

The Autoimmunity Screening for Kids (ASK) Study

EPIC CUSTOMIZATION

AMBER CORR, MA



Barbara Davis Center for Diabetes
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

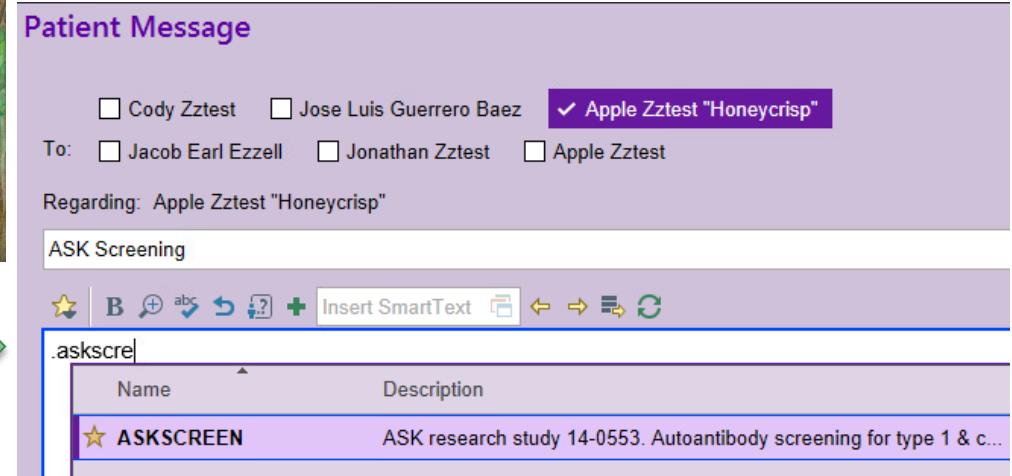
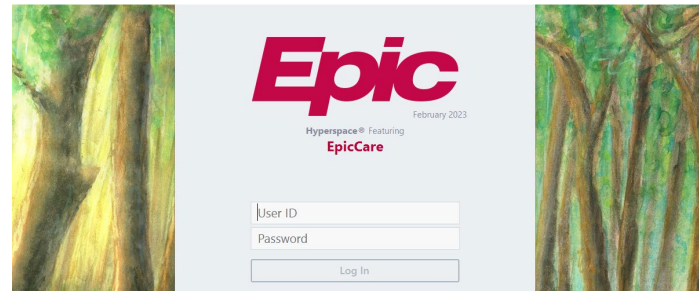


A SIMPLE TEST TO DETECT
Childhood Diabetes
+ **Celiac Disease**

Objectives

- 1. E-consent, lab orders, and result sharing at Children's Hospital Colorado (CHCO)**
- 2. Confirmation & interpretation of results via EHR communication**
- 3. ICD.10 codes and Best Practice Advisories**

