T1D Exchange Quality Improvement (T1DX-QI) Pediatric Quality Metrics 2023-2025

This document outlines quality measures for Pediatric centers in the T1DX-QI network.

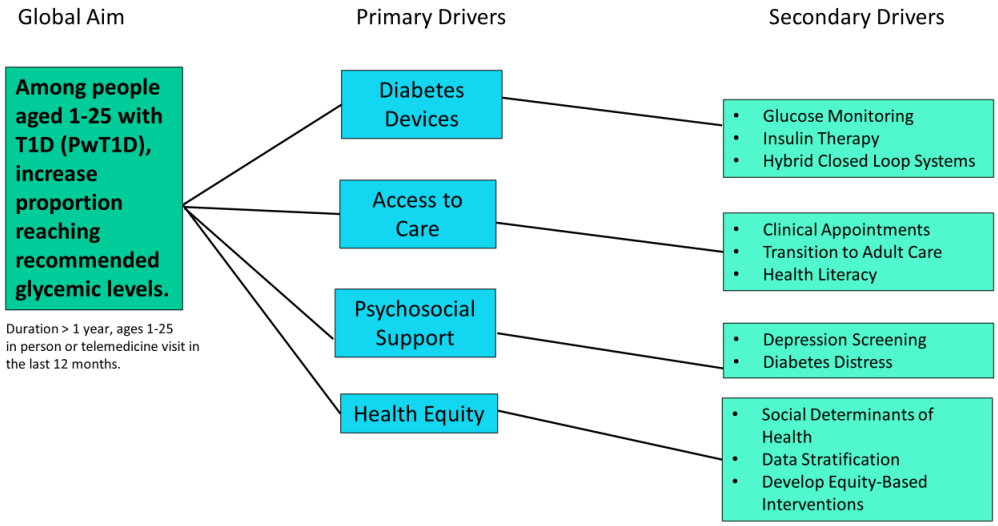
These data reported allow for benchmarking and quality improvement (QI) projects. For questions, email qi@t1dexchange.org or ask your center assigned T1DX-QI coach. We acknowledge that your center may not be able to report all the measures outlined in this document.

Aim Statement for 2023-2025

Among people aged 1-25 with T1D (PwT1D), increase proportion reaching recommended glycemic levels.

1. Optimize glycemic outcomes as measured by HbA1C.
    a. Increase % of people with HbA1c <7 by 5%.
    b. Decrease % of people with HbA1c >9 by 5%.
2. Optimize glycemic outcomes as measured by TIR.
    a) Increase % of people with Time in Range >70% by 5%.
    b) Increase % of people with Time in Range >50% by 10%.
    c) Decease % of people with Time below Range (<70 mmol/dL) >4% by 5%.

Key Driver Diagram



Denominator (A): People 1–25 years of age with type 1 diabetes[1] (minimum duration ≥ 12 months) with at least 1 HbA1c values in the preceding 12 months, and a diabetes related visit (in-person or telemedicine) from the reporting month)

Numerator:

1. HbA1c
    a. Number of PwT1D in (A) with HbA1c <7 (Most recent HbA1c)
    b. Number of PwT1D in (A) with HbA1c >9 (Most recent HbA1c)
    c. Median HbA1c for all PwT1D
2. Continuous Glucose Monitor (CGM)[2]:
    a. Number of PwT1D in (A) using CGM
    b. Number of PwT1D in (A) using CGM at using at least 14 days, 70% of the time in the reporting month
    c. Number of PwT1D in (3) with Time in Range (70-180 mg/dL) >50%
    d. Number of PwT1D in (3) with Time in Range (70-180 mg/dL) >70%
    e. Number of PwT1D in (3) with Time below Range (less than 70 mg/dL) <4%
3. Insulin Delivery: The number in (A) with evidence of:
    a. Insulin delivery system use including:
        i. Pumps
        ii. Open Loop
        iii. Closed loop/AID/HCL
    b. AID/HCL
    c. Smart or Connected Pen use
4. Depression Screening
    a. Number in A (12 years and older) who have not had depression screening in the last 12 months.
    b. Number in (5a) who have been screened for depression (PHQ-2, 4, 8or 9)
    c. Number in (5b) that screened positive for depression (PHQ8/PHQ-9 score above 10)
    d. Number in (5c) that received a behavioral health referral.
    e. Number in (5d) who received referral and kept their behavioral health visit.
5. Diabetes Ketoacidosis (DKA)[4] Hospitalization: -Number in (A) with at least one DKA hospitalization in the last 12 months.
6. Severe Hypoglycemia (SHE) Hospitalization: Number of patients A) with at least one SHE hospitalization in the last 12 months.
7. Transition plan
    a. Number of patients in (A) age 16 and older
    b. Number of patients in (6a) with the documented transition plan in the last 12 months
8. Social Determinant of Health Screening
    a. Food Insecurity: Number in (A) asked at least one of the questions below or similar questions.
        1. Within the past 12 months we worried whether our food would run out before we got money to buy more."
        2. Within the past 12 months the food we bought just didn't last and we didn't have money to get more."
            i. Number in (6a) who answered Yes to 6a 1 or 2.
            ii. Number in (6ai) who received a referral for food resources

