

# ASSESSING A PERSONALIZED APPROACH TO PEDIATRIC ABDOMINAL PAIN TRIGGERS

## ABDOMINAL PAIN: PREVALENCE AND DIAGNOSIS CHALLENGES

**Between 10 and 25 percent of school-age children have had abdominal pain within the last three months that has interfered with activities. The majority present with similar symptoms, but distinguishing which factors influence the symptoms for each child, and to what degree, is difficult because few patients have a clear, organic diagnosis for their pain.**

Studies of the root causes of abdominal pain to date have looked at factors across groups of children with symptoms that seemed similar on the surface. Children's Mercy Kansas City designed a study to instead look at symptoms and factors in-depth, one child at a time.

## DESIGNING A PROTOCOL FOR STUDYING PAIN TRIGGERS IN REAL TIME

Jennifer Schurman, PhD, Child Psychologist, Co-Director of the Abdominal Pain Program, Director of GI Psychosocial Programs & Services, and Director of Gastroenterology Research, understands that a combination of biological, psychological and social/environmental factors create abdominal pain triggers in pediatric patients, but it can be difficult to identify patterns. She posed this question:

**How can we determine the specific factors (to what degree, in what combination and under what circumstances) that are important to an individual patient's pain?**

Dr. Schurman, in tandem with collaborator Dr. Christopher Cushing at the University of Kansas, proposed an intensive, longitudinal study of individuals as a feasibility and acceptability trial to determine:

- Would patients be compliant with intensive data collection needs?
- Could multilevel models assess temporal relationships with pain intensity in real time?
- Could a personalized assessment fit into clinic flow in real time?
- Would patients and families see the protocol as worthwhile?

## PARTICIPANTS

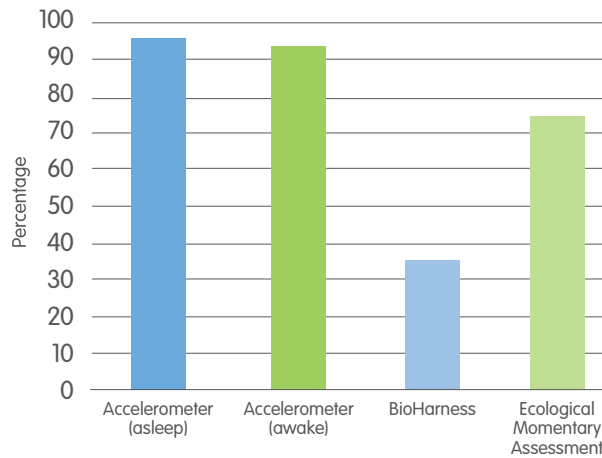
- 30 Abdominal Pain Program patients, ages 8 to 17
- Abdominal pain for 8 weeks, with two episodes per week
- Diagnosed with pain-related functional gastrointestinal disorder

## METHODOLOGY

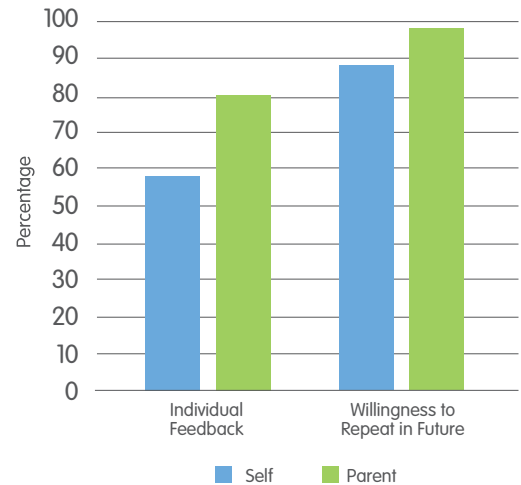
- 14-day data collection period
- Four surveys per day delivered via an app on a loaner smartphone
- Accelerometer worn 24 hours a day to monitor sleep and other activity
- Zephyr BioHarness worn for 12 hours around trunk
- Participant devices sent back for data analysis

## OUTCOMES

### PATIENTS WERE RELATIVELY COMPLIANT



### SATISFACTION WITH STUDY PROCEDURES



### Multilevel models were able to assess temporal relationships with pain intensity in real time.

For 24 of 30 participants, the study identified within-person variables that were related to pain intensity, making personalized recommendations possible.

### Personalized assessments fit into clinic flow in real time.

Data was processed within a few days of receiving the devices. Providers then created personalized feedback reports that were shared at the follow-up clinic visit. Proposed changes to treatment were discussed.

### Patients and families saw the protocol as worthwhile.

Twenty-seven of 30 participants returned for the four-week clinic follow-up. Two others had full resolution of symptoms based on recommendations made at the first visit. One was lost to follow-up.

Through the findings, Dr. Schurman and team gained a better understanding of each patient's pain triggers. The team also identified terminology that was understandable for patients, improving the effectiveness of treatment plans.

### WHAT'S NEXT?

A follow-up study is being designed to take this learning to a deeper level of personalization. The new study will measure the impact of the protocol on clinical processes and outcomes. If determined to have a positive effect on patient outcomes, the team also plans to scale up the model and make it accessible to primary care providers to help them provide earlier, more effective intervention in children with abdominal pain.



#### LEARN MORE ABOUT THE ABDOMINAL PAIN PROGRAM.

Jennifer Schurman, Ph.D., Abdominal Pain Program Co-Director  
jschurman@cmh.edu • (816) 302-3054  
transformpediatrics.childrensmc.org

For consults, admissions or transport call: 1 (800) GO MERCY / 1 (800) 466-3729.