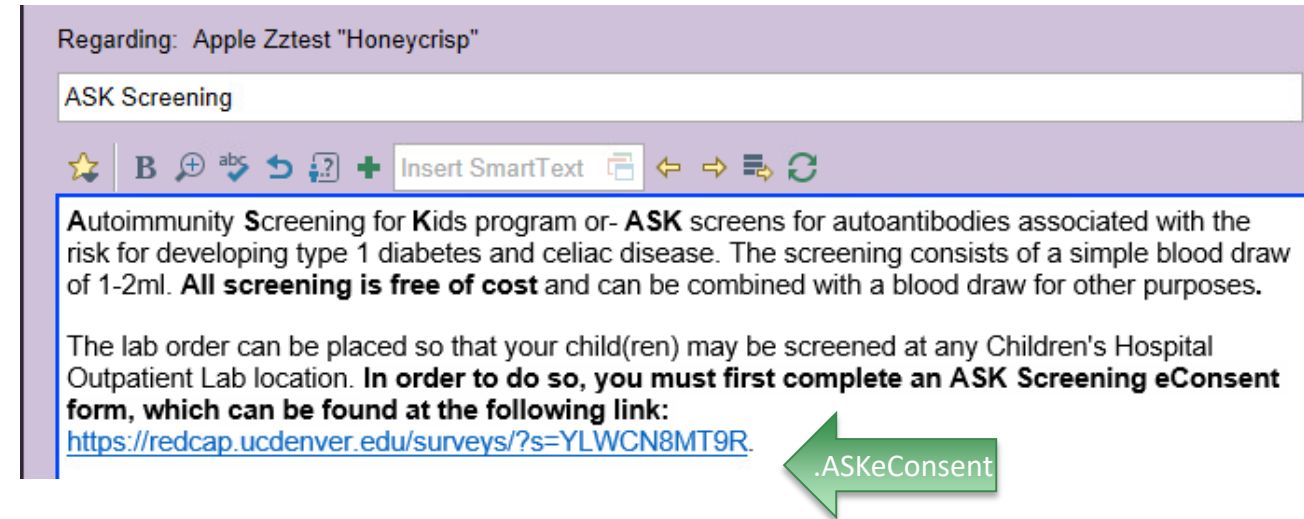
ASK eConsent



Electronic data capture system (EDC) RedCap.



- Automated alert to research coordinator for **EPIC lab order**
- eConsent can be sent via an EPIC **.smartphrase** to participants using **MyChart**



Placing Lab Orders

- ASK research coordinator requests a lab order in EPIC
- ASK PI signs the labs & releases it to 'held' in chart

Depending on participant preference the order may be:

1. released to active so participant may go to any of the CHCO's **outpatient labs** for their blood draw. **(most common workflow)**
2. left as a held lab for blood draw **at CHCO hospital:** ambulatory, in-patient, OR, or ED

R..	Date	Description	Status
Today			
	Today	ASK - tTG IgA Antibody	Held
	Today	ASK - Diabetes Autoantibodies	Held

Chart Review

Encounters Surgeries Lab Fetal Labs Imaging **Procedures** Cardiac M

Preview Refresh (6:15 PM) Select All Deselect All Review Selected Route

Filters Branch/Endoscopy

R..	Date	Description	Status
Recent			
	10/27/2023	ASK - tTG IgA Antibody	Active
	10/27/2023	ASK - Diabetes Autoantibodies	Active

Snapshot Chart Review Research Hub Orders Only Enter/Edit R

Flowsheets

File Add Rows LDA Avatar Add Col Insert Col Last Filed Req Doc Graph

Meds/IV Orders Order completion I/O & IV Flowsheet Vitals Pre-Op Checklist **OR Research**

Expanded View All

Orders Only from 10/31/2023 in Clinical Research Center O/P

10/31/2023

Search (Alt+Comma) 0900 1100

Research	
<input checked="" type="checkbox"/> Patient in Research	Yes
Protocol Name	14-0553
Principal Investigator	Rewers
Research Specimen(s) to be C...	(1) SST or Red Top 1-2mL
Research Procedure(s) to be ...	Screening

ASK Family Communications

Family Notification upon Completion of ASK eConsent

Thank you for completing a screening form and consent for your child(ren) to be screened through the Autoimmunity Screening for Kids or ASK program. We screen for autoantibodies associated with the risk of developing **Type 1 Diabetes** and **Celiac disease**. A lab order will be requested so that your child(ren) can be screened at any of the **Children's Hospital Colorado outpatient labs**.

It may take 5 – 7 business days for the lab order to be set. When the lab order is ready, you will receive a confirmation email from ASK with your copy of the lab requisition form. We ask that you please do not arrive at the outpatient lab before you receive this confirmation email from ASK- as this is a Colorado University research study protocol and there will be no one onsite at Children's Hospital that will be able to place the research lab orders for you.

If you use Epic MyChart and prefer all future ASK study communications come through your patient portal, please make that request by replying to this email with the phrase, **MYCHART.*

Family Order Notification

The **Children's Hospital** outpatient lab order is **ready**; your child/ren may now be screened by **ASK** to test for the autoantibodies associated with the risk of developing **Type 1 Diabetes** and **Celiac Disease**.

Attached is your copy of the **Research Lab Requisition Order**. The outpatient lab staff will locate the **ASK** lab orders in the **Children's Hospital** database by searching for your child/ren's medical registration number or **MRN**.

No appointment is required. Before arriving at your preferred Children's Hospital outpatient lab location, please review their hours of operation, which can be found at our website **ASKhealth.org**.

