

From Medscape Education Clinical Briefs

<http://www.medscape.org/viewarticle/737984>

Early vs Interval Appendectomy Preferred in Pediatric Patients **CME**

News Author: Emma Hitt, PhD

CME Author: Laurie Barclay, MD

Authors and Disclosures

CME Released: 02/25/2011; Valid for credit through 02/25/2012

This article is intended for primary care clinicians, surgeons, and other specialists caring for children with a perforated appendix.

Goal

The goal of this activity is to provide medical news to primary care clinicians and other healthcare professionals in order to enhance patient care.

Authors and Disclosures

As an organization accredited by the ACCME, Medscape, LLC, requires everyone who is in a position to control the content of an education activity to disclose all relevant financial relationships with any commercial interest. The ACCME defines "relevant financial relationships" as financial relationships in any amount, occurring within the past 12 months, including financial relationships of a spouse or life partner, that could create a conflict of interest.

Medscape, LLC, encourages Authors to identify investigational products or off-label uses of products regulated by the US Food and Drug Administration, at first mention and where appropriate in the content.

Emma Hitt, PhD

Emma Hitt is a freelance editor and writer for Medscape.

Disclosure: Emma Hitt, PhD, has disclosed no relevant financial relationships.

Dr. Hitt does not intend to discuss off-label uses of drugs, mechanical devices, biologics, or diagnostics not approved by the FDA for use in the United States.

Dr. Hitt does not intend to discuss investigational drugs, mechanical devices, biologics, or diagnostics not approved by the FDA for use in the United States.

Brandi Nicole Martin

CME Clinical Editor, Medscape, LLC

Disclosure: Brandi Nicole Martin has disclosed no relevant financial relationships.

Laurie Barclay, MD

Freelance writer and reviewer, Medscape, LLC

Disclosure: Laurie Barclay, MD, has disclosed no relevant financial relationships.

Sarah Fleischman

CME Program Manager, Medscape, LLC

Disclosure: Sarah Fleischman has disclosed no relevant financial relationships.

Learning Objectives

Upon completion of this activity, participants will be able to:

1. Compare the effects of early vs interval appendectomy on time away from normal activities and total length of hospital stay in children, based on a nonblinded, randomized trial.
2. Compare adverse events associated with early vs interval appendectomy in children, based on a nonblinded, randomized trial.



Medscape, LLC is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

February 25, 2011 — For children with a perforated appendix, early appendectomy appears to reduce the time away from normal activities and has fewer adverse events vs another common option, the interval appendectomy, performed several weeks after diagnosis, a new study suggests.



Martin L. Blakely, MD, MS, with the University of Tennessee Health Science Center in Memphis, and colleagues reported their findings in the February 21, 2011, online edition of the *Archives of Surgery*.

"The universally accepted treatment of acute, nonperforated appendicitis is urgent appendectomy," the researchers note. "The optimal treatment of perforated appendicitis, however, is controversial."

The 2 most commonly used treatments of children with perforated appendicitis are early appendectomy and interval appendectomy.

According to Dr. Blakely and colleagues, early appendectomy and interval appendectomy have not been directly compared in a randomized clinical trial. In both types, patients receive intravenous fluids and broad-spectrum intravenous antibiotics. However, early appendectomy involves surgery within the first 24 hours of hospitalization, whereas during interval appendectomy, surgery is performed 6 to 8 weeks after the initial diagnosis and after the patient returns to normal activities. In theory, the interval appendectomy may decrease the risk for intraoperative or postoperative complications because it is performed when resolution of peritoneal contamination has occurred.

To compare these 2 surgical approaches, the researchers randomly assigned 131 patients younger than 18 years with a preoperative diagnosis of perforated appendicitis to undergo either early appendectomy (n = 64) or interval appendectomy (n = 67).

Compared with interval appendectomy, early appendectomy reduced the time away from normal activities by an average of 5 days (13.8 vs 19.4 days, respectively; $P < .001$). Adverse events occurred in 30% of patients undergoing early appendectomy vs 55% of those undergoing interval appendectomy (relative risk with interval appendectomy, 1.86; 95% confidence interval, 1.21 - 2.87; $P = .003$).

Of the patients randomly selected to undergo interval appendectomy, 23 (34%) had an appendectomy earlier than planned because of failure to improve (n = 17), recurrent appendicitis (n = 5), or other reasons (n = 1).

