An evidenced-based clinical pathway for acute appendicitis decreases hospital duration and cost


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
An evidence-based clinical pathway for acute appendicitis.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population consisted of paediatric patients with acute appendicitis. Exclusion criteria were: age three years or younger; previous appendectomy; history of ovarian cysts, blood in the stools, a history consistent with pelvic inflammatory disease or pregnancy, cystic fibrosis, Chrohn?s disease, organ transplant or malignancy and suspected diagnosis not appendicitis.

Setting
The study setting was a paediatric institution. The economic study was carried out in the USA.

Dates to which data relate
Dare for resources and effectiveness were June 1996 to November 1996 for the intervention and June 1994 to November 1994 for the comparator. The price year was not reported.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken concurrently on the same patient sample as that used in the effectiveness analysis.

Study sample
Sample size calculations were performed with the intent of detecting a 25% decrease in length of stay with a 90% power and an alpha error of 0.05. Thus, 120 patients were enrolled in the study group and in the control group. Patients were enrolled in the study group from June through November 1996. Historical control patients were enrolled from June through November 1994.
Study design
This was a prospective, cohort study carried out at a single centre. All patients were scheduled for outpatient follow-up within 2 weeks of hospital discharge.

Analysis of effectiveness
The analysis of the clinical study was based on intention to treat. The primary health outcomes were the rates of explorations with negative results, the incidence of perforation and adverse effects of wound infection and intra-abdominal abscess. At analysis, acute, non-perforated, and perforated groups were shown to be comparable in terms of age, gender, and race, (p values greater than 0.05).

Effectiveness results
All results were as stated by the authors, although no p values or standard deviations were given. The significance level was stated to be 5%. The rates of explorations with negative results did not deviate significantly between the two groups (9.2% for pathway and 12.3% for control). The incidence of perforation was not significantly different between the two groups (18.3% for pathway and 26.2% for control). The pathway had no adverse effect with regard to rates of wound infection (1% versus 3%) or the subsequent development of an intra-abdominal abscess (2% in study and control groups).

Clinical conclusions
A clinical pathway for paediatric patients with appendicitis had no adverse effects on diagnostic accuracy or outcome.

Measure of benefits used in the economic analysis
No summary measure of benefit was included in the economic analysis implying that a cost-consequences analysis was conducted.

Direct costs
Direct costs were not discounted due to the short time horizon of the study (less than one year). Quantities and costs were reported separately although unit costs were not given. Quantities recorded were frequency of laboratory and radiological tests, length of hospitalisation and the use of preoperative antibiotics. Home care costs were also included. The quantity/cost boundary adopted was that of the health service. Costs and quantities were collected from the hospital cost accounting and medical record system of Children's Hospital Medical Center. It was not stated whether these referred to charges. The price year was not reported.

Statistical analysis of costs
Student's t tests and Wilcoxon Rank Sign tests were conducted for normally and not-normally distributed continuous variables.

Indirect Costs
Indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was reported.
Estimated benefits used in the economic analysis
See effectiveness results above.

Cost results
Total hospital costs (mean: 1 SD) were significantly reduced in patients with normal or acute, non-perforated appendicitis ($3,638: 1,633 versus 4,095: 1,280, p=0.001) as well as in patients with perforated appendicitis ($7,823: 2,366 versus 11,175: 3,893, p=0.0001).

Synthesis of costs and benefits
Costs and benefits were not combined into cost-effectiveness ratios.

Authors' conclusions
An evidence-based appendicitis pathway decreased duration of hospitalisation and cost without adversely affecting diagnosis or therapy. Clinical pathways for surgical diagnoses may prove useful as a means of minimising costs without compromising patient care.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparator used, namely no clinical pathway. You, as a user of the database, should decide if this health technology is relevant to your setting.

Validity of estimate of measure of benefit
The analysis was based on a cohort study with prospective intervention and retrospective control arms, which was appropriate for the study question. The study sample was representative of the study population. Patient groups were shown to be comparable at analysis. The analysis of effectiveness was handled credibly, although there was no power calculation for effectiveness. Also the follow up period was not given, but presumably this did not extend beyond the duration of hospital stay. Estimation of benefits was obtained directly from the effectiveness analysis.

Validity of estimate of costs
Given the health care perspective, only direct costs needed to be included. However, charges might have been used to proxy costs and the price year was not reported. More details could have been provided about the cost components included in the cost estimates. A statistical analysis was performed on quantities, but not on prices.

Other issues
The authors did not make appropriate comparisons of their findings with those from other studies. However, they did address the issue of generalisability to other settings in their discussion of pathway compliance by paediatric surgeons, given that the pathway contained only guidelines. For example, some surgeons prescribed urinalysis contrary to the guidelines. The authors did not present their results selectively. The study considered paediatric patients with acute appendicitis and this was reflected in the authors’ conclusions.

Implications of the study
According to the authors, clinical pathways for other surgical diagnoses may prove useful as a means to minimise costs without compromising patient care. Further research will need to be done to elucidate relative effects of the components of the pathway, such as strategy for and type of investigation.

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