

The term “evidence-based medicine” was first coined by Sackett and colleagues<sup>1</sup> as “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients.” The key to practicing evidence-based medicine is applying the best current knowledge to decisions in individual patients. Medical knowledge is continually and rapidly expanding and it is impossible for an individual clinician to read all the medical literature. For clinicians to practice evidence-based medicine, they must have the skills to read and interpret the medical literature so that they can determine the validity, reliability, credibility and utility of individual articles. These skills are known as critical appraisal skills. Generally, critical appraisal requires that the clinician have some knowledge of biostatistics, clinical epidemiology, decision analysis and economics as well as clinical knowledge.

The Canadian Association of General Surgeons and the American College of Surgeons jointly sponsors a program entitled “Evidence-Based Reviews in Surgery (EBRS),” supported by an educational grant from Ethicon Inc. and Ethicon Endo Surgery Inc. The primary objective of this initiative is to help practicing surgeons improve their critical appraisal skills. During the academic year, 8 clinical articles are chosen for review and discussion. They are selected not only for their clinical relevance to general surgeons but also because they cover a spectrum of issues important to surgeons; for example, causation or risk factors for disease, natural history or prognosis of disease, how to quantify disease

(measurement issues), diagnostic tests and the diagnosis of disease, and the effectiveness of treatment. Both methodologic and clinical reviews of the article are performed by experts in the relevant areas and posted on the EBRS website. A listserv discussion is held where participants can discuss the monthly article. Fellows and candidates of the College can access Evidence-Based Reviews in Surgery through the American College of Surgeons website ([www.facs.org](http://www.facs.org)).

All journal articles and reviews are available electronically through the website. Currently we have a library of 50 articles and reviews which can be accessed at any time. Beginning in October, a new set of articles will be available each month until May. Surgeons who participate in the current (modules) packages can receive CME credits by completing a series of MCQ. For further information about EBRS the reader is directed to the ACS website or should email the administrator, Marg McKenzie at [mmckenzie@mtsinai.on.ca](mailto:mmckenzie@mtsinai.on.ca).

In addition to making the reviews available through the ACS and CAGS websites, 4 of the reviews are published in condensed versions in the *Canadian Journal of Surgery* and the other four will be published in the *Journal of the American College of Surgeons* each year.

#### REFERENCE

1. Evidence Based Medicine Working Group. Evidence-based medicine. *JAMA* 1992;268:2420–2425.

#### SELECTED ARTICLE: Nonsurgical treatment of appendiceal abscess or phlegmon: a systematic review and meta-analysis

Andersson RE, Petzold MG. *Ann Surg* 2007;246(5):741–748.

#### Reviewed by

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#### ABSTRACT

**Objective:** To assess the non-surgical treatment of patients with appendiceal abscess or phlegmon.

**Data Source:** MEDLINE search in multiple languages between 1964 and 2005.

**Study Selection:** Sixty one studies reporting on the results of non-surgical treatment of appendiceal abscess or phlegmon.

**Outcome Measures:** Success rate, need for drainage of abscesses, risk of undetected serious disease and the need for interval appendectomy.

**Results:** Appendiceal abscess or phlegmon was found in 3.8% (95% CI; 2.6–4.9%) of patients with appendicitis. Non-surgical treatment failed in 7.2% (95% CI 4.0–10.5%) and drainage of an abscess was required in 19.7% (95% CI; 11–28.0%). Immediate surgery was associated with a higher morbidity compared with non-surgical treatment (OR=3.3; 95% CI; 1.9–5.6;  $p < 0.001$ ). After successful non-surgical treatment, malignant disease was detected in 1.2% (95% CI; 0.6–1.7%) and important benign disease in 0.7% (95% CI; 0.2–11.9%) during follow-up. The risk of recurrence was 7.4% (95% CI; 3.7–11.1).

**Conclusion:** The results of this review involving mainly retrospective studies supports the practice of non-surgical treatment without interval appendectomy in patients with appendiceal abscess or phlegmon.

**Commentary:** There is little debate about the appropriateness of appendectomy for acute nonruptured appendi-

citis or those with diffuse peritonitis from free appendiceal perforation. But a subset of patients presents farther along in their clinical course, typically with lingering symptoms associated with a smoldering peri-appendiceal inflammatory response. The objective of this systematic review by Andersson and Petzold was to assess the nonsurgical treatment of patients with appendiceal abscess or phlegmon. The common approach of nonsurgical management with interval appendectomy has been challenged because of the possible delay in diagnosis of other diseases (eg: colon cancer or Crohn's disease). On the other hand, the need for interval appendectomy has been questioned because of low recurrence rates following nonsurgical management. The specific study questions were to determine the success rate, need for drainage of abscesses, risk of undetected serious disease and need for interval appendectomy. The review is of interest not only for its clinical findings but also for the numerous methodologic issues associated with a systematic review of largely observational studies.

