

Improving Symptom Control in Pediatric Cancer Patients with SSPedi and SPARK

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NIH Pragmatic Trials Collaboratory Grand Rounds

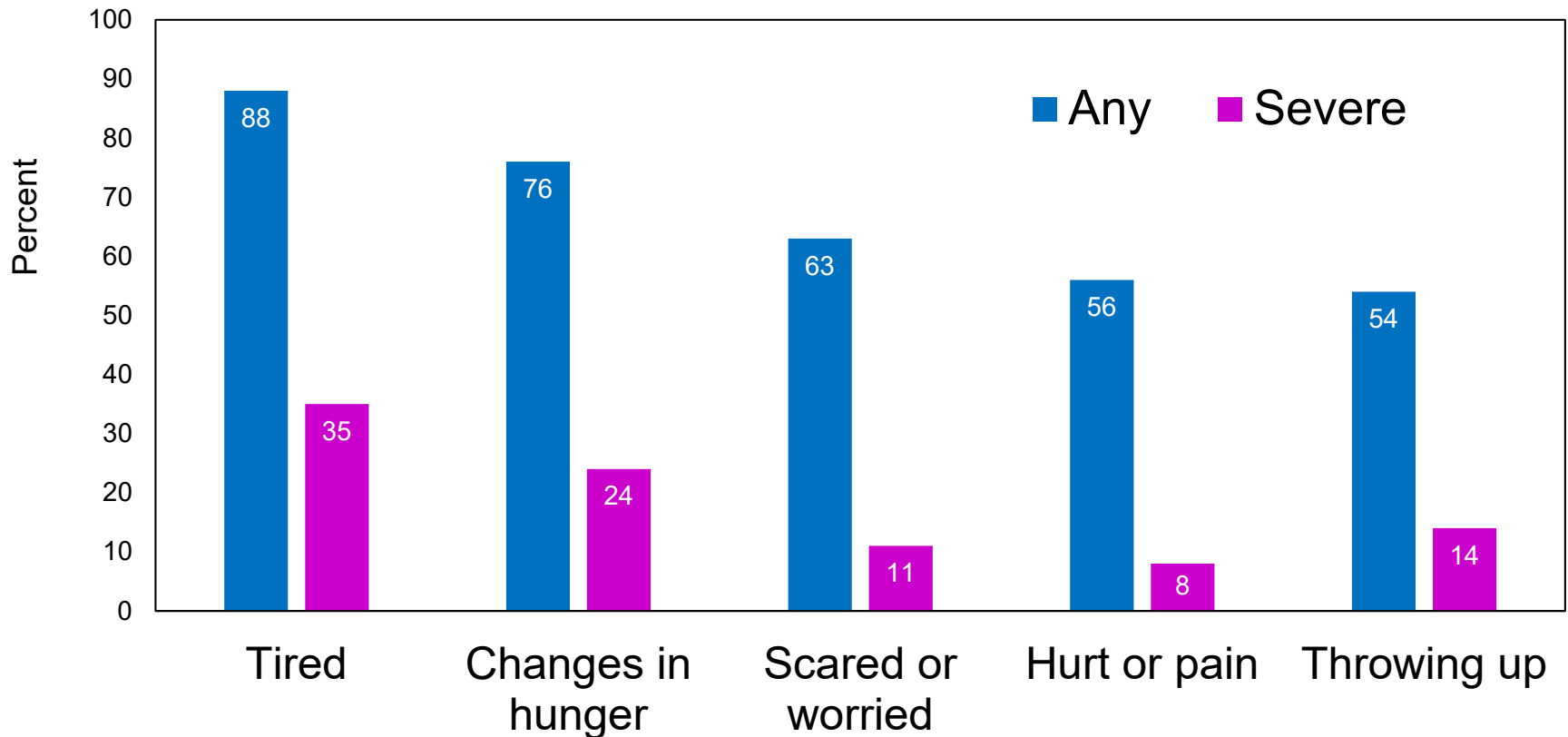
February 7, 2025



Healthier Children. A Better World.

Symptom Control is Poor

New diagnosis 8-18 years self-report (N=213)



Supportive care 2030 movement: towards unifying ambitions for global excellence in supportive cancer care—an international Delphi study



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Routine screening and actions

Routine collection of patient-reported outcomes measuresused to inform timely, individualized care for all people affected by cancer...

