucose Monitoring Uptake in Underserved Youth with Type 1 Diabetes: The IMPACT Study

Tyger Lin, Jacquelyn A. Manfredo, Nicole Illesca, Kai Abiola, Nearry Hwang, Sandra Salsberg, Yasmin Akhtar, Nestoras Mathioudakis, Elizabeth A. Brown, and Risa M. Wolf

Published Online: 27 Dec 2022 | https://doi.org/10.1089/dia.2022.0347

- Prospective study, Jan 2021 – June 2022
- Inclusion criteria: T1D, ages 5-21years, diabetes >3 months, CGM naïve or no CGM >12 months

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CGM study workflow

CGM offered and placed

Standard CGM education provided

Dexcom G6, Clarity Apps set up;
Dexcom Follow set up for parents;
Connected to clinic Clarity portal

Diabetes Nurse check-in at 5 days, 10 days, 3 months

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Study Participants/Flow

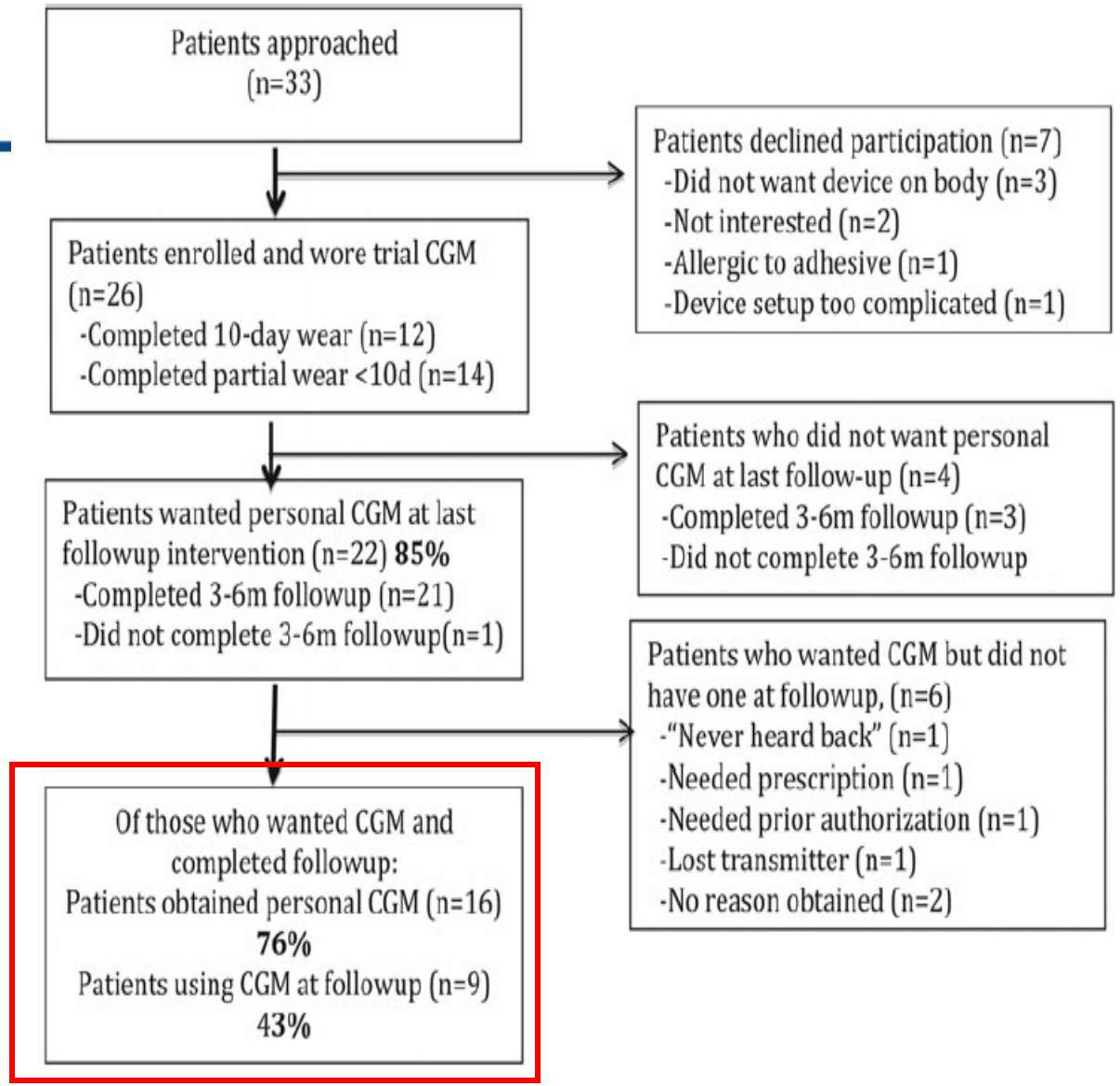

FIG. 1. Participant recruitment and follow-up flowchart.

TABLE 1. CHARACTERISTICS OF PARTICIPANTS WITH TYPE 1 DIABETES AT BASELINE VISIT WHEN TRIAL CONTINUOUS GLUCOSE MONITORING PLACED (*N*=26)

Variable	
Age (years)	14.1 (2.9)
Sex, male, *n* (%)	17 (65.4)
Race/ethnicity, *n* (%)	
NH White	11 (42.3)
NH Black	11 (42.3)
Hispanic	3 (11.5)
American Indian/White	1 (3.8)
Public insurance, *n* (%)	17 (65.4)
Parent education (*n*=24),[a] *n* (%)	
<High school	4 (16.7)
High school completed	12 (50)
>High school	8 (33.3)
Parent income (*n*=21),[a] *n* (%)	
<$50,000	9 (42.9)
$50,000–$100,000	5 (23.8)
>$100,000	7 (33.3)
HbA1c %, mean (SD)	10.7 (2.4)
Duration of DM (years), median (IQR)	4.6 (2.4–7.7)
