# Children In Areas With Few Pediatricians At Higher Risk For Serious Appendix Ruptures

*Fizan Abdullah, M.D.*

Children who live in areas with fewer pediatricians are more likely to suffer life-threatening ruptures of the appendix than those in areas with more pediatricians, even when accounting for other factors such as the number of hospitals, imaging technology, insurance coverage and the number of surgeons in an area, according to a study from the Johns Hopkins Children's Center. The study's findings, based on an analysis of nearly 250,000 hospital records of children with appendicitis, are published online in the December issue of JAMA-Archives of Surgery *[1]*.

"Our analysis shows that the most potent predictor of outcome in children with appendicitis was the number of pediatricians available in an area, emphasizing the pivotal role they play as the point of first contact in the care of a sick child," said lead investigator Fizan Abdullah, M.D., Ph.D [2]., a pediatric surgeon at Hopkins Children's.

The appendix is a small tube extending from the large intestine, and infections and inflammation of the organ can be dangerous. Each year, 77,000 children develop appendicitis, and an estimated one-third of them suffer a ruptured appendix, a serious complication of appendicitis that often results from delays in diagnosis and surgery to remove the inflamed or infected organ.

The analysis showed that children with appendicitis living in counties with the most pediatricians per capita were the least likely to develop complications, and the more pediatricians in a geographic area, the fewer the instances of ruptured appendix. For every 100 children with appendicitis, 12 more children (12 percent more) would end up with ruptured appendix in the area with the fewest pediatricians than in the area with the most pediatricians.

Factors such as the number of hospitals in the area, the number of hospitals with emergency rooms, the availability of a CT scanner and the number of surgeries performed in a county each year did not affect the risk for an appendix rupture, the study found. Neither did factors such as the number of emergency room physicians, surgeons or radiologists in the area. In their statistical analysis, the investigators also accounted for age, gender, household income, insurance coverage and race to ensure that the discrepancy in outcomes did not stem from such factors. It didn't.

Of the 241,301children with appendicitis in the study, 77,097 ended up with a ruptured appendix. The death rate was seven times higher among children with a ruptured appendix than in children with uncomplicated appendicitis (0.01 percent

vs. 0.07 percent). The Hopkins study also found that children with perforated appendix were hospitalized for twice as long — five days instead of two — as children with uncomplicated appendicitis, doubling the cost of care, from $10,385 to $20,581, on average.

The investigators say that health officials and policymakers should pay special attention to geographic areas with severe shortages of pediatricians and high rates of appendicitis complications and take steps to address the shortages as a life-saving and cost-cutting measure.

Co-investigators on the study included Melissa Camp, M.D. M.P.H., David Chang, Ph.D. M.P.H. M.B.A., Yiyi Zhang, M.H.S., Meghan Arnold, M.D., Leilani Sharpe, B.S., Alodia Gabre-Kidan, M.D., and Melinda Bathurst, M.S. M.B.A., all of Hopkins.

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[1] http://archsurg.ama-assn.org/
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