

# SPAP Shout Out

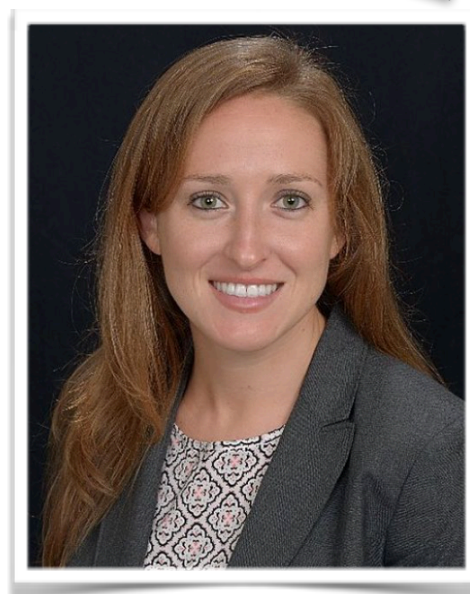
A monthly update for SPAP members with a purpose to educate and encourage the engagement of PAs who work with pediatric patients



## A Review of Pediatric Acute Appendicitis

*Tara Harkins, MMSc, PA-C*

*Tara currently works at Maine Medical Center in Portland, Maine within the pediatric surgery department. She previously worked at Texas Children's Hospital within the trauma surgery department. Tara joined SPAP in 2016 and was a Member-at-Large for two years before transitioning into the position of secretary. Tara is originally from the Washington DC area and enjoys running, yoga, and spending time with her family.*



With the season of acute gastroenteritis upon us, many children will present to pediatricians, urgent cares, and emergency rooms with the complaint of abdominal pain. The differential diagnosis list for acute abdominal pain in children is lengthy. In addition, we have entered into a peak season (December to February) of acute gastroenteritis.<sup>1</sup> Acute gastroenteritis is the most common cause of abdominal pain in children.<sup>2</sup> Acute appendicitis can present with similar signs and symptoms of gastroenteritis but requires surgical intervention. Therefore, it is important for providers to keep appendicitis on their differential during the winter months as it is the most common surgical diagnosis in children presenting with abdominal pain.<sup>2</sup>

### Background

The appendicitis is a 4-9 cm long diverticulum or pouch of the cecum. There are various thoughts on the specific causes of appendicitis (preceding viral illness causing lymphoid hyperplasia, fecaliths), but ultimately, they all involve obstruction of the lumen of the appendix. This obstruction causes inflammation and bacteria overgrowth, leading to acute appendicitis. 1/15 people will develop appendicitis in their lifetime, and the incidence increases with age. In other words, appendicitis is less common in a newborn, and most commonly presents in the second decade of life.<sup>3</sup>

The classic presentation of acute appendicitis is diffuse peri-umbilical pain that migrates to the right lower quadrant. The pain is often associated with emesis and fevers. However, young children can have more insidious presentations. Children might present with generalized abdominal pain, diarrhea, nausea, anorexia, etc. A fever might be absent. Depending on the location of the appendix, the classic right lower quadrant pain might also be absent. If the pain has been present for several days, the appendix might have perforated, and the patient might even report a brief improvement in pain. Unfortunately, many of these symptoms are the same symptoms you will see in acute gastroenteritis and other mimickers of appendicitis.

## Differential Diagnosis

As mentioned above, the differential diagnosis list for pediatric abdominal pain is extensive, there are several conditions that closely mimic appendicitis and are worth reviewing. Acute gastroenteritis is the most common cause of abdominal pain in children<sup>2</sup>, and usually has a viral etiology. Therefore, it is helpful to ask about recent sick contacts at school, at home, etc. Unlike acute gastroenteritis, acute appendicitis will not improve with watchful waiting. Mesenteric lymphadenitis is another mimicker of acute appendicitis. This condition is also often viral, and is usually adenovirus.<sup>2</sup> However, mesenteric adenitis classically causes diffuse pain and peritonitis is always absent. The patient might also have other areas of lymphadenopathy. Primary constipation is another common cause of abdominal pain in children. However, constipation *not* caused by an acute illness (such as gastroenteritis or appendicitis) is usually more chronic in nature. Also, the pain is more commonly left-sided pain or supra-pubic pain. It is helpful to try and distinguish if the current pain is a new, different type of pain, or if this pain is the same type of pain the patient has had before. While less common, inflammatory bowel disease (IBD) is a condition that should always be screened for while evaluating abdominal pain in a child. Pertinent information would be a family history of IBD, as well as any history of blood stools, weight loss, or changes in the characteristics of their bowel movements.

