Implementation Challenges: Monitoring and Transition to Clinical Care in Early Stage T1D

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Disclosures

- Consulting – Sanofi, SAB Bio, MannKind
- Scientific Advisory Board – SAB (Options)

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Goals

1. Role of the Pediatrician, Family Practice, and Medicine
2. Early-Stage Clinics
3. Monitoring in the Real-World vs TrialNet vs ASK
4. Conversations about Research vs Clinical immunotherapy
5. Off Label Therapies ?

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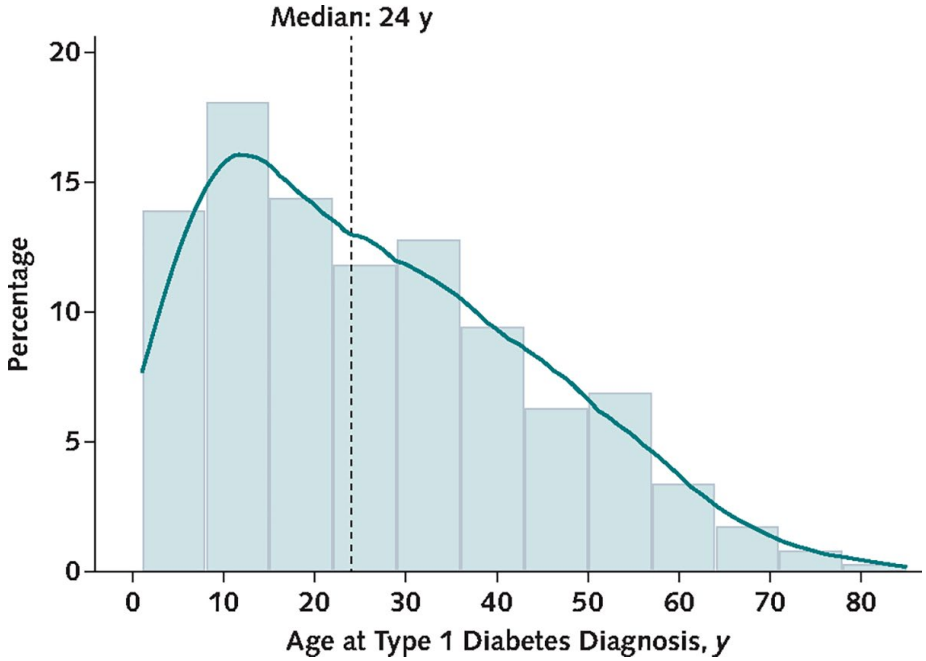
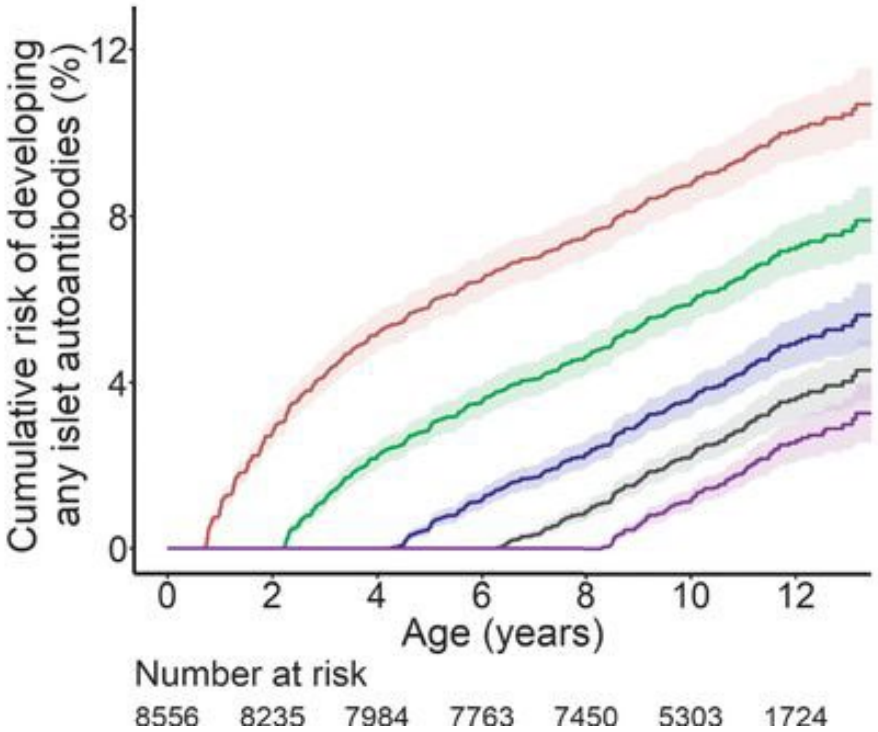
Age at T1D Onset



- T1D can occur at any age
  - Median age at diagnosis 24 years
- In childhood, T1D is the most common form of diabetes
  - 1 out of every 300 kids in the U.S.
  - 1 out of every 20 kids if there is a first degree relative with T1D

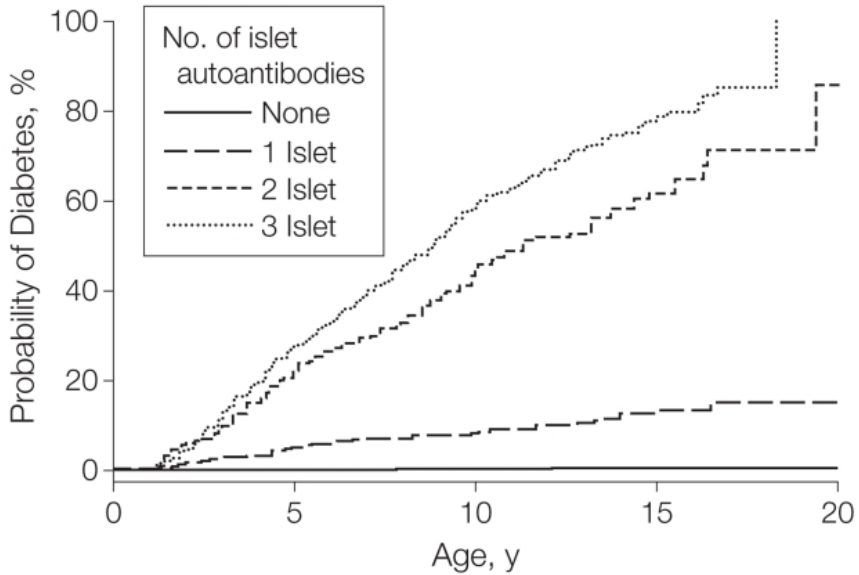
Fang et al. Ann Intern Med. 2023;176(11):1567-1568.

