

The Importance and Value of Pediatric Telephone Triage

Teresa Baird, BSN, RN, CPN

Kira Covill, MSN, RN-BC

Amanda Huner, BSN, RN, CPN



Children's Hospital Colorado
Here, it's different.™

Meet the Team



Teresa Baird, BSN, RN, CPN



Kira Covill, MSN, RN-BC



Amanda Huner, BSN, RN, CPN

Financial Disclosures:
No relevant financial relationships
with any commercial interests.



Objectives:

- Provide useful tips and resources for school and community health nurses.
- Define telephone triage.
- Identify concerning symptoms related to abdominal pain, neurologic symptoms, and vomiting.



Children's Hospital Colorado
Here, it's different.™



What is telephone triage?

Definition: “An interactive process between nurse and client that occurs over the telephone and involves identifying the **nature and urgency** of client healthcare needs and determining appropriate disposition.”

Telephone Triage is objective, thorough and systematic. *Our goal is to not make assumptions or jump to conclusions.* We strive to empower caregivers to recognize and follow up concerning symptoms.

Ultimately, we seek to:

- get the **Right patient**
- to the **Right care**
- at the **Right time**



Case Study

Healthy 8-year-old male with no history of chronic conditions or needing past hospitalizations or surgeries. Child presents afebrile with severe abdominal pain. He reports the pain to be continuous and near his navel for past 11 hours. Child cannot stand up straight and walks bent over. Vomiting began 24 hours ago, has not vomited in the last 7 hours. No diarrhea. Child is awake and alert, in bed, lying in the fetal position.



Poll Question

What symptom are you MOST concerned about?

1

Vomiting

2

Abdominal
pain

3

The fact
that the
child cannot
walk upright



Poll Question

Which symptoms are MOST commonly associated with appendicitis?

1

Abdominal
Pain

2

Vomiting

3

Diarrhea

4

Restricted
movement/
not wanting
to walk





Keys to triaging abdominal pain in children

1. Fever: not helpful in distinguishing appendicitis from gastroenteritis [5].
2. Diarrhea is usually absent (Exception: from pelvic appendix) [5].
3. Pain: Suspect appendicitis in children who have constant abdominal pain for more than 2 hours; even if they lack any of the classic symptoms [5]. Constant means that while the pain may lessen; the child is never pain-free .





General presentation of appendicitis in children

- Perumbilical pain for 4-12 hours, then constant localized RLQ pain [5].
- Vomiting is a predominate symptom. Present in 60% of cases but is usually **delayed**, starting 12-24 hours after pain. (Exception: Vomiting can be the first symptom in young children) [5].
- Movement: Increases pain (prefers to lie still). Children often lie on their side, with hips flexed and curled up. Usually children will refuse to jump/skip because it will make the pain worse. Children often refuse to walk or walk bent over and holding lower abdomen. Walking in a guarded way is also suggestive of appendicitis [5].

Complications of Appendicitis

- Perforation and peritonitis over 48 hours from onset of symptoms
- Ruptured appendix*/perforation at the time of surgery is common:
 - 90% in 0-2 year olds
 - 70% in 2-5 year olds
 - 30% for 6-12 year olds
 - 10% in teens
- Death from shock less than 1%

* Symptoms may change after perforation: The RLQ pain can become more generalized and the pain severity can temporarily diminish. However, the pain persists (it doesn't go away), the abdomen becomes rigid, fever begins or rises, and the child becomes less willing to move about [5].





Back to our case study

Our 8-year-old patient did have appendicitis with perforation. He was admitted to Children's and had emergency surgery and was discharged the next day thanks in part to a triage RN who worked at the Pediatric Call Center!



Questions?

Poll Question

What is the MOST likely virus to cause significant pediatric neurologic symptoms?

1

Enterovirus
that causes
Hand, Foot
and Mouth
Disease

2

COVID-19

3

Rhinovirus
that causes
common
cold
symptoms



Case Study 2

16-year-old with history of kidney injury 6 months ago and orthostatic hypotension presents with 2-day history of a headache with temperature between 99-101. Started complaining of dizziness on day of call. "can't focus" but able to walk. Complaining of teeth sensitivity and cannot eat a cracker due to pain. Headache is severe today, able to bring chin to chest, but says "it feels heavy."



Poll Question

What symptom are you MOST concerned about?

1

Headache

2

Fever

3

Dizziness

4

Teeth Pain

5

Health
history





Back to our case study

Our 16-year-old was admitted for Viral Meningitis with unknown etiology. Symptoms during admission: fevers, HA, back/neck pain along w/ waxing and waning focal neuro deficits which include blurry vision, dizziness, weakness, and twitching.

