Safety of prolonging peripheral cannula and IV tubing use from 72 hours to 96 hours

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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
Using 72- or 96-hours peripheral intravenous (IV) line change intervals in hospitalized patients undergoing peripheral intravenous (IV) catheter infusion therapy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Adult medical-surgical hospitalized patients undergoing peripheral intravenous (IV) catheter infusion therapy.

Setting
Hospital. The economic study was performed in Massachusetts, USA.

Dates to which data relate
The effectiveness data were collected in December 1992. No date for prices or the resources used was specified.

Source of effectiveness data
The evidence for the final outcomes was derived from a single prospective study.

Link between effectiveness and cost data
It was not explicitly stated whether the costing was performed on the same patient sample as that used in the effectiveness study or whether it was carried out prospectively or retrospectively.

Study sample
Power calculations were not used to determine the sample size. The study sample consisted of 1,292 inpatients who received 3,118 peripheral lines in total during the 1-month study period. 19.7% of lines were excluded from the study (2,503 lines remained in the study sample).

Study design
The study was a single centre, non-randomized controlled study with concurrent controls. The study period was 1 month.
Analysis of effectiveness
It was not stated whether the analysis of the clinical study was based on intention to treat or on treatment completers only. The clinical outcome measures consisted of the overall phlebitis rate, the phlebitis rate for 72- and 96-hour change intervals, the estimated number of IV lines which potentially could be prolonged beyond 72 hours, and the number of lines in 72- and 96-hour change intervals.

Effectiveness results
The patients in the sample experienced an overall phlebitis rate of 6.8%. The 72-hour change interval group had a phlebitis rate of 3.3% versus 2.6% for the 96-hour change interval group (P=1.000). The estimated number of IV lines which potentially could be extended beyond 72 hours was 300; the numbers of lines in 72- and 96-hour change intervals were 215, and 61, respectively. The number of lines kept beyond a 96-hour interval was 19.

Clinical conclusions
The study revealed that the IV line change intervals could be safely extended from 72 hours to 96 hours.

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic analysis and only separate clinical outcomes were reported.

Direct costs
Quantities were not reported separately. Cost items were reported separately. The insertion cost of IV lines consisted of nursing charge, and the costs of materials including IV start kit, saline flush solution, angiocatheter, and IV tubing. The annual cost saving resulting from 300 cases of estimated monthly number of IV lines which potentially could be extended beyond 72 hours was calculated. Only health services costs were considered. The sources of resource and cost data were not specified. The date to which the price data referred was not specified.

Indirect Costs
Not reported.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis
No summary benefit measure was identified.

Cost results
The annual cost saving resulting from an estimated 300 cases per month of IV lines which, potentially, could be extended beyond 72 hours was calculated to be $61,200 per year.

Synthesis of costs and benefits
No synthesis of costs and benefits was carried out by the authors since the extension of change intervals to 96-hour was a weakly dominant strategy.
Authors' conclusions
The author concluded that the "phlebitis rate for our peripheral intravenous catheters at 96 hours was significantly different from that at 72 hours. If intravenous cannulas and lines were prolonged to 96 hours, a potential cost saving of $61,200 per year could be realized".

CRD COMMENTARY - Selection of comparators
A justification for the choice of the comparator was given. it represented the routine procedure at the study site. You should consider whether this is a widely used health technology in your own setting.

Validity of estimate of measure of benefit
As acknowledged by the author, lack of randomisation in the study may have adversely affected the internal validity of the effectiveness study.

Validity of estimate of costs
Resource quantities were not reported separately from the costs. Adequate details of methods of cost estimation were not given. It was not specified whether the costing was performed prospectively or retrospectively.

Other issues
Given the lack of randomisation, sensitivity analysis, and statistical analysis of costs, the results need to be treated with some caution. The issue of generalisability to other settings or countries was not addressed. Appropriate comparisons were made with other studies.

Source of funding
None stated.

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