"Despite the frequency of perforated appendicitis in children, treatment for this condition is quite controversial," Dr. Blakely and colleagues note. Among pediatric surgeons, a consensus as to how to treat perforated appendicitis has not been reached, and few studies have compared the most common approaches.

On the basis of their findings, Blakely and colleagues suggest that early appendectomy is favored vs interval appendectomy. They note that a concern with early appendectomy is the difficulty of performing it during the acute phase immediately after a diagnosis of perforated appendicitis. However, they "found that the duration of the operation was not significantly longer with early (113 minutes) vs interval (112 minutes) appendectomy. Intraoperative complications were uncommon."

Limitations of the study include its single-center design, which affects the generalizability of the findings, and no standardized method to determine a child's return to normal activities.

This study was supported by a LeBonheur Children's Medical Center grant and funding from the Accredo Health Foundation. The study authors have disclosed no relevant financial relationships.

Arch Surg. Published online February 21, 2011. [Full text](#)

Clinical Context

Among children in the United States, appendicitis is the most prevalent gastrointestinal condition requiring urgent surgical intervention. Perforated appendicitis accounts for approximately 30% of cases. Urgent appendectomy is the gold standard of treatment of acute, nonperforated appendicitis.

There are 2 surgical treatment options in widespread use for children with perforated appendicitis. In early appendectomy, surgery is performed within the first 24 hours of hospitalization. In interval appendectomy, surgical removal is planned for 6 to 8 weeks after the initial diagnosis, once the

patient is discharged from the hospital and has resumed normal activities. The rationale behind interval appendectomy is that performing the surgery after contamination of the abdominal cavity has resolved could potentially result in fewer surgical complications.

Study Highlights

- The goals of this nonblinded, randomized trial were to compare the efficacy and adverse event rates of early (≤ 24 hours from admission) vs interval appendectomy (6 - 8 weeks after diagnosis) in children with perforated appendicitis.
- Between October 2006 and August 2009 at a tertiary-referral urban children's hospital, 131 patients younger than 18 years with a preoperative diagnosis of perforated appendicitis were randomly selected to receive early appendectomy (n = 64) or interval appendectomy (n = 67).
- Most operations were done laparoscopically in both groups, and conversion rates from laparoscopic to open surgery were not different between groups.
- The primary study endpoint was time (in days) away from normal activities.
- Secondary endpoints were overall adverse event rates and rates of predefined specific adverse events, including intra-abdominal abscess, surgical site infection, and unplanned readmission.
- Time away from normal activities was significantly lower with early appendectomy vs interval appendectomy (mean, 13.8 vs 19.4 days; $P < .001$).
- Mean total length of hospital stay was also reduced by more than 2 days for early appendectomy vs interval appendectomy.
- There were no deaths in either group.
- Overall adverse event rate was 30% for early appendectomy and 55% for interval appendectomy (relative risk with interval appendectomy, 1.86; 95% confidence interval, 1.21 - 2.87; $P = .003$).
- The most frequent adverse events in the interval group, accounting for the increased rate overall, were intra-abdominal abscesses during the treatment period, development of a small-bowel obstruction, unplanned readmission, and recurrent appendicitis.
- Among children assigned to interval appendectomy, 23 (34%) had an appendectomy earlier than planned because of failure to improve (n = 17), recurrent appendicitis (n = 5), or other reasons (n = 1).
- On the basis of these findings, the investigators concluded that early appendectomy significantly reduced the time away from normal activities and that the overall adverse event rate after early appendectomy was significantly lower than after interval appendectomy.
- Limitations of this study include single-center design, with unknown generalizability to surgeons other than experienced pediatric surgeons trained in minimally invasive techniques; and lack of a well-accepted, standardized method by which to determine when a child has returned to normal activities.

Clinical Implications

- For children with a perforated appendix, early vs interval appendectomy appears to reduce the time away from normal activities by approximately 5 days, as well as the total duration of hospital stay, based on findings of a nonblinded, randomized trial.
- In a nonblinded, randomized trial, the overall adverse event rate after early appendectomy was significantly lower than after interval appendectomy. Approximately one third of children assigned to the interval appendectomy had an appendectomy earlier than planned