Diagnosis age (years)	8.4 (3.8)
Insulin pump use, *n* (%)	5 (19.2)
Previous CGM use, *n* (%)	11 (42.3)
Needed compatible smart phone to use CGM, *n* (%)	4 (15.4)

Data are *n* (%) or mean ± SD unless otherwise noted.
[a]Some participants chose not to report information on parental education and income.
CGM, continuous glucose monitoring; IQR, interquartile range; SD, standard deviation.

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Providing Point-of-Care Sample CGM Increases Uptake of Personal CGM

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Keywords
type 1 diabetes, type 2 diabetes, continuous glucose monitors, barriers, underserved youth

90 Received CGM sample

87 had follow-up: 39/87 (45%) using personal CGM

Of the 39 CGM users, 31 had second follow-up where 90% (28/31) had sustained CGM use

Table 1. Descriptive Characteristics of Patients Given Sample CGM ($n = 90$).

Variable	*n* (%)
Male	40 (44.4)
Age in years[a]	14.6 (12.4–16.4)
Race/ethnicity	
NH Black	60 (66.7)
NH White	20 (22.2)
Hispanic	7 (7.8)
Asian	2 (2.2)
Unknown	1 (1.1)
Public insurance	66 (73.3)
Type DM	
Type 1	58 (64.4)
Type 2	32 (35.6)
CGM brand given	
Dexcom G6	33 (36.7)
Freestyle Libre 2	57 (63.3)
Time to first follow-up, days[a] $n = 87$	96 (63–128)
Time to second follow-up, days[a] $n = 70$	202.5 (157–262)
Prior CGM use	34 (37.8)
Dexcom G6	33
Freestyle Libre 2	1

Abbreviations: CGM, continuous glucose monitor; DM, diabetes mellitus; NH, non-Hispanic.
[a]Data reported are median with interquartile range.

