

# Canadian Association of General Surgeons Evidence Based Reviews in Surgery. 11.

## Evidence-based guidelines for children with isolated spleen or liver injury

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### CAGS Evidence Based Reviews in Surgery

In September 2000, the Canadian Association of General Surgeons (CAGS) initiated a program titled CAGS Evidence Based Reviews in Surgery (CAGS-EBRS) to help practising clinicians improve their critical appraisal skills. During the academic year, 8 clinical articles are chosen for review and discussion. Both methodologic and clinical reviews of the article are made by experts in the relevant areas. The *Canadian Journal of Surgery* publishes 4 of these reviews every year. Each review includes an abstract of the selected article and summarizes the methodologic and clinical reviews. We hope that readers will find these useful and learn skills that can be used to evaluate other articles. For more information about CAGS-EBRS or about participating in the program, email [mmckenzie@mtsinai.on.ca](mailto:mmckenzie@mtsinai.on.ca)

### Selected articles

**Stylianos S and the APSA Liver/Spleen Trauma Study Group. Evidence-based guidelines for resource utilization in children with isolated spleen or liver injury. *J Pediatr Surg* 2000;35(2):164-7, discussion 167-9.**

**Stylianos S. Compliance with evidence-based guidelines in children with isolated spleen or liver injury: a prospective study. *J Pediatr Surg* 2002;37(3):453-6.**

### Abstract

**Objective:** To determine the impact of clinical practice guidelines (CPGs) on the management of trauma to the pediatric spleen and liver. **Data sources:** The CPGs were formulated by the American Pediatric Surgery Association (APSA) based on evidence from multiple sources including published non-randomized trials, historical controls and expert clinical

experience and consensus, along with a retrospective review of 856 children with isolated spleen or liver injuries treated at 32 centres of pediatric surgery from June 1995 to July 1997. **CPG implementation:** The CPGs were applied prospectively in 312 children treated nonoperatively at 16 centres between 1998 and 2000. Compliance was analyzed for age, gender, the organ injured and its grade by computed tomography. All patients underwent follow-up for 4 months. **Outcomes:** Hospital stay, follow-up imaging and interval of activity restriction. **Main results:** Compared with the 832 patients previously studied, the 312 patients who had prospective application of the proposed guidelines had significant reductions in intensive-care-unit (ICU) and hospital stay (both  $p < 0.0006$ ), follow-up imaging ( $p < 0.0001$ ) and interval of rest from physical activity ( $p < 0.05$ ) at each grade of injury. **Conclusion:** Application of specific CPGs based on injury severity has resulted in conformity in patient management, im-

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proved utilization of resources and validation of guideline safety.

## Commentary

Many clinicians are wary of CPGs, feeling that they restrict their ability to do what is best for the individual patient. However, practice guidelines are intended to assist doctors and their patients in making clinical decisions that improve patient outcomes. Practice guidelines have been defined by the Institute of Medicine as “systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances.”<sup>1</sup> They are intended to be flexible enough to accommodate individual patient characteristics and preferences.

Numerous organizations are involved in guideline development, often leading to contradictory recommendations and to confusion and further physician uncertainty about the value of guidelines. Guidelines may be developed informally by consensus. The United States National Institutes of Health (NIH) Consensus Development Program is an example of this type of guideline development. The disadvantage of this approach is that the process tends to be informal; there is no systematic approach to gathering and evaluating the evidence and the process is not described in detail, so the reader cannot judge the validity of the guidelines.

An alternative is the development of evidence-based guidelines. With this approach, there is a focused clinical question and a systematic approach to the retrieval, assessment of quality and synthesis of the evidence. In addition to an assessment of the literature, there is usually some interpretation of the evidence by experts, and the evidence may be modulated according to current or local circumstances. Such guidelines tend to be more rigorous and hopefully more valid. Inadequacy of evidence may make guideline development impossible; another pitfall is noncommittal

recommendations of limited value to the practising clinician.

The earlier of this month’s articles, by Stylianos and the APSA Liver/Spleen Trauma Study Group, reports on the development and impact of practice guidelines on the management of isolated spleen or liver injury in the pediatric population.<sup>2,3</sup> The guideline development process is not well described: “evidence from multiple sources including published nonrandomized trials, historical controls and expert clinical experience and consensus” were utilized. As well, the courses of 832 patients from 32 pediatric centres were reviewed, classified by severity of injury, and various outcomes analyzed. Based on this, a set of guidelines for resource utilization in children with isolated spleen or liver injury were developed. In the more recent paper, Stylianos reported the impact of the guidelines on resource utilization at 16 centres.

