American Diabetes Association.

The Time is NOW: T1D Screening & Treatment in DSMES

Where to operationalize in the DSMES Cycle?

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The Time is NOW T1D Screening & Treatment in DSMES

Presenters

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University of Oklahoma

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EmpowerMNT

Panelists

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Presenter's and Panelist's Disclosure

- **Joni Beck:**

Speakers Bureau: Sanofi

- **Jo Ellen Condon:**

No current or past relationship with commercial interests

- **Becky Sulik:**

Speakers Bureau: Tzield
Other: Medtronic Tandem, Insulet & Betabionics

- **Jonathan Velez**

Speakers Bureau: Tandem, Sequel & Sanofi
Other: Cequr simplicity

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Commercial Disclosure

- This learning activity has received financial support from Sanofi in the form of educational grant

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Presentation Overview

- Types of Diabetes
- Staging Type 1 Diabetes (T1D)
- Screening
  - Why
  - Who
  - How
- Diabetes Self-Management Education and Support Services (DSMES)
- Summary
- Panel Discussion

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Presentation Objectives

- Identify and describe the three stages of T1D.
- Recognize key signs and symptoms associated with each stage of T1D.
- Understand the role and timing of screening for T1D.
- Discuss the latest developments in T1D therapy, including immune-modulating agents like teplizumab.

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Presentation Objectives continued

- List critical points during the DSMES cycle when Diabetes Care and Education Specialists (DCES) should discuss screening and therapeutic options.
- Emphasize the importance of early detection and intervention to improve outcomes and quality of life for people with T1D.

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Common Types of Diabetes

- **Type 1 diabetes (T1D)**: due to autoimmune β-cell destruction, usually leading to absolute insulin deficiency
- **Type 2 diabetes (T2D)**: due to non-autoimmune progressive loss of β-cell insulin secretion frequently on the background of insulin resistance and metabolic syndrome
- **Gestational diabetes (GDM)**: diagnoses in the second or third trimester of pregnancy
- **Other types of diabetes**: neonatal, monogenic diabetes, cystic-fibrosis related, drug/chemical induced, etc.

Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025. *Diabetes Care*. 2025;48(Suppl 1):S27-49.

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ADA Diagnostic Criteria

Table 2.1—Criteria for the diagnosis of diabetes in nonpregnant individuals

A1C ≥6.5% (≥48 mmol/mol). The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.*
OR
FPG ≥126 mg/dL (≥7.0 mmol/L). Fasting is defined as no caloric intake for at least 8 h.*
OR
2-h PG ≥200 mg/dL (≥11.1 mmol/L) during OGTT. The test should be performed as described by the WHO, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.*
OR
In an individual with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥200 mg/dL (≥11.1 mmol/L). Random is any time of the day without regard to time since previous meal.

DCCT, Diabetes Control and Complications Trial; FPG, fasting plasma glucose; OGTT, oral glucose tolerance test; NGSP, National Glycohemoglobin Standardization Program; WHO, World Health Organization; 2-h PG, 2-h plasma glucose. *In the absence of unequivocal hyperglycemia, diagnosis requires two abnormal results from different tests, which may be obtained at the same time (e.g., A1C and FPG), or the same test at two different time points.

Diagnosis and Classification of Diabetes: Standards of Care in Diabetes—2025. *Diabetes Care*. 2025;48(Suppl 1):S27-49.

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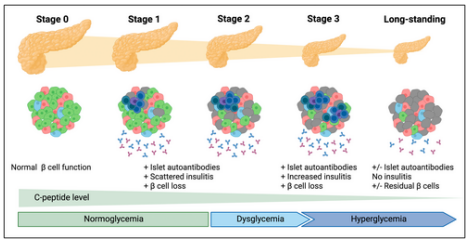
T1D Autoimmune Destruction of Pancreatic β-cells Over Time



- Reduction in pancreas volume
- Pancreatic islets at different stages of destruction
- Islet autoantibodies signal damage
- Inflammation/insulitis leads to further cell loss
- C-peptide decreases; normoglycemia cannot be maintained

Aamodt KI, Powers AC. The pathophysiology, presentation, and classification of type 1 diabetes. *Diabetes Obes Metab.* 2025;27(Suppl 6):15-27. doi:10.1111/dom.16628

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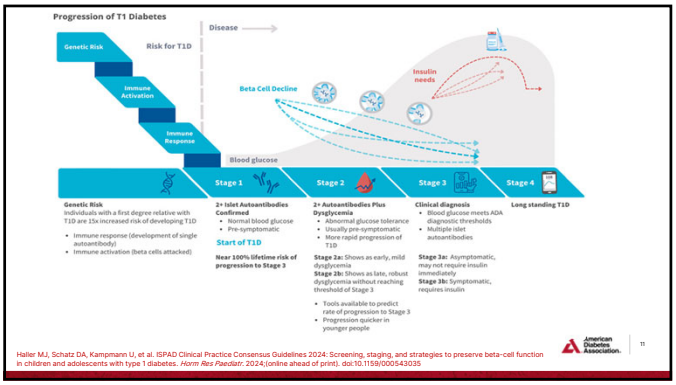

Haller MJ, Schatz DA, Kampmann U, et al. ISPAD Clinical Practice Consensus Guidelines 2024: Screening, staging, and strategies to preserve beta-cell function in children and adolescents with type 1 diabetes. *Horm Res Paediatr.* 2024;(online ahead of print). doi:10.1159/000543035

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Screening: Why?

1) Prevent diabetic ketoacidosis (DKA): Emergency room (ER) care or hospitalization
2) Identify those who may qualify for therapeutic interventions
   - Delay Stage 3 T1D
   - Prolong β Cell function
3) Explore clinical research options
4) Avoid an incorrect diagnosis
5) Inform the start of insulin

Consensus Guidance for Monitoring Individuals With Islet Autoantibody-Positive Pre-Stage 3 Type 1 Diabetes. Diabetes Care. 2024;47(8):1-23.

