Efficacy and cost-effectiveness of a needleless intravenous access system

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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
Intravenous access procedures. In particular: a heparin-lock intermittent intravenous access procedure and a needleless intravenous access system.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Health care workers.

Setting
Hospital. The economic study was conducted in the Health Sciences Center, Winnipeg, Manitoba, Canada.

Dates to which data relate
Costs and outcomes when the heparin-lock procedure was in place were collected from October 1991 to the end of September 1992. Costs and outcomes for the needleless system were collected from October 1992 to the end of September 1993.

Source of effectiveness data
Evidence for outcomes was based on the single study.

Link between effectiveness and cost data
Prospective costing was undertaken on the same population as that used in the effectiveness study, albeit at different time periods, dependent upon the product being analysed.

Study sample
The whole population of workers at the hospital: approximately 6000 staff were employed at any one time. There was no indication of the size of staff turnover during the period.

Study design
Before-and-after study. Duration of follow-up was not specified.
Analysis of effectiveness
The primary health outcome measured was the number of needlestick injuries.

Effectiveness results
There were 159 needlestick injuries from all procedures and events, following the introduction of the needleless system. Before the introduction of the system there were 281 injuries. Intravenous line-related injuries decreased from 61 to 13 in the same period.

Clinical conclusions
The needleless system was effective in reducing intravenous line-related needlestick injuries.

Measure of benefits used in the economic analysis
Needlestick injuries avoided.

Direct costs
The viewpoint was that of the hospital. Direct costs arising during the year were the only ones considered and potential long term costs such as compensation claims were specifically excluded.

Costs included: needles, syringe-needle combinations, non-interlink injection caps, intravenous sets, interlink products, laboratory costs, primary and secondary prophylaxis, personnel time.

Costs were not discounted. Quantities and costs of the products used for intravenous procedures in each year of the study were provided by the purchasing department: these were not analysed separately. Costs associated with sharps disposal were taken directly from actual amounts paid. It is not stated whether prices differed in the two years and costs were not discounted. Costs of nursing time in using the different procedures were not included. Costs of a needlestick injury were estimated from the possible direct costs that might be associated with an injury follow up. Numbers of injuries are given but actual costs involved are not stated.

Currency
Canadian dollars (Can $).

Sensitivity analysis
The costs were estimated using the extremes of the range for the cost of a needlestick injury and the resulting totals were also given as a range.

Estimated benefits used in the economic analysis
Total reduction in needlestick injuries was 122 (43.4%) and the reduction in intravenous line-related needlestick injuries was 48 (78.7%).

Cost results
The cost of the interlink system ranged from Can$480,340 to Can$556,024. The cost of the previous system ranged from Can$455,960 to Can$589,716. The difference ranged from a saving Can$33,692 for the needleless system to a cost of Can$24,380.

Synthesis of costs and benefits
Costs and benefits were not combined.
Authors' conclusions
The interlink system was effective in reducing intravenous line-related needlestick injuries and the system did pay for itself.

CRD Commentary
The authors defined the study as a cost-benefit analysis but the only benefits quantified are the cost saving to the hospital from the reduction in needlestick injuries and other resource savings.

There was no indication of whether the numbers of staff changed from year to year, whether there was any staff turnover, or whether the workload remained the same. Total numbers of procedures requiring intravenous access in each year were not given.

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