This article was chosen for discussion in Evidence Based Reviews in Surgery for several reasons. First, the group of surgeons who are part of the American Pediatric Surgical Association Trauma Committee are to be commended for collaborating to form these guidelines.

Second, although one can be critical that the guidelines are based on what would generally be considered poor evidence, they are an example of what might be done when no Level I evidence exists, as is the case in many realms of general surgery. The guidelines seem to be more rigorously developed than simply by consensus, since an attempt was made to review the literature and also retrospectively review their own experience. However, the challenge now for this group would be to use the information gained from the 2 case studies (1 retrospective and 1 prospective) to design a randomized controlled trial addressing some of the more important issues: to see whether hospital stay could be shortened and if ICU stay is necessary, etc., and then

develop guidelines that are “more” evidence-based.

Third, guideline development often ends with development of the guideline. The development cycle nonetheless includes development, dissemination and implementation, evaluation of their impact on practice and constant updating of the guidelines. As it is unusual for groups who develop guidelines to do anything beyond develop them, this group is again to be commended for trying to implement them and evaluate their impact, although only in 16 centres. A challenge to all who develop guidelines is their implementation, and it is here where better use of existing technology would be worthwhile. As well, it is difficult to know the effect of these guidelines when the report of their impact is only from the centres where they were developed.

In children, the spleen and liver are the organs most commonly injured by blunt abdominal trauma. Whereas some of these injuries are minor and may even go unrecognized, others are life-threatening. Children are also at higher risk than adults for postsplenectomy sepsis, given their greater immunologic “naïveté,” so the adverse consequences of unnecessary splenectomies in children are potentially greater than in adults.

The current nonoperative approach to managing pediatric splenic injuries has a relatively short and distinctly Canadian history. Before the 1900s, nonoperative management of splenic injuries was the rule, but carried a mortality rate close to 100%.<sup>1</sup> During the early part of the 20th century, operative treatment became the standard, with a much lower mortality rate. Beginning in the 1940s, surgeons at The Hospital for Sick Children in Toronto have employed a nonoperative approach for selected children with blunt injuries to the spleen.<sup>2,4</sup> Viewed skeptically when first proposed, this approach has become the standard of care in pediatric centres throughout the world. In

many centres, more than 95% of children with blunt splenic injuries can be managed successfully without operation. The success of nonoperative management of splenic injuries has been extended to liver injuries, with generally satisfactory results.

This success has also brought with it new questions about the management of children with blunt liver or spleen injuries. Understandably, initial management protocols for nonoperative management of splenic injuries were very cautious, including admission to the ICU for 48 hours of monitoring and bed rest for as long as 14 days.<sup>3</sup> Based on the clinical impression that lengths of bed rest and hospital stay could be shortened without compromising patient outcomes (as well as logistical and financial imperatives to shorten hospital stays), efforts have been made to stratify patients and develop protocols to optimize the length of patient stay according to clinical criteria.<sup>5-7</sup>

This paper demonstrates that clinical practice guidelines can be implemented and followed, leading to shorter ICU and hospital stays for children with liver and spleen injuries, without compromising their clinical outcomes. It certainly provides some useful directions for surgeons looking

after these children. However, it is worth remembering that these results were achieved in pediatric surgical centres with the full range of pediatric care available, including 24 h/d in-house surgical coverage. Furthermore, it is not possible to tell from the data how many of the 312 patients had liver injuries and how many, splenic. It is likely that the majority were splenic injuries, so one must be cautious about accepting the guidelines for liver injuries. As the authors noted, a major impetus for this study was the desire to shorten hospital stays to decrease costs. For these participating pediatric centres, the decreased hospital costs were meaningful. From the perspective of a general surgeon who may see a pediatric liver or spleen injury only once every few years, the financial savings to the health system by reducing length of stay will be trivial.

These guidelines provide useful algorithms for managing pediatric patients with liver and spleen injuries, but it is essential to recognize the irreplaceable role of the surgeon's clinical judgement and the willingness of pediatric surgical colleagues to assist in the management of children with these potentially life-threatening injuries.

**Competing interests:** None declared.

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