Eastern Massachusetts Prevention Epicenter June 2008
Grace Lee, MD MPH

Prioritization of Recommended Infection Control and Prevention Practices in the U.S.

Background:

CDC has 13 comprehensive guidelines for hospitals on infection control and prevention with over 1,200 practices recommended within these guidelines. Most of these guidelines focus on the strength of evidence for each recommendation, which implicitly guides prioritization. However, over 500 practices are strongly recommended and further input on how these practices should be prioritized is not provided.

Objective:

To provide decision makers with a framework for prioritizing recommendations for infection control and prevention in the U.S.

Methods:

We propose to use a decision analysis framework to clarify trade-offs in decisions to invest in the adoption of one infection control recommendation versus another. Decision-making is an intrinsic component of patient care; however, almost all decisions are undertaken under conditions of uncertainty. Decision analysis offers a systematic approach by explicitly stating assumptions and quantifying the outcomes. Thus, the impact of each intervention can be compared explicitly. It is particularly useful when decisions must be made in the face of limited resources.

Cost-effectiveness analysis (CEA) builds upon the field of decision analysis. In addition to incorporating the probability of disease and their outcomes, CEA also includes the costs incurred along each pathway. Cost-effectiveness analysis is appealing because the outcome can be expressed in terms of health benefits such as cost per case prevented. A limitation of cost-effectiveness analysis arises when comparisons are made using different units of benefit. For example, comparing the cost per case of surgical site infection prevented to the cost per case of catheter-associated UTI prevented is difficult. The units are not inherently comparable and decision-makers need to be able to allocate resources amongst different programs with different health outcomes. Thus, the field of CEA has adopted the approach expressing health outcomes in terms of cost per life-year saved or cost per quality-adjusted life year (QALY) saved. The former approach allows us to compare the ability of different programs to save lives, but does not adequately capture the morbidity associated with different diseases. In contrast, using the outcome of cost per QALY saved allows decision makers to compare 2 different programs and their ability to prevent both morbidity and mortality by using the same denominator.

A simple core model will be created to estimate the net health benefits and costs of each recommended intervention. Probabilities, costs, and utilities used in the model will be based on published literature, empiric data when published estimates are unavailable (e.g. from Epicenters hospitals), and expert panel opinion. Outcomes will include costs, health benefits, cost per case prevented, and cost per QALY saved for each recommended intervention studied. Sensitivity analyses will be conducted to understand how model results change as key assumptions are varied over plausible ranges. By identifying assumptions to which the model is sensitive, potential areas where future research is needed can be targeted.