



Barbara Davis Center for Diabetes
UNIVERSITY OF COLORADO **ANSCHUTZ MEDICAL CAMPUS**

7th Symposium on Screening for T1D
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PCP, diabetes clinic, and parents: Who is responsible for monitoring?

BRIGITTE I. FROHNERT MD PHD

ASSOCIATE PROFESSOR OF PEDIATRICS

Presenter Disclosure

BRIGITTE FROHNERT MD PHD

DISCLOSED NO CONFLICTS OF INTEREST



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Goals of Monitoring

1. Prevent DKA at stage 3

- Emergency care or admission

2. Inform about potential interventions to prolong β -cell function

- Intervention studies
- Clinical therapy

3. Avoid misdiagnosis of T2D and delayed insulin start

4. To provide advice for start of insulin in stage 3 T1D

❖ Improve patient experience

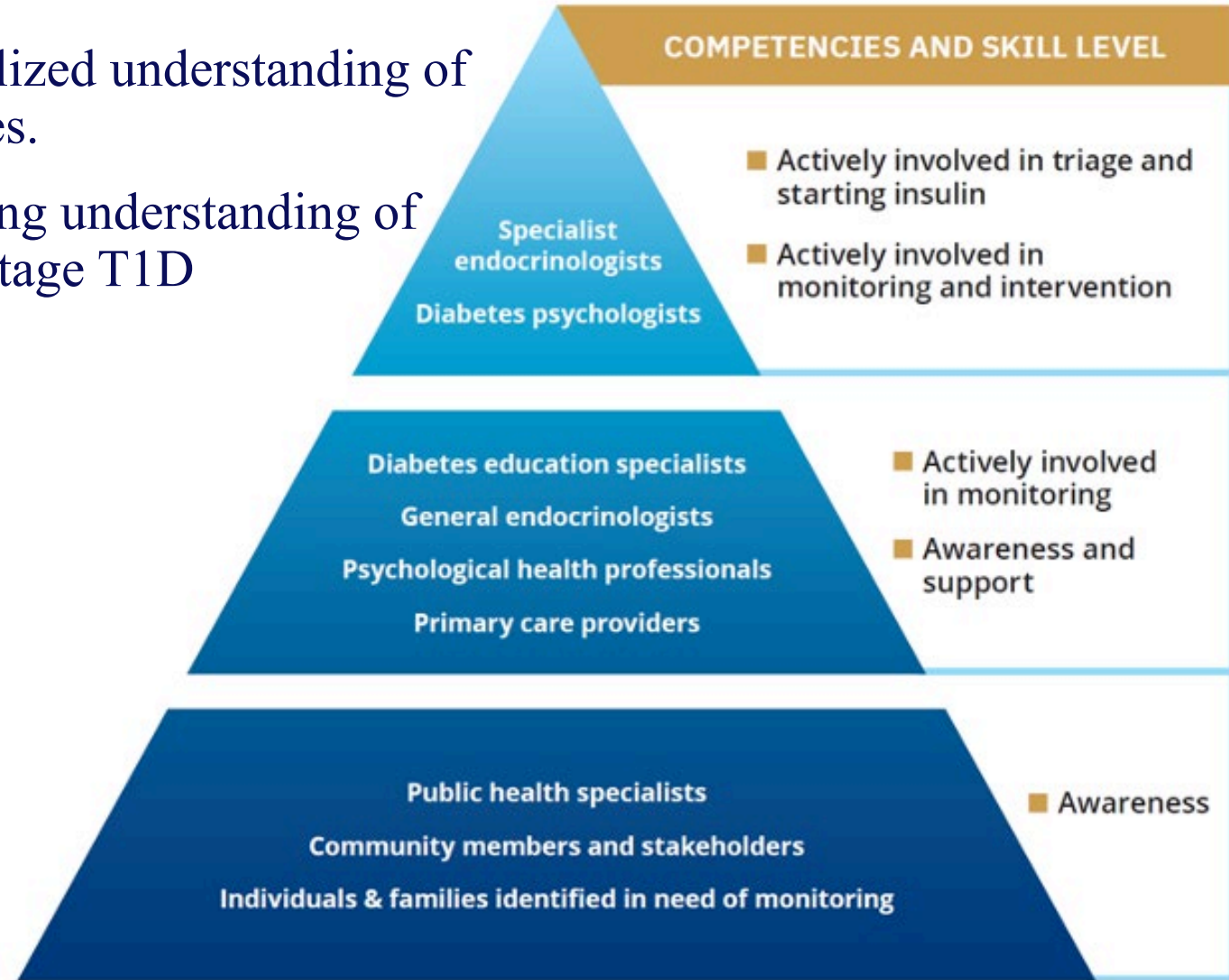
- ❖ Alleviate anxiety
- ❖ Empower with knowledge before start of insulin
- ❖ Promote healthy habits
- ❖ Address disparities at stage 3 for historically marginalized groups



Medical Community Stakeholders

Phillip, et al. Consensus
guidance for monitoring
individuals with islet
autoantibody-positive pre-
stage 3 type 1 diabetes
*Diabetes Care and
Diabetologia* (2024)

- Specialized understanding of diabetes.
- Evolving understanding of early-stage T1D