Families can receive these ASK notifications via **email or **MyChart****

ASK Result Letter

Dear Parents,

Thank you for taking the time to speak with us about the autoantibody test results for ██████████ drawn on ██████████. As we discussed on the phone, your child's confirmed test results for diabetes and celiac screening are:

Type 1 Diabetes:

-Your child is **positive** or above normal for more than one diabetes-predicting autoantibody. We believe your child's risk for type 1 diabetes is significantly increased. Close monitoring for diabetes by ASK is strongly recommended with visits to the Barbara Davis Center.

Celiac Disease:

-Your child's celiac disease screening results were **negative**.

We use two laboratory methods to test for antibodies. Your child's final screening results are listed below.

Diabetes autoantibody:

IAA - **Positive** IA-2 - **Positive**
GAD - **Negative** ZnT8 - **Positive**

Celiac autoantibody:

TG - **Negative**

Autoantibodies may develop at any time throughout childhood. Negative results do not mean that your child will never develop autoantibodies, diabetes or celiac disease.

If you have any questions or concerns please contact the ASK team at 303-724-1275. Thank you again for your participation in the ASK Program.

Entering Results

- All ASK participant results are entered into a **clinical EPIC workflow**
- Results are placed in the **‘Enter/Edit’** tab of the chart

	2023 6/13/23 00:00	2/2/23 00:00	2021 7/27/21 00:00	2017 5/30/17 00:00
CHEMISTRY, GENERAL				
A1c Hemoglobin - BDC	5.5	5.0		
GLUCOSE TOLERANCE				
Glucose, Fasting - BDC			88	
Glucose, Fasting, -10 Minute - BDC			87	
Glucose, 2 Hours Post Meal - BDC			118	
DIABETES AUTOIMM...				
Insulin Auto-Antibody (IAA) - BDC				Positive ⚠️
GAD Antibody - BDC				Positive ⚠️
Islet Antigen 2 Antibody (IA-2) - BDC				Negative
Zinc Transporter 8 Antibody (ZNT8...				Negative
TTG AB				
tTG IgA - BDC				Negative
tTG IgA Value - BDC				-0.011
tTG IgA Confirmation - BDC				Negative
tTG IgA Confirmatory Value - BDC				-0.011

Enter/Edit Results

Preview Refresh (12:17 PM) Ext Result Edit

Filters Outstanding Orders Default Types today BDC

Date/Time	Test
Recent	
09/05/2023 4:10 PM	ASK - tTG IgA Antibody
09/05/2023 4:10 PM	ASK - Diabetes Autoantibodies

Interpretating Results

- An automated alert is sent to all providers in the ‘**care team**’ and to the family through **MyChart**
- **Positive ASK** results are flagged as ‘**abnormal**’
- **Result narratives** explain the participant’s **risk status & recommended monitoring/care instructions**

The screenshot displays a patient's MyChart portal. At the top right, a 'Care Team' section lists several providers with their specialties: a Generalist PCP, a Cardiologist, an Endocrinologist, a Palliative Care physician, and a Palliative Care nurse. Below this, the 'Transplant Team' section identifies the patient as a heart transplant recipient from 7/29/2011, with a Heart Coordinator and a Surgeon listed.

The main section is titled 'RESULT NOTES' and contains a table of test results from 6 years ago. The table has three columns: Component, Ref Range & Units, and the result. Two results are highlighted in yellow with a red exclamation mark: 'Insulin Auto-Antibody (IAA) - BDC' and 'GAD Antibody - BDC', both showing 'Positive'. Other results for 'Islet Antigen 2 Antibody (IA-2) - BDC' and 'Zinc Transporter 8 Antibody (ZNT8) - BDC' are 'Negative'. The resulting agency is listed as 'CHCO Anschutz Lab'.

Below the table is a 'Narrative' section titled 'RESULTS FROM TYPE 1 DIABETES SCREENING', performed by CHCO Anschutz Lab. The text explains that the patient had screening for type 1 diabetes (T1D) using islet autoantibody testing through the Autoimmunity Screening for Kids (ASK) study on 5/30/2017. It states that the patient tested POSITIVE for multiple islet autoantibodies, significantly increasing the risk for developing symptomatic T1D. The narrative provides specific risk statistics: a 50% chance of developing symptomatic T1D in 5 years and a 70% chance in the next 10 years, with a lifetime risk approaching 100%. It also mentions that the patient has been invited to continue monitoring for development of T1D as part of the ASK study at the Barbara Davis Center for Diabetes, with details on the monitoring process and family instructions.