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Phillip M, Smart C, Corathers S, et al. Consensus guidance for monitoring individuals with islet autoantibody–positive pre–stage 3 type 1 diabetes. *Diabetes Care*. 2024;47(8):1-23.

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Prevent DKA: ER or Hospitalization

Avoid a DKA

- Up to 62% of persons diagnosed with T1D have DKA at the time of their diagnosis
- Avoid negative medical consequences of DKA
  - Acute (cerebral edema, neurocognitive, etc.)
  - Long-term data emerging – hemoglobin A1c (A1c)
    - Especially severe DKA – higher insulin needs, higher body mass index and more additional DKA episodes at 2 years
  - Less residual β cell function
    - Preserving residual endogenous insulin secretion is tied to less glycemic variability & improved glycemic outcomes

Sims EK, Bundy BN, Stier K, et al. *Diabetes*. 2022;71(4):610-623.; American Diabetes Association. Standards of Care in Diabetes—2025. *Diabetes Care*. 2025;48(suppl 1):S27-S49; Alonso GT, Corathers SD, Shah AS, et al. Increased incidence of diabetic ketoacidosis at diagnosis among youth with type 1 diabetes. *Diabetes Care*. 2020;43(1):117-121; Dovc K, Neuman V, Gita G, et al. Association of diabetic ketoacidosis at onset, diabetes technology uptake, and clinical outcomes after 1 and 2 years of follow-up: a collaborative analysis of pediatric registries involving 9,269 children with type 1 diabetes from nine countries. *Diabetes Care*. 2025;48(4):648-654. doi:10.2337/dc24-2483; Marcovecchio ML, Hendriks AEJ, Delfin C, et al. The INNODIA Type 1 Diabetes Natural History Study: a European cohort of newly diagnosed children, adolescents and adults. *Diabetologia*. 2024;67:995-1008.

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Screening: Why?

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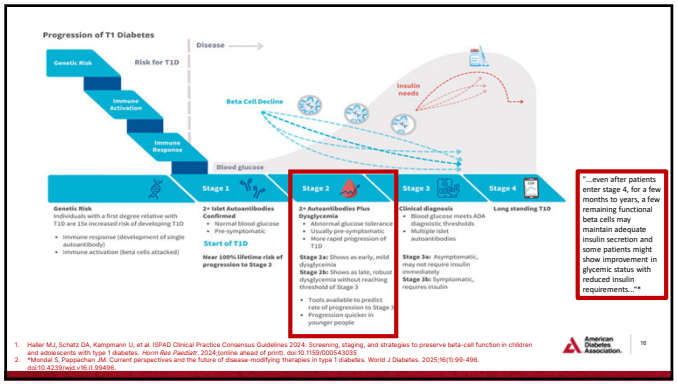

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Progression of T1D

- Without intervention, progressive loss of endogenous insulin production over time
- **Stage 2 to Stage 3 T1D**
  - 2 years: ~ 60%
  - 4-5 years: ~ 75%
  - Lifetime: ~ 100%

"...not a matter of if; but when..."

1. Insel RA, Dunne JL, Atkinson MA, et al. Staging presymptomatic type 1 diabetes: A scientific statement of JDRF, the Endocrine Society, and the American Diabetes Association. *Diabetes Care*. 2015;38(10):1964-1974. doi:10.2337/dc15-1419.
2. van Belle TL, Coppieters KT, von Herrath MG. Type 1 diabetes: Etiology, immunology, and therapeutic strategies. *Physiol Rev*. 2011;91(1):79-118. doi:10.1152/physrev.00003.2010.
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Identify Those Who May Qualify for Therapeutic Treatment

- Stage 2 T1D; ≥ 2 or more autoantibodies and dysglycemia

	MEASURE	Stage 1 T1D NORMOGLYCEMIA	Stage 2 T1D DYSGLYCEMIA	Stage 3 T1D CLINICAL DIABETES
A	Fasting plasma glucose (NO intake for at least 8 h)	<100 mg/dL (< 5.6 mmol/L)	IFG: 100-125 mg/dL (5.6-6.9 mmol/L)	≥ 126 mg/dL (≥ 7.0 mmol/L)
B	2-h plasma glucose during OGTT	< 140 mg/dL (< 7.8 mmol/L)	IGT: 140-199 mg/dL (7.8-11.0 mmol/L)	≥ 200 mg/dL (≥ 11.1 mmol/L)
C	A1c*	< 5.7 % (< 39 mmol/mol)	5.7 – 6.4 % (39-47 mmol/mol) or ≥ 10% increase in A1c	≥ 6.5 % (≥ 48 mmol/mol)
D	Random plasma glucose (in patient with hyperglycemic crisis or classic symptoms of hyperglycemia)			≥ 200 mg/dL (≥ 11.1 mmol/L)

IFG: impaired fasting glucose
IGT: impaired glucose tolerance
OGTT: oral glucose tolerance test (performed as described by the World Health Organization [1.75 g glucose/kg up to a maximum of 75 g]

Stop T1D Program. Module 1. Available at: https://www.stopt1dprogram.org/hcp-directory/module-1. Accessed January 21, 2026.
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Tzield™; Monoclonal Antibody

***INDICATIONS AND USAGE** ----------

TZIELD is a CD3-directed antibody indicated to delay the onset of Stage 3 type 1 diabetes (T1D) in adults and pediatric patients aged 8 years and older with Stage 2 T1D

- Infusion for 14 consecutive days (Stage 2)
  - 30-minute infusion (~ 2-3 hours/day)
- Primary side effects include:
  - Lymphopenia
  - Rash
  - Leukopenia
  - Headache
- Proactively discuss how to mitigate side effects

*TZIELD ™ (teplizumab-mzwv) injection. Prescribing Information. Red Bank, NJ: Provention Bio, Inc.; *2022*.
**Mehta S, et al. Pediatric Endocrine Society statement on considerations of use of teplizumab (Tzield ™) in clinical practice. *Horm Res Paediatr*. 2024. doi:10.1159/000538775.