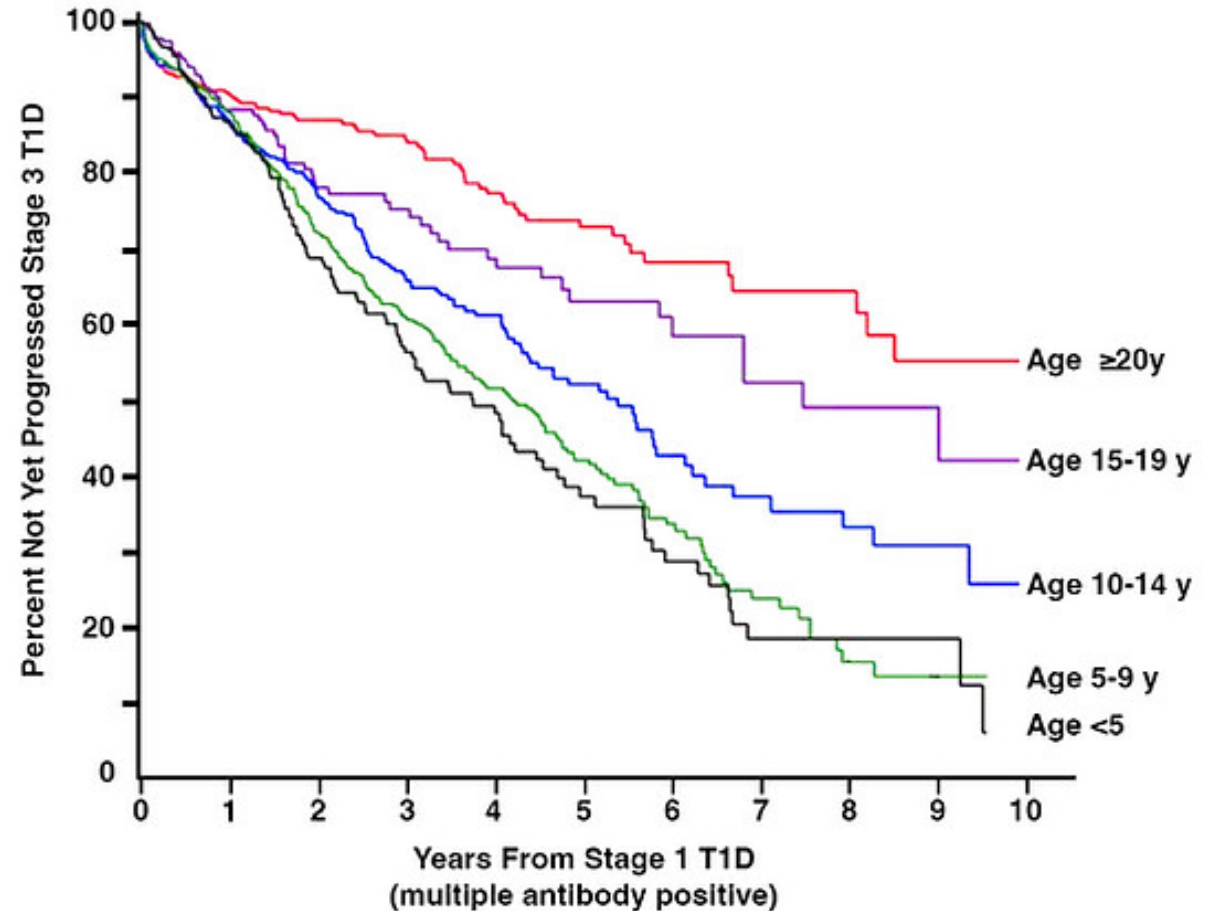
Challenge: Timing



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Variable time for Progression to Stage 3 by age of onset Stage 1 T1D

Time from Stage 1 to Stage 3 T1D



Wherrett DK, et al.
Diabetes Care (2015)



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Long-term engagement with team is critical

- Ongoing monitoring essential for DKA prevention
- Screening alone doesn't prevent DKA
 - (*Barker 2004, Larsson 2011, Winkler 2012, Wersäll 2021*)
- Monitoring: Less severe symptoms at stage 3 onset
 - (*Schneider 2023, Hummel 2023*)



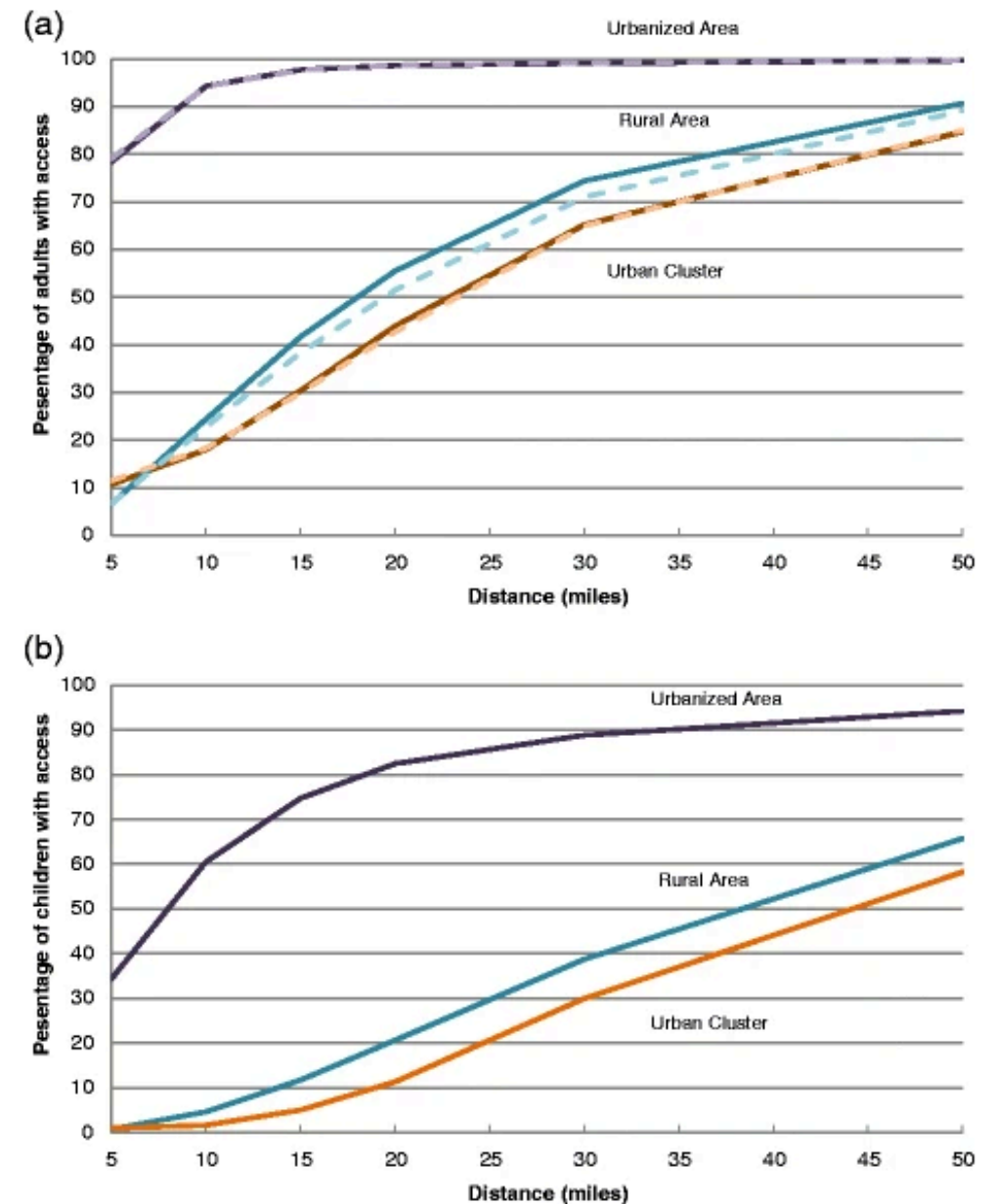
Challenge: Endocrinology Access



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Endocrinology in the US

- ❖ 1,494 Pediatric Endocrinologists
 - ❖ 352,000 youth <20yo with diagnosed diabetes
 - ❖ 304,000 with type 1 diabetes
- ❖ 8,998 Adult Medicine Endocrinologists
 - ❖ 29.4 adults with diagnosed diabetes.
 - ❖ 1.7 million with type 1 diabetes
- ❖ Decreased numbers in fellowship training
- ❖ Aging workforce
- ❖ ?Data on midlevel providers in endocrinology



Other health professionals



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Primary Care Providers

Strengths

Long-term relationships with families
Geared towards screening for health concerns
Trusted advice on maintenance of health
Ability to obtain intermittent labs

Challenges

Widespread confusion regarding type 1 vs type 2 diabetes
Limited (but growing) awareness of early-stage T1D
Skillset may not include:

- Use and interpretation of glucometer and CGM data

- Primary care HCPs should understand stages of T1D, methods of and suggested frequency for metabolic monitoring [E]
- The primary care provider, specialist provider, and the person who is Ab+ should determine who will have primary responsibility and what degree of collaboration is needed [E]

This may shift over time for the individual with Ab



Certified Diabetes Care and Education Specialists

Strengths

>19,500 in the US (about 2x MDs)

CDCES credentialed professionals

- Registered Dietitian Nutritionists (RDNs) and Registered Nurses.