Treated with gabapentin
MRI brain/spine WNL.
Neg enterovirus, EBV, HIV, HSV.

Discharged home after 3 days



Meningitis

- Meningitis is an inflammation (swelling) of the protective membranes covering the brain and spinal cord, caused by a bacterial or viral infection. [9]
- Enteroviruses are thought to cause over 75,000 cases of meningitis in the USA each year and cause substantial morbidity in adults as well as children. [7]
- Non-polio enteroviruses are the most common cause of viral meningitis in the United States. However, only a small number of people infected with enteroviruses will develop meningitis. [7]
- Other viruses like HSV, EBV, varicella-zoster, influenza, mumps, West Nile virus, HIV, and COVID-19 can also lead to an immune response that triggers neurological symptoms. [9]



Neurologic Involvement in Children and Adolescents Hospitalized in the United States for COVID-19 or Multisystem Inflammatory Syndrome

- 1695 Pediatric Patients from 31 states hospitalized for COVID
 - Median Age 9 years;
 - 365 patients (22%) had neurologic symptoms
 - 53% were previously healthy and 22% had underlying neuro condition
 - 43/365 (12%) had life threatening neurologic involvement
 - 79% of which were previously healthy; 7% had underlying neuro condition
 - 47% had MIS-C versus 53% with acute COVID
 - Severe encephalopathy, ischemic/hemorrhagic stroke, ADEM, cerebral edema, and GBS
 - 11/43 (26%) died and 17/43 (40%) were discharged with new neurologic deficits [8]



Difficulties identifying Meningitis

- Delayed diagnosis of meningitis is the most common cause of a malpractice lawsuit in pediatric practice and telephone care [10]
- Meningitis lawsuits are predominately a pediatric problem. [10]
- Errors in Initial Diagnosis: viral infection/influenza 36%, ear infection 12%, gastroenteritis (vomiting) 4%, migraine 3%, febrile seizure 3% [6]



Difficulties identifying Meningitis continued

- In older children, the main symptoms are:
 - stiff neck
 - headache (especially if not responding to OTC pain medication)
 - confusion
 - fever
- Younger children and infants usually do not present this way. Vomiting and fever are the most common symptoms. Younger children are also lethargic or so irritable that they can't be consoled. If not treated early, child can suffer brain damage.
- Index of suspicion must be high for any young child with fever and isolated vomiting. [6]



Questions?



Case Study 3

A healthy 6-year-old female, who's only notable medical history is Urinary Reflux.

The patient presents with vomiting, she also has COVID, along with the rest of her family. She is vomiting everything her mom has offered to her for the last several hours.

She has low energy, but isn't truly lethargic, as she has been alert when awake. She is reported to have no confusion, she's moving her neck normally, but does c/o of her "heart beating fast."

She recently had UOP and doesn't appear to be too dehydrated at this point. She has c/o some leg pain, mild sore throat, and mild HA.



Poll Question

What symptom are you MOST concerned about?

1

Possible
elevated
heart rate

2

Consistent
vomiting

3

Mild pains
(legs,
throat,
headache)





Diabetic Ketoacidosis (DKA)

- Definition - Blood glucose > 250 mg/dL (13.8 mmol/L) with acidosis and ketosis (urine ketones moderate to large or blood ketones 1.4 mmol/L or above).
- 30% of new onset childhood diabetes presents in ketoacidosis. [4]



Poll Question

What symptoms are **MOST** commonly associated with DKA?

1

Weight Loss

2

Excessive
thirst

3

Frequent
urination

4

Vomiting/
Abdominal
pain

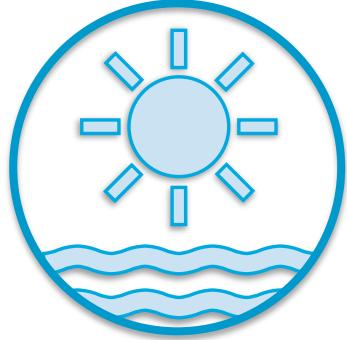
5

Breathing
and/or
heart rate
changes

6

Confusion





Early symptoms of diabetes are from passing glucose in the urine:

- New onset of polydipsia
- Polyuria
- Nocturia
- Sometimes bedwetting
- Weight loss ^[4]



Late symptoms after 2 to 4 weeks are from dehydration and ketoacidosis:

- Vomiting
- Abdominal pain
- Rapid/deep breathing
- Fruity odor on breath
- Confusion
- Sleepiness
- Coma ^[4]



