

Benefits of Early Stage T1D Education

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Disclosures

I have no conflict of interest to disclose



Goals

- 1. Identify common themes for successful monitoring in the ASK follow-up and TESS cohorts**
- 2. Identify reoccurring challenges in early T1D education and monitoring**
- 3. Early T1D Monitoring Model**
- 4. Next steps**



Benefits of Early Stage T1D Education and Monitoring

Education and monitoring

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graph TD; A[Education and monitoring] --> B[Prevention of DKA]; A --> C[Prevention trials]; A --> D[Therapy to delay onset (Tziield)];
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Prevention of
DKA

Prevention
trials

Therapy to delay
onset (Tziield)



ASK Protocol for IA+ Participants

- Every 3-6 months: repeat islet autoantibodies, A1C, blinded CGM
- Every 6 months: OGTT
- Finger stick blood glucose 2-4 x/month

ASK Screening

**ASK
Confirmation**

**ASK Follow-up
Education and
Monitoring**



The Early Start Study (TESS) enrollment

ASK Screening

ASK Confirmation

**ASK Follow-up
Education and
Monitoring**

Dysglycemia

TESS Enrollment



TESS Enrollment Criteria

- Age 2 to 20 years
- Islet autoimmunity with high risk of progression:
 - Multiple IA positive (>50% 5-year risk)
 - Single high-affinity IA (>30% 5-year risk)
- Dysglycemia:
 - ADA criteria
 - CGM-based criteria
 - Home glucose testing data

ADA Criteria for Stage 2 T1D

OGTT (plasma glucose)	
Fasting	100-125 mg/dL
2 hour glucose	140-199 mg/dL
A1c	
At visit	5.7-6.4%
Increase from last visit	≥10%

Additional TESS Criteria for Stage 2 T1D

OGTT (plasma glucose)	
30, 60 or 90 min glucose	>200 mg/dL
CGM (worn for ≥ 5 days)	
Average sensor glucose	≥120 mg/dL
% time above 140 mg/dl	≥15%
Peaks ≥200 mg/dl	on ≥2 days
Home glucometer:	
Fasting BG	>110 mg/dL on ≥2 days
2-hour post meal BG	>150 mg/dL on ≥2 days
Single random BG	> 200 mg/dL



TESS Design

- ❖ Case-control intervention trial for participants in stage 2 T1D to assess:
 - ❖ Best early education and monitoring strategy
 - ❖ CGM-guided insulin start
- ❖ 6 months intervention and 6 months follow-up
- ❖ 31 participants recruited from ASK study
- ❖ Study groups: randomized 2:1 (intervention:control)

➤ Intensive monitoring / education

Every 3 months

A1C

Every 6 months:

OGTT

CGM 20 days/ month unblinded

CGM-guided education

Structured education visits with clinical team via telemed

➤ Standard monitoring (control)

Every 3 months

A1C

Blinded CGM wear

Every 6 months:

OGTT

2-4x / month FSBG

Education on signs/symptoms



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Early-stage T1D education topics by Telemedicine

Pathophysiology of T1D (MD)

- ❖ Why did this happen?
- ❖ Stages of T1D/How blood glucose changes
- ❖ Ketosis, illness and avoidance of DKA

Monitoring education: (CDCES)

- ❖ Symptoms of highs and lows
- ❖ Checking glucose
- ❖ When/how to check ketones
- ❖ CGM placement, alarms, troubleshooting

Interventions: (MD)

- ❖ Options
- ❖ Eligibility criteria

Dietary education: (RD)

- ❖ Diet history
- ❖ What foods have carbohydrates?
- ❖ Healthy diet choices, balanced diet
- ❖ Exercise: impact on glucose, lifetime health, exercise goals

Emotional and Family impacts (SW)

- ❖ Family strengths/challenges
- ❖ Diabetes is a collaboration
- ❖ Assessment of depression/anxiety
- ❖ Coping with uncertainty
- ❖ Resources



Use of CGM-Guided Education (MD and NP)

- ❖ Practical CGM use (CDCES)
 - ❖ Troubleshooting problems
 - ❖ When to double-check with glucometer
- ❖ Observation of patterns (reviewed at 5 visits)
 - ❖ Impact of diet and exercise on glycemic excursions
 - ❖ Trends with illness / hormones / changes in activity level
- ❖ Recognition of need for insulin
 - ❖ Discussion of when and how to start insulin