Diabetes prevention, prediabetes, and diabetes management.

Focus on self-management, including lifestyle changes, device training, and medication adherence.

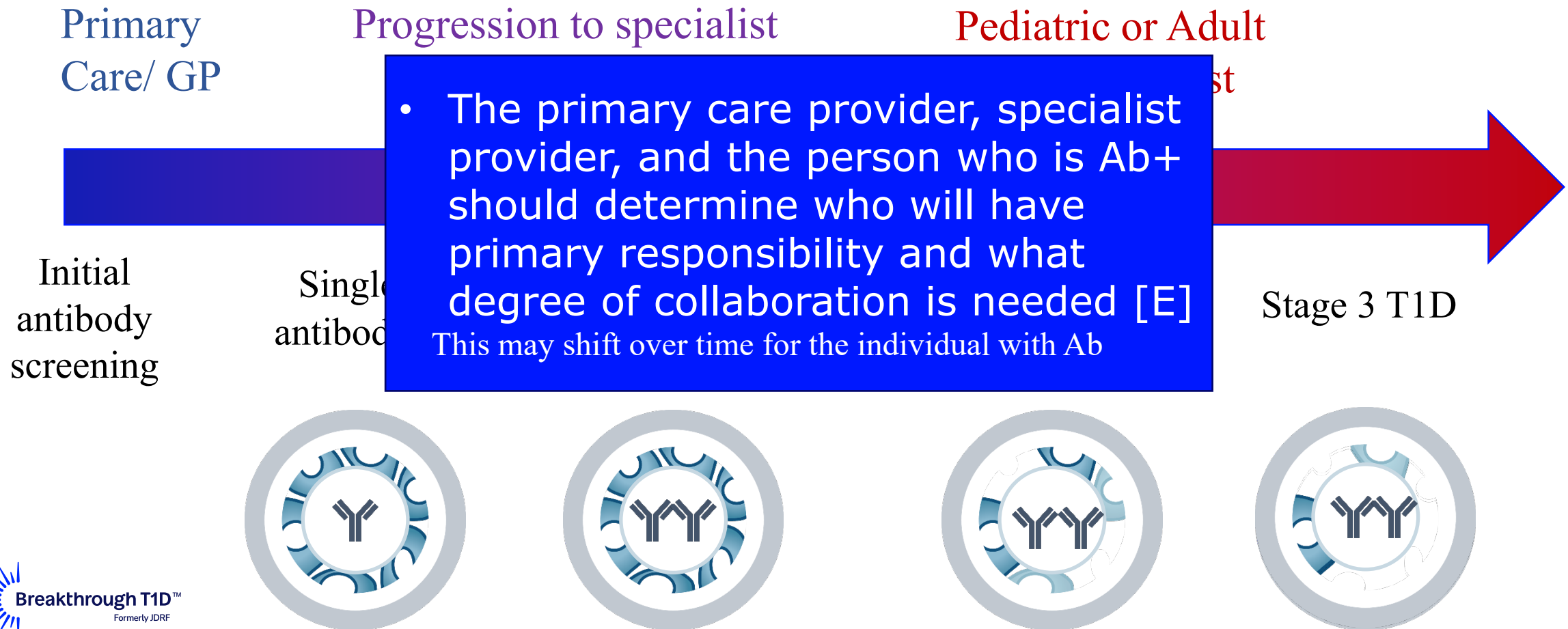
Challenges

Often more focus on type 2 vs type 1 diabetes

Limited (but growing) awareness of early-stage T1D



Care Continuum for Monitoring



Th

Strengths

Many patient
problem-based

Opportunity

Opportunity

- Medical records must reflect the Ab status and the plan for monitoring and for urgent evaluation if needed [E]

**Statement
of risk**



**Suggested
order set
options**



BestPractice Advisory - ZzCDS, Two

Medium Priority - Clinical Care (1)

ⓘ Place orders to decrease risk of missing diagnosis

Two has pre-symptomatic type 1 diabetes mellitus with dysglycemia (not yet requiring insulin) and is at risk for developing symptomatic (insulin-requiring) type 1 diabetes mellitus and diabetic ketoacidosis.
Consider further evaluation, if clinically indicated.
Contact Pediatric Diabetes (Barbara David Center) consult if labs show ketosis, HbA1c greater than 6.4, glucose greater than 200 mg/dL, or if questions.

Order	Do Not Order	Hemoglobin A1C
Order	Do Not Order	Glucose, Blood
Order	Do Not Order	Urine Dipstick
Order	Do Not Order	POCT Glucose
Order	Do Not Order	POCT Glucometer
Order	Do Not Order	Renal Function Panel