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CGM T1D study results

- Placing CGM at the point of care increases uptake of personal CGM
- Study: 85% wanted CGM ->76% obtained CGM ->43% using CGM ---additional barriers exist
- Clinic samples: 45% using personal CGM at follow-up

CGM use in 2022

Pediatric Patients with T1DM

	Full Cohort	Minority	Non-minority	*p*-value	Public Insurance	Private Insurance	*p*-value	Underserved	Other	*p*-value
	N=787	N=248	N=539		N=262	N=525		N=359	N=428	
CGM*, N (%)	618 (78.5)	158 (63.7)	460 (85.3)	<.0001	174 (66.4)	444 (84.6)	<.0001	245 (68.2)	373 (87.1)	<.0001
CGM + pump, N (%)	410 (52.1)	69 (27.8)	341 (63.3)	<.0001	76 (29.0)	334 (63.6)	<.0001	120 (33.4)	290 (67.8)	<.0001
HbA1c %, mean ± SD	8.5 ±1.9	9.4 ± 2.3	8.1 ± 1.6	<.0001	9.3 ± 2.3	8.1 ±1.6	<.0001	9.2 ± 2.9	7.9 ± 1.5	<.0001

T1DM=type 1 diabetes mellitus; Minority=Black or Hispanic; Public insurance=Medicare or Medicaid; Underserved=Minority and/or public insurance; *CGM with or without insulin pump; SD=standard deviation; N=number of unique patients.

Adult Patients with T1DM

	Full Cohort	Minority	Non-minority	p-value	Public insurance	Private Insurance	p-value	Underserved	Other	p-value
	N=1,645	N=369	N=1,276		N=319	N=1326		N=569	N=1,076	
CGM*, N (%)	898 (54.6)	134 (36.3)	764 (59.9)	<0.001	135 (42.3)	763 (57.5)	<0.001	233 (40.9)	665 (61.8)	<0.001
CGM + pump, N (%)	639 (38.8)	74 (20.1)	565 (44.3)	<0.001	80 (25.1)	559 (42.2)	<0.001	139 (24.4)	500 (46.5)	<0.001
A1c %, mean ±SD	8.2 ±1.7	9.3 ±2.0	7.9 ±1.4	<0.001	8.7 ±1.9	8.1 ±1.6	<0.001	8.9 ±1.9	7.8 ±1.4	<0.001

T1DM= type 1 diabetes mellitus; Minority= Black or Hispanic; Public insurance = Medicare or Medicaid; Underserved= Minority and/or public insurance; *CGM with or without insulin pump; SD= standard deviation; N= number of unique patients.

