

# Poor access to general surgeons increases the risk of ruptured appendix for young children

October 29 2014

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Delayed treatment for appendicitis can often lead to a ruptured appendix. That's exactly what is more likely to happen to many children in North Carolina if they have to delay getting treatment because of poor access to general surgeons, according to new study findings presented this week at the American College of Surgeons 2014 Clinical Congress.

Appendicitis is a common condition, but previous research has shown that complications from the condition may be directly tied to living in an area without enough [general surgeons](#). Findings from a May 2014 study published in the *Annals of Surgery* indicated that "living in a service area with less than 3 GSs per 100,000 people significantly increases the probability of rupture in individuals with [appendicitis](#)."

For this study, the surgical team at University of North Carolina in Chapel Hill wanted to see if other factors—like age and transfer rates as a surrogate for distance from surgical care—also contributed to a higher likelihood of having a [ruptured appendix](#) as a child, said study lead author Michael Phillips, MD, a sixth year surgery resident at UNC-Chapel Hill.

Dr. Phillips and his colleagues looked at discharge data on nearly 7,000 patients under age 18 who were diagnosed with appendicitis at North Carolina surgical facilities between 2007 and 2009. Of those patients, nearly one in four suffered a ruptured appendix.

The surgeons found that children who were transferred to another

hospital were 1.7 times more likely to have a ruptured appendix. Furthermore, children who came from areas with a severe shortage of general surgeons—fewer than three for every 100,000 people—were 1.4 times more likely to have a ruptured appendix.

Limited access to general surgeons could likely mean those children have to wait longer to be transferred and start receiving care. "Transfers from other hospitals tend to be younger children," Dr. Phillips said. "Rural surgeons may feel comfortable treating a 12 or 13-year-old, but if the child is one month or 5 years old, they will usually be transferred."

Transferring appendicitis patients from [general surgery](#) shortage areas could mean driving three hours to get to University of North Carolina or one of the other pediatric surgical facilities, which could delay treatment.

The problem, is that most of the surgical facilities are concentrated in a few areas in North Carolina, leaving many areas without an adequate workforce to provide general surgery services, Dr. Phillips explained.

Three of the six pediatric surgery centers in North Carolina are within 30 minutes of each other, Dr. Phillips said. "We're doing our best to staff offices in rural areas, but distribution of general surgeons is still an issue."

Their analysis also showed that younger children—from newborns to age 5—were 5.6 times more likely to have a ruptured appendix than children older than age 12. Pediatric patients between the ages of 5 and 12 were 1.3 times more likely to have a ruptured appendix than children older than age 12.

One reason for this difference could be that younger [children](#) are not able to articulate what's wrong with them, which could delay a diagnosis.

"In some cases, the child will have signs of appendicitis, like eating less and a fever, but parents will think it's something else," Dr. Phillips explained. "Then they send the child to a pediatrician, wait for lab tests to come back, then have an imaging study. This process can take a while."

Still, the call to action for clinicians is to do their best to help staff general surgery shortage areas and advocate for patients who may not have good access to general surgical care. "And for parents, go to the closest medical center you can find, so your child can be evaluated early," Dr. Phillips suggested.

Provided by American College of Surgeons

Citation: Poor access to general surgeons increases the risk of ruptured appendix for young children (2014, October 29) retrieved 25 April 2024 from <https://medicalxpress.com/news/2014-10-poor-access-surgeons-ruptured-appendix.html>

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