## Workup

The initial workup starts with a history and physical. As mentioned above, questions about the location, type, and duration of pain are important. The literature often discusses “classic” physical exam findings such as pain at McBurney’s point (1/3 of the distance between the anterior superior iliac spine to the umbilicus), Rovsing’s sign (increased pain in the RLQ with palpation of the LLQ), and psoas sign (pain when lying on left side with extension of the right leg indicating irritation to iliopsoas muscles). In addition to physical exam findings, laboratory tests can also be useful. The patient might have an elevated white blood cell count with a left shift, which increases the suspicion for appendicitis. Other lab values such as C-reactive protein, a marker of inflammation, might also be elevated. Ultrasound is the first imaging of choice to assess for appendicitis. Although less sensitive and specific than CT, ultrasound spares radiation. The appendix is not always able to be visualized

with ultrasound, but when it is positive findings can include an increased appendiceal diameter and/or a non-compressible or hyperemic appendix. The appendix might also have surrounding fluid collections which might indicate perforation and abscess formation. Ultrasound is also helpful to identify mesentery adenitis, as it can pick up on prominent lymph nodes. When an ultrasound exam is equivocal, a CT scan might be indicated. A CT scan is the gold standard for identifying appendicitis on imaging and is better at visualizing the appendix. The PAS, or pediatric appendicitis score, is a diagnostic tool that can also help guide providers on the likelihood of appendicitis.

## Treatment

The current standard of treatment for acute appendicitis in children is an appendectomy. This is usually done laparoscopically, although it was traditionally done as an open procedure. In cases where the appendix has already perforated, there is the option to perform an interval appendectomy. In these cases, the degree of inflammation and infection is thought to increase the intra-operative and postoperative complication rates. This option involves a course of antibiotics and a delayed appendectomy performed several weeks later once the inflammation and infection has subsided. Additionally, if there is an abscess formation, a drain might be placed to drain the abscess cavity. Research is currently being done to explore of the treatment option of antibiotics alone, with no planned surgical intervention, for the treatment of appendicitis. However, this method has not been shown to be non-inferior to the appendectomy, and surgical remove of the appendix is still the current standard of treatment.

## Bibliography

1. <https://emedicine.medscape.com/article/176515-overview>
2. <https://www.aafp.org/afp/2003/0601/p2321.html>
3. <https://www.medscape.org/viewarticle/506300>

Diagnostic Indicators	Score Value
Cough <i>or</i> percussion <i>or</i> hop tenderness	2
Anorexia	1
Pyrexia	1
Nausea/emesis	1
Tenderness in RLQ	2
Leukocytosis > 10,000	1
Polymorphonuclear neutrophilia	1
Migration of pain	1
<i>Total</i>	<i>10</i>

PAS = Pediatric Appendicitis Score; RLQ = right lower quadrant.

# NEW STUDENT NEWSLETTER

*We will be starting a brand new student newsletter soon! Student newsletters will be sent to all SPAP student members. Newsletters will provide advice on how to ace your pediatrics rotation, tips on interacting with patients, and much more! Keep an eye out for the first edition release in a few weeks. If you have any questions about the newsletter or would like to get involved, please contact our student representative, Morgan Dailey at [medailey0805@email.campbell.edu](mailto:medailey0805@email.campbell.edu)*

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# SPAP Member Spotlight

Kate Shand, PA-C

*Kate went to PA school at the Rochester Institute of Technology and graduated in 2004. She then went into family medicine for a year, then internal medicine for 6 years, and has currently been in pediatrics for the past seven years. She is board certified with the National Commission on Certification of PAs and is a member of the American Academy of Pediatrics, the Society for PAs in Pediatrics, the American Academy of PAs, the New York State Society of PAs, and the Rochester Regional PA Association. She is also a Clinical Instructor for the PA Program at Rochester Institute of Technology.*



## **How did your career as a PA start?**

My career started in a rural family medicine practice in my hometown. I loved taking care of families and different generations, but was always more interested in kids. Shortly after, I switched jobs and worked in internal medicine with a solo physician. I was there until I had my first child. It was then, while interviewing pediatricians to bring my child to, that I met Dr. Janet Casey. She told me how much she loved PAs, being trained at Duke where the first PA program was started. Almost right off the bat she was pushing me to join her practice. She wore me down eventually and I started working with her in pediatrics when my son was six months old. It was the best decision I have ever made - she's always respected me and treated me like a peer. We are a great team.

## **What does your average day at work look like?**

My average day is always a mix of sick/acute visits and physicals. The physicals can range from newborns to college physicals, from runny noses to depressed teens. I also see all the babies when they first come out of the hospital because I'm also a Lactation Consultant.

## **How did you first hear about SPAP?**

I'm not sure - I have always been an advocate of being a member of every career organization I can (state, regional, national, specialty, etc). I know that membership money goes to good use for lobbying for our needs as PAs. I probably looked it up somewhere!

## **Why pediatrics?**

Kids. Are. Awesome. I get to be silly and fun and get to know these kids throughout their lives. It's an honor and SO FUN.

**What is your favorite part of being a PA?**

The relationships - all of them- between parents, kids, and coworkers. I work with the best bunch of nurses and doctors, and another PA. It's a great group.

**Any advice for new PAs or PA students?**

Find your place. It took me a few jobs to find the right supervising physician and group of people who share the same values in patient care as I do. Don't give up!