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Explore Clinical Research Options

- Research Opportunities
  - Stage 2
  - Stage 3
    - Several ongoing with various enrollment criteria
- Refer those interested
  - Diabetes specialist
  - Endocrinologist
  - Research center
  - Academic medical center

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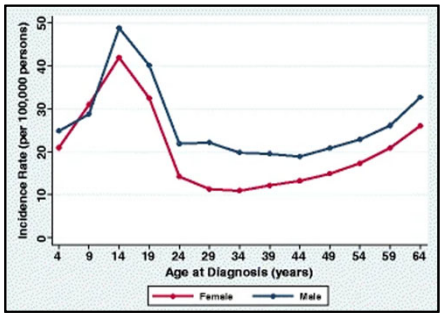

Fig 1: Incidence rates for type 1 diabetes by age at diagnosis and sex, United States, 2001-2015

Roger MAM, et al. Type 1 diabetes in adults: misdiagnosis and clinical characteristics. *BMC Med.* 2017;15(1):199.

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Age of Autoantibody Development & Stage 3 T1D in Children

- The Environmental Determinants of Diabetes in the Young (TEDDY)
  - Showed detection of autoantibodies peaked between 9 months and 2 years of age in genetically at-risk person
- Average age for the diagnosis of T1D
  - Generally, two peak age ranges:
    - 4-7
    - 10-14
- Opportunity to intervene!

1. Ziegler AG, Bonifacio E. Age-related islet autoantibody appearance and progression to type 1 diabetes in young children. *Diabetologia.* 2012;55(7):1937-1943.
2. Krischer JP, Liu X, Lernmark Å, et al. Characteristics of children diagnosed with type 1 diabetes before vs after participating in longitudinal screening. *Diabetologia.* 2015;58(5):980-987.

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Misdiagnosis of Other Types of Diabetes?

- Most diagnosed with T1D are adults (~ 59%)
- Over 40% of adults over 30 are initially diagnosed with T2DM
- Risk of misdiagnosis increases with age

- Consider screening:
  - Not classic phenotype
  - Not achieving glucose outcomes despite medications
  - Other autoimmune conditions

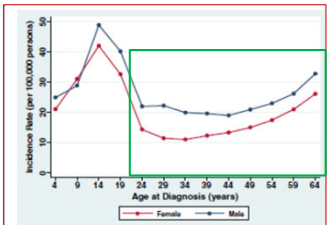

Fig. 1 Incidence rates for type 1 diabetes by age at diagnosis and sex, United States, 2001–2015

1. Roger MAM, et al. Type 1 diabetes in adults: misdiagnosis and clinical characteristics. *BMC Med.* 2017;15(1):193.
2. Munoz C, et al. Identifying type 1 diabetes in adults: misclassification and clinical costs. *Clin Diabetes.* 2016;31(3):376–381.
3. Mancio AL, et al. Perspectives on diabetes management. *Cureus.* 2022;15(7):e41658. *The Lancet Regional Health-Europe.* Trends in diabetes research. *Lancet Reg Health Eur.* 2023;29:100661.

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Inform the Start of Insulin

- Education and empower
  - Medical interpretation of results
    - Next steps for monitoring
  - Explanation of signs, symptoms, and general management
  - Understand resources
    - Specialty referrals – when and how
    - Support services
      - Diabetes educators
      - Medical nutrition therapy
      - Psychological resources and support

Phillip M, et al. Consensus guidance for monitoring individuals with islet autoantibody-positive pre-stage 3 type 1 diabetes. *Diabetes Care.* 2024;47(8):1-23.

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Who to Screen?

- Relatives of patients with T1D
  - First-degree family members have a ~ 15x greater risk of T1D versus the general population
- Those with a personal/family history of certain autoimmune diseases
  - Thyroid
    - Hashimoto's thyroiditis ~ 2.4x
    - Graves' disease ~ 3x
  - Celiac disease ~2.5x
- Questionable diabetes diagnosis

1. Edelman SV, et al. Presented at the European Association for the Study of Diabetes (EAS) 2024 Annual Meeting; Madrid, Spain. Presentation No. 114.
2. Phillip M, Smart C, Corathers S, et al. Consensus guidance for monitoring individuals with islet autoantibody-positive pre–stage 3 type 1 diabetes. *Diabetes Care*. 2024;47(8):1-23.
3. T1eld HCP. How to Screen for Type 1 Diabetes. Adapted from: https://www.t1eldhcp.com/pdf/how-to-screen.pdf. Accessed January 21, 2026.

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General Population Screening?

- **Early identification, monitoring and regular follow-up of high-risk individuals can decrease DKA rates from as high as 62% down to 4-6%***
  - Reduce A1c
  - Reduce long-term complications
- Many European nations have research and/or regional initiatives for widespread early detection
- US – Screening for autoantibodies is recommended
  - ADA
  - International Society for Pediatric and Adolescent Diabetes (ISPAD)
  - Breakthrough T1D
- Other organizations are reviewing recommendations

*Sims EK, Bundy BN, Stier K, et al. *Diabetes*. 2022;71(4):610-623.; American Diabetes Association. *Standards of Care in Diabetes—2026. Diabetes Care*. 2026;49(suppl 1):S1-S371; Breakthrough T1D. Available at: https://www.breakthrought1d.org. Accessed January 16, 2026; Haller MJ, Schatz DA, Kanapruan U, et al. ISPAD Clinical Practice Consensus Guidelines 2024: Screening, staging, and strategies to preserve beta-cell function in children and adolescents with type 1 diabetes. *Horm Res Paediatr*. 2024;[online ahead of print]. doi:10.1159/000543035

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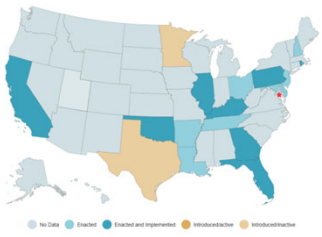
Diabetes Patient Advocacy Coalition

- Legislative action to enact screening laws
- Assist individuals and families in accessing T1D screening



Getting Ahead of Type 1. *State Screening Legislation Map*. Available at: https://www.gettingaheadoftype1.org/map. Accessed January 15, 2026.