Evidence-based guidelines driven care

Supportive care is accessible to all people affected by cancer informed by evidence-based guidelines that are promoted and supported by the local and global community.

spark      

SSPedi: Symptom Screening in Pediatrics Full time for instructions SAVE

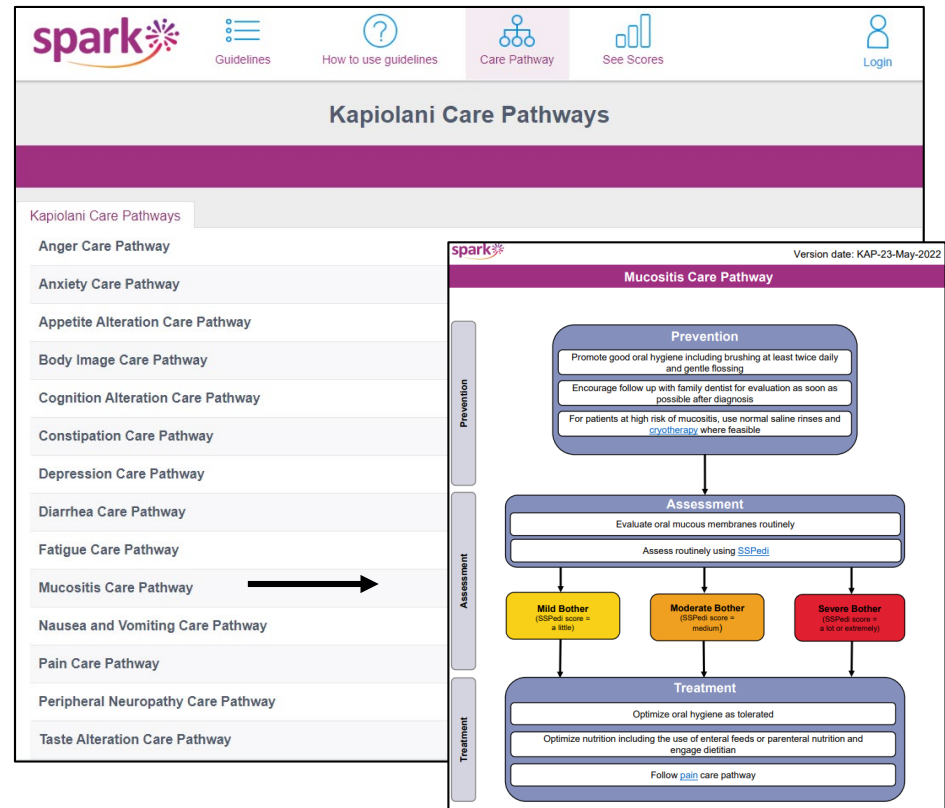
Please tell us how much each of these things bothered you yesterday or today by tapping the circle that best describes the amount it bothered you:

Completed 9 of 15

	Not at all bothered	A little	Medium	A lot	Extremely bothered
Feeling disappointed or sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling scared or worried	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling cranky or angry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problems with thinking or remembering things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changes in how your body or face look	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling tired	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mouth sores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Headache	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hurt or pain (other than headache)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tingly or numb hands or feet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Throwing up or feeling like you may throw up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling more or less hungry than you usually do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changes in taste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

spark Supportive care (Prevention, Assessment, and Recommendations) for Kids. [About SPARK](#) [Contact Us](#)

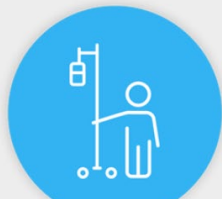
Care Pathways



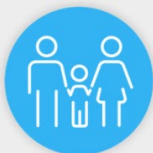


SPARK links the detection of symptoms related to cancer treatment with the best supportive care for kids

Login EN



I am a **patient**



I am a **family member**



I am a **healthcare professional**

SPARK has two parts

SSPedi (track symptoms) and clinical practice guidelines (treat symptoms)



2:17

90%

Dear Erin testpat9,

Your patient Erin Plenert's scores from SSPedi, a validated symptom screening tool, on Friday February 12, 2021:

spark

Do SSPedi See Scores How SSPedi Works Care Recommendations SSPedi

CANCEL

SSPedi: Symptom Screening in Pediatrics

Please tell us how much each of these things bothered you yesterday or today by tapping the circle that best describes the amount it bothered you:

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Heart or pain (other than headache)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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spark Supportive Care Prioritization, Assessment, and Recommendations for Kids

About SPARK Contact Us

Thank you,

SPARK Research Team



Healthier Children. A Better World.