AAb at Young Age = Highest Risk for T1D



Bonifacio et al. Diabetes Care 2021;44(10):2260–2268

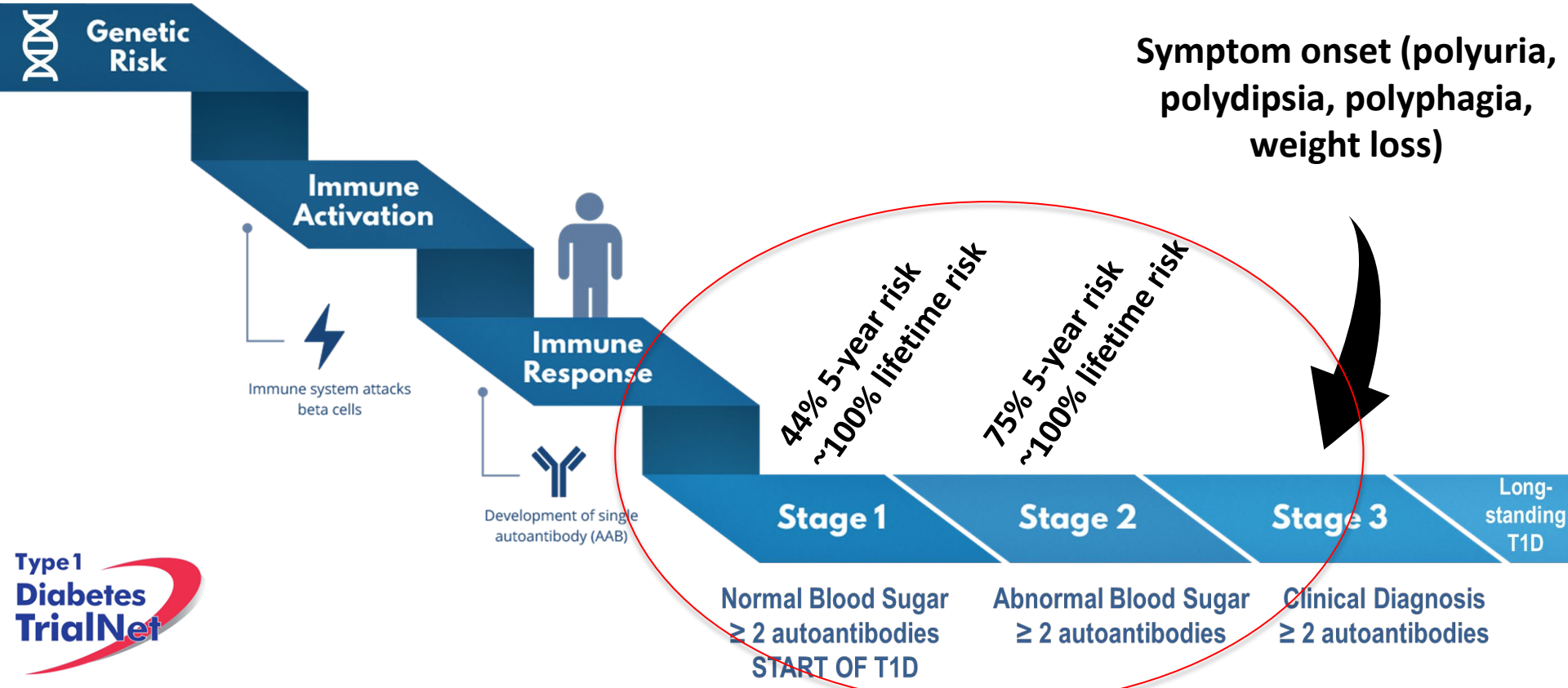
Islet Autoantibodies Can Predict T1D



No. at risk Islet autoantibodies, No.					
3 Islet	358	250	112	20	
2 Islet	227	168	82	19	1
1 Islet	474	430	272	118	9
None	12318	8875	5253	1161	44

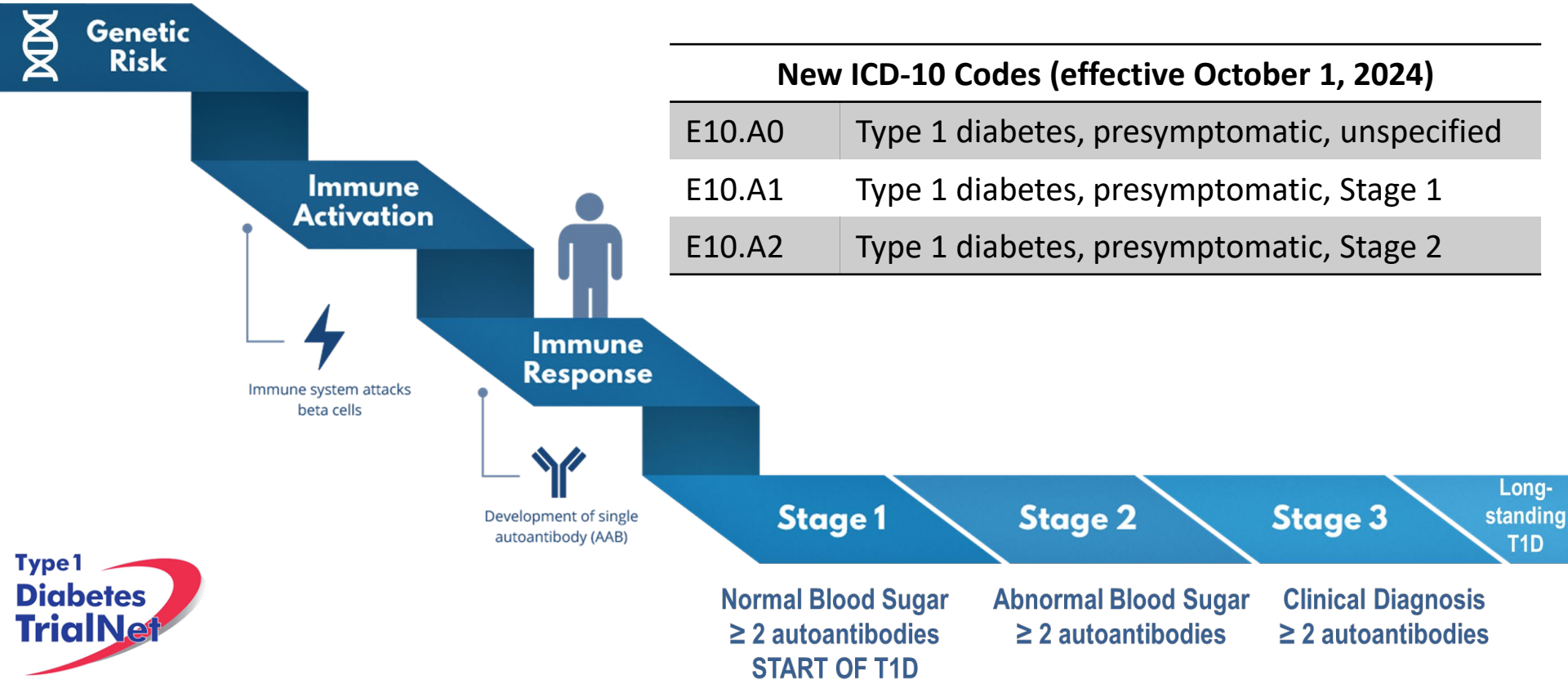
Ziegler et al. JAMA. 2013 Jun 19;309(23):2473-9