The first challenge in a systematic review is identifying articles. Appropriately broad inclusion criteria were used to identify articles. The search strategy, however, was not as exhaustive as it should have been. The authors performed a Medline search only. By not searching other databases up to a third of significant articles could have been missed.<sup>1</sup> Articles published in several different languages were included, which makes it surprising that the Embase database was not searched as well. There is no comment whether content experts were contacted in order to identify significant articles not found in the search nor were references from the identified articles searched.

Once the studies were identified, a checklist for assessing the quality of non-randomized studies, taking into account categories for data reporting, external validity, internal validity, and analysis might have been considered.<sup>2</sup> Quality could also have been used as an inclusion criterion or in subgroup analysis.

The authors tried to describe the interventions as best they could, but as they noted: "The analysis of the studies is hampered by incomplete definitions and lack of information regarding the diagnosis and treatment, how the patients were selected for nonsurgical treatment, and the definition of failure of this treatment." Specific interventions inadequately described included: if, what, and how long antibiotic treatments were used in both groups, and the timing of interval appendectomy in the nonsurgical group. Similarly, morbidity was not well defined. Although complications such as intestinal fistula, small bowel obstruction, infection, and recurrence after initially successful nonsurgical management are mentioned, operational definitions including severity are not provided. These data were

most likely not available in the majority of studies because of the retrospective case study design.

Results from each study were presented in well organized tables addressing specific questions. Studies were grouped by method of detection. Heterogeneity of the outcomes between the individual studies was easy to assess because study outcomes were presented in this stratified manner. The only quantitative assessment of heterogeneity was made for the examination of morbidity after immediate surgical versus nonsurgical treatment. The heterogeneity test was significant so a random effects model was used for the meta-analysis for a combined result. Combining results after a positive test for heterogeneity is controversial.<sup>3</sup>

Various clinically relevant outcomes were assessed. Failure of nonsurgical treatment (defined as need for surgical intervention at the same admission) occurred in approximately 7% of patients. Rates for other clinical outcomes were also favorable. Immediate surgery was associated with a 3.3 higher odds of morbidity compared with nonsurgical treatment. This was a clinically significant result; absolute values were 36% and 13% respectively. As previously stated, the authors provided or commented on a number of subgroup analyses based on whether patients were children and adults, definition of the diagnosis, patient age, whether studies were prospective or retrospective, and the method of diagnosis. The results appear to be consistent and thus generalizable across a number of settings.

Potential biases were addressed to a limited extent only. For the comparison of morbidity between immediate surgical and nonsurgical treatment the authors appropriately performed and reported that a funnel plot showed no publication bias. Several studies comparing nonsurgical with immediate surgical treatment appear to have a bias toward initial surgery based on a much larger proportion of patients included in that group. All of those studies, however, recommended nonsurgical treatment. Overall the results of this meta-analysis must be interpreted with caution because they are mainly based on retrospective case series and only three small prospective randomized studies. Also the included studies were published during a 40 year time frame and both the diagnosis and management of appendiceal abscess and phlegmon has changed significantly over time and the early results may not be relevant.

The risk of recurrence after nonsurgical treatment was low but may not be a realistic estimate because of the relatively short follow-up in most studies. Perhaps this could be better answered in future prospective studies and a randomized controlled trial to determine whether an interval appendectomy is warranted. The author's conclusion that, "The results of this review involving mostly retrospective studies support the practice of nonsurgical treatment with-

out interval appendectomy in patients with appendiceal abscess or phlegmon.” appears to be supported by the data. But the conclusions are based on non-experimental data that may be biased and therefore the conclusions must be accepted with caution.

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**REFERENCES**

1. Royle P, Milne R. Literature searching for randomized controlled trials used in Cochrane Reviews: Rapid versus exhaustive searches. *International Journal of Technology Assessment in Health Care* 2003;19:591–603.
2. Downs SH, Black N. The feasibility of creating a checklist for the assessment of the methodologic quality both of randomised and non-randomised studies of health care interventions. *J Epidemiol Community Health* 1998;52:377–384.
3. Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group. *JAMA* 2000;283:2008–2012.