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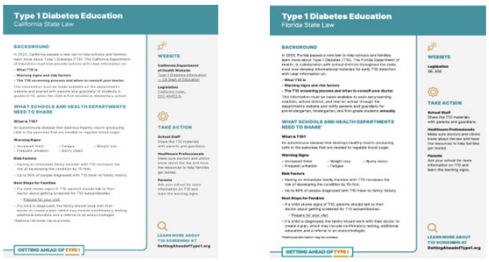

Getting Ahead of Type 1. *State Screening Legislation Map*. Available at: https://www.gettingaheadoftype1.org/map. Accessed January 15, 2026.

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How? Find your Local Screening Options

Doctor's office or lab = need order by health care provider	Blood draw	Most insurance plans cover some or all of the cost; all ages	GADA, IAA, IA-2A, ZnT8
ASK (Autoimmunity Screening for Kids) – T1D & Celiac	Blood draw or fingerstick	Research-based; no cost for 1-17 with or without a family history of T1D	GADA, IAA, IA-2A, ZnT8
TrialNet – T1D	Blood draw or fingerstick	Research-based; no cost; 2-45 1st degree relative; 2-20 2nd degree relative; anyone with 1 + antibody	Initial GADA and IAA; A1-2A, ZnT8 and ICA
Online ordering (Enable Biosciences)	Fingerstick	Approximately ~ $100/kit; ages 1 and older	GADA, IAA, IA-2A

GADA = glutamic acid decarboxylase autoantibody, IA-2A = islet antigen 2 autoantibody, IAA = insulin autoantibody, ZnT8 = zinc transporter 8 autoantibody, ICA = islet cell autoantibody.

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Stop T1D Program. Module 4: Screening Options. Available at: https://www.stopt1dprogram.org/hcpdirectory/module-4. Accessed January 21, 2026.

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Monitoring:

Guidance from Breakthrough T1D and Barbara Davis Center

- **Children:**
  - Screening ages concurrent with well-child visits
    - 1-2, 4-6, 11-13
      - (2, 6, 10 = easy to recall)
  - If negative:
    - Rescreen those with increased risk in 1 year
    - All others; 6 and 10 years
  - If positive:
    - Confirmatory test
      - < 3, rescreen every 6 months x 3 years then annually x 3 years
        - If no additional antibodies; stop screening
      - > 3, rescreen annually x 3 years
        - If no additional antibodies; stop screening
  - ≥ 2 Antibodies; collaborate and/or refer to specialist

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T1eld HCP. How to Screen for Type 1 Diabetes. Adapted from: https://www.t1eldhcp.com/pdf/how-to-screen.pdf. Accessed January 21, 2026.

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Monitoring:

Guidance from Breakthrough T1D and Barbara Davis Center

- **Adults:**
  - Screen during a routine clinic visit
  - If negative:
    - Rescreen those with increased risk in 1 year
  - If positive:
    - Confirmatory test
      - For patients with increased risk
        - Implement a type of monitoring
          - A1c, OGTT, meter, CGM, etc.
        - Screen annually
      - All others
        - Rescreen in 3 years
  - ≥ 2 Antibodies; collaborate and/or refer to specialist

Tzield HCP. How to Screen for Type 1 Diabetes. Adapted from: https://www.tzieldhcp.com/pdf/how-to-screen.pdf. Accessed January 21, 2026.

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Monitoring: New Recommendation

- ADA Standards of Care in Diabetes – 2026
- Standard 2.9

> **2.9** Individuals with a single confirmed IA-2 autoantibody should be monitored similarly to individuals with multiple islet autoantibodies, as IA-2 autoantibody positivity is an independent risk factor for progression. **B** Individuals with a single confirmed islet autoantibody should undergo repeat antibody testing every 6 months to 3 years (depending on age) to assess for persistence or seroconversion. **E**

- *SINGLE* IA-2 autoantibody

American Diabetes Association. *Standards of Care in Diabetes—2026.* Diabetes Care. 2026;49(suppl 1):S1-S371.

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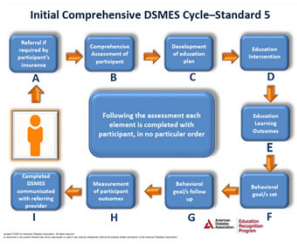
Staging, Screening & Monitoring Summary

- Types of Diabetes
- Staging T1D
- Screening
  - Why
  - Who
  - How
- **DSMES**
- **Summary**
- **Panel Discussion**



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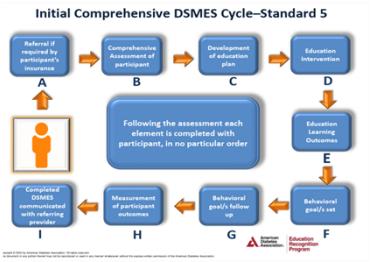
Operationalizing T1D Screening & Staging into the DSMES Standards and Cycle



DSMES

Educating all people affected by diabetes about T1D

- Stage 1
- Stage 2
- Stage 3
- Stage 4

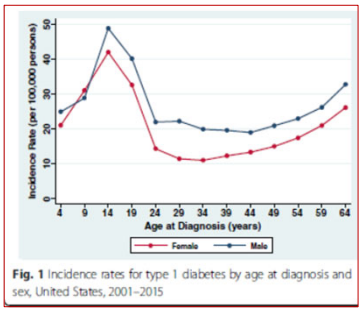


Fig. 1 Incidence rates for type 1 diabetes by age at diagnosis and sex, United States, 2001–2015

2022 National Standards for DSMES

Six Standards

- Standard 1: ***Support for DSMES Services***
- Standard 2: ***Population and Service Assessment***
- Standard 3: ***DSMES Team***
- Standard 4: ***Delivery and Design of DSMES Services*** ←
- Standard 5: ***Person-Centered DSMES Services***
- Standard 6: ***Measuring and Demonstrating Outcomes of DSMES Services***