Acknowledge Reason

Not indicated

Reviewing chart

Patient in code/trauma event

✓ Accept

Dismiss

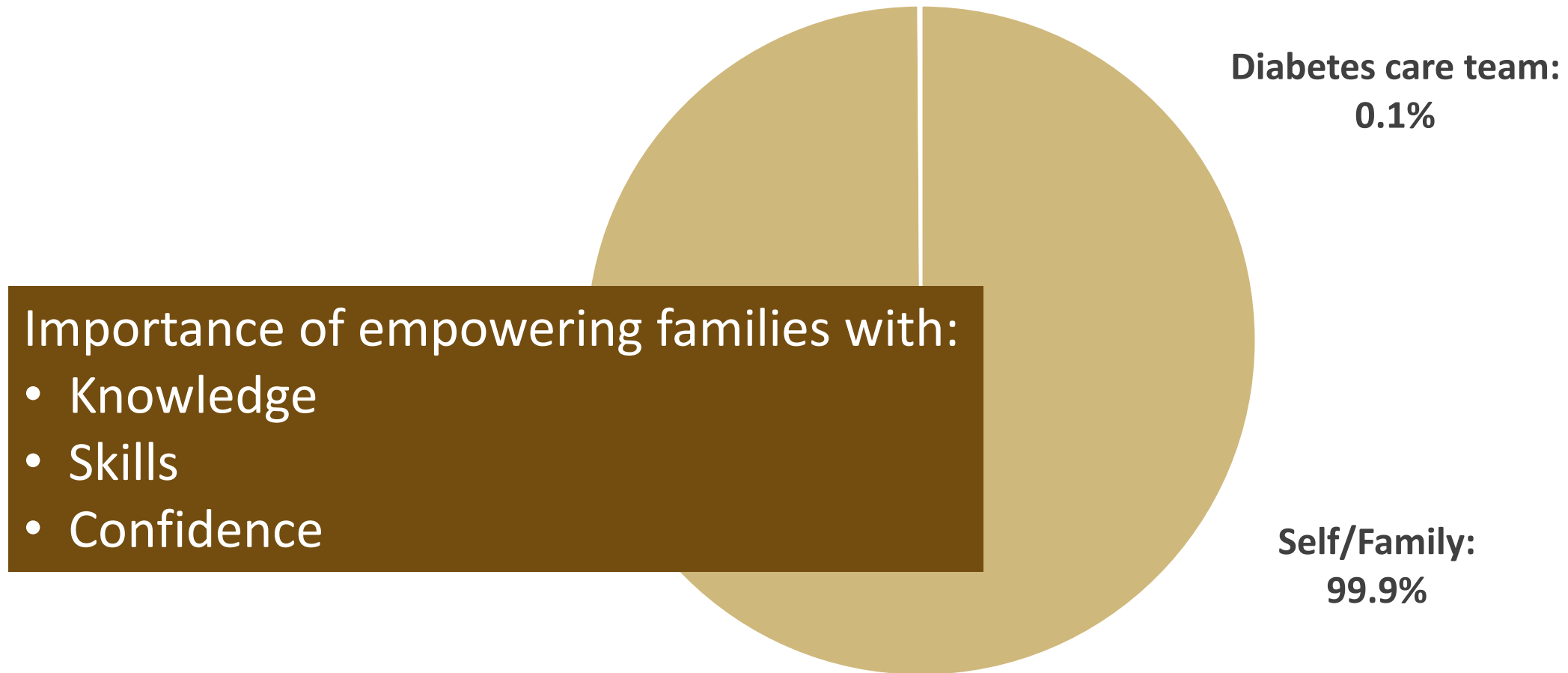


But most importantly....
Patients and families



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Hours managing T1D



A Case Study



The Early Start Study (TESS) intervention arm:

Structured education for patients/families with stage 2 T1D

- Telemedicine visits
- MD/NP
- CDCES
- Dietitian
- Social Worker

Unblinded CGM wear with repeat telemedicine visits to discuss



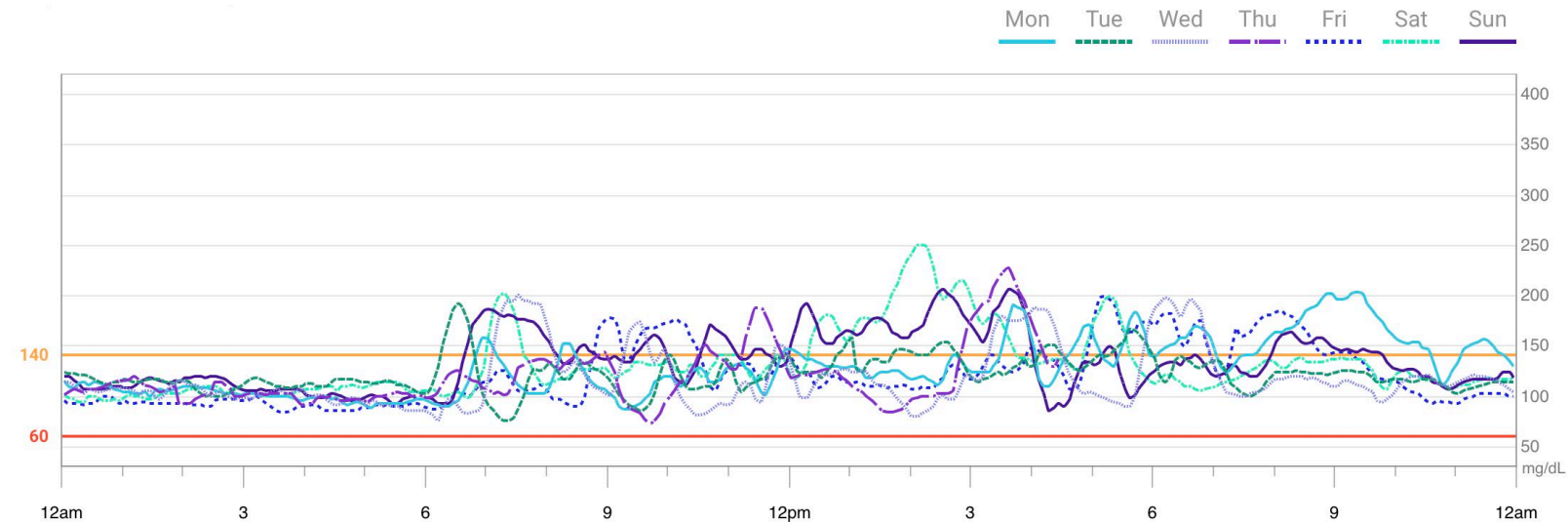
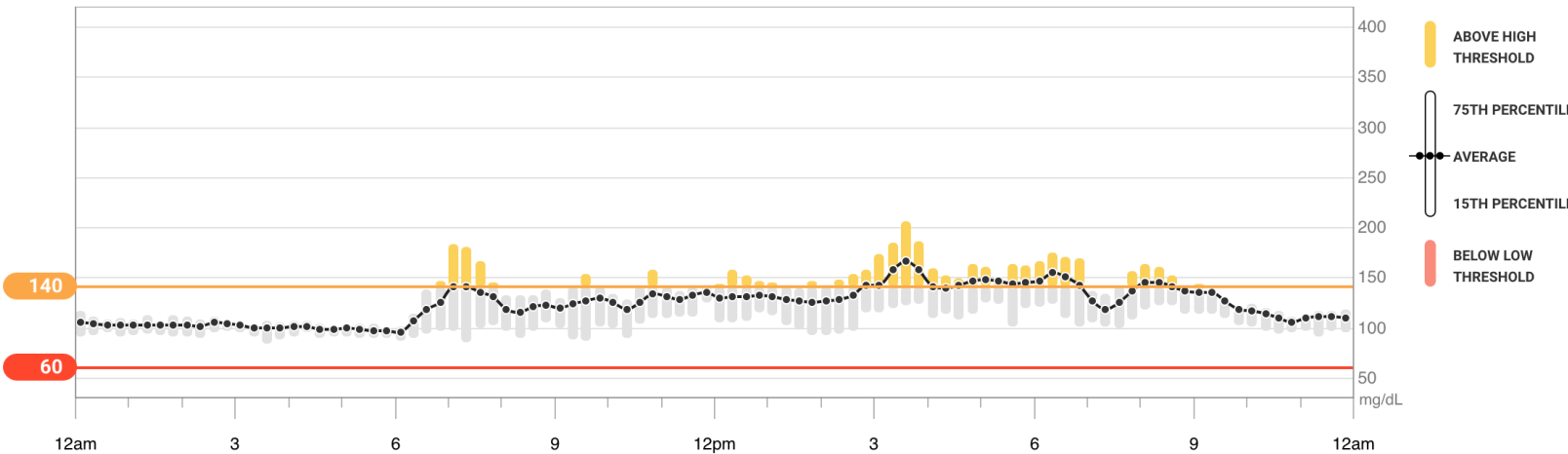
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3 yo - at Stage 2 T1D entry into The Early Start Study

