Prehospital classification combined with an in-hospital trauma radio system response reduces cost and duration of evaluation of the injured patient


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
Pre-hospital trauma classification system (PHTCS) combined with an in-hospital trauma radio system response (IHTRSR).

Type of intervention
Management of disease.

Economic study type
Cost-effectiveness analysis.

Study population
Adult and pediatric trauma patients (excluding those with burns) with an injury severity score (ISS) greater than 9.

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

Dates to which data relate
Effectiveness and resource data were collected during the period 1991-1993. Price date was not given.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Costing was undertaken on the same patient population used in the effectiveness analysis. It was not clear if this was done prospectively or retrospectively.

Study sample
1389 patients with an ISS greater than 9 constituted the study sample. 396 and 686 patients related to the intervention periods (period 2 and 3), while 307 patients related to the comparator period (period 1).

Study design
Case series (a series of patients before the implementation of the system was compared to a series of patients after the implementation of the system) single centre study. There was no loss to follow-up. Duration of follow-up was not specified.
Analysis of effectiveness
The analysis was based on intention to treat. Clinical effectiveness was proxied by emergency room (ER), intensive care unit (ICU) and hospital length of stay. Mortality rates were also considered. Patients' groups were comparable in terms of age, ISS, mechanism of injury, and destination after ER.

Effectiveness results
There was a significant reduction in time spent in ER over the three periods (p=0.001). The analysis of subgroups in terms of destination after leaving the ER, showed a significant reduction in time for patients going to the ICU or to the operating room (OR) (p=0.001). A decrease in the other outcome parameters was also observed, however this was not statistically significant (p>0.05).

Clinical conclusions
The implementation of PHTCS and IHTRSR had no adverse effect of patients' health outcomes.

Measure of benefits used in the economic analysis
Benefit was proxied by ER, ICU and hospital length of stay. Mortality rates were also considered.

Direct costs
Some costs and quantities were reported separately. Resources measured were based on actual data (unit of analysis). A specific ER fee schedule was used to value the time patients spent in the ER unit. The costs of implementing the radio system were also considered. Costs were not discounted. No price date was given. No other details were reported.

Statistical analysis of costs
Quantities of resources were reported as mean +/- standard deviations. P-values were also reported.

Currency
US dollars ($)

Sensitivity analysis
No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis
There was a significant reduction in time spent in the ER over the three periods (p=0.001). The analysis of subgroups in terms of destination after leaving ER, showed a significant reduction in time for patients going to the ICU or to the OR (p=0.001). A decrease in the other outcome parameters was also observed, however this was not statistically significant (p>0.05).

Cost results
The implementation of the radio system cost $44,000. However, this was more than compensated by the cost reduction of $236,000 verified from period 1 to period 3. Duration of costs was evaluated over a two-year period. No discount was applied.

Synthesis of costs and benefits
The implementation of the PHTCS and IHTRSR was a dominant strategy.
Authors' conclusions
The authors concluded that the implementation of PHTCS and IHTRSR was cost-effective and should be considered in trauma system development.

CRD Commentary
This study was notable for the effort spent collecting a great amount of data. However, it must be considered as a preliminary study since it lacked a more comprehensive and detailed analysis. The clinical study design may be prone to bias, given the non-randomisation method and the poor definition of the clinical outcomes (no morbidity outcomes were assessed). Costs of the implementation of the system were partial (only costs related to the implementation system in period 2 were considered). No discounting was applied, although the cost duration was more than one year. A sensitivity analysis would have been desirable, given the local emphasis of the study cost structure.

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