Stage of T1D



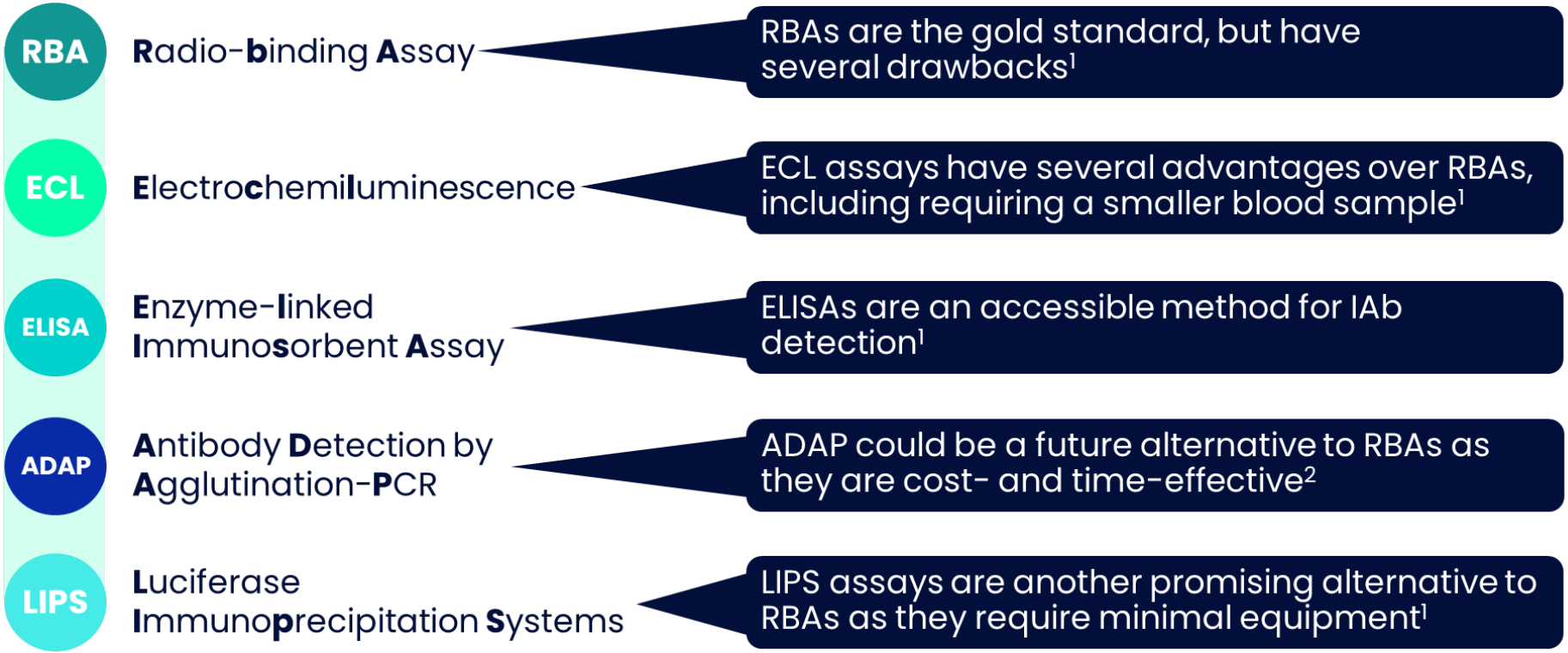
Type 1 Diabetes TrialNet

Early Stage T1D



New ICD-10 Codes (effective October 1, 2024)	
E10.A0	Type 1 diabetes, presymptomatic, unspecified
E10.A1	Type 1 diabetes, presymptomatic, Stage 1
E10.A2	Type 1 diabetes, presymptomatic, Stage 2

Type 1 Diabetes TrialNet



ADAP, antibody detection by agglutination polymerase chain reaction; ECL, electrochemiluminescence; ELISA, enzyme-linked immunosorbent assay; IAb, islet autoantibody; LIPS, luciferase immunoprecipitation systems; RBA, radio-binding assay; T1D, type 1 diabetes.

1. Fyvie MJ, Gillespie KM. Front Immunol. 2023;14:1158278. 2. Cortez F, et al. SLAS Technol. 2022;27(1):26-31.

Methods for T1D Monitoring

International consensus guidance is available for monitoring autoantibody-positive individuals in early-stage T1D.[2] *(scan below)*

Negative Result?

Consider additional testing in the future if at risk for developing T1D.

Every 2-3 years in childhood

Positive Result?

- Order confirmatory testing
- Consider referral to TrialNet for free confirmatory testing and possible referral to research studies
- Additional metabolic testing: HbA1c, random blood glucose
- Provide patient education including T1D symptoms
- If multiple autoantibodies present or dysglycemia, refer to Endocrinology

Many diabetes programs are developing T1D at-risk clinics

With your support, we are creating a movement to improve and change life with T1D, advancing breakthroughs on the way to cures.

To find out more about resources and support, visit **BreakthroughT1D.org/early-detection/.**

Early Stage T1D Clinic - Mission

Provide comprehensive, person-centered care to patients and families who are at risk for type 1 diabetes (T1D) or in early-stage T1D including mental health considerations.

Early Stage T1D Clinic - Vision

- Serve as a referral center for the state of FL for children and young adults with/at-risk for early-stage T1D to be seen via telemedicine or in person.
- Train pediatric endocrinology teams and eventually primary care providers in the care and management of these populations as the screened population grows.

Early Stage T1D Clinic – Patient Goals

1. Ensure understanding that patient has T1D
2. Psychological support
3. Establish Glycemic Baseline
4. Discuss Monitoring options
5. Dispel myths / misinformation
6. Offer research opportunities (ASK, TrialNet, etc)

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Early Stage T1D Clinic - Logistics

- TrialNet / Ask Screen Positives who decline follow up
- Screening in General Pediatric – T1D Sibs, Celiac, Thyroid, Adrenal, Vitiligo (1st priority), then Gen Pop
- Virtual Consults - State / Regional Centers of Excellence
- Billable service (E/M codes)
- ….If you build it, they will come.

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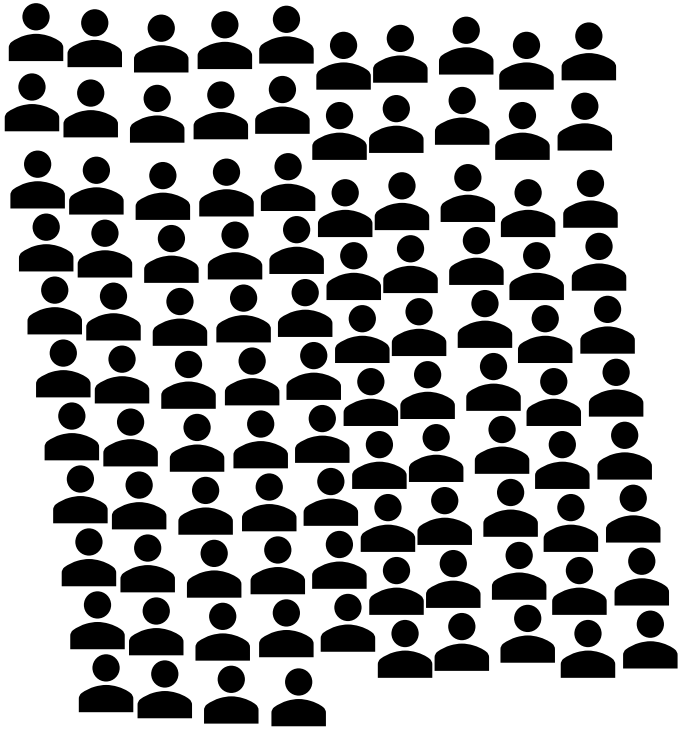
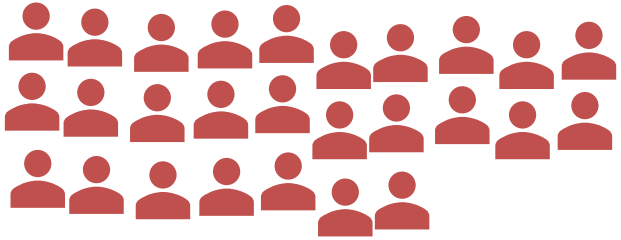
Partner Clinics – Screening Location & Number Offered Clinical T1D Screening

Diabetes Clinic (relatives)