ASK - Diabetes Autoantibodies

Collection date:

Collection time:

No collection information available

Providers

Billing:

Resulting:

Send Results:

Component	Value	Flags	Low	High	Ref Range	Units	Comment
INSULIN AUTO-ANTIBODY - BDC	Positive	Abnormal			Negative		
GAD ANTIBODY - BDC	Positive - ...	Abnormal			Negative		
ISLET ANTIGEN 2 ANTIBODY - BDC	Negative				Negative		
ZINC TRANSPORTER 8 ANTIBODY - ...	Negative				Negative		

Result

Result date:

Result time:

Abnormal:

Status:

Positive islet autoantibodies **may** indicate an increased risk for developing symptomatic type 1 diabetes. **These results need to be confirmed** in order to estimate risk. @FNAME@ follow-up for confirmation with the Autoimmunity Screening for Kids (ASK) study.

Please contact the Autoimmunity Screening for Kids (ASK) study with questions.

www.askhealth.org
303-724-1275

SmartPhrase Manager - search result for "askres"

Level:

New User SmartPhrase Edit SmartPhrase Lookup Share With

Name	Description
ASKRESMULTI	MULTIPLE - Confirmed
ASKRESNEG	NEGATIVE
ASKRESPOS	POSITIVE Screening
ASKRESSBB	SBB-Confirmed
ASKRESTGCONF	POSITIVE TG confirmed
ASKRESTGNEG	NEGATIVE TG screening
ASKRESTGPOS	POSITIVE TG Screening

User SmartPhrase - ASKRESMULTI [507242]

Do not include PHI or patient-specific data in SmartPhrases.

Multiple positive islet autoantibodies indicate that **risk for developing symptomatic type 1 diabetes is significantly increased**. This **confirmed** result indicates a 50% chance of developing symptomatic diabetes in 5 years and a 70% chance in the next 10 years, with a lifetime risk approaching 100%.

Please contact the Autoimmunity Screening for Kids (ASK) study with questions.

www.askhealth.org
303-724-1275

Challenges in Staging & Monitoring Early-T1D in EHR

Problem- research communications such as memos, notes, & FYIs can become buried and ineffective in EHR

Solution- Using effective clinical communication tools:

- **Problem list entries** (mapped to ICD.10 codes) can indicate stage of early T1D
- **'Best practice advisories' (BPA)** activated by problem list entry can alert HCPs:
 - Risk of progression to T1D
 - Signs and symptoms
 - Optional labs for evaluation

When these two clinical mechanism are paired, it opens a pathway to effective communication and robust monitoring between clinical research teams and health care providers

ASK Study EPIC Problem List Entries

Problem List

ENT
Seasonal allergic rhinitis

Endocrine and Metabolic
BMI (body mass index), pediatric, 95-99% for age
BMI (body mass index), pediatric, 85% to less than 95% for age
Stage 1 presymptomatic normoglycemic type 1 prediabetes

Skin
Atopic dermatitis

The screenshot shows the EPIC Problem List interface. At the top, there is a search bar for new problems and a 'Care Coordinator Note' section. Below, the 'Diagnosis' section lists two entries under 'Endocrine and Metabolic':
1. 'Stage 2 presymptomatic dysglycemic type 1 prediabetes' with an 'Overview' link and a description: '@FNAME@ had screening for type 1 diabetes (T1D) using islet autoantibody testing through the Autoimmunity Screening for Kids (ASK) study'. It includes action buttons: 'Edit Overview', 'Change Di', and 'Resolve'.
2. 'Stage 1 presymptomatic normoglycemic type 1 prediabetes (Resolved)' with an 'Overview' link and a description: '@FNAME@ had screening for type 1 diabetes (T1D) using islet autoantibody testing through the Autoimmunity Screening for Kids (ASK) study'. It includes action buttons: 'Edit Overview', 'Change Di', and 'Resolve'.
At the bottom, there are checkboxes for 'Mark as Reviewed' and 'Never Reviewed'.