SickKids
THE HOSPITAL FOR
SICK CHILDREN

Randomized Controlled Trials

Individual patient RCT (N=345)



Symptom screening

Usual care



Cluster RCT (N=445)



Symptom screening

Usual care



Methods – Cluster RCT

Sites: 20 US sites

Years: July 2021 to August 2023

Unit of Randomization: Sites



*Thank
you*

Site Name	Site Principal Investigator
Blank Children's Hospital	Wendy Woods-Swofford MD, MPH
Children's Hospital Colorado	Jenna Demedis MD, MS
Children's Hospital New Orleans	Lolie Yu MD, MPH
Children's Hospital of Richmond	Daniel Cannone DO
Children's Hospital Los Angeles	David Freyer DO, MS Etan Orgel MD, MS
Columbia University	Melissa Beauchemin PhD
Connecticut Children's	Andrea Orsey MD, MSCE
Driscoll Children's Hospital	Farha Sherani MD
Kapi'olani Medical Center for Women & Children	Wade Kyono MD
Lucile Packard Children's Hospital	Catherine Aftandilian MD Christina Baggott PhD
MD Anderson Cancer Center	Michael Roth MD
Nemours Children's Hospital, Delaware	Emi Caywood MD
Nemours Children's Hospital, Florida	Vibhuti Agarwal MD Ramamoorthy Nagasubramanian MD
Nemours Jacksonville	Scott Bradfield MD
Phoenix Children's	Alexandra Walsh MD
Roswell Park Oishei Children's	Kara Kelly MD
University of Iowa	David Dickens MD
UT Health San Antonio	Allison Grimes MD, MSCI
Vanderbilt University Medical Center	Adam Esbenshade MD, MSCI
Washington University in St. Louis	Allison King MD, PhD

Procedures



Contracts and
IRB - agree to
intervention or
control groups



Randomize – stratify:

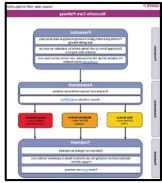
- No. patients
- Private insurance



Include: New diagnosis
cancer
Plan any treatment
English/Spanish
8-18 years

Intervention Sites

Control Sites



Adapt 14 care pathways
symptom management

Usual Care



Patient reminders – email or
text



Symptom screening 3 times
weekly x 8 weeks



Email to HCPs ≥ 1 severely
bothersome symptom

Outcomes

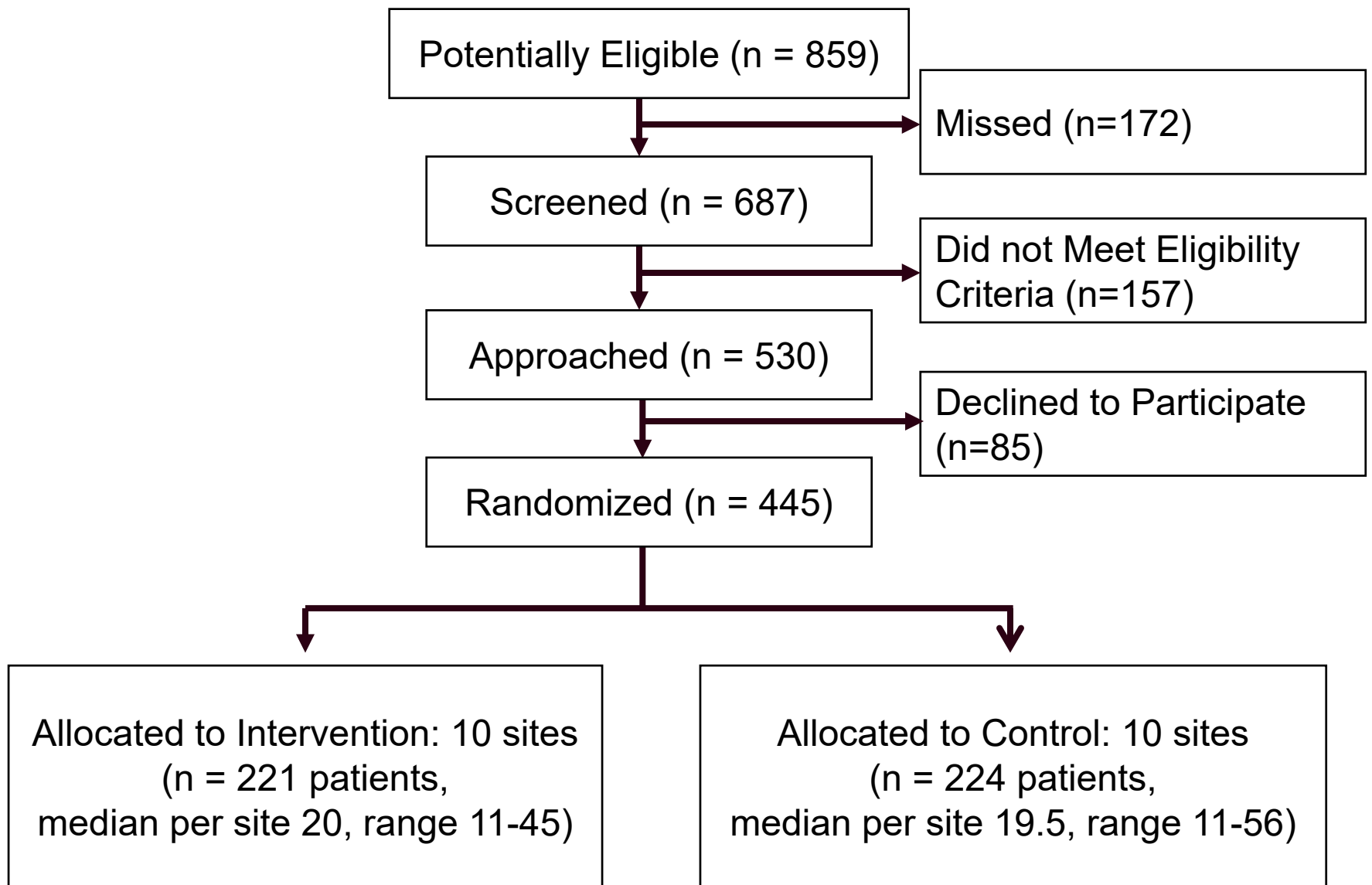
Patient Reported
Outcomes –
baseline, weeks 4, 8

Primary: Total SSPedi score (0-60) at 8 weeks

Secondary:

- Individual SSPedi symptoms
 - PedsQL domain scores
 - PROMIS Fatigue
-
- Symptom documentation and interventions
 - ED visits, unplanned clinic visits and unplanned hospitalizations

Chart
Review –
weeks 4, 8



Baseline Characteristics

Characteristic	Symptom Screening	Usual Care
	n=221	n=224
Male, n (%)	133 (60.2)	129 (57.6)
Age Group in Years, n (%)		
8-10	33 (14.9)	37 (16.5)
11-14	77 (34.8)	85 (37.9)
15-18	111 (50.2)	102 (45.5)
Race, n (%)		
American Indian or Alaska Native	2 (0.9)	4 (1.8)
Asian	13 (5.9)	7 (3.1)
Black or African American	13 (5.9)	14 (6.2)
Native Hawaiian or Other Pacific Islander	14 (6.3)	1 (0.4)
White	113 (51.1)	145 (64.7)
Ethnicity, n (%)		
Hispanic or Latino	85 (38.5)	63 (28.1)
Not Hispanic or Latino	123 (55.7)	139 (62.1)

Some Study Metrics

- R01 scores – Feb 2020
- Completed accrual about 1 year early
- Only one patient came off study early
- Week 4 and week 8 PROs:
 - Missing 3.5% and 5.3%
 - 70 obtained remotely
- Intervention: median # SSPedi 20 (IQR 13 to 24)
 - Median minutes 1.0 (IQR 0.7 to 1.7)

Primary Outcome – Week 8 Total SSPedi Score

Baseline Mean (SD)		Week 8 Mean (SD)		Treatment Effect Estimate Mean Difference (95% CI)	
SPARK	Usual Care	SPARK	Usual Care	Unadjusted	Adjusted
11.8 (8.2)	13.5 (8.2)	7.9 (7.2)	11.4 (8.7)	-3.7 (-6.3, -1.1)	-3.8 (-6.4, -1.2)



