Cost-effectiveness of routine radiographs after emergent open cavity operations
Dossett LA, Dittus RS, Speroff T, May AK, Cotton BA

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.

CRD summary
The aim was to assess the cost-effectiveness of radiography compared with surgical counts, for detecting retained surgical sponges after operations performed on an emergency basis. The authors concluded that routine radiography was a cost-effective option compared with surgical counts. There were a few limitations to the study, especially concerning the data used in the analysis, and the authors’ conclusions should be considered with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study compared the cost-effectiveness of two strategies for the detection of retained surgical sponges and instruments after operations performed on emergency basis.

Interventions
The interventions were routine radiography performed after surgery versus surgical count followed by radiography in the case of an inconsistent count.

Location/setting
USA/secondary care.

Methods
Analytical approach:
A decision analytic model was used and the time horizon was not explicitly stated. The authors reported that the perspective was that of a university level one urban trauma centre, with more than 4,000 annual trauma admissions.

Effectiveness data:
The effectiveness estimates were from a range of sources including published literature and expert opinion. The clinical estimates included the post- and pre-test probability of retained surgical sponges and the sensitivity and specificity of the interventions.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
No summary benefit measure was used.

Cost data:
The economic analysis included the costs of radiograph (the portable machine, labour, supplies, and utilities), additional operating room time (nursing and anaesthesia staff and equipment), and legal settlements (re-operation and legal defence and settlement fees). The costs were derived from the authors’ setting, while legal settlements were from data in the literature, augmented by expert opinion.

Analysis of uncertainty:
The parameter uncertainty was investigated using one-way sensitivity analyses in which all the model parameters were varied. Two-way sensitivity analysis was also carried out by varying the sensitivity of the count and the radiography.
Threshold analysis was performed to assess the values at which the preferred strategy changed.

**Results**
Assuming a sponge detection probability of one for radiography and 0.999 for surgical count, the expected cost per open emergency operation was $705 for radiography and $1,155 for surgical count. Intra-operative radiography was the dominant strategy, which means it was more effective and less costly.

The sensitivity analyses demonstrated that these results were robust.

**Authors’ conclusions**
The authors concluded that intra-operative radiography was a cost-effective intervention for preventing retained surgical sponges after operations performed on an emergency basis.

**CRD commentary**

**Interventions:**
The interventions were clearly reported and it appears that the study was thorough in its coverage of the alternative interventions in the setting, including the current practice.

**Effectiveness/benefits:**
No details of the literature source were reported and this means that an objective assessment of the validity of the estimates used is not possible. The use of expert opinion was justified on the grounds of a lack of available evidence.

**Costs:**
The costs appear to have reflected the perspective stated, but they were only reported as macro-categories, which might limit the transparency of the analysis. The time horizon was not reported, but it appears that it was less than a year meaning that discounting was not relevant. The price year was reported, which will facilitate future reflation exercises. The uncertainty around the cost estimates was investigated in the sensitivity analysis.

**Analysis and results:**
The model structure was reported along with the modelling assumptions and a diagram. The authors conducted an appropriate incremental analysis and the results for the non-dominated strategies were fully and clearly presented. The impact of uncertainty was investigated which improves the reliability of the results. The authors acknowledged some limitations to their analysis and these mainly related to the quality of the data used to populate the model.

**Concluding remarks:**
There were a few limitations to the methodology and the data used, and the authors’ conclusions should be considered with caution.

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