Behavioral Health Measures

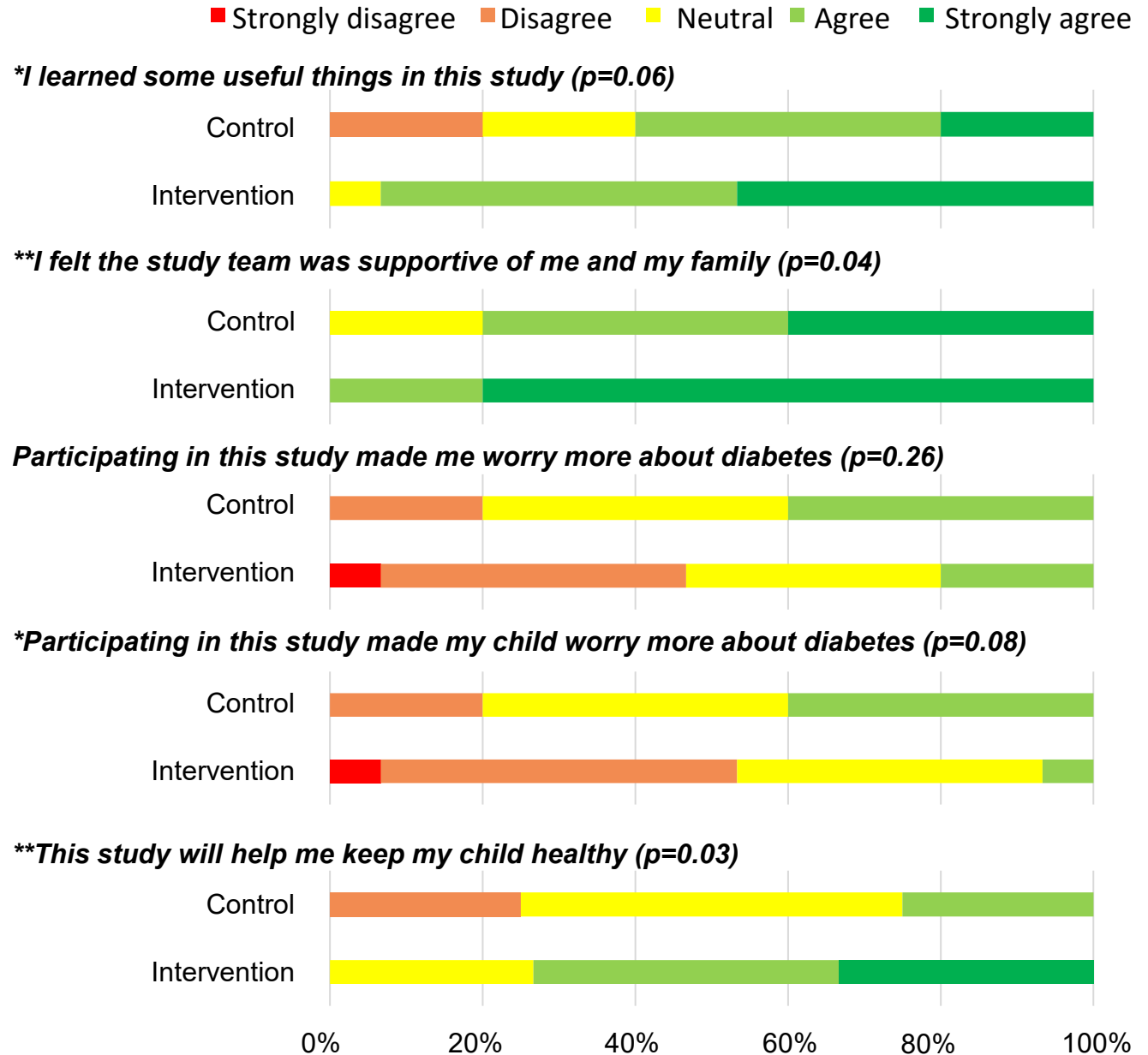
No differences by arm or from baseline to follow-up

- ❖ PedsQL-Family Impact
- ❖ PHQ8 depression scale (parent)
- ❖ Tolerance of Uncertainty
- ❖ Diabetes Attitude Survey (adapted)