Adjusted
P = .007

Less symptoms

More symptoms

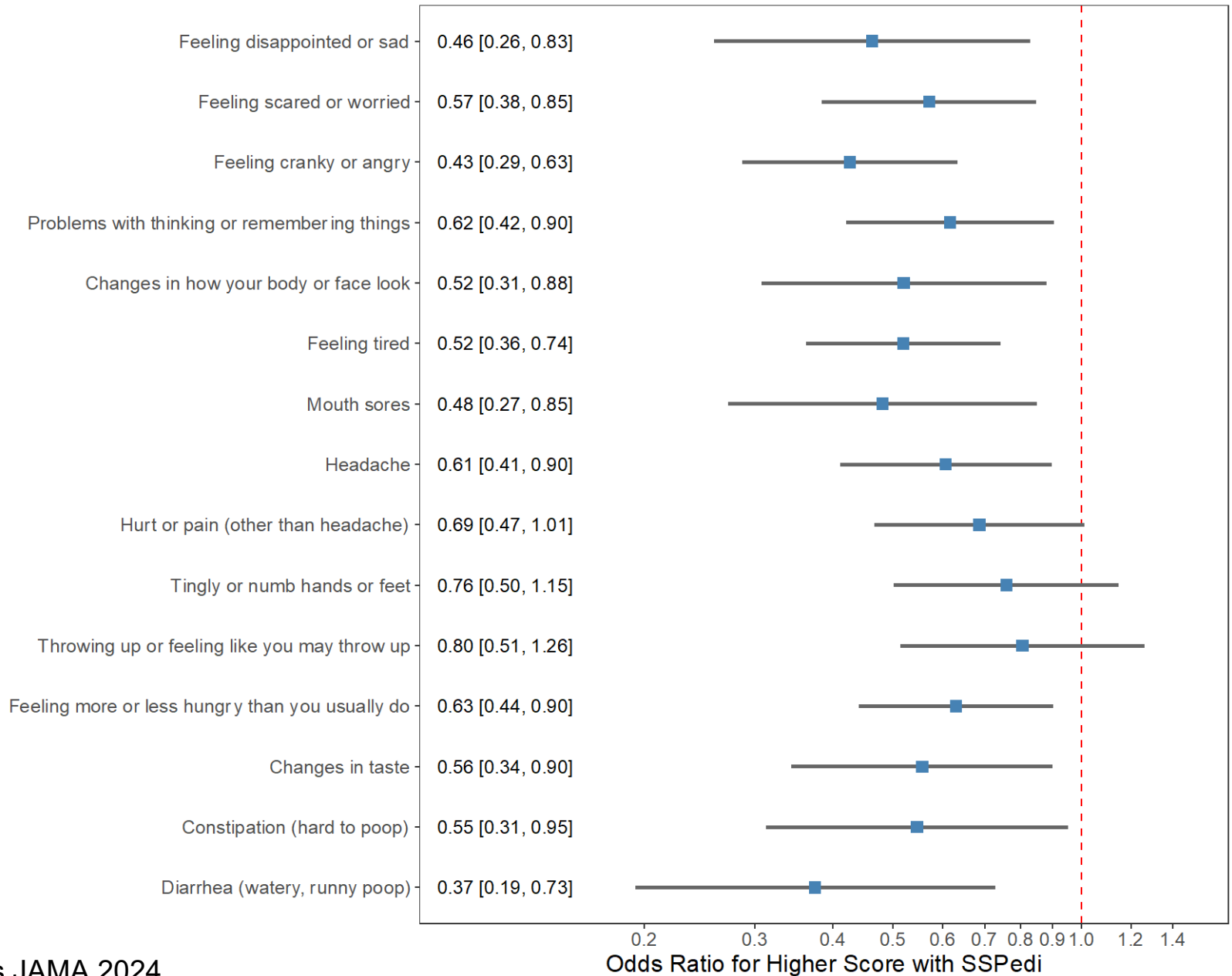


Chart Review

Symptom-specific intervention (provision clearly for symptom) more common in symptom screening group for six symptoms:

- Hurt or pain
- Changes in hunger
- Constipation
- Peripheral neuropathy
- Disappointed or sad
- Nausea and vomiting

Healthcare Encounters

	Symptom Screening Mean (SD)	Usual Care Mean (SD)	Rate Ratio (95% CI)	P Value Adjusted
ED Visits	0.77 (1.12)	0.45 (0.81)	1.72 (1.03, 2.87)	0.0374
Unplanned Clinic Visits	0.40 (1.09)	0.24 (0.58)	1.01 (0.41, 2.50)	0.9865
Unplanned Admissions	0.65 (0.93)	0.43 (0.81)	1.40 (0.96, 2.03)	0.0803