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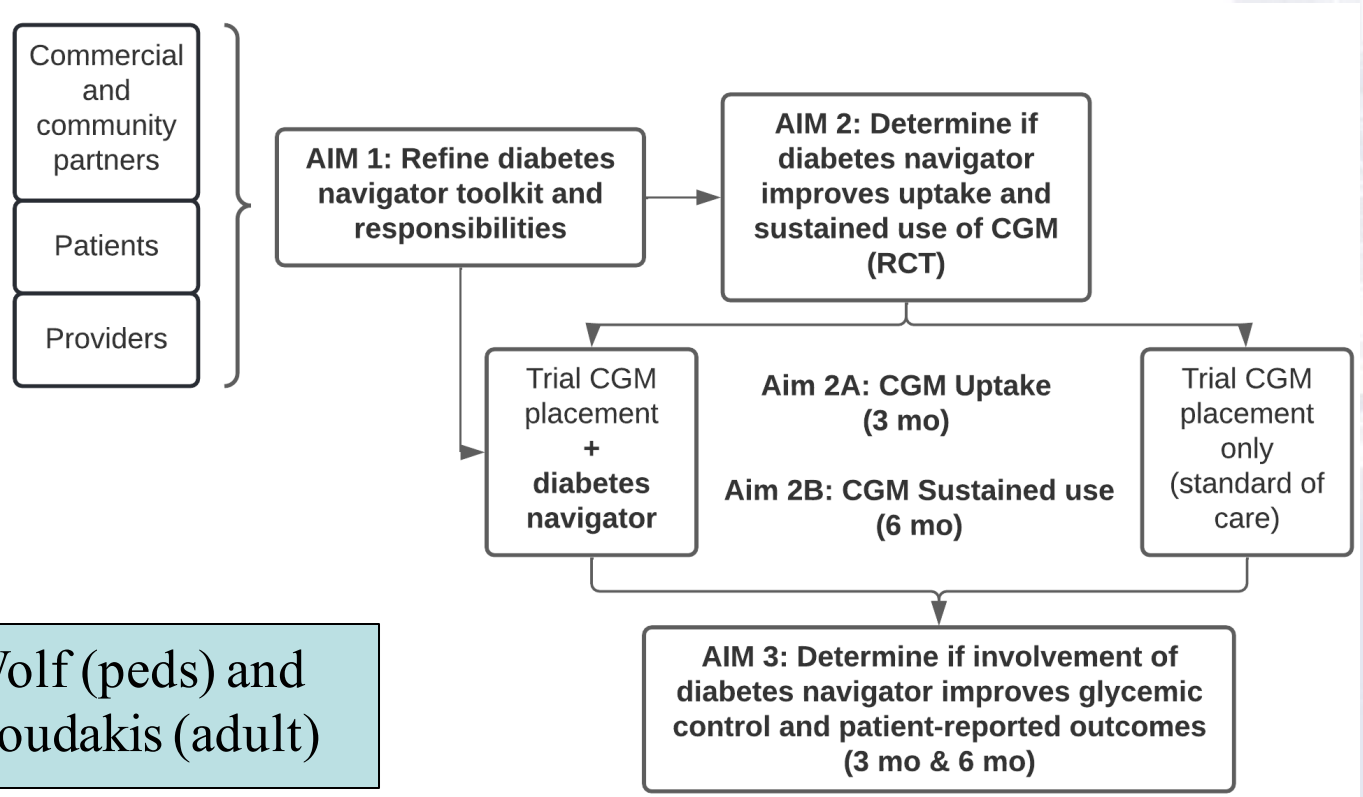
IMPACT proposal and study

AIM: To determine if the **support of a diabetes navigator can improve uptake and sustained use of CGM and diabetes technologies** compared to the standard of care, and if the diabetes navigator model is acceptable and feasible in the real-world setting.



PIs: Dr Wolf (peds) and Dr Mathioudakis (adult)

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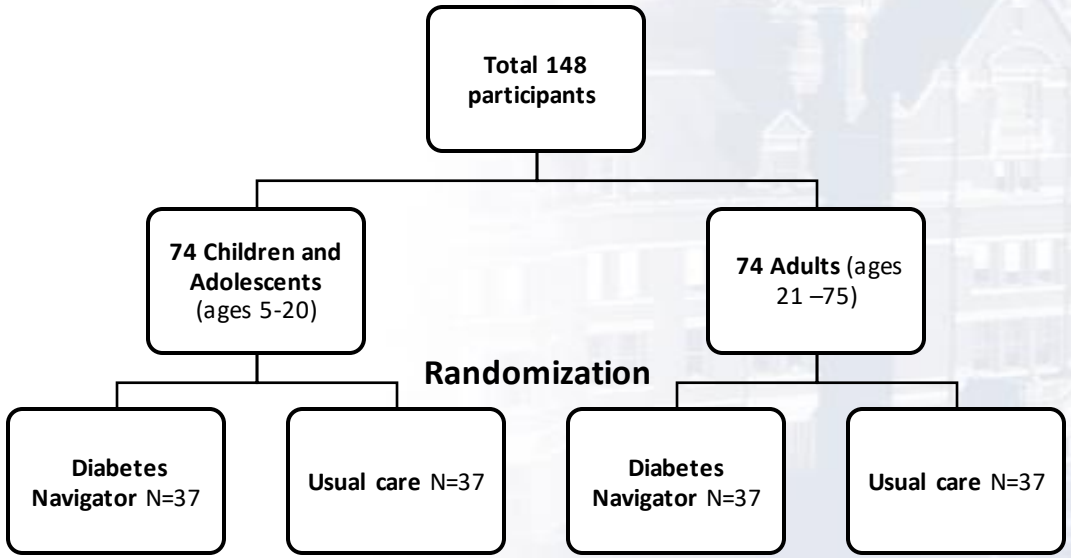
IMPACT Randomized Controlled Trial