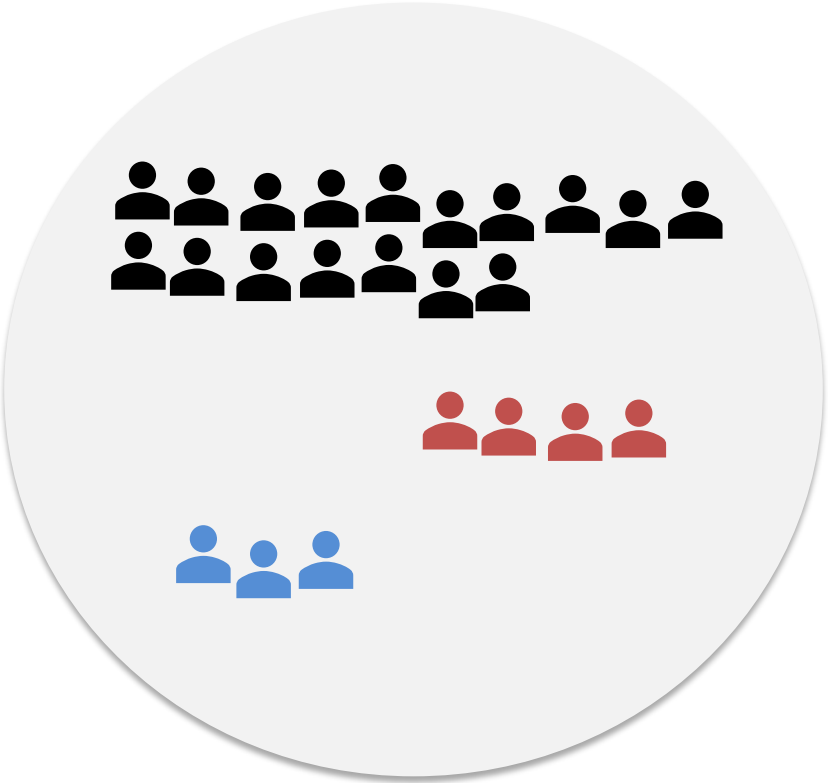
Endocrine Clinic (personal autoimmunity)



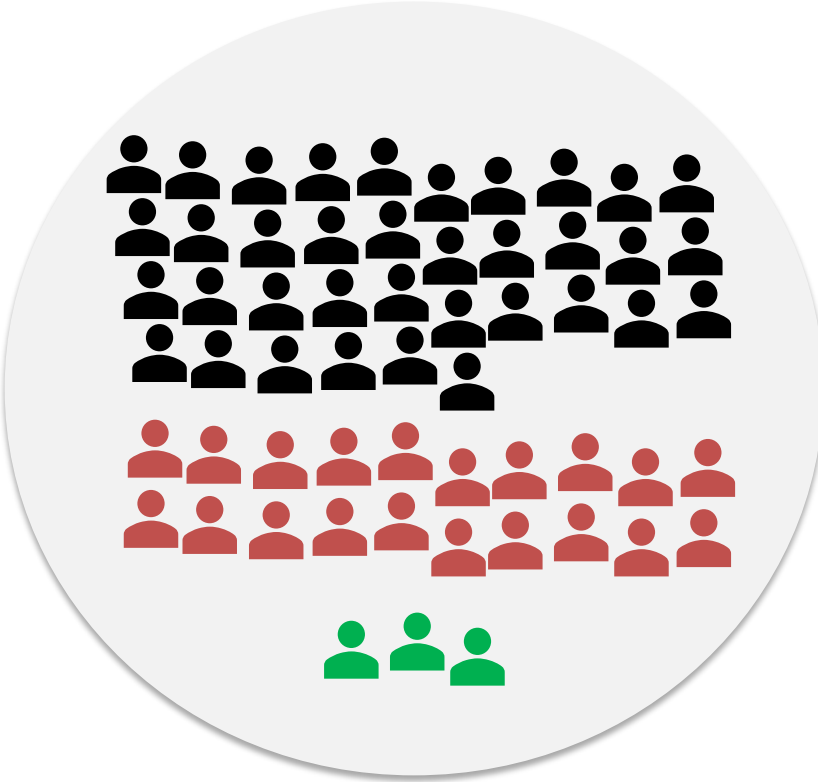
GI Clinic (personal autoimmunity)

Metabolic Clinic (elevated A1c, but atypical for T2D)