Logistic Regression ED Visits Among SPARK Group Only

	Est (SE)	P Value
Any Intervention		
Headache	0.987 (0.313)	0.002
Pain	0.812 (0.267)	0.002
Peripheral neuropathy	0.926 (0.001)	<0.001
Symptom-Specific Intervention		
Pain	1.066 (0.327)	0.001
Nausea and vomiting	0.291 (0.001)	<0.001

Baseline SSPedi

- Care pathways implemented upon randomization and thus, in place at baseline
- Thus, baseline – impact of care pathways without symptom screening

Baseline Mean (SD)		Week 8 Mean (SD)		Treatment Effect Estimate Mean Difference (95% CI)	
SPARK	Usual Care	SPARK	Usual Care	Unadjusted	Adjusted
11.8 (8.2)	13.5 (8.2)	7.9 (7.2)	11.4 (8.7)	-3.7 (-6.3, -1.1)	-3.8 (-6.4, -1.2)



Adjusted
P = .04

Conclusions

- Symptom screening improves symptom control
- Care pathway has independent effect on improving symptoms
- Symptom screening associated with increased ED visits – likely due to identification of symptoms requiring medical attention
- Strong support for integrating symptom screening into routine care

Methods – Inpatient RCT

Sites: 8 Canadian sites

Years: July 2018 to September 2023

Unit of Randomization: Patients



*Thank
you*

Site Name	Site Principal Investigator
BC Children's Hospital Vancouver	Dr. David Dix
Children's Hospital London Health Sciences Centre	Dr. Serina Patel
Children's Hospital of Eastern Ontario	Dr. Donna Johnston
Cancer Care Manitoba	Dr. Magimairajan Issai Vanan
IWK Health Centre	Dr. Ketan Kulkarni
McMaster Children's Hospital	Dr. Paul Gibson
Stollery Children's Hospital Alberta	Dr. Sarah McKillop
The Hospital for Sick Children	Dr. Lillian Sung and Dr. Lee Dupuis

Procedures



Include: cancer
8-18 years, English
In hospital/clinic daily x 5
days

Randomize – stratify:

- Age (8-10, 11-14, 15-18)
- Current HCT (yes/no)