Optional Measures. These elective measures should only be done after completing Measures 1-8

9. Economics
    a. Number in A who have been screened for financial needs: How hard is it for you to pay for the very basics like food, housing, medical care, and heating? [Sample Responses: Very hard, Hard, somewhat hard, not very hard, Not hard at all, Patient refused, Not asked]
    b. The number in A for the reporting month who have been screenedfor medication affordability. Are you able to afford your medication?
        i. Yes; 2. No
10. Transportation
    a. Number of A who have been screened for transportation needs. Inthe past 12 months, has lack of transportation kept you from medical appointments or from getting medication?
        i. Yes; 2. No
    b. In the past 12 months, has lack of transportation kept you from meetings, work orfrom getting things needed for daily life?
        i. Yes; 2. No
11. Housing
    a. Number of (A) for the reporting month who have been screened forhousing needs. What is your housing situation today?
        i. I have a steady place to live
        ii. I have a stead place to live today, but I am worried about it in the future
        iii. I do not have a steady place to live (I am temporarily staying with others,in a hotel, in a shelter, living outside on the street, on a beach, in a car, abandoned building, bus or train station, or in a park)
        iv. Unknown
    b. In the last 12 months, was there a time when you were not able to pay the mortgage or rent on time?
        i. Yes 2. No
12. Tobacco The number (A) seen in the reporting month who have been screened for tobacco use in the past year.
        i. Never, ii. Current (within past month); iii. Past (ever); iv. Tried once
13. Number in (A) seen in the reporting month who have been screened for distress in the past year. Do you feel stressed – tense, restless, nervous, or anxious, or unable to sleep at night because your mind is troubled all the time – these days?
        i. Not at all; ii Only a little; iii to some extent; iv Rather much; v Very much
14. Number in (A) seen in the reporting month who have been screened for isolation in the past year. Social: how often do you feel isolated from others?
        i. Never, ii Rarely; iii Sometimes; iv Often; v Always

Health Equity Measures:

15. Number in (A) with at least one in person or virtual visit in the reporting month.
    a. Number in (15A) by race and ethnicity.
        1. NH White
        2. NH Black
        3. Hispanic

1. Asian
2. Other
3. Not Reported

b. Number in (15A) by insurance type.

1. Public
2. Private
3. Uninsured
4. Other

16. Number in (A) who reported using insulin pump during the reporting month.
    a. Number in (16A) by race and ethnicity.
        1. NH White
        2. NH Black
        3. Hispanic
        4. Asian
        5. Other
        i. Not Reported
    b. Number in (16A) by insurance type.
        1. Public
        2. Private
        3. Uninsured
        4. Other
17. Number in (A) who were not on pump previously, were prescribed insulin pump in the reporting month.
    a. Number (17A) by race and ethnicity.
        1. NH White
        2. NH Black
        3. Hispanic
        4. Asian
        5. Other
        6. Not Reported
    b. Number in (17A) by insurance type
        1. Public
        2. Private
        3. Uninsured
        4. Other

Screening and Monitoring:

18. Number in (A) wo have been screened for T1D antibodies.
19. Number in (A) that have been screened and confirmed positive for antibodies (GAD65, Anti-IA2, Tyrosine Phosphatases IAS and IA 2β, ZNT8)
    a. Number in (19A) confirmed for single autoantibody.
    b. Number in (19A) confirmed for multiple antibodies.

