Outpatient bowel preparation for elective colon resection

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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
Out-patient bowel preparation with polyethylene glycol-electrolyte lavage solution (PEG-ELS) pre-elective colon resection.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients who had elective segmental or total abdominal colectomy with primary anastomosis. 51% of outpatients (52% inpatients) were male. Mean outpatient age was 62 years (inpatient age was 65.7 years). The main outpatient characteristics (inpatient characteristics in brackets) included hypertension 8% (10%), diabetes 5% (7%), coronary artery disease 6% (7%) and chronic obstructive pulmonary disease 3% (3%). Main preoperative diagnoses include colon cancer 45% (42%) and masslips 45% (46%).

Setting
The practice setting was the secondary care. The economic study was carried out in New Orleans, USA.

Dates to which data relate
Effectiveness and resource use data were obtained between July 1987 and July 1991. The price date was not specified.

Source of effectiveness data
The estimates for final outcomes were derived from a single study.

Link between effectiveness and cost data
Costing was undertaken on the same patient sample as that used in the effectiveness study. Costing and effectiveness measures were analysed retrospectively.

Study sample
Initially 726 patients were selected. Patients who required protective proximal stoma, emergency surgery, colostomy closure, or restorative proctocolectomy were excluded. A total of 319 patients were included in the analysis. They were divided into 2 groups that were approximately equivalent by age, sex, preoperative diagnosis, procedures carried out, postoperative diagnosis and comorbidity factors. 145 outpatients and 174 inpatients were given bowel preparations. No power calculations were reported.
Study design
Non-randomised trial with concurrent controls. The study was single-centred. The length of follow-up was not stated explicitly but the discharge outcome was recorded.

Analysis of effectiveness
The clinical study was based on intention to treat. The primary outcomes were surgical outcomes and included days of hospitalization, days of nothing by mouth, days of nasogastric tube, days of gastrostomy tube and discharge outcome. At analysis, the outpatient and inpatient group were found to be matched equally on age, sex, preoperative diagnosis, procedures carried out, postoperative diagnosis and comorbidity factors.

Effectiveness results
Morbidity rates were 21% for the inpatient and 19% for the outpatient group (excluding spontaneously resolving postoperative fevers). No complications were reported relating to bowel preparation whether conducted in the inpatient or outpatient setting. Surgical outcomes were similar amongst the 2 groups. Days of hospitalization were a mean of 9 (+/- 2.7) and 10.7 (+/- 4.6) for outpatients and inpatients respectively. The days of nothing by mouth were 6 (+/- 2.0) for outpatients and 6.8 (+/- 3.1) for inpatients. Mean days with the nasogastric tube were 5.5 (+/- 2.0) for outpatients and 6.0 (+/- 2.9) for inpatients. The mean days of gastrostomy tube were 6.2 (+/- 1.4) and 7.2 (+/- 3.4) for outpatients and inpatients respectively. For 99% of inpatients, home was the discharge outcome, compared to 97.7% for inpatients. No p values were reported.

Clinical conclusions
Out-patient preparations with PEG-ELS and oral antibiotics before elective colon resection is as safe as its inpatient equivalent.

Modelling
Not undertaken.

Measure of benefits used in the economic analysis
No complications were reported following PEG-ELS in either the inpatient of outpatient group. Surgical outcomes post colon resection were similar in terms of days of hospitalisation, nothing by mouth, nasogastric tube, gastrostomy tube and discharge outcome. Health states were valued by direct measurement by the clinicians.

Direct costs
Costs were not discounted. Quantities and costs were reported separately. The hospital perspective was adopted. Quantities and costs were based on actual data. The price date was not specified. The incremental cost of the inpatient over the out-patient group is evident from the cost savings generated. Direct costs included PEG-ELS, erythromycin, acomycin, and a semi-private room.

Statistical analysis of costs
Not conducted.

Indirect Costs
Not included.

Currency
NHS Economic Evaluation Database (NHS EED)
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US dollars ($).

**Sensitivity analysis**
Not performed.

**Estimated benefits used in the economic analysis**
Benefits of inpatient to out-patient bowel preparation using PEG-ELS were found to be very similar.

**Cost results**
The cost per person of a preoperative bowel preparation was $40.62 (outpatient) and $395.28 (inpatient). No discount rate was used. This translates to $72 million savings per annum in the US using the outpatient preparation approach.

**Synthesis of costs and benefits**
A synthesis of costs and benefits was not performed as benefits between groups were taken to be equivalent, and hence, cost savings generated through the outpatient approach became the focus. Per patient, the outpatient approach cost $354.66 less than the inpatient approach.

**Authors' conclusions**
The outpatient preparation is both equally safe and much cheaper (by over $350 per patient) than its inpatient comparator.

**CRD COMMENTARY - Selection of comparators**
The selection of comparator was justified.

**Validity of estimate of measure of benefit**
internal validity is likely as the 2 patient groups were equally matched according to age, sex, preoperative diagnosis, procedures done, post-operative diagnosis and comorbidity factors. However, it is not clear whether the patient sample size was sufficiently large enough for a difference in complication rate to be detected between the 2 groups.

**Validity of estimate of costs**
Whilst resources were reported separately from prices, inadequate details of the costing were provided (i.e. source, price year, lack of identifiable perspective, etc.)

**Other issues**
The study was retrospective. No sensitivity analysis was conducted and the length of follow-up was not stated clearly. It appears that patients were monitored only for the duration of their hospital stay following colon resection. Whilst in general comparisons with other studies support the findings in this study, as the authors suggest, a large randomised study is desirable to confirm the findings.

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