Intervention



Daily symptom screening x
5 days



Reports provided to bedside
nurse and HCP



Email to HCPs ≥ 1 severely
bothersome symptom on
days 1 and 3

Control

Usual Care

Outcomes

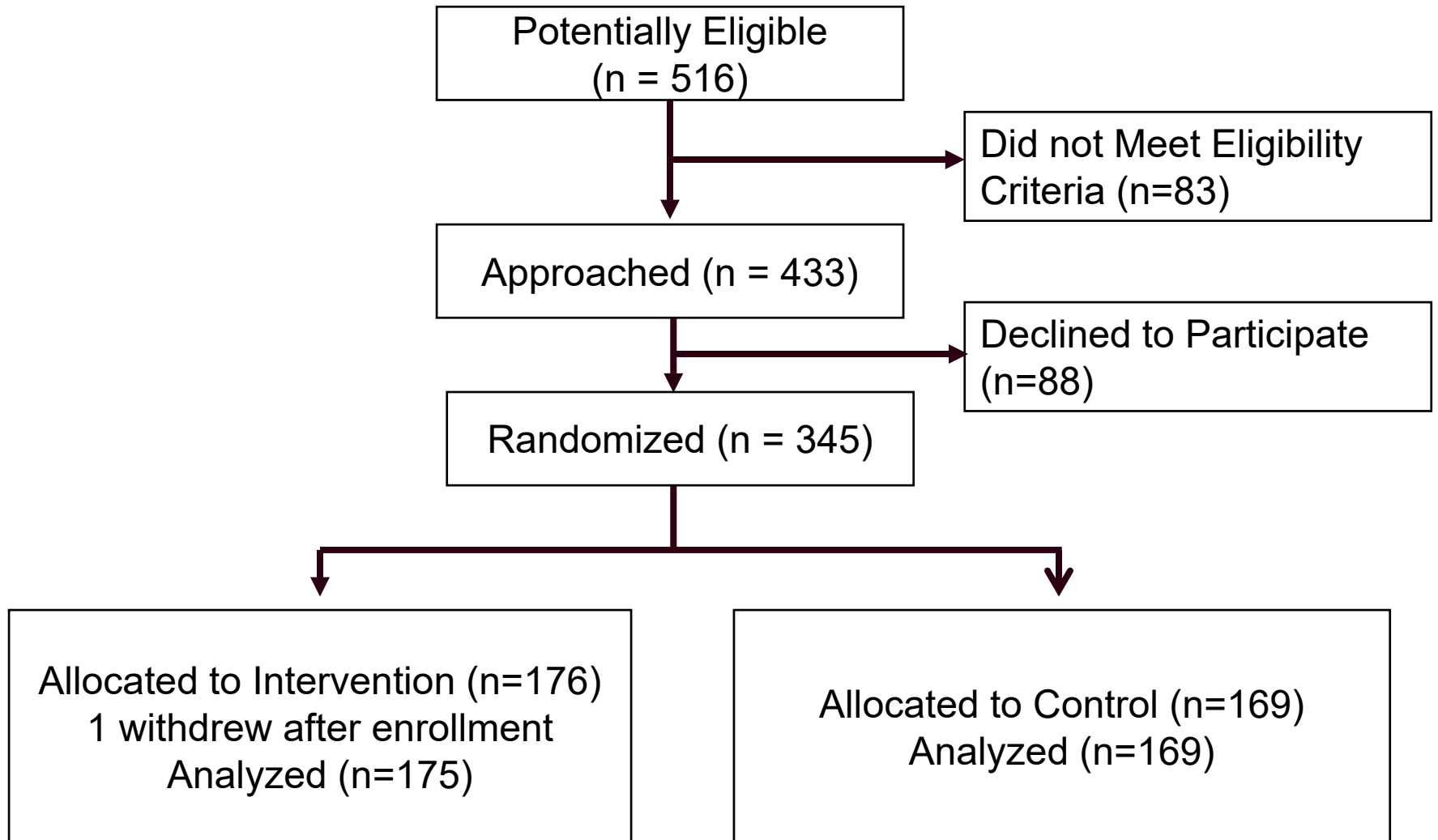
Patient Reported
Outcomes –
baseline and day 5

Primary: Total SSPedi score (0-60) on day 5

Secondary:

- Individual SSPedi symptoms
 - PedsQL domain scores
 - Faces pain scale-revised
-
- Symptom documentation and interventions

Chart
Review -
day 5



Baseline Characteristics

Characteristics	Symptom Screening	Usual Care
	n=176	n=169
Sex, n (%)		
Male	100 (56.8)	95 (56.2)
Female	76 (43.2)	74 (43.8)
Median Age in Years (range)	13.9 (8.0-18.4)	13.6 (8.0-18.8)
Age Group in Years, n (%)		
8-10	45 (25.6)	42 (24.9)
11-14	69 (39.2)	70 (41.4)
15-18	62 (35.2)	57 (33.7)
HCT	19 (10.8)	14 (8.3)

Some Study Metrics

- Accrual impacted by COVID19 pandemic
- Missing day 5 PROs 3.8%
- Timing day 5 PRO:
 - Day 5 (n=321)
 - Day 4 (n=5)
 - Day 6 (n=6)

Primary Outcome – Day 5 Total SSPedi Score

Baseline Mean (SD)		Day 5 Mean (SD)		Treatment Effect Estimate Mean Difference (95% CI)	
SPARK	Usual Care	SPARK	Usual Care	Unadjusted	Adjusted
13.2 (8.0)	13.1 (8.2)	10.2 (7.4)	12.7 (8.3)	-2.5 (-4.2, -0.8)	-2.5 (-3.8, -1.2)