HbA1c 5.1%

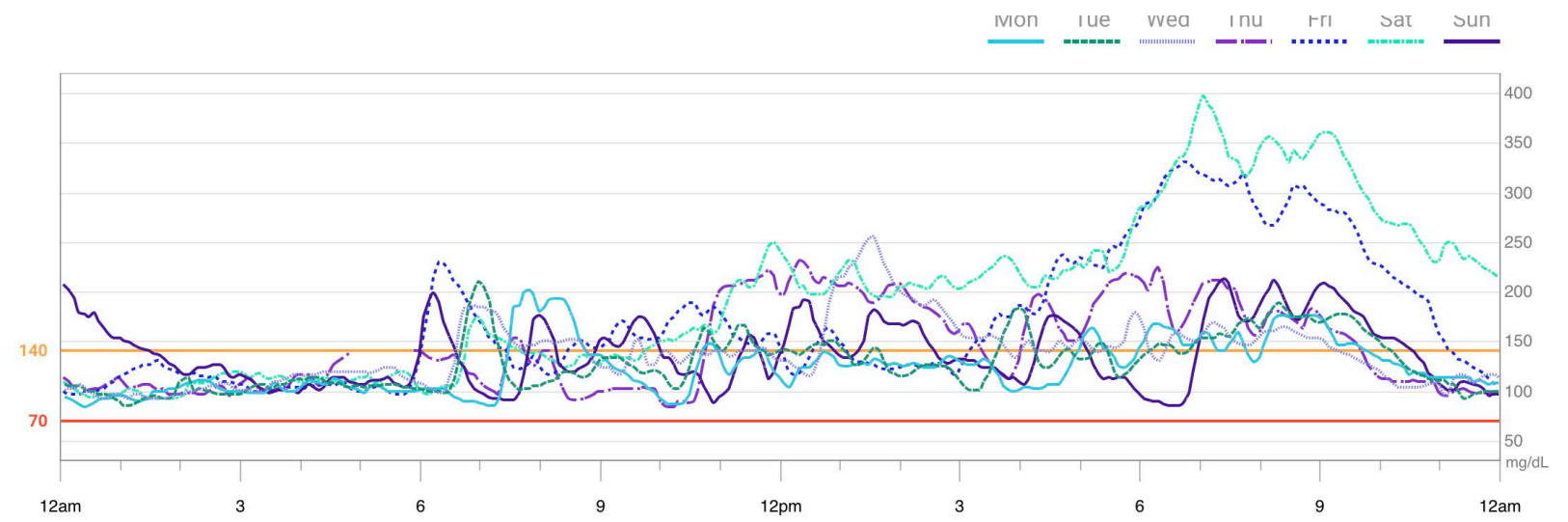
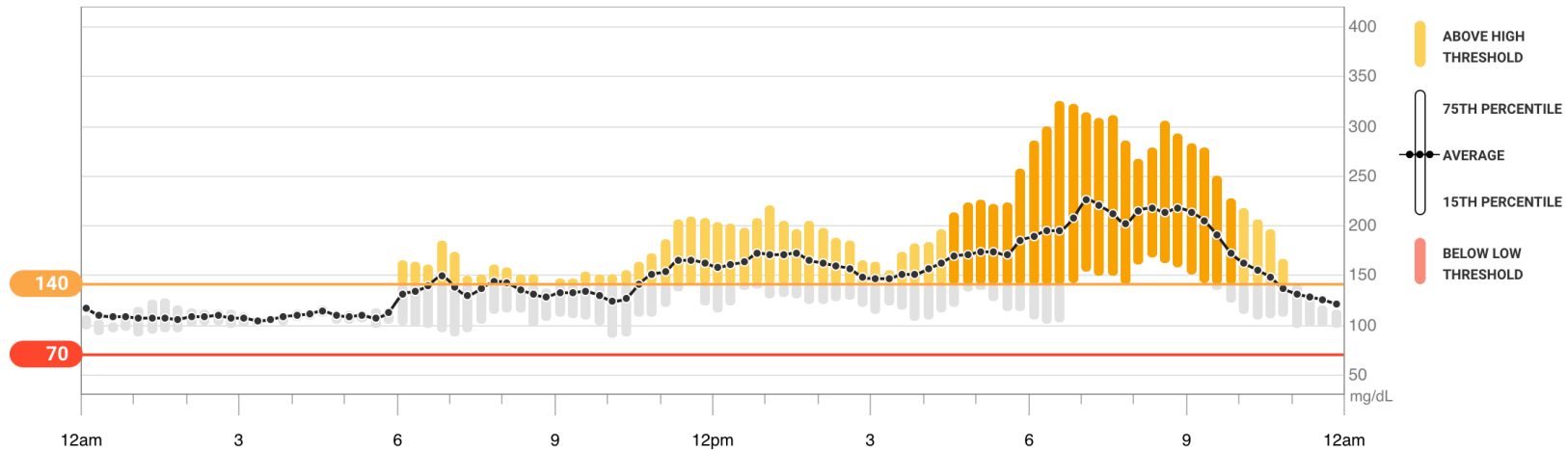
CGM	
>140:	22%
Time in range:	78%
Avg SG (mg/dL):	123 ± 29

