The impact of a clinical pathway for gastric bypass surgery on resource utilization
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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
A new clinical pathway for the management of patients undergoing gastric bypass surgery as a surgical weight loss procedure, was examined. The clinical pathway was designed by a multidisciplinary team (Department of Surgery, Nursing, and Clinical Nutrition) to meet the specific patient needs for procedures during all steps of the intervention.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with clinically severe obesity, with a Body Mass Index (BMI) of greater than 35.

Setting
The setting of the study was a hospital. The study was conducted at the Penn State Hershey Medical Centre, Pennsylvania, USA.

Dates to which data relate
The effectiveness and resource use data were gathered from June 1998 to December 1999. The price year was not reported.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

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

Study sample
Power calculations were not performed to determine the sample size. The study included 16 patients undergoing gastric bypass surgical procedures from June 1998 to March 1999 (pre-pathway group, Pre), and 12 patients undergoing the same intervention from April to December 1999 (post-pathway group, Post), at the authors’ institution. The mean age in the Pre group was 40.9 (+/- 1.91) years, and 11 of the patients were female. The mean age in the Post group was 39.9 (+/- 3.68) years and 7 of the patients were female. None of the patients were excluded from the initial sample.
Study design
This was a prospective case-control (before and after the introduction of the pathway) study carried out in a single centre, the Penn State Hershey Medical Centre. The patients were followed for no more than 6 weeks after discharge. A single surgeon performed the surgical procedures in each group.

Analysis of effectiveness
All patients included in the initial sample were accounted for in the analysis, in effect intention to treat. The primary health outcomes were the mean length of hospital stay and the overall incidence of complications. The groups were generally comparable in terms of the demographics (age and gender) and clinical conditions (BMI and the number of weight-related medical diagnoses). However, the patients in the Post group showed a greater BMI and greater incidence of obesity diagnosis.

Effectiveness results
The mean length of stay was 7 days in the Pre group and 4 days in the Post group. This difference was statistically significant, \( p<0.001 \).

The overall incidence of complications was 12% in the Pre group and 16% in the Post group. This difference did not reach statistical significance.

Clinical conclusions
The effectiveness analysis showed that the new clinical pathway was a safe procedure, which provided a sensible reduction in the length of hospitalisation when compared with the standard procedure.

Measure of benefits used in the economic analysis
The health outcomes were left disaggregated and no summary benefit measure was used. A cost-consequences analysis was therefore conducted.

Direct costs
Discounting was irrelevant since the costs were incurred over a time period of less than 2 years. The unit costs and the quantities of resources were not reported. The cost/resource boundary adopted appears to have been that of the hospital. The health service costs included in the analysis were for room and board, the operating room, supplies, the laboratory and radiology, and miscellaneous. The costs were calculated using cost/charge ratios. The costs and the quantities of resources were both estimated using actual data obtained from the hospital financial system, on the basis of DRG 288 (surgical procedures for obesity). The quantities of resources consumed were collected from June 1998 to December 1999. The price year was not reported.

Statistical analysis of costs
Statistical analyses of the costs were conducted to compare the total costs of the interventions.

Indirect Costs
The indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analyses were conducted.

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
The costs for room and board were $3,641 (+/- 398.35) in the Pre group and $2,389 (+/- 346.82) in the Post group, (p=0.013).

The costs of the operating room were $3,467 (+/- 253.31) in the Pre group and $4,251 (+/- 152.19) in the Post group, (p=0.02).

The costs of supplies were $1,152 (+/- 194.06) in the Pre group and $679 (+/- 106.89) in the Post group, (p=0.06).

The costs of the laboratory and radiology were $629 (+/- 84.34) in the Pre group and $312 (+/- 112.29) in the Post group, (p=0.03).

Other costs were $1,098 (+/- 121.74) in the Pre group and $878 (+/- 179.34) in the Post group, (p=0.30).

The total costs were $10,176 (+/- 788.71) in the Pre group and $8,511 (+/- 762.60) in the Post group. This difference was not statistically significant, (p=0.15).

**Synthesis of costs and benefits**
Not relevant due to the cost-consequences approach used.

**Authors’ conclusions**
The new clinic pathway for gastric bypass surgery was a safe procedure, which reduced the length of hospitalisation. Although the difference in the costs between the new pathway and the standard procedure was not statistically significant (due to the high costs for anaesthesia time and equipment in the operating room), a 15% reduction in the overall costs was reported.

**CRD COMMENTARY - Selection of comparators**
The rationale for the selection of the comparator was clear. The standard procedure for managing patients undergoing gastric bypass surgery was compared with the new clinical pathway recently introduced at the authors' institution. You should assess whether these approaches represent widely used health interventions in your own setting.

**Validity of estimate of measure of effectiveness**
The effectiveness analysis was conducted using a case-control (before-and-after) design, which appears to have been appropriate to the study hypothesis. However, the study groups were not perfectly matched in terms of some specific disease diagnoses. The lack of randomisation could also have increased the risk of confounding factors and selection bias. In addition, the sample size was somewhat small and power analyses were not performed. These issues clearly limit the internal validity of the analysis.

**Validity of estimate of measure of benefit**
No summary benefit measure was used in the economic analysis. It would have been interesting had the authors adopted a summary benefit measure (such as the quality-adjusted life-year) related to health, to assess the impact of the interventions on the patients' well-being.
Validity of estimate of costs
The study had a few limitations. First, the unit costs and the quantities of resources were not reported. Second, the cost estimates were specific to the study setting. Finally, the price year was not reported. These features limit the generalisability of the cost results. However, cost/charge ratios were used to assess the true costs of the interventions, which enhances the external validity of the results.

Other issues
The issue of the generalisability of the study to other settings and contexts was not addressed. In addition, sensitivity analyses were not conducted, and therefore, the external validity of the study was low. The authors made some comparisons of their findings with those from other studies.

Implications of the study
Compared with the Pre group, the costs in the operating room almost offset the cost-savings realised with the remaining cost items in the Post group. Further attention should be given to this specific phase (use of operating room) of the procedure.

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