2022 National Standards for DSMES

Standard 1: ***Support for DSMES Services***

- Communicate with your external service stakeholders
- Invite new stakeholders such as:
  - Primary care physicians, pediatricians and providers who may have patients that meet the screening criteria
  - Infusion center associates
  - Patients or family members who have been screened, staged, etc.
  - School health representative
  - T1D therapeutic specialists

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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2022 National Standards for DSMES

Standard 2: ***Population and Service Assessment***

- Evaluate and assess if the service has:
  - **Current** T1D screening and staging education materials and resources
  - Referral pathways for patients or family members who want to be screened
  - Explored opportunities to educate people in general who meet the screening criteria about T1D screening
  - Behavioral health support team members or/and referral options
  - Added the ICD-10 codes for T1D stages have been added to referral form

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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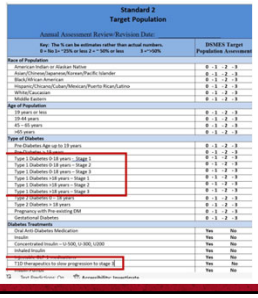
2022 National Standards for DSMES

Standard 2: ***Population and Service Assessment*** - **Standard 2 template update**


Standard 2
Target Population

Annual Assessment Review/Revision Date:

Key: The % can be estimates rather than actual numbers. 0 = No 1= ~25% or less 2 = ~ 50% or less 3 =~>50%	DSMES Target Population Assessment
Race of Population	
American Indian or Alaskan Native	0 - 1 - 2 - 3
Asian/Chinese/Japanese/Korean/Pacific Islander	0 - 1 - 2 - 3
Black/African American	0 - 1 - 2 - 3
Hispanic/Chicano/Cuban/Mexican/Puerto Rican/Latino	0 - 1 - 2 - 3
White/Caucasian	0 - 1 - 2 - 3
Middle Eastern	0 - 1 - 2 - 3
Age of Population	
19 years or less	0 - 1 - 2 - 3
19-44 years	0 - 1 - 2 - 3
45 – 65 years	0 - 1 - 2 - 3
65 + years	0 - 1 - 2 - 3
Type of Diabetes	
Pre-Diabetes Age up to 19 years	0 - 1 - 2 - 3
Pre-Diabetes 19 + years	0 - 1 - 2 - 3
Type 1 Diabetes 0-18 years – Stage 1	0 - 1 - 2 - 3
Type 1 Diabetes 0-18 years – Stage 2	0 - 1 - 2 - 3
Type 1 Diabetes 0-18 years – Stage 3	0 - 1 - 2 - 3
Type 1 Diabetes >18 years – Stage 1	0 - 1 - 2 - 3
Type 1 Diabetes >18 years – Stage 2	0 - 1 - 2 - 3
Type 1 Diabetes >18 years – Stage 3	0 - 1 - 2 - 3
LADA / Diabetes 1 – 18 years	0 - 1 - 2 - 3
Type 2 Diabetes > 18 years	0 - 1 - 2 - 3
Pregnancy with Pre-existing DM	0 - 1 - 2 - 3
Gestational Diabetes	0 - 1 - 2 - 3
Diabetes Treatments	
Oral Anti-Diabetes Medication	Yes No
Insulin	Yes No
Concentrated Insulin – U-500, U-300, U200	Yes No
Pramlintide	Yes No
Glucagon	Yes No
T1D therapeutics to slow progression to stage 3	Yes No

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2022 National Standards for DSMES

Standard 3: ***DSMES Team***

- Evaluate each DSMES team member has current knowledge of T1D
  - Screening
  - Staging
  - DSMES education materials and resources
  - Therapeutic options
  - Referral options for wrap around services

This recorded webinar CEU will be available on ADA's Institute of Learning through the end of 2026

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

1. **Diabetes pathophysiology**
   - Ensure T1D diagnosis, screening, stages therapeutic options are part of this topic
   - Let's review Joni's slide addressing who to screen

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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Who to Screen?

- Relatives of patients with T1D
  - First-degree family members have a ~ 15x greater risk of T1D versus the general population
- Those with a personal/family history of certain autoimmune diseases
  - Thyroid
    - Hashimoto's thyroiditis ~ 2.4x
    - Graves' disease ~ 3x
  - Celiac disease ~2.5x
- Questionable diabetes diagnosis

1. Edelman SV, et al. Presented at the European Association for the Study of Diabetes (EAS) 2024 Annual Meeting; Madrid, Spain. Presentation No. 114.
2. Phillip M, Smart C, Corathers S, et al. Consensus guidance for monitoring individuals with islet autoantibody–positive pre–stage 3 type 1 diabetes. *Diabetes Care*. 2024;47(8):1–23.
3. Tzield HCP. How to Screen for Type 1 Diabetes. Adapted from: https://www.tzieldhcp.com/pdf/how-to-screen.pdf. Accessed January 21, 2026.

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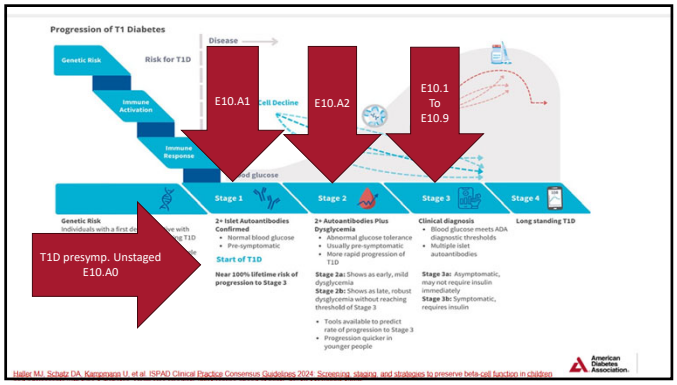

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

1. **Diabetes pathophysiology**
   - T1DM screening autoantibodies
     1. Insulin antibodies (IAA)
     2. Glutamic acid decarboxylase antibodies (GAD)
     3. **Islet antigen 2 antibodies (IA-2A)
     4. Zinc transporter 8 antibodies (ZnT8)

Patient can be advised to ask provider for these test if misdiagnosis suspected.