OGTT		mg/dL
0 min	81	
Peak	185	
120 min	143	



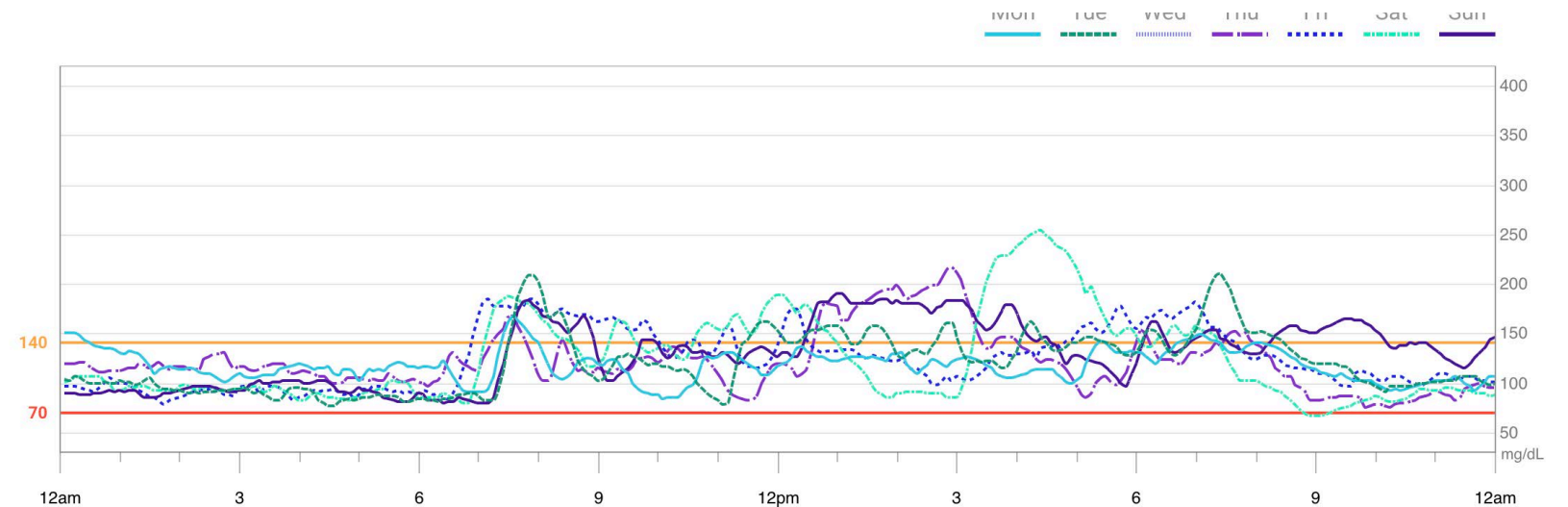
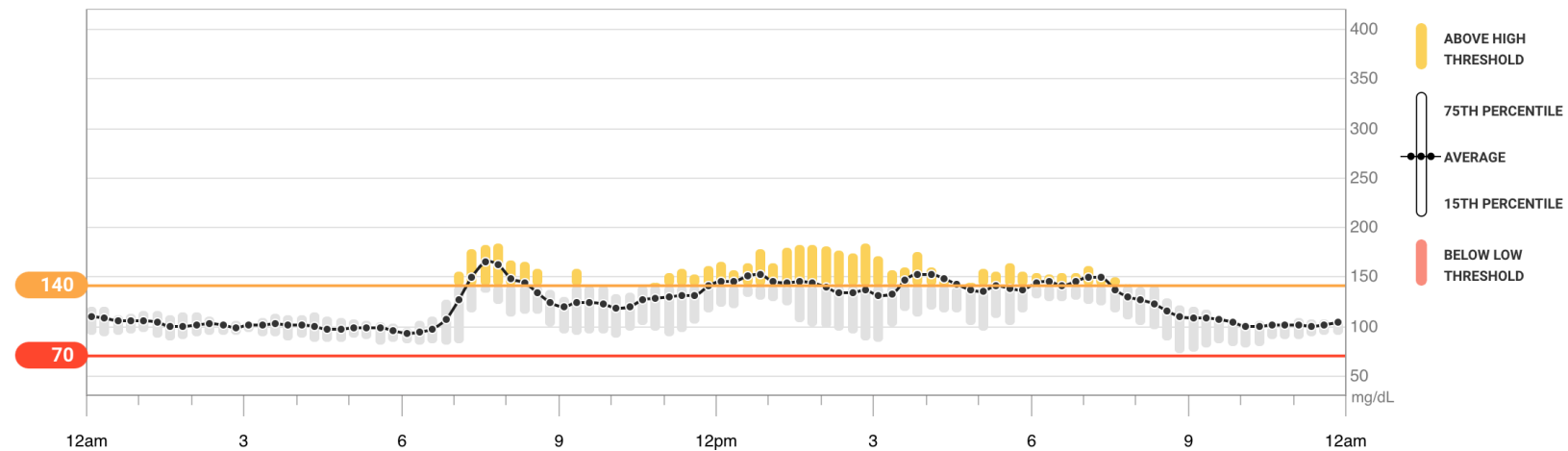
One week later, has an illness with fever