Diabetes Clinic Endocrine Clinic GI Clinic Metabolic Clinic



Autoantibody Positive



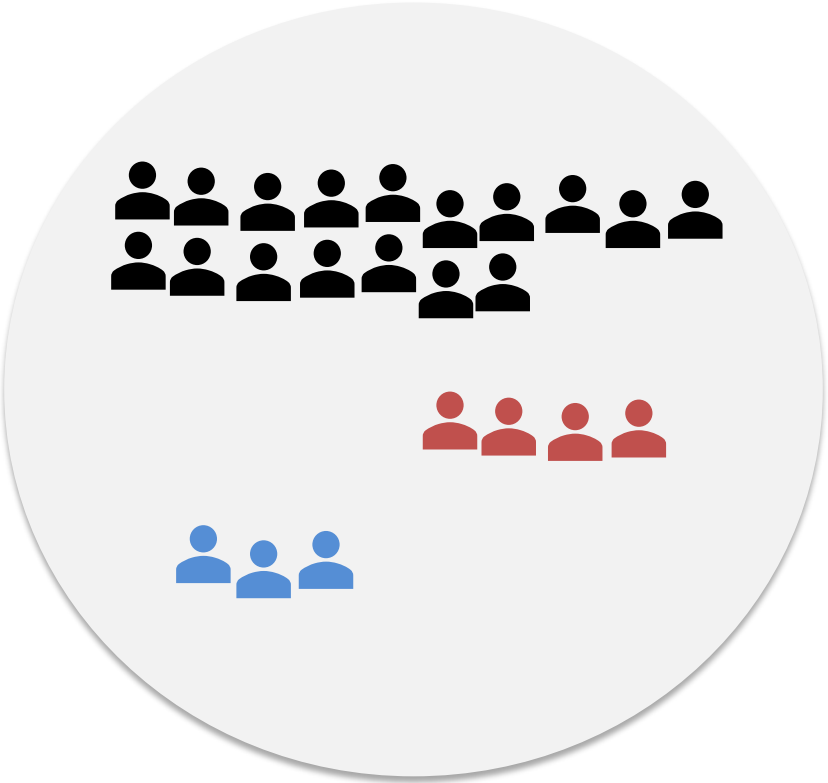
Autoantibody Negative

Diabetes Clinic

Endocrine Clinic

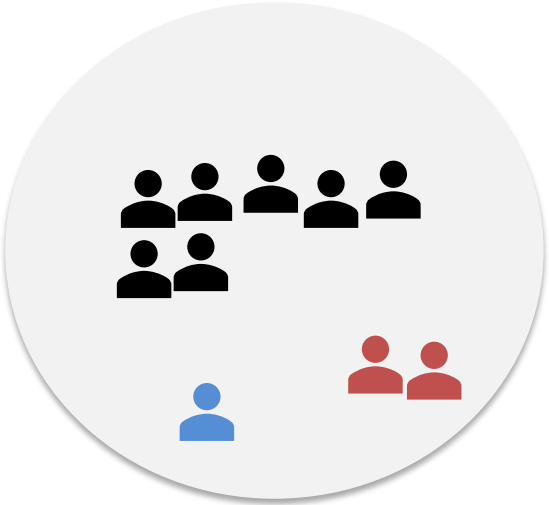
GI Clinic

Metabolic Clinic

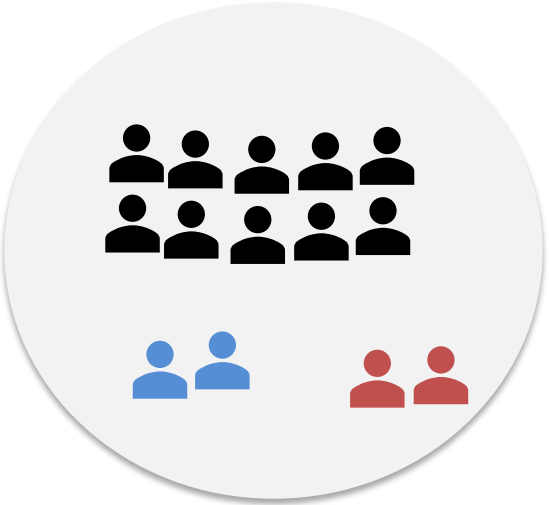


Autoantibody Positive

Diabetes Clinic Endocrine Clinic GI Clinic Metabolic Clinic

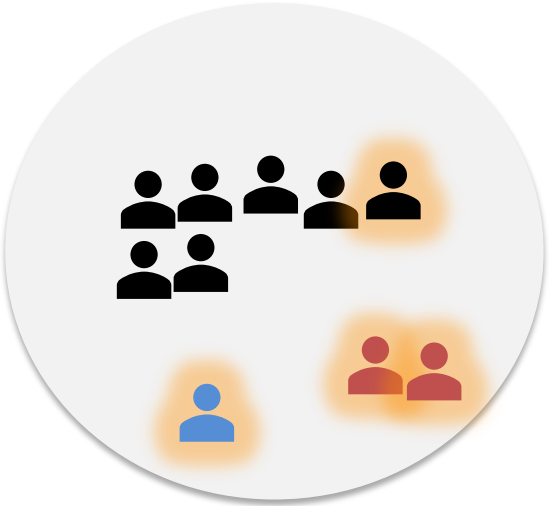


Single Positive

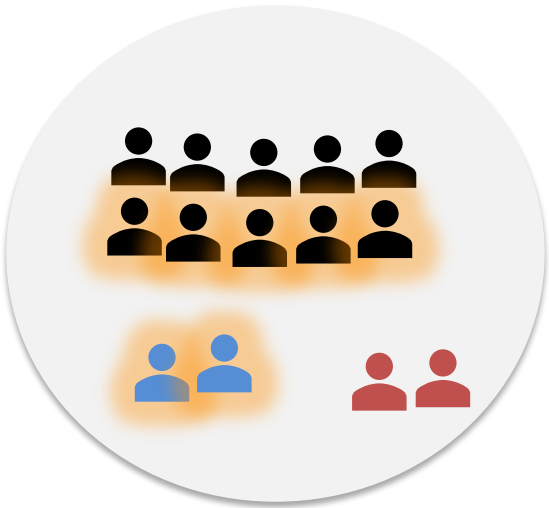


Multiple Positive

Diabetes Clinic Endocrine Clinic GI Clinic Metabolic Clinic



Dysglycemia
“Stage 2”

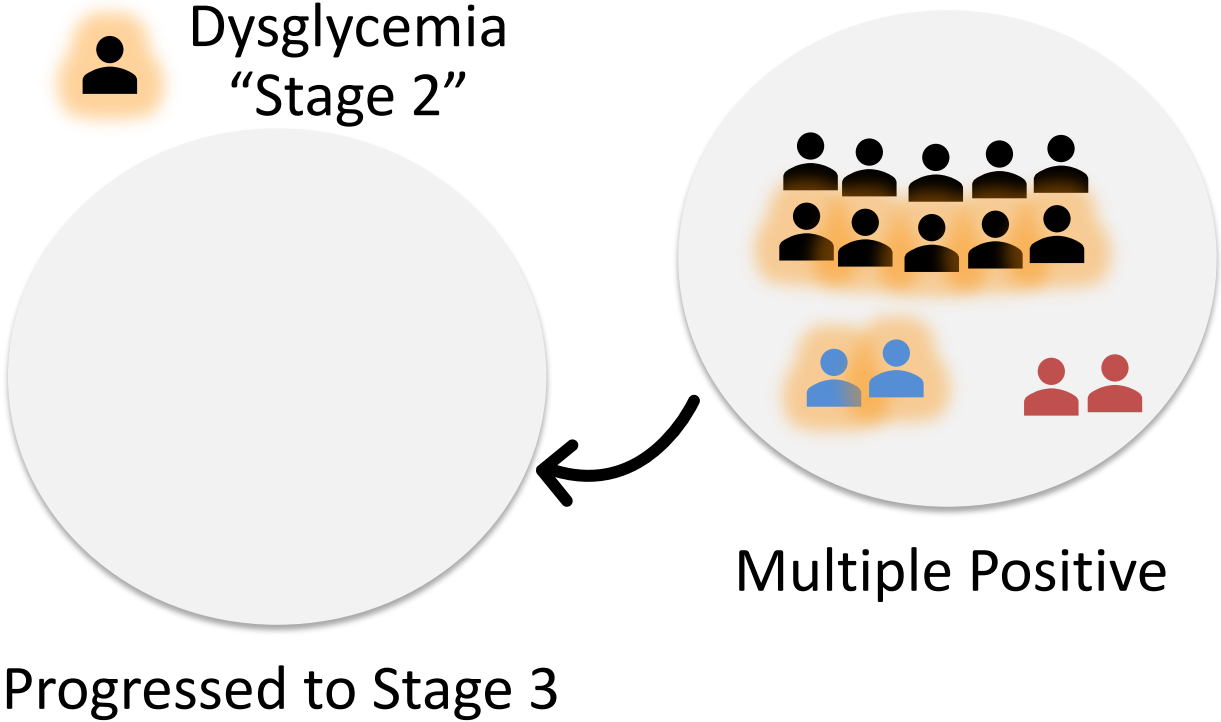


Single Positive

Multiple Positive

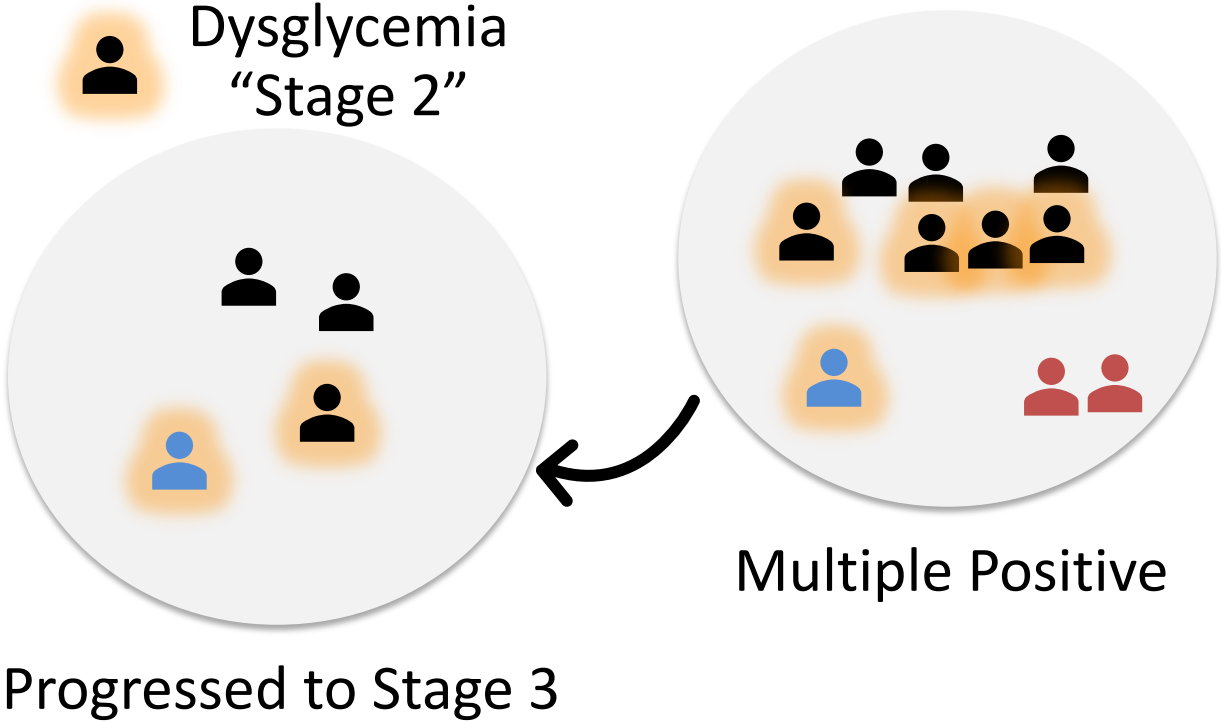
Diabetes Clinic **Endocrine Clinic** **GI Clinic** **Metabolic Clinic**

