The influence of an enhanced recovery programme on clinical outcomes, costs and quality of life after surgery for colorectal cancer


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 enhanced recovery programme (ERP) for colorectal cancer (CRC) surgery patients was studied. The ERP included preoperative conditioning of expectations and postoperative use of epidural analgesia, early mobilisation and early feeding.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients undergoing resection of CRC. Inclusion criteria for this study were age 18 years or older, suitable for elective CRC resection, no malignancy within the past 5 years, no intestinal obstruction, and ability to provide a written consent. Patients with tumours of the transverse colon were excluded since these were deemed to be too difficult for laparoscopic resection.

Setting
The setting was not explicitly reported, but it was probably secondary care. The economic study was carried out in the UK.

Dates to which data relate
The effectiveness data were collected between June 1997 and February 2004. Staffing costs were calculated on the basis of national figures published in 2001. The dates to which other cost data related were not specified. The price year was not explicitly stated.

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

Link between effectiveness and cost data
The costing appears to have been estimated prospectively from the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were performed to determine the sample size. All patients presenting with colorectal...
adenocarcinoma to a single consultant between January 2002 and February 2004 were assessed for entry into this study. Sixty patients were included in the ERP group. The control group consisted of all patients prospectively entered into the multi-centre, Conventional versus Laparoscopic-assisted Surgery in Colorectal Cancer (CLASICC) trial between June 1997 and December 2001. There were 86 patients in the CC group.

**Study design**
This was a comparative study with historical controls. ERP was introduced to the institution in January 2002. Consecutive patients presenting to a single consultant after January 2002 were assessed for entry into the study in the intervention group. The control group consisted of a prospectively studied historic cohort receiving CC and entered into the multi-centre CLASICC trial between June 1997 and December 2001. The duration of follow-up was not explicitly stated, but it appears to have been 3 months. Blinding was not performed.

**Analysis of effectiveness**
The primary outcome was postoperative hospital stay. Eight patients who died were excluded from the analysis of hospital stay. Baseline clinical data were shown to be similar in the two groups. An analysis of variance was used to make comparisons while controlling for the potential confounding effects of type of surgery (laparoscopic, laparoscopic converted and open) and stoma.

**Effectiveness results**
The length of postoperative stay for patients treated within the ERP was 54% of that for patients having CC (95% confidence interval, CI: 45% to 66%; p<0.001).

The figure remained significant at 49% when the convalescent and readmission stays were included (95% CI: 39% to 61%; p<0.001).

There were no differences in either minor or major complications between the groups.

The differences remained significant after adjusting for potential confounding factors (type of surgery and stoma).

**Clinical conclusions**
Postoperative hospital stay was significantly reduced in the ERP group compared with the CC group.

**Measure of benefits used in the economic analysis**
There was no summary measure of benefit. In effect, a cost-consequences analysis was performed.

**Direct costs**
Health service costs were included in the analysis. These included theatre time, theatre equipment, hospital ward hotel costs, staff costs, costs of outpatient visits, general practitioner visits and use of community services. Discounting was not carried out, but it was not relevant since the costs were incurred during less than 2 years. The quantities and the costs were not reported separately. The costs were obtained from the hospital finance department. Specific theatre equipment was costed at the manufacturer’s selling price to the hospital. Staff costs were estimated on the basis of published national figures. The price year was not specified.

**Statistical analysis of costs**
The authors provided mean values and the 95% CI for costs.
Productivity loss was estimated from the patients’ employment status at entry into the study and the date on which they returned to work. Average earnings were estimated from the Department of Works and Pensions. The quantities and the costs were not analysed separately. The price year was not specified.

**Currency**

UK pounds sterling ().

**Sensitivity analysis**

A sensitivity analysis (+20%) was undertaken to determine whether manipulation of key variables (theatre costs, hospital hotel costs, and community costs) would alter the conclusions of the study.

**Estimated benefits used in the economic analysis**

See the 'Effectiveness Results' section.

**Cost results**

The mean total cost for patients undergoing surgery for CRC was 7,998.18 with CC and 7,327.47 with the ERP.

The mean difference was 670.71 in favour of ERP, although it did not reach statistical significance.

Hospital (hotel) costs favoured ERP and the indirect costs were also substantially lower (527).

Values were derived from bootstrap estimates (10,000 iterations) with the CI taken as 2.5% and 97.5% percentiles.

**Synthesis of costs and benefits**

The costs and benefits were not combined as a cost-consequences approach was adopted.

**Authors’ conclusions**

Patients undergoing colorectal resection within an enhanced recovery programme (ERP) required a hospital stay that was half as long as those receiving conventional care (CC), with no increased morbidity, deterioration in quality of life (QOL) or increased cost.

**CRD COMMENTARY - Selection of comparators**

Although no detailed justification was given for the choice of the comparator, it would appear that CC was standard care before the introduction of the ERP. You should decide if the comparator represents current practice in your own setting.

**Validity of estimate of measure of effectiveness**

The analysis of effectiveness was based on a prospective comparative study with historical controls. The authors noted that this design could mask changes in clinical practice that could have occurred naturally over time, leading to a reduction in hospital stay and costs. The authors also noted that there might have been observer bias in the decision to discharge patients in the ERP group. These represent limitations to the internal validity of the findings and suggest that the effectiveness results should be treated with some caution.

**Validity of estimate of measure of benefit**

No summary benefit measure was used as a cost-consequences approach was adopted. Please refer to the comments in the 'Validity of estimate of measure of effectiveness' field (above).
Validity of estimate of costs
The perspective adopted in the study was explicitly reported as that of the UK NHS. However, indirect costs in terms of lost wages were also included, suggesting that the perspective might, in fact, have been societal. Details of the analysis of resource quantities and unit costs were not reported, which means that it would be difficult to replicate the study in other settings. The price year was also not specified. The time horizon was not explicitly stated, but follow-up appears to have been for 3 months and the costs were calculated as having been incurred within this period. Under these circumstances discounting was not relevant and, appropriately, was not performed.

Other issues
The authors compared their findings with those of other studies. The issue of generalisability was not explicitly addressed. The authors did not report their results selectively. The authors stated limitations to the effectiveness data.

Implications of the study
The authors did not make any specific recommendations for practice or suggestions for further research.

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