20. Number in (A) who have multiple islet autoantibodies, normal blood glucose.
21. Number in A who have multiple islet autoantibodies, abnormal glucose tolerance OR HbA1c 5.7-6.4%
    a. Number in (21A) offered Teplizumab prescription.
22. Number in (20A and 21A) with a scheduled endocrinologist.
23. Number of individuals in (A) monitored for T1D diagnosis in last 12 months who have a DKA in reporting month.

i.

Appendix:

Type 1 Diabetes Diagnosis Inclusion criteria

Eligible patients meet one or more of the following criteria [1]:

- Positive for autoimmune marker:
    - GAD (GAD65)
    - Tyrosine Phosphatases IA-2 and IA-2β
    - ZnT8, OR
- T1D diagnosis determined using clinical judgment, OR
- Idiopathic Type 1 diabetes (negative autoantibodies but with permanent insulinopenia and prone to ketoacidosis)

Test or condition	Type of code	ICD/LOINC Code
GAD65 autoimmune marker	LOINC	13926-1; 56540-8; 58451-6; 81725-4; 72523-4
Idiopathic type 1 diabetes (Type 1 diabetes mellitus without complications	ICD-10	E10.9
Type 1 Diabetes Mellitus with Hyperglycemia	ICD	10.65
Tyrosine Phosphatases IA-2 and IA-2β autoimmune marker	LOINC	31209-0; 56718-0; 81155-4; 32636-3; 70253-0; 70252-2
ZnT8 autoimmune marker	LOINC	76651-9

T1D Exclusion criteria

1. Patients are excluded from the T1D population if they meet any of the below criteria. However, if a patient with T1D is later diagnosed with one of these criteria, they remain included.
    - Cystic Fibrosis related diabetes (CFRD)
    - Steroid induced/Glucocorticoid
    - Genetic evidence of Monogenic Diabetes (MODY)/neonatal diabetes
    - Gestational diabetes
    - Type 2 diabetes

Test or condition	Type of code	ICD/LOINC Code
Cystic Fibrosis	ICD-10	E84.*
Steroid induced/glucocorticoid	ICD-10	E09*
Gestational diabetes	ICD-10	024.*
Monogenic Diabetes (MODY; neonatal diabetes)	ICD-10	P70.2
New Onset of Diabetes Mellitus in Pediatric Patient	ICD-10	E10.9
Type 2 Diabetes	ICD-10	E11. *

2. *CGM use can be patient reported or confirmed through device data download and can be report/measured in multiple ways, including but not limited to:*
    - ❖ *CGM in the medication list within the last 12 months, OR*
    - ❖ *CGM in flow sheet as Yes/No, OR*
    - ❖ *CGM company models updated in the last 12 months (see Table 2 for examples), OR*
    - ❖ *CGM data available (Yes/No, for example from Abbott Libre, Dexcom Clarity, Glooko, or Tidepool, OR*
    - ❖ *Site-specific measure that is accurate and frequently updated*

3. Insulin Pump use can be patient reported or confirmed through device data download and can be reported/measured in multiple ways, including but not limited to:

i. Pump prescribed in the medication list within the last 12 months, OR
ii. Pump use in flow sheets, OR
iii. Pump company models updated in the last 12 months (see Table 2 for examples), OR
iv. Pump data available (Yes/No, for example from Tandem T: Connect, Medtronic Care Link, Glooko, or Tidepool, OR
v. Data download from Medtronic Care Link, Tandem, Glooko, Tidepool, OR
vi. Site-specific measure that is accurate and frequently updated

4. DKA can be measured as:
    - ❖ Electronic Medical Record or patient reported and confirmed by lab result**,** OR
        - ➢ Elevated serum or urine ketones (greater than the upper limit of the normal range), AND
        - ➢ Serum bicarbonate below 15 mmol/L, OR
        - ➢ Blood pH below 7.3.
    - ❖ DKA recorded in problem list during reported month