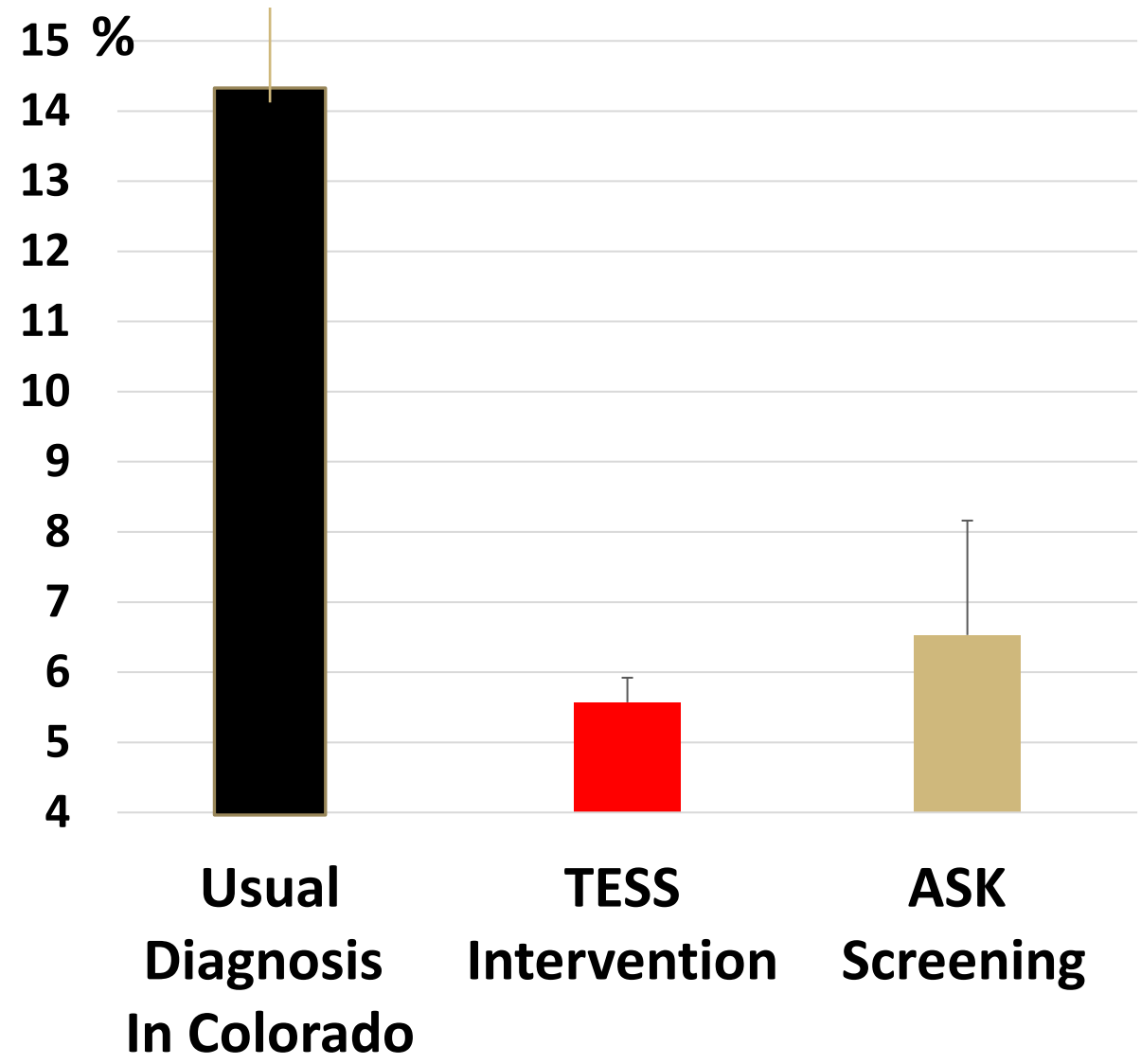


Unblinded CGM and Education vs Control (standard follow-up)

- Intervention did not increase worry for parents or children (by parent report)
- Parents felt study would keep child healthy



Comparison of HbA1c at Diagnosis



Benefits from TESS and ASK

1. Prompt identification of stage 3 (No DKA in either arm of TESS)
2. Increase family confidence with English and Spanish materials
3. Increased confidence in CGM technology use
4. Unblinded CGM does not appear to negatively impact quality of life.
5. Unblinded CGM allowed parents to participate in conversation around timing of starting insulin



Challenges in TESS and ASK monitoring

1. Time demand on families and clinical staff
2. Needlephobia
3. CGM technology issues
4. Lack of trust in research
5. Complex family dynamics



Keys for successful education and monitoring

- Continuity
- Establishment of rapport/building trust
- Engagement of participant's healthcare providers
- Design of culturally appropriate educational content



Next Steps

- ❖ Continue exploring different avenues for educating people in early stages of T1D.
- ❖ Early stage Education and Support Study (ESTES)
 - ❖ BDC, Colorado
 - ❖ Mercy Children's Hospital (Missouri)
 - ❖ University of Florida
 - ❖ Sanford Health (ND, SD, MN)
- ❖ Online education tailored to stage 1, 2 and 3 T1D
- ❖ Group zoom classes
- ❖ Bilingual curriculum (English/Spanish)
- ❖ Partnership with local PCP/Endo
- ❖ Focus on accessibility and retention for historically marginalized communities
- ❖ Incorporate community feedback



ASK/TESS Study Group at the University of Colorado

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