CGM	
>140:	44%
Time in range:	56%
Avg SG (mg/dL):	149 ± 54



Two weeks later, illness resolved

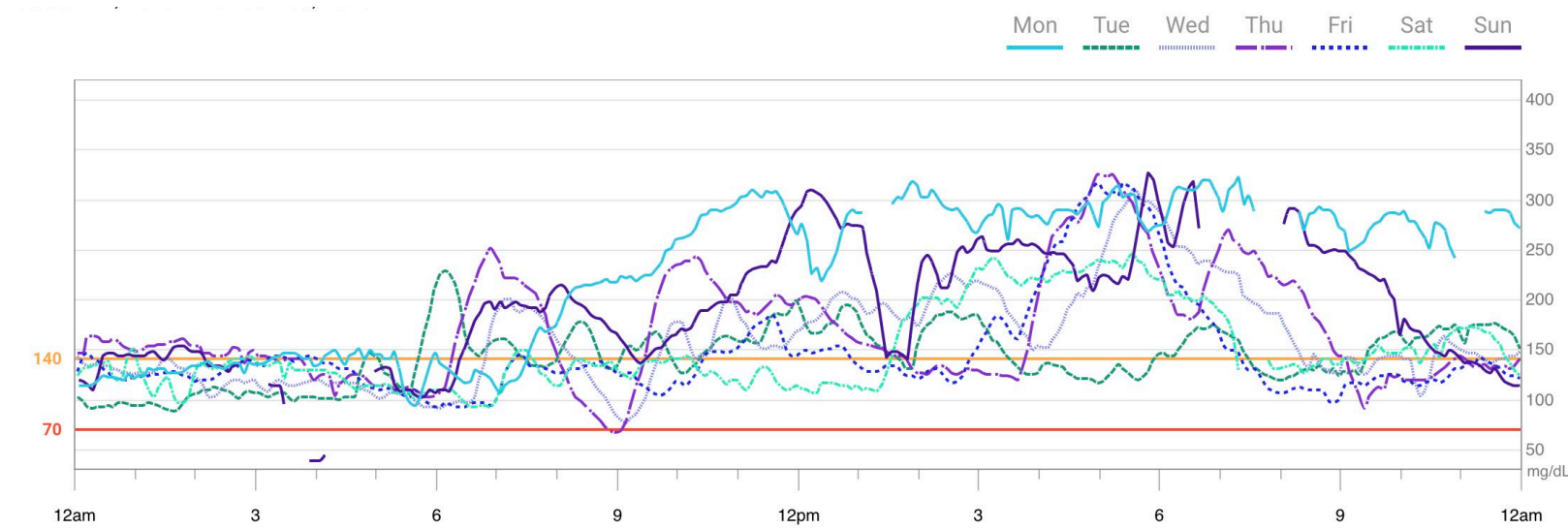
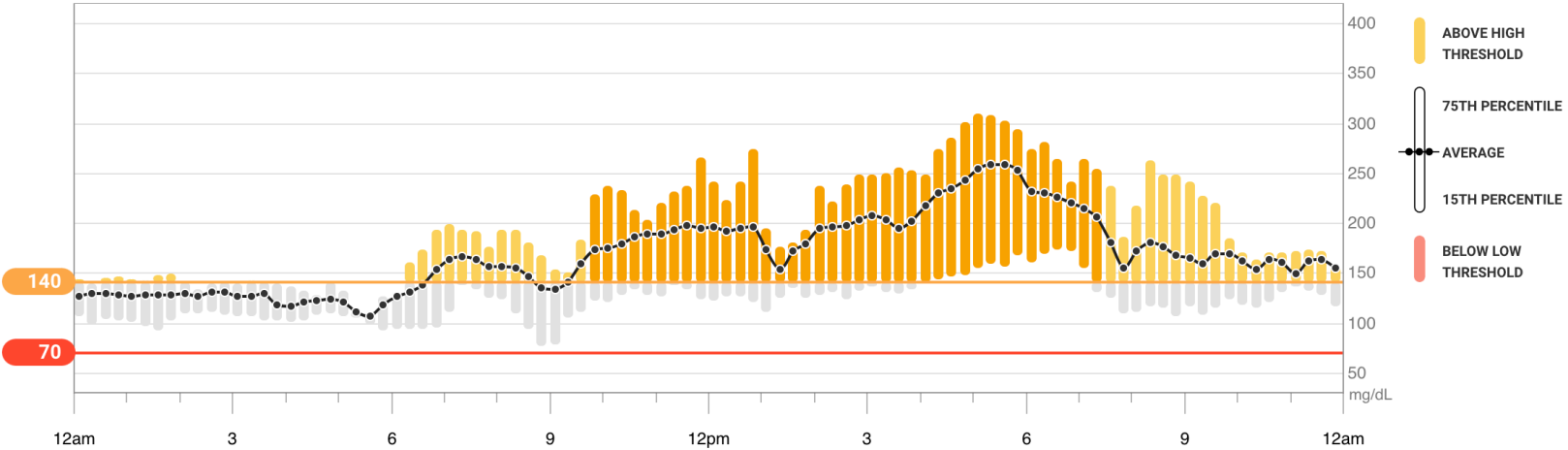
CGM	
>140:	25%
Time in range:	74%
Avg SG (mg/dL):	123 ± 32



Two months later, diagnosed with Stage 3 T1D

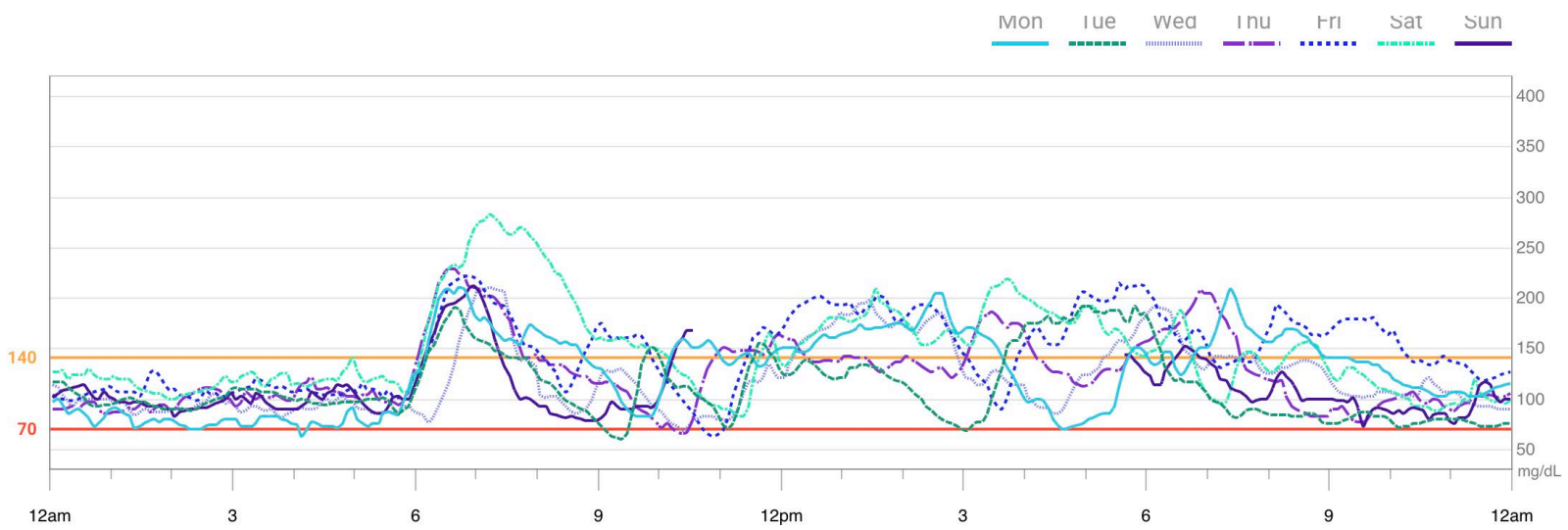
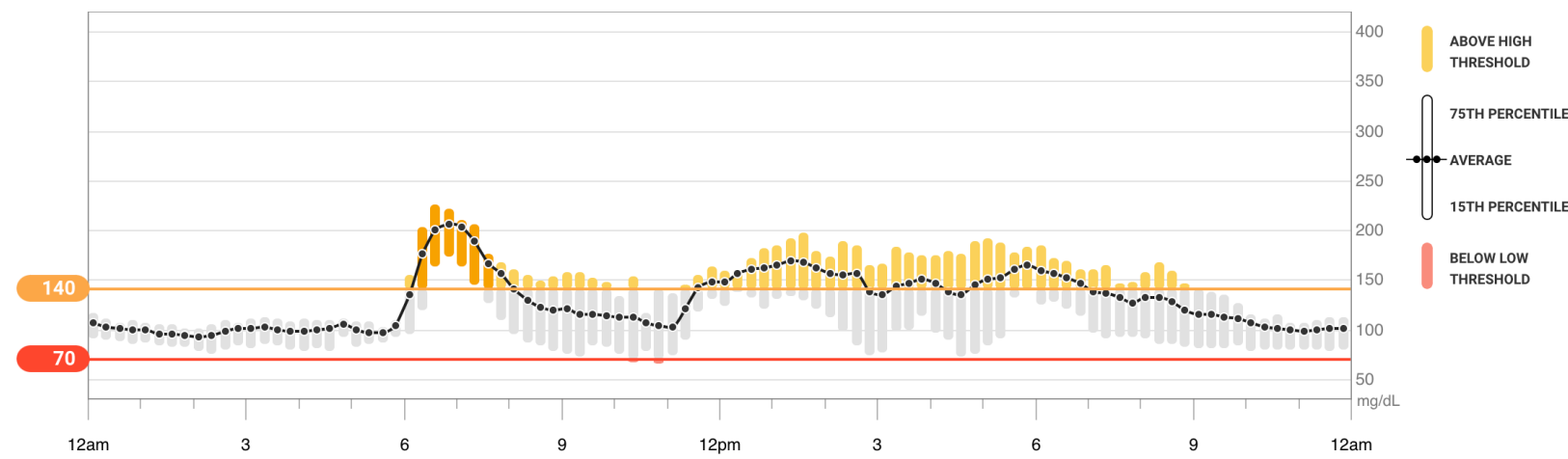
HbA1c	6.0%
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CGM	
>140:	56%
Time in range:	43%
Avg SG (mg/dL):	168 ± 59

