Reuse of external skeletal fixator components: effects on costs and complications

Dirschl D R, Smith I J

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 programme for the reuse of selected components of external skeletal fixator.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with fractures stabilised with external fixators.

Setting
Hospital. The economic study was carried out in the USA.

Dates to which data relate
The effectiveness and resource use data refer to 1993-1995. The price year was not reported.

Source of effectiveness data
The evidence for the final outcome was based on a single study.

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

Study sample
Power calculation were not used to determine the sample size. The sample included 134 fractures treated with external fixators. The number of external fixation devices applied to the fractures were 69 before reuse and 65 after reuse.

Study design
This was a retrospective cohort study carried out in a single hospital. The duration of the follow-up was until fracture had united and the outcome was known. There was no loss to follow-up.

Analysis of effectiveness
The analysis of the clinical study was based on intention to treat. The primary health outcome was the rate of
complications and reoperations. It is not clear whether groups were comparable in terms of their baseline characteristics.

**Effectiveness results**

The complications of external fixation by fracture type were:

- The rate of reoperations before reuse for fractures of the distal radius was 3, and for tibial plafond, tibial shaft and femoral shaft were all 1;
- The number of pin tract infections before reuse was 5;
- The rate of reoperations after reuse was (by fracture type):
  - Distal radius, 3;
  - Tibial plafond, 2;
  - Proximal tibia, 1;
  - Tibia shaft, 1;
  - Femoral, 2.
- There were 4 pin tract infections after reuse.

**Clinical conclusions**

There were no differences in the rates of reoperation or complications before and after institution of the reuse programme. There was one mechanical failure, which did not affect the fracture alignment.

**Measure of benefits used in the economic analysis**

Since the effectiveness analysis showed no difference in effectiveness between the intervention and the comparator, the economic analysis was based on differences in costs only.

**Direct costs**

Quantities and costs were reported separately. Hospital costs for external devices were included in the analysis. The estimation of quantities was based on actual data. The quantity/cost data were obtained from hospital, operating room, and outpatient records and from direct patient interview. The price date was not stated.

**Currency**

US dollars ($).

**Sensitivity analysis**

A sensitivity analysis was not carried out.

**Cost results**

The overall mean hospital charge for an external fixation device was $4,067 (range: $2,009 - $10,002) before reuse and $2,791 (range: $1,106 - $10,415) after reuse. The overall hospital cost for external skeletal fixators was $128,614 before reuse (mean $1,864 per fixator) and $79,463 after reuse (mean $1,225 per fixator). The overall hospital cost for external fixators after institution of the reuse programme was $80,498 (mean, $1,238 per fixator).
Authors' conclusions
The results indicate a 34% cost savings to the hospital as a result of the reuse programme and a 32% mean cost saving to the patient. The overall rate of complications was no different before and after institution of the reuse programme.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear. You as a database user should decide whether this applies to your own setting.

Validity of estimate of measure of benefit
It is not clear whether differences between groups were statistically significant. The sample size may have been insufficient to detect clinically significant differences. Given that no differences in effectiveness were noted between the intervention and the comparator this may be regarded as a cost-minimisation study.

Validity of estimate of costs
Charges were used rather than costs. Insufficient details of the cost analysis were provided and it is therefore not possible to judge whether important cost items were omitted.

Other issues
The authors acknowledged some limitations of the study, such as the small sample size and variation in the designs of the fixators used. Appropriate comparisons with other studies were made and the issue of generalisability was addressed by the authors.

Implications of the study
Further research is needed to assess the cost-effectiveness of reuse of external fixators.

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