No Single Positive have progressed to Stage 3 without interim stage



Diabetes Clinic **Endocrine Clinic** **GI Clinic** **Metabolic Clinic**

No Single Positive has progressed to Stage 3 without interim Stage 1/2

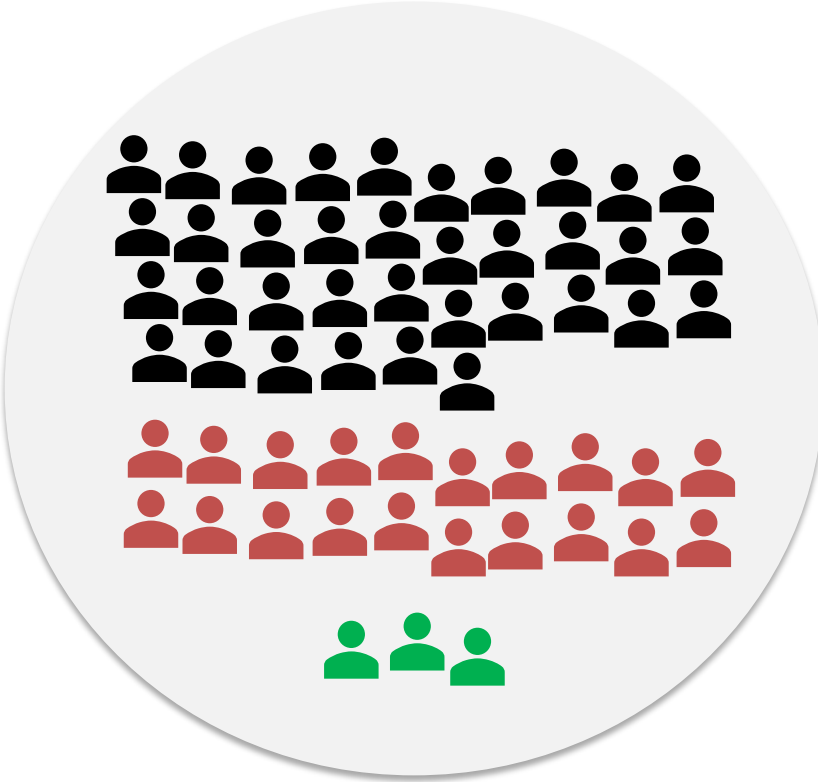


Diabetes Clinic

Endocrine Clinic

GI Clinic

Metabolic Clinic



Autoantibody Negative

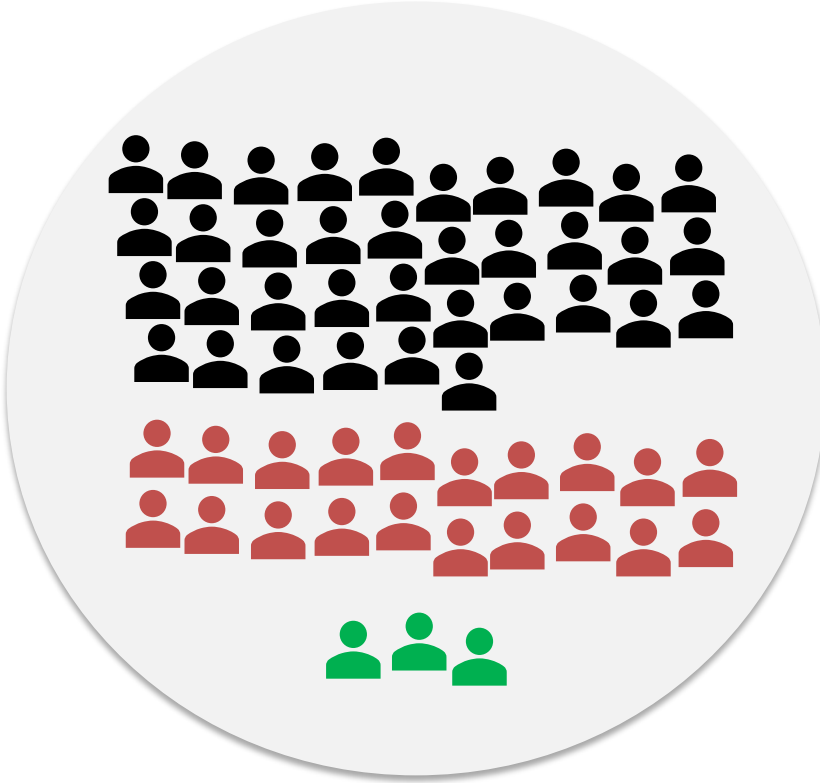
Diabetes Clinic

Endocrine Clinic

GI Clinic

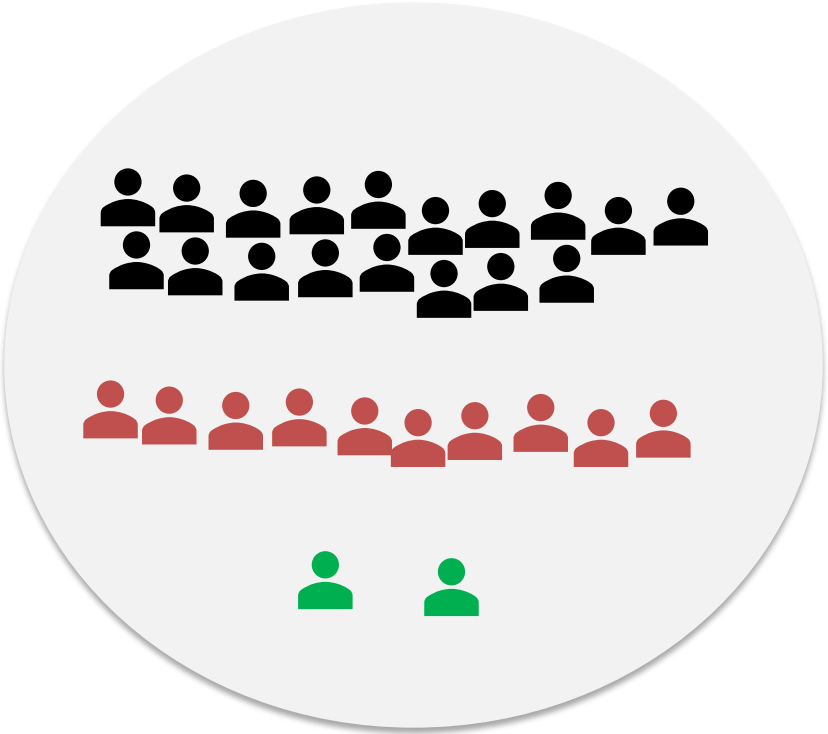
Metabolic Clinic

Negative ≤15 years old
(will re-screen)