- Participants randomized to:
  - Diabetes navigator arm
  - Standard of care arm
- Enrolled during provider or educator visits
- 148 total participants
  - 74 adults
  - 74 children and adolescents
- Participant duration : 6 months



Navigator Arm vs Standard Care Arm

Navigator Arm	Standard Care
Usual care + Diabetes Navigator **The diabetes navigator will:** • Provide individualized support for effective uptake and use of technology. • Address any issues with insurance, technology, and providers. • Facilitate communication. • Provide ongoing support for any ADT-related issues.	**Usual care :** Provided by the nurse and diabetes educator • Standardized education to support patients in initiation or use of diabetes technologies. • Diabetes education and support • Trial CGM placement at the point-of-care if currently offered in the participating clinic

Racial Disparities in Access and Use of Diabetes Technology Among Adult Patients With Type 1 Diabetes in a U.S. Academic Medical Center

Sarah Kanbour,[1] Marissa Jones,[1] Mohammed S. Abusamaan,[1] Caitlin Nass,[1] Estelle Everett,[2] Risa M. Wolf,[3] Aniket Sidhaye,[1] and Nestoras Mathioudakis[1]

Diabetes Care 2023;46:56–64 | https://doi.org/10.2337/dc22-1055

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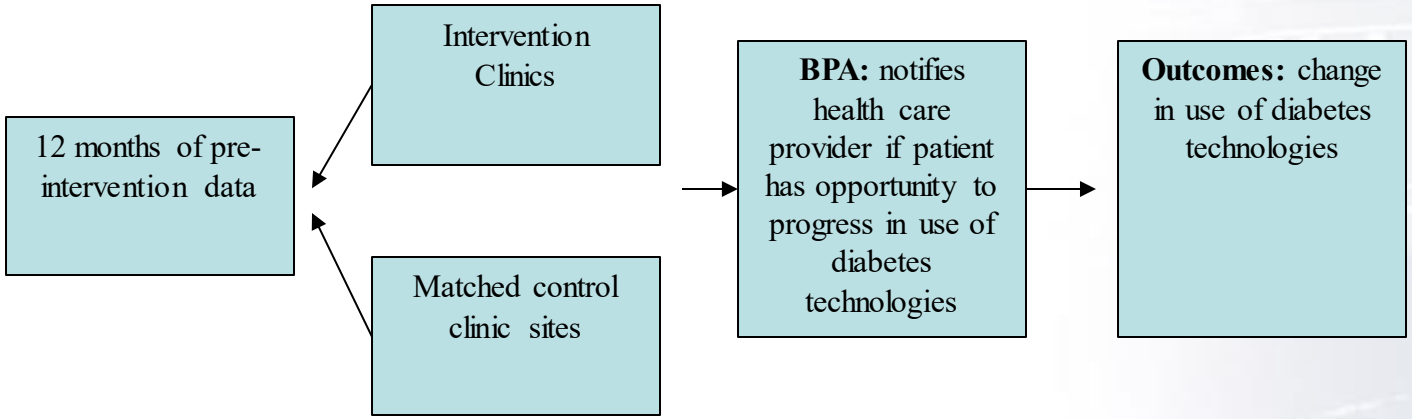
JDRF Health Equity BPA Project

- Aim: To evaluate the effectiveness of a Best Practice Advisory (BPA) in the EHR to reduce disparities in use of advanced diabetes technologies.



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Questions?

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