ASK Stage 1
Presymptomatic normoglycemic type 1 prediabetes
ICD.10 Code: R73.03
EPIC Mapping Code: 1676361
EpicSmartPhrase: .ASKSTG1

Problem List

Endocrine and Metabolic
Stage 2 presymptomatic dysglycemic type 1 prediabetes

ASK Stage 2
Presymptomatic dysglycemic type 1 prediabetes
ICD.10 Code: R73.03
EPIC Mapping Code: 1676362
Epic SmartPhrase: .ASKSTG2

@FNAME@ tested confirmed **POSITIVE** for multiple islet autoantibodies. This means that the **risk for developing symptomatic T1D is significantly increased**. Youth with two or more positive islet autoantibodies have a 50% chance of developing symptomatic T1D in 5 years and a 70% chance in the next 10 years, with a lifetime risk approaching 100%.

@FNAME@ tested confirmed **POSITIVE** for one or more of the four islet autoantibodies tested. Additionally, @FNAME@ has shown **dysglycemia consistent with prediabetes on one or more measures**. This means that the **risk for developing symptomatic T1D is significantly increased**.

@FNAME@ and family have been taught to monitor at home by checking finger stick blood glucose after meals a few times per month and to increase to daily checks during illness or with onset of symptoms (including polyuria, polydipsia, nausea, fatigue and weight loss). @FNAME@'s family has been instructed to contact Autoimmunity Screening for Kids (ASK) study staff and @HIS@ health care provider if they note any confirmed finger stick blood glucose >200 mg/dL or any of the above T1D symptoms. Recommended further evaluation may include HbA1c, blood glucose and blood or urine ketone measurement. Early recognition of T1D can prevent potentially life-threatening complications such as diabetic ketoacidosis (DKA). **For clinical consultation call the Pediatric Diabetes (Barbara Davis Center) at One Call (720-777-3999) with questions or if labs show ketosis, HbA1c ≥ 6.5, or glucose >200 mg/dL.**

@FNAME@ and family have been taught to monitor at home by checking finger stick blood glucose after meals a few times per month and to increase to daily checks during illness or with onset of symptoms (including polyuria, polydipsia, nausea, fatigue and weight loss). @FNAME@'s family has been instructed to contact Autoimmunity Screening for Kids (ASK) study staff and @HIS@ health care provider if they note any confirmed finger stick blood glucose >200 mg/dL or any of the above T1D symptoms. Recommended further evaluation may include HbA1c, blood glucose and blood or urine ketone measurement. Early recognition of T1D can prevent potentially life-threatening complications such as diabetic ketoacidosis (DKA). **For clinical consultation call the Pediatric Diabetes (Barbara Davis Center) at One Call (720-777-3999) with questions or if labs show ketosis, HbA1c ≥ 6.5, or glucose >200 mg/dL.**

*Glucose measurements; results are entered before Stage 2 Problem List code

ASK Study EPIC (BPA) Monitoring Early T1D

		2023	10/20/23	10/20/23	9/19/23
		10/20/23	14:35	13:00	13:09
CHEMISTRY, GENERAL		Glucose,S	103	113	▲
URINALYSIS GROUP		Glucose-UA	Negative		

Statement of risk →

		2022	
		7/13/22	
		00:00	
CHEMISTRY, GENERAL		A1c Hemoglobin - BDC	5.9 ▲

Suggested order set options →

GLUCOSE TOLERANCE	
Glucose, Fasting - BDC	67
Glucose, Fasting, -10 Minut...	51
Glucose, 2 Hours Post Meal - BDC	147 ▲

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 _____

Case Example

- 4.5 yo female screened 2 antibodies positive in ASK
- Parents refused confirmation or monitoring but agreed to notation in EMR (Problem list entry)
- At 9y 10m, BPA launched during PCP visit, no symptoms noted
- HbA1c 6.9% resulted later that day
- PCP called family and on-call BDC physician
- Family presented to BDC next AM for insulin start and teaching

Future Goals

- **Continue work with EPIC functionalities using BPA to target screening:**
 - **Well child visits (recommended ages)**
 - **Those with personal or family history of autoimmune disease**
- **Partner with additional children's hospitals & HCP networks to support local EMR/EPIC outpatient lab screening protocols**
- **Implement a Laboratory Information System (LIS) for BDC labs to further expand access to our gold-standard assay for autoantibodies**

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Sponsors



Patten-Davis Foundation

**Our ASK
participants,
their families,
and ASK
provider
partners!**

Partners



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Autoimmunity Screening for Kids