Type 1 Diabetes

- * Other names - Insulin Dependent Diabetes (IDDM), Juvenile Onset Diabetes.
- * Physiology - There is no production of insulin by the body.
- * Ketosis-prone - Patients with Type 1 diabetes are ketosis-prone, which means that if they do not receive enough daily insulin shots their bodies cannot utilize glucose. This results in breaking down fats and producing ketones. The ketones spill into the urine and can be measured. Patients with Type I diabetes are susceptible to developing Diabetic Ketoacidosis (DKA), a life-threatening condition.
- * Treatment - Insulin therapy is always required. Insulin is given subcutaneously at least twice daily. Patients striving for better control of their blood glucose will take insulin more often than twice a day or may utilize an insulin pump. An insulin pump can be used safely even in preschoolers.
- * Onset - 50 - 75% of those with type 1 diabetes have their onset in childhood or adolescence. Approximately 10% of all individuals with diabetes have type 1. [3]





Back to Our Case Study

- The child was admitted in moderate DKA (Initial Blood sugar of 450mg/dL, pH of 7.19, bicarb < 5, and A1C 10.9%) and a new diagnosis of Type I Diabetes.
- She stayed for 2 days while they stabilized her blood sugar, and then DC'd to do outpatient diabetic education at the Barbara Davis Center.

**According to Dr Justin Sears, Infectious Disease at CHCO; COVID has caused an uptick in new Type I cases in the pediatric population.

Questions?



In summary

The value of nurse triage in the pediatric setting is of great value as evidenced by research:

- Even though children are rarely severely ill, calls about sick children are among the most prevalent, mainly due to parental worry [11].
- Pediatric calls are considered challenging, as the call-handler must rely on parents' second-hand information [11].
- If parents lack the ability to determine the severity of their child's symptoms, they are more likely to seek immediate health care rather than monitoring their child at home or making an appointment with their PCP [12].



ChildrensMD Mobile App

Android



Apple



Children's Hospital Colorado
Here, it's different.™

References

1. Baumer-Mouradian SH, Gray MP, Wolfgram PM, Kopetsky M, et al. Improving emergency department management of diabetic ketoacidosis in children. *Pediatrics*. 2019 Oct;144(4). pii: e20182984.
2. Cashen K, Petersen T. Diabetic ketoacidosis. *Pediatr Rev*. 2019 Aug;40(8):412-420.
3. Cooke D, Plotnick L. Type1 diabetes mellitus in pediatrics. *Pediatr Rev*. 2008;29(11):374-384.
4. Cooke DW, Plotnick L. Management of diabetic ketoacidosis in children and adolescents. *Pediatr Rev*. 2008;29(12):431-435.
5. Garfield, K. & Sergent, S. (July, 2021) StatPearls Pyloric Stenosis. <https://www.ncbi.nlm.nih.gov/books/NBK555931>
6. Schmitt-Thompson Clinical Content. <https://www.stcc-triage.com/> Accessed May 11,2022
7. Centers for Disease Control and Prevention. Viral Meningitis. <https://www.cdc.gov/meningitis/viral.html>. Accessed May 11,2022



References

8. LaRovere KL, Riggs BJ, Poussaint TY, et al. Neurologic Involvement in Children and Adolescents Hospitalized in the United States for COVID-19 or Multisystem Inflammatory Syndrome. *JAMA Neurol.* 2021;78(5):536–547. doi:10.1001/jamaneurol.2021.0504
 9. Kohil A, Jemmieh S, Smatti MK, Yassine HM. Viral meningitis: an overview. *Arch Virol.* 2021;166(2):335-345. doi:10.1007/s00705-020-04891-1
 10. McAbee GN, Donn SM, Mendelson RA, et al. Medical diagnoses commonly associated with pediatric malpractice lawsuits in the United States. *Pediatrics.* 2008;122:e1282-e1286.
 11. Gren C, Pedersen MK, Hasselager AB, Folke F, Ersbøll AK, Cortes D, Egerod I, Gamst-Jensen H. How parents express their worry in calls to a medical helpline: a mixed methods study. *BMC Prim Care.* 2022 Apr 15;23(1):80. doi: 10.1186/s12875-022-01680-4. PMID: 35421930; PMCID: PMC9012025.
 12. Mary Jean Ohns, Sandra Oliver-McNeil, Leanne M. Nantais-Smith, Nancy M. George, Nonurgent Use of the Emergency Department by Pediatric Patients: A Theory-Guided Approach for Primary and Acute Care Pediatric Nurse Practitioners, *Journal of Pediatric Health Care*, Volume 30, Issue 4, 2016.
- **Thank you to Dr Justin Searns, Hospitalist and Infectious Disease for presenting Neurologic Manifestations of COVID in Children for the Pediatric Call Center.**



ChildrensMD Mobile App

Android



Apple



Children's Hospital Colorado
Here, it's different.™