Implementation of a critical pathway for complicated gallstone disease: translation of population-based data into clinical practice
Sheffield KM, Ramos KE, Djukom CD, Jimenez CJ, Mileski WJ, Kimbrough TD, Townsend CM, Riall TS

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.

CRD summary
The objective was to assess the impact on outcomes and costs of the implementation of a critical pathway for patients with complicated gallstone disease. The authors concluded that the multidisciplinary critical pathway improved cholecystectomy rates on initial hospitalisation and lowered costs. The study had a number of important limitations and the difference in costs was not statistically significant. The authors’ conclusions should be treated with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess cholecystitis rates during initial hospitalisation, time to cholecystectomy, length of initial stay, readmission rates, and costs before and after the implementation of a critical pathway for complicated gallstone disease.

Interventions
A critical pathway for patients with complicated gallstone disease was compared with no such pathway. The pathway consisted of the following: patients with acute gallstone pancreatitis, acute cholecystitis, or choledocholithiasis were required to undergo cholecystectomy upon initial hospitalisation; for patients with acute cholecystitis, cholecystectomy should have occurred within 48 hours of admission; and for patients with gallstone pancreatitis or choledocholithiasis, cholecystectomy should have occurred within 48 hours of resolution of symptoms (gallstone pancreatitis) or bile duct clearance (choledocholithiasis).

Location/setting
USA/tertiary in-patient care.

Methods
Analytical approach:
The clinical and effectiveness evidence was from a cohort study. The time horizon was six months. The perspective was not explicitly reported by the authors.

Effectiveness data:
The clinical and effectiveness data were from one cohort study of patients admitted to a tertiary hospital in Texas, USA. The pre-pathway group consisted of patients with an initial hospitalisation for complicated gallstone disease, from January 2005 to February 2008 (455 patients), and the post-pathway group consisted of such patients admitted to the hospital from January 2009 to May 2010 (112 patients). All patients were followed-up for six months after discharge, from initial hospitalisation, or until June 2010 for post-pathway patients. From the review of electronic and paper medical records the authors obtained information on cholecystitis rates during initial hospitalisation, time to cholecystectomy, length of initial stay, and readmissions.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The measures of benefit were cholecystitis rates during initial hospitalisation, time to cholecystectomy, length of initial stay, and readmission rates.

Cost data:
The direct costs were those of the initial hospitalisation, readmission to hospital, and emergency room visits. The resource use was from a review of electronic and paper medical records. Hospital charges were provided by the hospital’s department of clinical data management. All costs were reported in US dollars ($).

Analysis of uncertainty:
Statistically significant differences between groups were analysed, using χ² or t-tests, as appropriate. Statistical significance was determined by a probability of less than 0.05.

Results
In the pre-pathway group, 218 patients (47.9%) received a cholecystectomy on initial hospitalisation, compared with 87 (77.7%) in the post-pathway group (p<0.0001). There was no difference in operative mortality and in operative complications between the two groups.

The mean length of stay for the initial hospitalisation was 5.4 days (SD 4.3) in pre-pathway patients compared with 4.4 days (SD 3.0) in post-pathway patients (p=0.010). The total mean overall length of stay decreased from 7.1 days before to 4.5 days after implementation of the pathway (p<0.0001).

In the pre-pathway group, 150 patients (33.0%) had at least one hospital readmission for gallstone problems or operative complications, compared with 11 patients (9.8%) in the post-pathway group (p<0.0001).

Total mean charges per patient were $27,981 (SD 21,736) in the pre-pathway group, compared with $26,888 (SD 15,044) in the post-pathway group (p=0.530).

Authors’ conclusions
The authors concluded that the implementation of a multidisciplinary critical pathway improved cholecystectomy rates on initial hospitalisation and lowered the costs by shortening the length of stay and reducing readmissions.

CRD commentary
Interventions:
The interventions were reported clearly and in detail.

Effectiveness/benefits:
The clinical and effectiveness data were from a before-and-after study undertaken in a tertiary hospital. The authors determined that the two patient groups were similar in their baseline characteristics, but this study design is prone to biases. For example, patients could have differed systematically in unobserved characteristics; or external factors, such as changes in hospital management, could have produced differences between the two groups. The patients in the pre-pathway group were followed-up for six months, but not all of the patients in the post-pathway group were; some of these patients only had one month of follow-up. Patients in the post-pathway group could have had lower readmissions and complications, and shorter hospital stays simply because they were followed-up for a shorter period.

Costs:
The perspective was not explicitly reported, but it was that of the hospital. For this perspective, it appears that all the relevant costs were included. The sources for the cost information and resource use were reported. The authors found a non-significant difference in costs between the two groups. As with the effectiveness data, this could have been due to patients in the post-pathway group being followed-up for less time than those in the pre-pathway group. The time horizon and currency were reported, but the price year was not and this will hamper future inflationary exercises.

Analysis and results:
The authors did not combine the cost and outcome information, as the pathway intervention was found to be less costly (not significant) and more effective, meaning it was dominant. The authors performed statistical analyses to assess
whether the differences between the study groups were significant. They reported some limitations to their study, such as that not all of the post-pathway patients had complete six-month follow-up data and the small sample for the post-pathway group.

Concluding remarks:
The study had a number of important limitations. The authors concluded that the critical pathway resulted in lower costs, but this difference was not statistically significant. The authors’ conclusions should be treated with caution.

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