2.9 Individuals with a single confirmed IA-2 autoantibody should be monitored similarly to individuals with multiple islet autoantibodies, as IA-2 autoantibody positivity is an independent risk factor for progression. **B** Individuals with a single confirmed islet autoantibody should undergo repeat antibody testing every 6 months to 3 years (depending on age) to assess for persistence or seroconversion. **E**

American Diabetes Association. 47

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

1. **Diabetes pathophysiology**
   - Include screening and monitoring cadence
   - Let's revisit Joni's slides

American Diabetes Association. 48

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Monitoring:

Guidance from Breakthrough T1D and Barbara Davis Center

- **Children:**
  - Screening ages concurrent with well-child visits
    - 1-2, 4-6, 11-13
      - (2, 6, 10 = easy to recall)
  - If negative:
    - Rescreen those with increased risk in 1 year
    - All others; 6 and 10 years
  - If positive:
    - Confirmatory test
      - < 3, rescreen every 6 months x 3 years then annually x 3 years
        - If no additional antibodies; stop screening
      - > 3, rescreen annually x 3 years
        - If no additional antibodies; stop screening
  - ≥ 2 Antibodies; collaborate and/or refer to specialist

American Diabetes Association. 49

Tzield HCP. How to Screen for Type 1 Diabetes. Adapted from: https://www.tzieldhcp.com/pdf/how-to-screen.pdf. Accessed January 21, 2026.

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Monitoring:

Guidance from Breakthrough T1D and Barbara Davis Center

- **Adults:**
  - Screen during a routine clinic visit
  - If negative:
    - Rescreen those with increased risk in 1 year
  - If positive:
    - Confirmatory test
      - For patients with increased risk
        - Implement a type of monitoring
          - A1c, OGTT, meter, CGM, etc.
        - Screen annually
      - All others
        - Rescreen in 3 years
  - ≥ 2 Antibodies; collaborate and/or refer to specialist

American Diabetes Association. 50

Tzield HCP. How to Screen for Type 1 Diabetes. Adapted from: https://www.tzieldhcp.com/pdf/how-to-screen.pdf. Accessed January 21, 2026.

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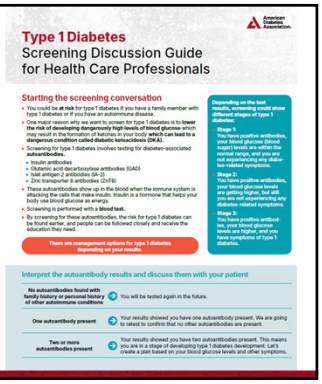
Type 1 Diabetes Screening Discussion Guide for Health Care Professionals

https://professional.diabetes.org/t1dtoolkit



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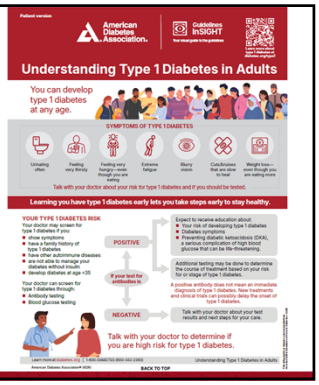
Tools and Resources to Retain Key Education

Understanding Type 1 Diabetes in Adults infograph

https://professional.diabetes.org/t1dtoolkit



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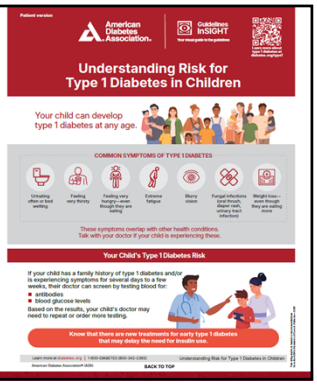
Tools and Resources to Retain Key Education

Understanding Risk for Type 1 Diabetes in Children

https://professional.diabetes.org/t1dtoolkit



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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

2. Healthy eating

3. Being active

Ensure content reflects that while healthy eating and staying active cannot ultimately prevent stage 3 T1D these things are essential in promoting good health at any stage of T1D and for the the population in general

Begin discussion about carbohydrate, label reading, etc..

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2396

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Progression of T1D

- Without intervention, progressive loss of endogenous insulin production over time
- **Stage 2 to Stage 3 T1D**
  - 2 years: ~ 60%
  - 4-5 years: ~ 75%
  - Lifetime: ~ 100%

"…not a matter of if; but when…"

1. Insel RA, Dunne JL, Atkinson MA, et al. Staging presymptomatic type 1 diabetes: A scientific statement of JDRF, the Endocrine Society, and the American Diabetes Association. *Diabetes Care*. 2015;38(10):1964-1974. doi:10.2337/dc15-1419.
2. van Belle TL, Coppieters KT, von Herrath MG. Type 1 diabetes: Etiology, immunology, and therapeutic strategies. *Physiol Rev*. 2011;91(1):79-118. doi:10.1152/physrev.00003.2010.

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

4. Taking medications

Ensure curriculum reflects the difference between T1D and T2D medications and why T2D medications will not help people with T1D meet glucose targets

Ensure T1D Stage 2 therapeutic options are current as the options and method of delivery will most likely advance with continued research

Begin insulin discussion to address any fears or myths

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

4. Taking medications

Let's review Joni's slide T1D therapeutics infusion therapy

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Infusion Therapy

- Infusion for 14 consecutive days (Stage 2)
  - 30-minute infusion (~ 2-3 hours/day)
- Primary side effects include:
  - Lymphopenia
  - Rash
  - Leukopenia
  - Headache
    - Proactively discuss how to mitigate side effects

TZIELD™ (teplizumab-mzwv) injection. Prescribing information. Red Bank, NJ: Provention Bio, Inc.; 2022.

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

5. Monitoring glucose

T1D Stages and glucose monitoring options and timing

- Fingerstick (typical some fasting and some 2-hour post-prandial values)
- Continuous Glucose Monitors – intermittent or continuous will vary
- Oral Glucose Tolerance Test, A1c as ordered by a provider
- Increased monitoring during times of illness
- Instructions when to call health care provider (HCP)(i.e. glucose values over 200 mg/dL, etc.)