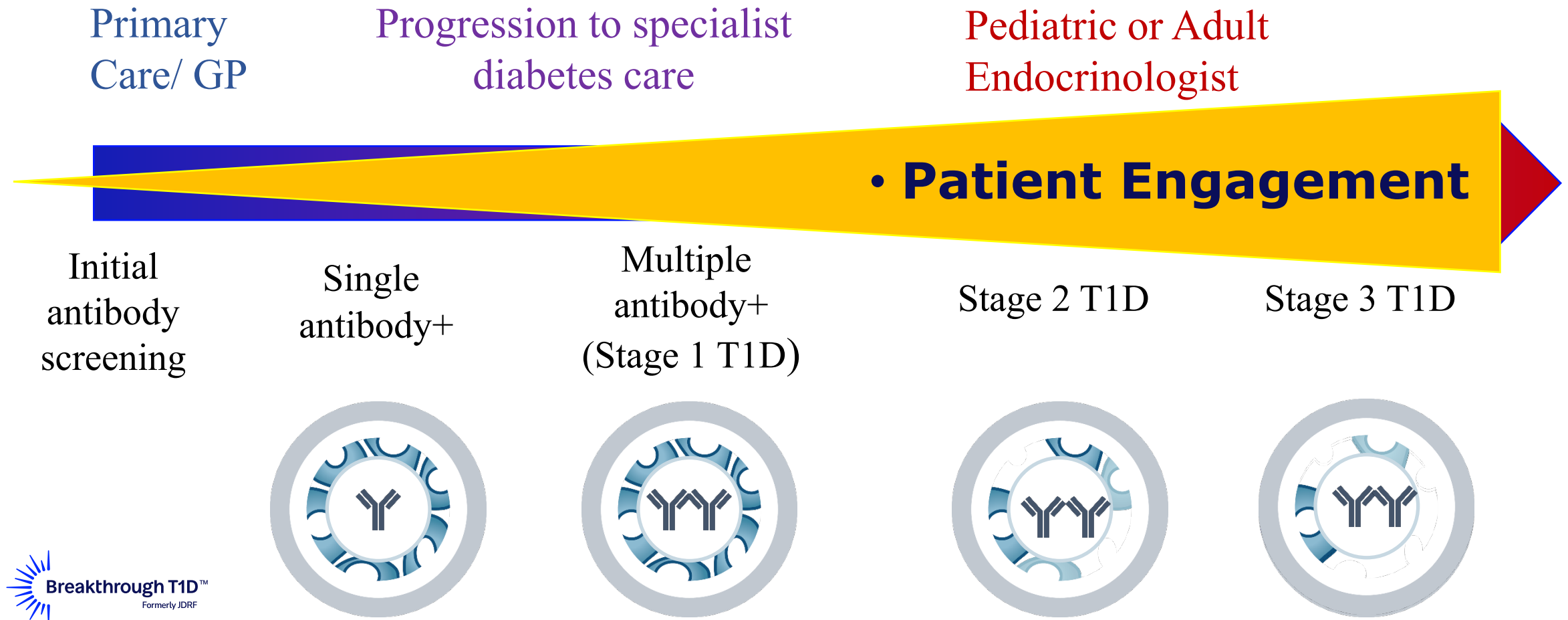


One month later, Short-acting insulin at dinner

CGM	
>140:	33%
Time in range:	65%
Avg SG (mg/dL):	127 ± 40



Care Continuum for Monitoring



Conclusion: Who is responsible for monitoring?

It takes a village!

Collaboration across medical team – primary to specialty care

Leverage skillsets of medical teams:

- Endocrinologists
- Endocrine midlevel providers
- CDCES
- Diabetes care team (psychosocial, dietitians)
- Primary Care Providers

EHR to increase awareness and leverage incidental visits.

Extend care with telemedicine, remote consults, and remote education

Patients/families are central to monitoring – just as for stage 3 T1D care

- Build awareness through knowledge
- Build confidence through shared data and decision making
- Appropriate risk assessment improves engagement



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ASK/TESS Study Group at the University of Colorado

Barbara Davis Center for Diabetes:

Marian Rewers, MD, PhD, Principal Investigator ASK

Brigitte Frohnert, MD, PhD, Principal Investigator TESS

Kimberly Bautista, MPH, Judith Baxter, MA, Daniel Felipe-Morales, BS, Fran Dong, MS,

Isabel (Maria) Flores Garcia, Cristy Geno Rasmussen, PhD, MPH,

Patricia Gesualdo, RN, MSPH, Michelle Hoffman, RN, Xiaofan Jia, Rachel Karban, MPH, Holly O'Donnell, PhD,

Meghan Pauley, DO, Laura Pyle, PhD, Flor Sepulveda, BS, Kimber Simmons, MD, Andrea Steck, MD,

Iman Taki, MPH, Kathleen Waugh, MS, Liping Yu, MD

CHCO Epic Integration:

Amber Baumgardner, MA (Informatics)

Department of Pediatrics, Pediatric Gastroenterology, Hepatology & Nutrition:

Edwin Liu, MD, Marisa Stahl, MD

Skaggs School of Pharmacy and Pharmaceutical Sciences:

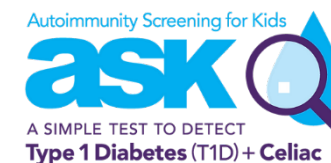
R. Brett McQueen, PhD

Colorado School of Public Health:

Jill M. Norris, PhD

Denver Health and Hospital, Denver:

Holly Frost, MD, Sonja O'Leary, MD



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