Adjusted
P=0.0003

Less symptoms

More symptoms

ORs for Individual SSPedi Symptoms

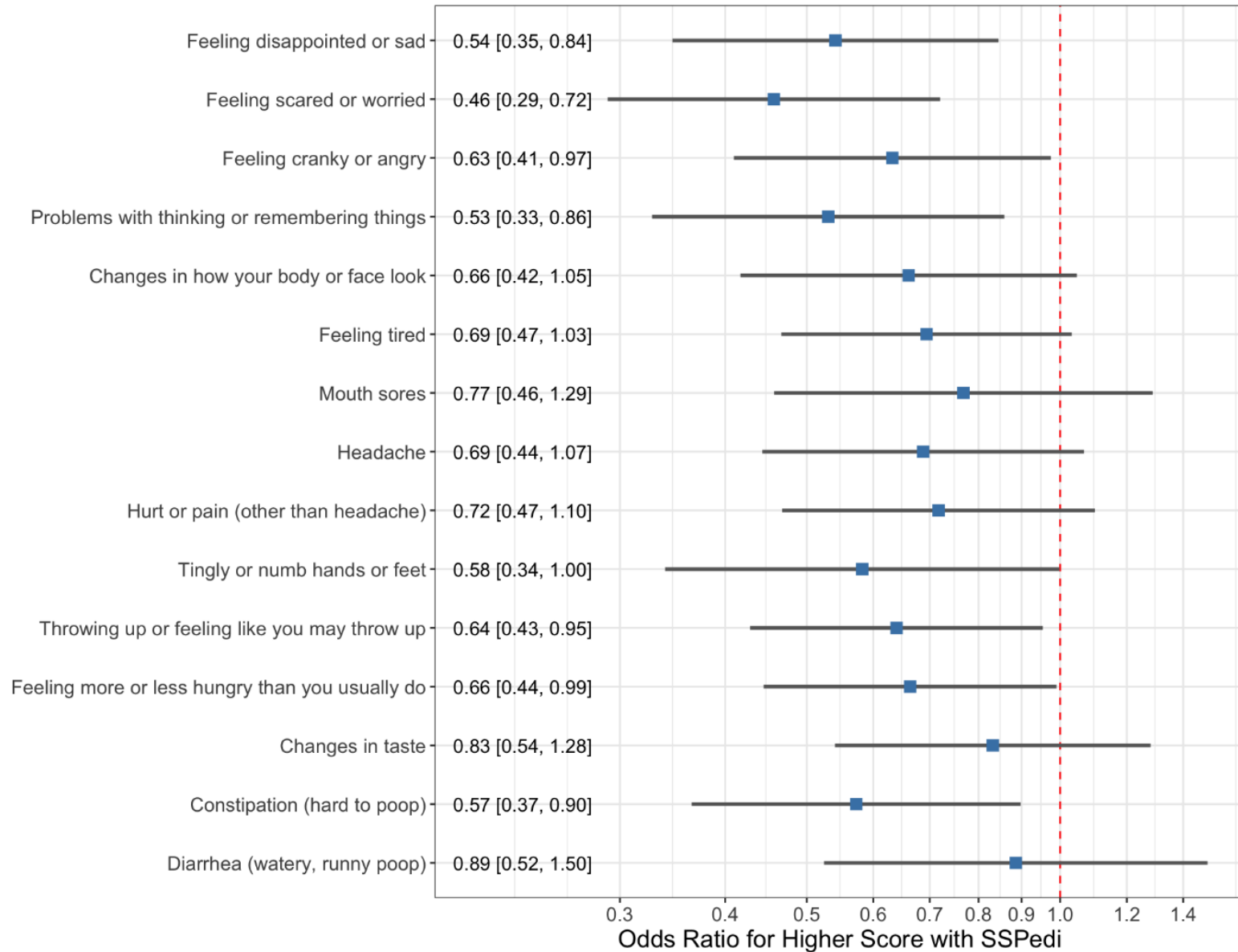


Chart Review

Symptoms documented or treated more often in symptom screening for five symptoms:

- Hurt or pain
- Changes in hunger
- Constipation
- Feeling cranky or angry
- Peripheral neuropathy

Conclusions

- Symptom screening improves symptom control
- Strong support for integrating symptom screening into routine care

Clinical Implementation

SSPedi incorporated into Epic Foundation

SickKids implementing via Remote Care
Management for outpatients



Healthier Children. A Better World.

SickKids
THE HOSPITAL FOR
SICK CHILDREN

Site PIs and CRAs

SPARK Investigators

Lee Dupuis

Allison Grimes

George Tomlinson

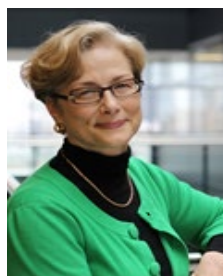
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Emily Vettese

Sadie Cook

Nicole Crellin-Parsons



POGO

Paula Robinson

Priya Patel



The Garron Family Cancer Centre



Canadian
Cancer
Society

Société
canadienne
du cancer