danger of the drug to children. Secondly, they may not know that there is an antidote, and, thirdly, parents may fear professional accusations of poor parenting. Methadone users must be made aware of its dangers. Liverpool Drug Dependency Unit has designed posters with suitable warnings and advice.

All children suspected to have ingested methadone should be admitted to hospital. An emetic should be given only if the child is alert. Children with symptoms should receive a bolus of intravenous naloxone followed by an infusion at a rate determined by clinical criteria. Respiratory support may be needed. If a child has taken large volumes the stomach should be emptied by lavage while the airway is protected.

Emetic should not be given before the child reaches hospital because of the risk of aspiration. Intramuscular naloxone can be given safely by paramedics or general practitioners: 400 µg for a child under 5 years and 800 µg for an older child.

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(Accepted 7 February 1994)

Use of coughing test to diagnose peritonitis

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The test for rebound tenderness is advocated for diagnosing general or localised irritation of the peritoneum, but the diagnostic accuracy and patients' acceptance of the test have been questioned.^{1,2} Other methods for identifying peritonitis include asking patients to cough and percussion of the abdomen. We routinely ask patients to cough and have evaluated this coughing test for diagnosing peritonitis.

Subjects, methods, and results

One hundred and fifty consecutive patients (70 male, 80 female; range 4-95 years, median 46) who were admitted for emergency treatment with abdominal pain were examined in a prospective study. The patients were asked to cough, and if they showed signs of pain—namely, flinching, grimacing, or moving their hands towards their abdomen—a positive result was recorded. If a patient was examined more than once only the result of the first examination was taken into account. Equivocal results were regarded as negative to increase specificity.

We assessed the accuracy of the coughing test in detecting peritonitis by comparing the results with the final diagnosis, using the same diagnostic categories as Liddington and Thomson.² Seven of the 150 patients were excluded from the analysis because their diagnoses did not easily fall into one of the specified categories. The table shows the results in the remaining 143 patients.

The diagnostic value of the coughing tests was highly significant when tested for the odds ratio (13.1 (95% confidence interval 5.8 to 28.9) $P < 0.001$) and with the χ^2 analysis with Yates's correction ($\chi^2 = 43.3$, $df = 1$, $P < 0.001$). Sensitivity and specificity were 0.78 and 0.79 respectively, and the positive predictive value for peritonitis was 76%.

Comment

The test for rebound tenderness has been advocated as the most sensitive and reliable test for peritonitis.³ It requires touching a patient's abdomen, however, and the expectation of sudden pain may raise anxiety and result in voluntary guarding, leading to a false positive

Results of coughing test compared with final diagnoses in 143 patients admitted with abdominal pain. Values are numbers of patients

	Positive test result	Negative test result
Patients with peritonitis:		
Appendicitis	24	2
Cholecystitis	6	7
Perforated viscus	5	0
Diverticulitis	3	3
Haemoperitoneum	1	0
Infarcted bowel	2	1
Acute pancreatitis	5	0
Large bowel obstruction	2	0
Incarcerated para-umbilical hernia	1	2
Ruptured ectopic pregnancy	2	0
Total	51	15
Patients with no peritonitis:		
Non-specific abdominal pain	12	38
Gastroenteritis	2	3
Ureteric colic	1	7
Biliary colic	1	1
Small bowel obstruction	0	4
Chronic pancreatitis	0	1
Urinary tract infection	0	4
Constipation	0	3
Total	16	61

result. The coughing test can be performed from the end of a bed and is less likely to lead patients to expect pain.

False positive and false negative results may occur because of the assumption that the various conditions that can cause peritonism always do so, and vice versa. We chose a classification of conditions that would allow us to compare our results with the published data.² The positive predictive value and odds ratio of the coughing test in this study (76%, 13.1) compare favourably with those for the test for rebound tenderness reported by Liddington and Thomson (49%, 4.2).² Dixon *et al* reported an odds ratio of only 1.42 for pain aggravated by coughing, but this was only for diagnosing appendicitis.⁴

The coughing test is simple, kinder to patients than the test for rebound tenderness, and less open to spurious demonstration of pain. We advocate that it is used to assess acute abdominal pain.

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3 Moore SW. The physiological basis for diagnostic signs of an acute abdomen. *Surg Clin North Am* 1958;38:371-83.

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(Accepted 3 March 1994)