Autoantibody Negative

Diabetes Clinic Endocrine Clinic GI Clinic Metabolic Clinic



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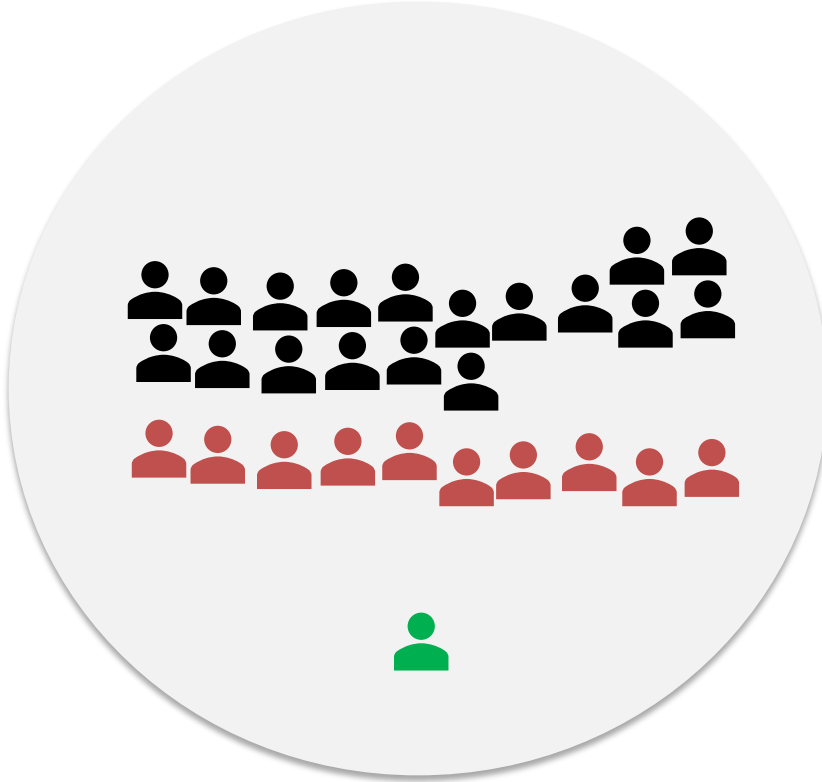
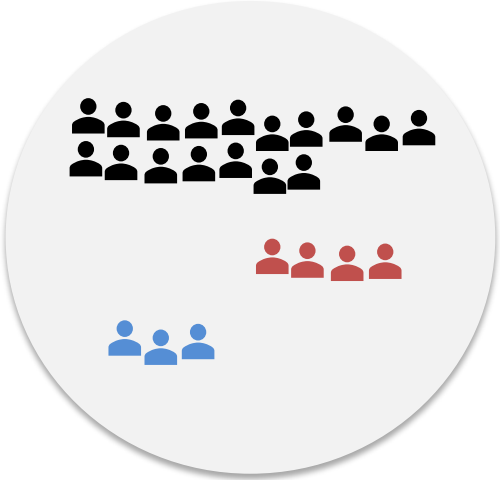


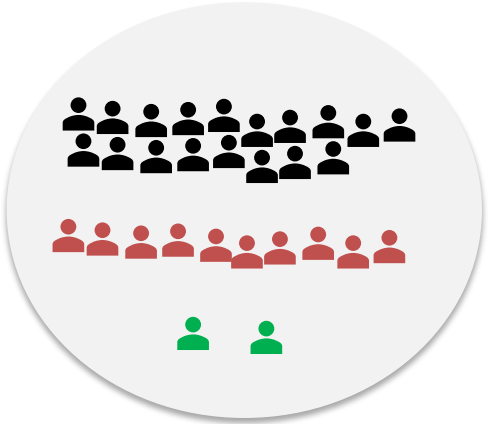
Autoantibody Negative

Real-world At-Risk & Early-Stage

WHO NEEDS MONITORING



Autoantibody Positive

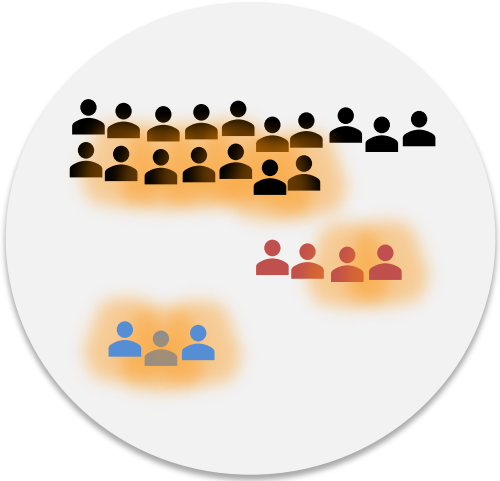


Negative ≤15 years old (will re-screen)

Real-world At-Risk & Early-Stage

WHO NEEDS MONITORING

Dysglycemia
"Stage 2"



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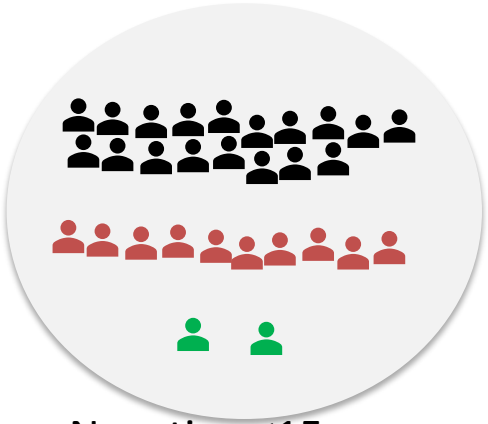

Negative ≤15 years old (will re-screen)

Multiple Monitoring Options

Monitoring

- TrialNet – OGTT, A1c, Risk Scores, HLA….
- Clinic – A1c, SMBG, CGM, A1c (Dr. Steck)
- Patient and family dependent
- q 3-6 months depending on age / stage
- DKA risks only reduced WITH follow up

Monitoring Challenges

- Stage Flipping
- CGM obsessives – Psychological harm
- Lifestyle Changers – Low Carb / Exercise / Calorie
- Immune Therapy for Stage 1
- Off Label Discussions for Stage 2
- When to start insulin ?

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Real-world At-Risk & Early-Stage

BILLING

3 AAB testing insurance denials:

- Aetna out of state: Denied, submitted LMN. Then only ICA was denied $138.59
- BCBS FL: Insurance did not cover ICA, amount pending per insurance $350.23
- Tricare: $86.07 not covered after “contractual adjustments” by Tricare

Removed ICA from our orders

CPT 99205 DX E10.A2 - Type 1 diabetes mellitus, presymptomatic, stage 2	•Commercial plan; eventually paid $383.91 (after secondary insurance was included for primary coverage to consider)
CPT 99214 DX E10.A2 - Type 1 diabetes mellitus, presymptomatic, stage 2	•Commercial plan; Paid $100.26
CPT 99204 Dx R76.8 - Other specified abnormal immunological findings in serum	•Commercial plan; Deductible amt paid by pt $313.15

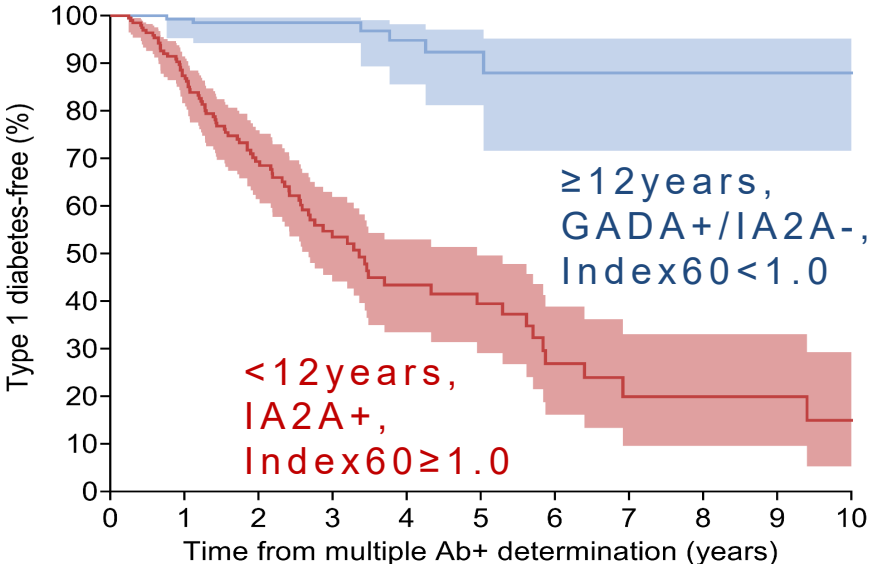
Nuances to T1D Monitoring

Without regular follow up the rate of DKA was still high

Incidence of DKA among those who did not adhere to the research protocol was higher (0.48 1,000 person-years) than among those who did adhere (0.20; P = 0.047)

Jacobsen et al. Diabetes Care. 2022;45(3):624-633.

