A randomized-control study of active and passive treatments for chronic low back pain following L5 laminectomy
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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
Prevention of chronic low back pain (CLBP) following an L5 laminectomy with passive treatments (physical agents, and joint manipulation); and active treatments (low-tech exercise and high-tech exercise).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients employed in an industrial setting (automobile manufacturing) with post-lumbar laminectomy chronic low back pain.

Setting
Hospital (outpatient clinic). Some subjects were treated on a non-clinical basis at home, at work or in other settings of the subjects’ choice. The economic study was performed in Saginaw, USA.

Dates to which data relate
Effectiveness and cost data were collected in the period January 1984 to May 1992. Dates relating to the prices used were not stated.

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

Link between effectiveness and cost data
Costing was undertaken prospectively on the same patient sample from which the clinical effectiveness data were obtained.

Study sample
The study was of a randomized control group pretest-posttest design. A power calculation was undertaken to determine the sample size: \( (1-B=.90) \) (\( \alpha=.05 \)). The experimental sample consisted of 250 patients (68 females, 182 males) aged from 34 to 51 years of age (mean age 43 +/- 7.6 years), who were randomly assigned to five experimental groups: four treatment groups (physical agents, joint manipulation, low-tech exercise and high-tech exercise) and a control group which did not receive treatment. There were 50 patients in each arm of the study. 133 patients (53.2%) received
a right laminectomy and 117 patients (46.8%) received a left laminectomy at the L5 vertebral level.

**Study design**
A single-centre randomised controlled trial with a follow-up duration of one year after completion of the 8-week experiment.

**Analysis of effectiveness**
The analysis was based on intention to treat and the groups were comparable in terms of age, sex and prog nostic features. A confounding variable was the variation in length of time for which the subjects had had chronic low back pain before surgery. The primary health outcomes used in the analysis included symptom relief, lumbar flexion, extension and lifting capability.

**Effectiveness results**
The high-tech and low-tech exercise groups produced statistically significant (p<0.05) increases in lumbar flexion, extension ROM, and lifting capability, but there were no statistically significant improvements in the Oswestry disability questionnaire scores for these groups. There were no statistically significant increases in the scores for the physical agents and joint manipulation groups compared to the control group for either lumbar flexion, extension ROM, or lifting capability nor were there statistically significant decreases in their disability scores.

**Clinical conclusions**
Low-tech exercise and high-tech exercise were shown to be the only effective treatments for chronic low back pain.

**Measure of benefits used in the economic analysis**
The benefit measure was the number of weeks of symptom relief.

**Direct costs**
Costs were based on the average cost per patient per session for the different forms of treatment and were based on charges to the Workers- Compensation system. These costs were not defined further and were not discounted. Quantities and costs were not analysed separately and only health service costs were included in the analysis.

**Statistical analysis of costs**
Standard deviations were presented for the costs for each intervention: (a) physical agents = 67.00, (b) joint manipulation = 58.00, (c) low-tech exercise = 72.00, and (d) high-tech exercise = 69.00.

**Indirect Costs**
Not stated

**Currency**
US dollars ($).

**Sensitivity analysis**
A sensitivity analysis was not performed.

**Estimated benefits used in the economic analysis**
The mean length of relief from chronic low back pain was 91.4 weeks for the low-tech exercise group; 52.8 weeks for the high-tech exercise group; 5.7 weeks for the joint manipulation group; 2 weeks for the physical agents group and 1.6 weeks for the control group.

Cost results
The average cost per subject was: $1,842 ($76.75 per session x 3 sessions/week x 8 weeks) for the physical agents group; $1,260 ($52.50 per session x 3 sessions/week x 8 weeks) for the joint manipulation group; $1,392 ($58.00 per session x 3 sessions/week x 8 weeks) for the low-tech exercise group; $1,716 ($71.50 per session x 3 sessions/week x 8 weeks) for the high-tech exercise group; $0 for the control group.

Synthesis of costs and benefits
The cost per week of symptom relief was $921 for the physical agents, $221.05 for joint manipulation, $32.50 for high-tech exercise and $15.23 for low-tech exercise.

Authors' conclusions
The authors conclude that low-tech exercise is the most cost-effective form of treatment for the problem of CLBP.

CRD COMMENTARY - Selection of comparators
Justification was given for the comparators used. The comparators chosen represent variations of usual practice and are, therefore, sensible.

Validity of estimate of measure of benefit
The study was based on a randomised controlled trial. However, follow-up was only for twelve months, and chronic low back pain may last for the patient’s lifetime.

Validity of estimate of costs
Though adequate details were given of the sources of estimates and how the average cost per subject was derived, it would have been helpful to have information on how the costs per session were derived for each of the treatment groups. Costs were only from the perspective of the health service and excluded costs experienced by others in society such as patients. Productivity losses could be considerable in patients with chronic illnesses and there could be considerable out-of-pocket expenditure, such as transportation costs to and from the clinic for treatment sessions.

Other issues
Costs data may not be generalisable to other settings or countries.

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None stated.

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