

## Can we improve diagnosis of acute appendicitis?

*Ultrasonography may complement clinical assessment in some patients*

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“**D**iagnosis of appendicitis is usually easy”—thus wrote Sir Zachary Cope, but with the rider: “but there are difficulties which need to be discussed.”<sup>1</sup> The essential features of appendicitis are well known to most clinicians; there is gradual onset of central abdominal pain, often followed by vomiting, with localisation of the pain to the right iliac fossa. Localised tenderness and evidence of peritoneal inflammation (guarding and percussion tenderness) make the diagnosis probable. Clinical diagnosis is based on showing that movement between adjacent inflamed peritoneal surfaces causes pain.<sup>2</sup> Laboratory investigations usually contribute little and can be misleading. For example, the proportion of gangrenous and perforated appendixes in patients with a normal white count is the same as in those with an raised count.<sup>3</sup> The diagnosis is essentially a clinical one—or so it would seem.

The “difficulty” alluded to by Cope relates to our inability to reliably diagnose appendicitis on clinical grounds. The vagaries of presentation and the variability of signs are such that even the most experienced surgeons may remove normal appendixes or “sit on” those that have perforated. The sequelae of delayed diagnosis may result from late presentation by the patient but are sometimes due to the initial failure of the clinician to make the correct diagnosis.<sup>4</sup> The sequelae of delayed treatment include a higher incidence of postoperative sepsis and longer hospital stay. Against this, it is generally accepted that unnecessary surgery should be avoided, and this aspect of care is usually measured by the proportion of appendixes that are normal on histology. The Australian Council of Healthcare Standards has chosen this criterion as one of its clinical indicators of outcome in appendicitis.<sup>5</sup>

Can we improve our clinical performance? Over the years various clinical scoring systems (some computer assisted) have been used, and, although their clinical benefit has varied, most reports describe some improvement in clinical performance with their use—at least for the duration of the study. The greatest beneficiaries may be junior staff, whose diagnostic accuracy increases from 58 % to 71%.<sup>6</sup> In some reports perforation rates have dropped by 50% (in one study from 27% to 12.5%), but in others no reduction has been shown.<sup>6,7</sup> A prospective study of 118 children found that current clinical practice was more accurate than the modified Alvarado score (that measures the likelihood of appendicitis by producing

a score based on various clinical and other parameters) in the diagnosis of acute appendicitis.<sup>8</sup> The main value of computer aided diagnosis may be as an ongoing stimulus to good clinical practice.<sup>6,7</sup> Despite initial optimism, it has become apparent that in most units the normal appendix rate remains 15-30%.

Can graded compression ultrasonography improve our diagnostic accuracy? In the study reported in this issue of the *BMJ* (p 919) the use of a diagnostic protocol incorporating both the Alvarado score and graded compression ultrasonography failed to produce better outcomes than unaided clinical diagnosis.<sup>7a</sup> The proportion of patients in each group who had an adverse outcome (either a non-therapeutic operation or delayed treatment in patients with appendiceal perforation) was nearly identical—about 12%. Graded compression ultrasonography performed by experienced ultrasonographers still produced a 5% false negative result.

Given the frequency of both false positives and false negatives with ultrasonography, should it be allowed to override clinical judgment? Could it cause too many patients to be subjected to non-therapeutic operations (arguably unnecessary surgery) where clinical judgment might have avoided this, or could it have resulted in surgery where observation alone would have led to resolution of symptoms? In contrast, a positive result on graded compression ultrasonography may enable earlier operation in some patients with equivocal clinical signs and facilitate prompt and appropriate surgical intervention, thus reducing morbidity.

Current evidence, mostly from series of patients and retrospective studies, suggests there is probably no role for ultrasonography where clinical evidence of appendicitis is convincing, given the known false negative rate of graded compression ultrasonography and the knowledge that it may delay appropriate surgery.<sup>9</sup> Moreover, the low false positive rate (6%) in clinically obvious cases of appendicitis does not warrant routine ultrasonography.<sup>10</sup> One prospective observational multicentre study of 2280 patients found no clinical benefit when routine ultrasonography was performed in all patients.<sup>11</sup>

The main role for ultrasonography may be for the equivocal case, where a combination of repeated clinical assessment and graded compression ultrasonography may provide the additional information required to determine whether surgery is necessary.<sup>12</sup> Finally, we

should heed the advice offered by the authors in this issue that patients should not be sent home after negative results on ultrasonography unless there are also clinical grounds for their discharge. The hands of clinicians are not yet superfluous.

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## Treating children with speech and language impairments

*Six hours of therapy is not enough*

About 5-8% of children under the age of 5 have developmental impairments of speech and language. This proportion is higher than that for any other neurodevelopmental condition occurring at that age.<sup>1</sup> Parents are concerned about these impairments, and the number of children being referred to speech and language therapy services is increasing.<sup>2</sup>

These impairments are characterised by a low level of speech and language skills. Such difficulties may occur secondary to disabilities such as cerebral palsy, sensorineural hearing loss, or autism. Impairment may also be the main symptom in a constellation of comorbid difficulties, such as challenging behaviour or otitis media.<sup>3</sup>

Although spontaneous remission of symptoms in primary speech and language disorders sometimes occurs many children will experience long term effects from these disorders. Studies of samples of children from different communities show that children who are at the extreme ends of the distribution of speech and language impairment are at risk of developing problems that can persist into adulthood.<sup>4-6</sup> The inability to communicate with peers can have a marked effect on wellbeing.

Given what we know about the stability of speech and language impairments across time, what role can intervention play? There is evidence to suggest that some interventions can modify intelligence,<sup>7</sup> and the literature about the Head Start programmes in the United States has shown that preschool programmes have a long term impact in terms of social outcomes (for example, in reducing the incidence of teenage pregnancy or incarceration).<sup>8</sup> Clinical experience suggests that speech (whether difficulties involve dyspraxic—that is, neuromotor—or phonological pres-

entations) and vocabulary can be modified but that it is much more difficult to change elements of syntax and verbal comprehension.

At first glance the picture painted by Glogowska et al in this issue of the *BMJ* (p 923) is gloomy.<sup>9</sup> Interventions for speech and language impairments do not seem to work. However, there are some features of this study that should be interpreted cautiously. On average the children spent just six hours with their speech and language therapist in 12 months. How long would it take most people to change their speech and language behaviours? More than six hours, we would argue, even if clients were highly motivated. It is particularly important to note that both groups of children in the study (those who were given therapy and those who were not) continued to have marked language difficulties.

This study also needs to be set against a recent systematic review of studies of speech and language impairments that identified effect sizes for randomised and quasi-experimental study designs on the order of one standard deviation.<sup>10</sup> This corresponds to a shift from the 25th to the 5th centile: a good improvement by any standard. These studies all included children of comparable ages and levels of language impairment. The source of the difference provides a potential explanation for the findings of Glogowska and colleagues. All of the studies in the review offered more treatment. In many cases the studies were carried out in university clinics and could best be described as efficacy rather than effectiveness studies. On the other hand, Glogowska et al's project is a study of the routine clinical services that are currently available to children in the United Kingdom.

Taken together the data indicate that offering limited amounts of speech and language therapy is not

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