Short-term risk of progression is variable based on specific AAb and other features



Jacobsen et al Diabetologia 2020;63(3):588-596.

Offer Interventions to Alter Disease Course

Immune Therapies

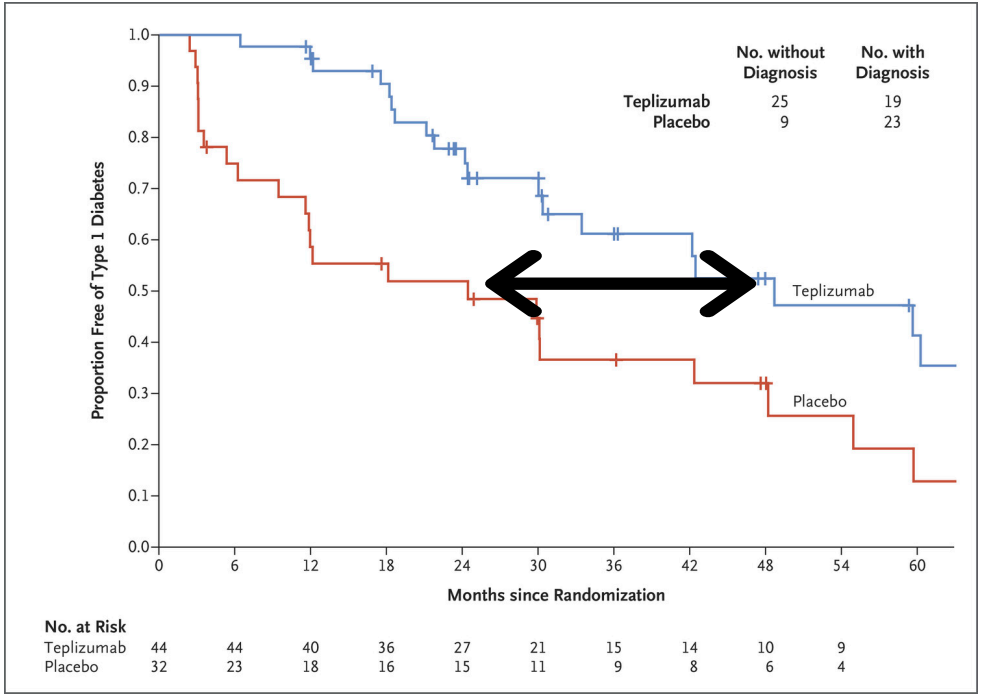
11 Treated Commercially

FDA-approved

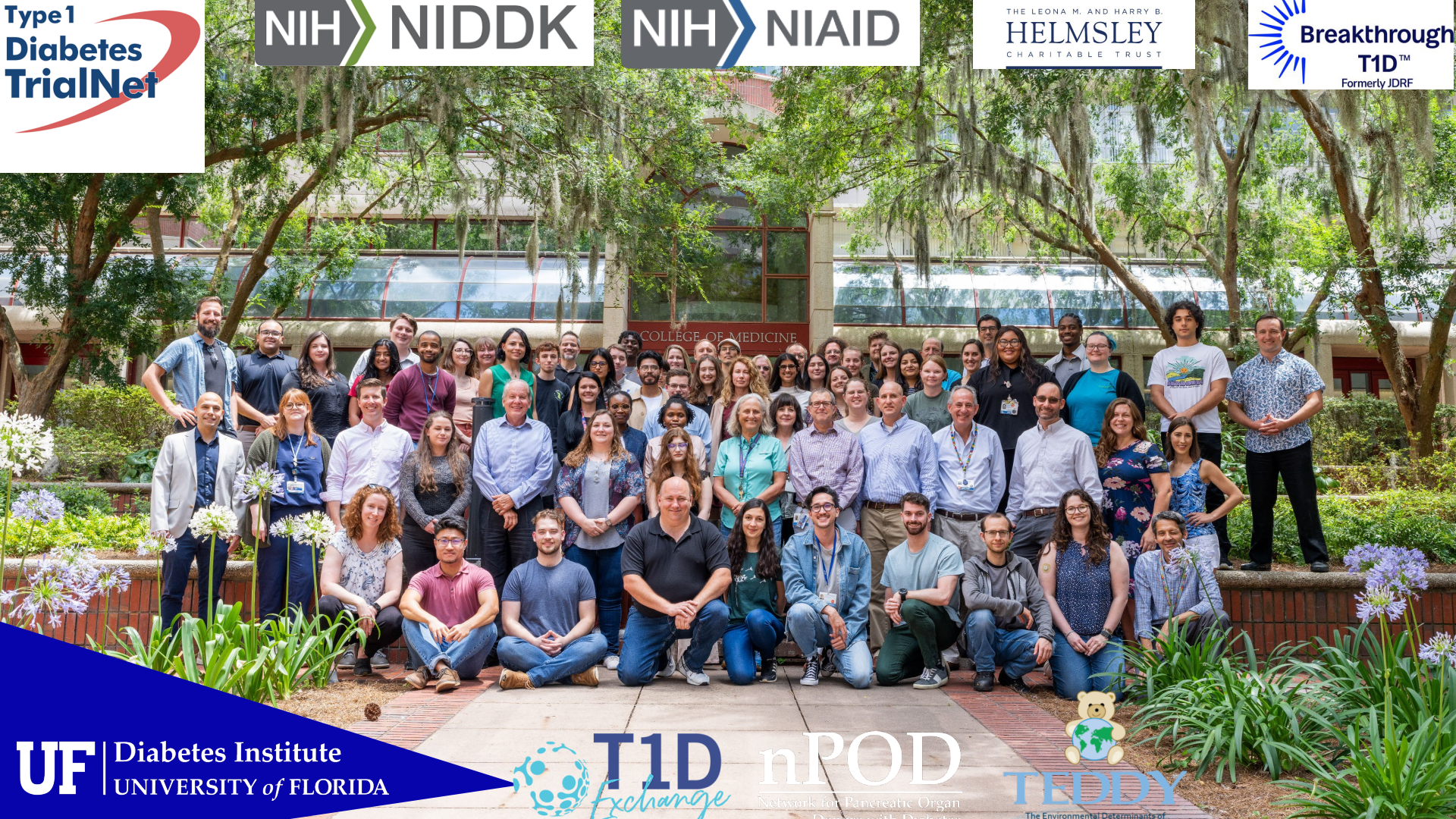
- Teplizumab, ages 8 and up in stage 2 T1D, 14-day infusion (average 2-year delay)

Clinical Trials

- ATG vs Teplizumab – TN40A
- Others coming….



Herold et al. NEJM 2019;381:603-613.


Type 1 Diabetes TrialNet
NIH NIDDK
NIH NIAID
THE LEONA M. AND HARRY B. HELMSLEY CHARITABLE TRUST
Breakthrough T1D™ Formerly JDRF
COLLEGE OF MEDICINE
UF Diabetes Institute UNIVERSITY of FLORIDA
T1D Exchange
nPOD Network for Pancreatic Organ
TEDDY The Environmental Determinants of

Questions / Discussion

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