Interpreting glucose results during all stages and when to contact HCP

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

5. Monitoring glucose

	MEASURE	Stage 1 T1D NORMOGLYCEMIA	Stage 2 T1D DYSGLYCEMIA	Stage 3 T1D CLINICAL DIABETES
A	Fasting plasma glucose (NO intake for at least 8 h)	<100 mg/dL (< 5.6 mmol/L)	IFG: 100-125 mg/dL (5.6-6.9 mmol/L)	≥ 126 mg/dL (≥ 7.0 mmol/L)
B	2-h plasma glucose during OGTT	< 140 mg/dL (< 7.8 mmol/L)	IGT: 140-199 mg/dL (7.8-11.0 mmol/L)	≥ 200 mg/dL (≥ 11.1 mmol/L)
C	A1c*	< 5.7 % (< 39 mmol/mol)	5.7 – 6.4 % (39-47 mmol/mol) or ≥ 10% increase in A1c	≥ 6.5 % (≥ 48 mmol/mol)
D	Random plasma glucose (in patient with hyperglycemic crisis or classic symptoms of hyperglycemia)			≥ 200 mg/dL (≥ 11.1 mmol/L)

IFG: impaired fasting glucose
IGT: impaired glucose tolerance
OGTT: oral glucose tolerance test (performed as described by the World Health Organization [1.75 g glucose/kg up to a maximum of 75 g]

Stop T1D Program. Module 1. Available at: https://www.stopt1dprogram.org/hcp-directory/module-1. Accessed January 21, 2026.

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

6. Acute complications prevention
7. Chronic complications prevention

Let's revisit Joni's slide concerning Preventing DKA

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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Prevent DKA: ER or Hospitalization

Avoid a DKA

- Up to 62% of persons diagnosed with T1D have DKA at the time of their diagnosis
- Avoid negative medical consequences of DKA
  - Acute (cerebral edema, neurocognitive, etc.)
  - Long-term data emerging – hemoglobin A1c (A1c)
    - Especially severe DKA – higher insulin needs, higher body mass index and more additional DKA episodes at 2 years
  - Less residual β cell function
    - Preserving residual endogenous insulin secretion is tied to less glycemic variability & improved glycemic outcomes

Sims EK, Bundy BN, Stier K, et al. *Diabetes*. 2022;71(4):610–623.; American Diabetes Association. Standards of Care in Diabetes—2025. *Diabetes Care*. 2025;48(suppl 1):S27–S49; Alonso GT, Corathers SD, Shah AS, et al. Increased incidence of diabetic ketoacidosis at diagnosis among youth with type 1 diabetes. *Diabetes Care*. 2020;43(1):117–121; Dovc K, Neuman V, Gita G, et al. Association of diabetic ketoacidosis at onset, diabetes technology uptake, and clinical outcomes after 1 and 2 years of follow-up: a collaborative analysis of pediatric registries involving 9,269 children with type 1 diabetes from nine countries. *Diabetes Care*. 2025;48(4):648–654. doi:10.2337/dc24-2483; Marcovecchio ML, Hendriks AEJ, Delfin C, et al. The INNODIA Type 1 Diabetes Natural History Study: a European cohort of newly diagnosed children, adolescents and adults. *Diabetologia*. 2024;67:995–1008.

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

6. Acute complications prevention

Prior to T1D stage 3:

- Educate people who are presymptomatic of the signs and symptoms, detection of hyperglycemia and when to contact HCP
- Stress importance of timely follow up with HCP once hyperglycemia is detected to prevent DKA
- Review sick day guidelines
- Stress importance of having glucose monitoring tools available at all times including during travel

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

7. Chronic complications

Empower people with understanding that good glucose control early and throughout lifespan with T1D can prevent/delay long term complications

Glucose too high or too low can have long term affects.

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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2022 National Standards for DSMES

Standard 4: ***Delivery and Design of DSMES Services***

8. Lifestyle and healthy coping

Ensure content reflects how poor lifestyle choices can impact those with T1D

Smoking/vaping - Illegal drug use – Inactivity - Poor sleep hygiene

9. Diabetes distress and support

Ensure there is a DSMES team member or referral options to provide support to individuals (patient or family members) navigating the emotions and stress a positive screen and new diagnosis can trigger

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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2022 National Standards for DSMES

- Standard 4: ***Delivery and Design of DSMES Services***
- **9. Diabetes distress and support**
- For most; the distress of positive autoantibodies should not prevent screening and monitoring
  - Many benefits we reviewed
  - Goal is to avoid a crisis; allow the person and their family time to prepare for Stage 3 TID
- Acknowledge and address concerns
  - Provide education to empower individuals and families
  - Each person concerns will be unique
  - Refer for additional behavioral health support as appropriate

1. Duker. Diabetes self-management and care strategies. *The Science of Diabetes Self-Management and Care*. 2025;51(3):345-351.
2. Marker AM, et al. Psychosocial factors in diabetes care. *Diabetes Spectrum*. 2021;34(2):166-174.
3. Manov AE, et al. Perspectives on diabetes management. *Cureus*. 2023;15(7):e42459.
4. Hummel S, et al. Advances in understanding type 1 diabetes. *Diabetologia*. 2023;66(9):1633-1642.
5. Scheiner G, et al. Practical approaches in diabetes education. *ADCES in Practice*. 2022;10(5):20-25.
6. *The Lancet Regional Health–Europe*. Trends in diabetes research. *Lancet Reg Health Eur*. 2023;29:100661.

