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
This study assessed the cost-effectiveness of various strategies to routinely test for and decolonise methicillin-resistant Staphylococcus aureus (MRSA) in patients aged 60 years or older who were undergoing haemodialysis. The authors concluded that routine testing and decolonisation was cost-effective, for a wide range of MRSA prevalence, decolonisation costs and success rates, and testing intervals. The data sources were not extensively presented, but the cost-effectiveness framework was conventional and the authors’ conclusions appear to be robust.

Type of economic evaluation
Cost-utility analysis

Study objective
This study assessed the cost-effectiveness of various strategies to routinely test for and decolonise methicillin-resistant Staphylococcus aureus (MRSA) in patients aged 60 years or older who were undergoing haemodialysis.

Interventions
The two tests were polymerase chain reaction (PCR) or agar testing. The agar testing was a single anterior nares (nose) culture, while PCR involved nucleic acid detection, with an amplified probe technique. Testing was performed every three, six, or 12 months.

The three decolonisation options were: mupirocin 300mg; mupirocin, with rifampin twice daily for 10 days; and mupirocin with rifampin plus chlorhexidine (4% chlorhexidine gluconate).

The background comparator was no testing.

Location/setting
USA/out-patient.

Methods
Analytical approach:
The analysis was based on a Markov model, with a lifetime horizon (the median patient survival was 4.8 years). The authors stated that it was carried out from the perspective of the third-party payer.

Effectiveness data:
The clinical data were mainly from published sources, with a wide variety in the type and quality of studies. Where multiple sources were available, mean values were used. Some data were from interviews and consultations with an infectious disease physician and a nephrologist.

Monetary benefit and utility valuations:
The utility values were from published sources.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure.

Cost data:
The economic analysis included the costs of vancomycin, decolonisation (mupirocin, rifampin, and chlorhexidine), death, infections (bacteraemia, endocarditis, line infection, osteomyelitis, pneumonia, and wound infection), clinical procedures (transthoracic echocardiogram, tunnelled dialysis catheter insertion and removal, and arteriovenous graft insertion and removal), temporary catheter, physician consultation, agar testing, and PCR. The hospital costs for the management of conditions related to MRSA were age-specific data from the Healthcare Cost and Utilization Project. Other sources were average wholesale prices and published studies. The average national hospital length of stay was used. All costs were in US dollars ($) and a 3% annual discount rate was applied. The price year was 2010.

Analysis of uncertainty:
A probabilistic sensitivity analysis was undertaken to investigate if the base-case results were robust. Each set of inputs was assigned a probability distribution. One-way sensitivity analyses were performed on selected inputs, using authors’ opinions for the ranges of values.

Results
At a cost-effectiveness threshold of $50,000 per QALY gained, either testing strategy was highly cost-effective compared with no testing. The cost-effectiveness ratios decreased when testing frequency was reduced to six or 12 months.

In some scenarios, testing was dominant, as it was more effective and less expensive than no screening. For example, if the decolonisation cost was $104.57 or less, agar surveillance was dominant with an MRSA colonisation rate of 5% or more and a decolonisation success rate of 25% or more.

At a decolonisation cost of $200, three-monthly agar testing had an incremental cost per QALY gained of $1,701 or less when assuming no spontaneous clearance. The ratio was $1,683 or less assuming 25% or greater spontaneous clearance.

PCR was cost-effective, compared with no testing. The incremental cost per QALY gained was $4,833 or less in all scenarios. PCR was dominant when the MRSA prevalence was 20% or more and the decolonisation success rate was 75% or more, with no spontaneous clearance.

Variations in the cost of infection did not substantially alter the base-case findings.

Authors' conclusions
The authors concluded that routine periodic testing and decolonisation of MRSA in haemodialysis patients was cost-effective for a wide range of MRSA prevalence, decolonisation costs and success rates, and testing intervals.

CRD commentary
Interventions:
The selection of the comparators was appropriate as the two available testing strategies were compared against no surveillance and three decolonisation strategies were considered. This increases the relevance of the results for different settings.

Effectiveness/benefits:
No literature search was reported to identify the relevant sources of data and these sources were not described. An objective assessment of the validity of the clinical inputs is not feasible. The authors stated that great variety was found in the quality of the published evidence, but wide ranges were used, in the sensitivity analyses, for the most uncertain inputs and the results remained stable. QALYs were an appropriate benefit measure, but the derivation of the utility values was not fully described.

Costs:
The cost categories and most of their sources appear to have been relevant to the perspective of the third-party payer. The sources were representative of the USA. The costs were presented as category totals and were not broken down into individual items. This reduces the transparency of the analysis. The cost of decolonisation was a key input and its impact on the cost-effectiveness was extensively investigated in the sensitivity analysis. Reflation exercises will be possible as the price year was reported.
Analysis and results:
The results were presented selectively, as the expected costs and benefits were not reported. The incremental cost-utility ratios were given for a wide range of scenarios, which showed the stability of the conclusions. Appropriate sensitivity analyses were carried out to calculate confidence intervals around the model outcomes. The impact of variations in selected inputs was considered. The authors stated that their analysis focused on patients aged 61 years or more, it cannot be generalised to younger patients. The results appear to be specific to the USA and might not be easily transferred to other settings.

Concluding remarks:
The data sources were not extensively presented, but the cost-effectiveness framework was conventional and the authors' conclusions appear to be robust.

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