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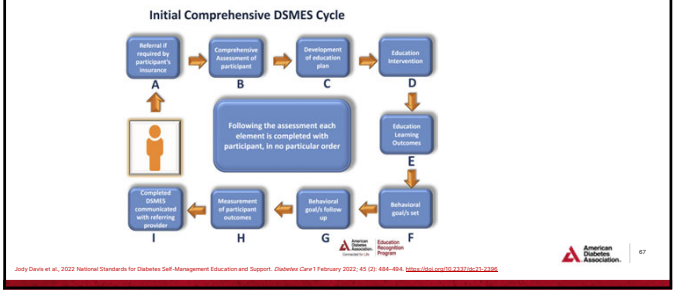
2022 National Standards for DSMES

Standard 5: ***Person-Centered DSMES Services***



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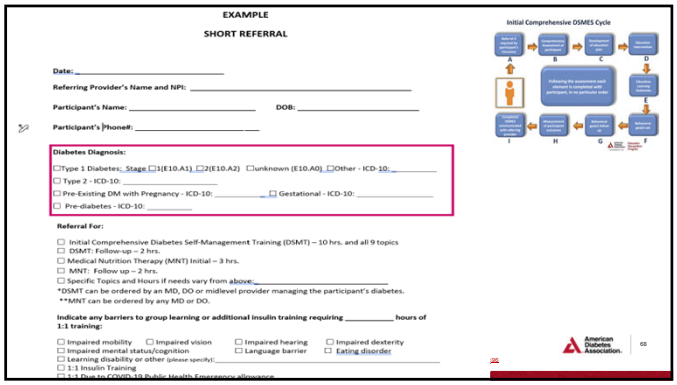

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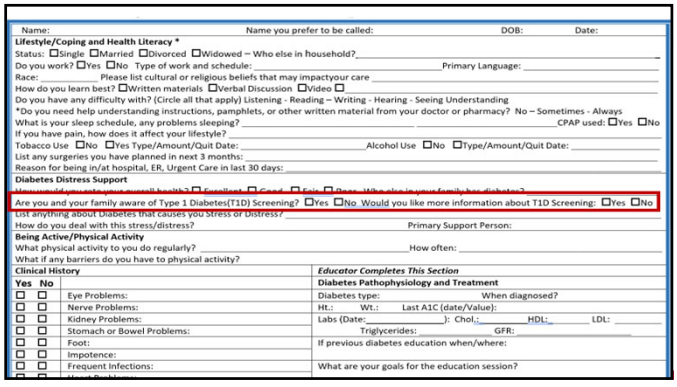

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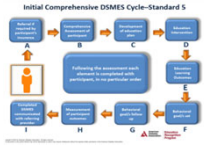
2022 National Standards for DSMES

Standard 5: ***Person-Centered DSMES Services***



Development of education plan — C

Education Intervention — D

Education Learning Outcomes — E

The participants individualized DSMES education plan will now also potentially include T1D screening and staging, and the other elements added to the curriculum for T1D stages 1 and 2

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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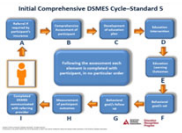
2022 National Standards for DSMES

Standard 5: ***Person-Centered DSMES Services***



Behavioral goal/s set — F

Behavioral goal/s follow up — G

Examples of participant selected behavioral goal around T1D screening, stages etc.

- Get screened for T1D
- Share screening information with family members
- Establish care with an endocrinologist
- Monitor glucose if stage 1 or 2, etc.
- Select to receive T1D stage 2 therapeutics
- Participate in research opportunities

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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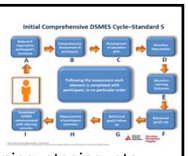
2022 National Standards for DSMES

Standard 5: ***Person-Centered DSMES Services***



Measurement of participant outcomes — H

Examples of service participant outcomes around T1D screening, staging, etc.

- Number or percentage of participants seeking T1D screening, staging knowledge
- Number of participants or family members getting screened for T1D
- Outcomes around people screening positive and T1D stages or change in diagnosis
- Number of participants who receive T1D stage2 therapeutics
- Outcomes around timing of progression to Stage 3 for those who opted in and out of received therapeutics

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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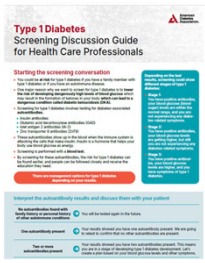
2022 National Standards for DSMES

Standard 5: ***Person-Centered DSMES***

Completed DSMES communicated with referring provider

This communication now might need to include that a participant or family members are interest in T1D screening and especially if HCP is a primary care physician, information addressing screening labs, locations and resources



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2022 National Standards for DSMES

- Standard 6: ***Measuring and Demonstrating Outcomes of DSMES Services***
  - The DSMES service has to aggregate at least one participant selected behavioral goal
  - We reviewed a few T1D screening and staging options
    - Get screened for T1D
    - Share screening information with family members
    - Establish care with an endocrinologist
    - Monitor glucose if stage 1 or 2, etc.
    - Participate in T1D progression delay therapeutics
    - Participate in research opportunities

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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2022 National Standards for DSMES

- Standard 6: ***Measuring and Demonstrating Outcomes of DSMES Services***
  - The DSMES service has aggregate at least one clinical or quality of life outcome

- Number or percentage of participants seeking T1D screening, staging knowledge
- Number of participants or family members getting screened for T1D
- Outcomes around people screening positive and T1D stages or change in diagnosis
- Number of participants who receive T1D stage2 therapeutics
- Outcomes around timing of progression to Stage 3 for those who opted in and out of received therapeutics

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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2022 National Standards for DSMES

- Standard 6: ***Measuring and Demonstrating Outcomes of DSMES Services***
  - The DSMES service must have at least one Continuous Quality Improvement (CQI) project
  - A CQI project could be developed around any of the T1D screening and staging outcome examples we have reviewed to improve their DSMES services

Jody Davis et al., 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care* 1 February 2022; 45 (2): 484–494. https://doi.org/10.2337/dc21-2395

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Presentation Summary

- T1D screening is important to:
  - prepare people and families for T1D stage 3
  - potentially have the option to delay progression to stage 3
  - prevent avoidable acute and potentially chronic complications
- T1D screening and staging should be part of all DSMES services regardless of the age of the population served

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Panelist/Discussion

- Dr. Jonathan Velez, MD
- Becky Sulik, RD, LD, CDCES

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Audience Questions

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Thank you for joining us!

It takes *all of us* to educate and empower individuals living with diabetes.

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