The economic impact of infection control: Making the business case for increased infection control resources

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Escalating costs are a major concern for everyone involved in health care delivery but particularly to those who have little say in budgeting decisions. Infection control specialists attending the Association for Professionals in Infection Control and Epidemiology's 32nd Annual Educational Conference and International Meeting, held in Baltimore, Maryland, in June of this year (2005) were anxious to obtain practical information on how to deal with dwindling resources. In a well-attended session, the first 2 speakers on the subject, Patricia Stone and Edwin Hedblom, provided a framework for evaluating the economic impact of health care-associated infections (HAIs); the next 2 speakers, Denise Murphy and Steven Miller, provided practical tips as to which arguments work and which do not when asking hospital administrators for more money. The following is a condensed version, highlighting the main points of their talks:

PATRICIA W. STONE: REVIEW OF THE LITERATURE ON INFECTION COSTS

HAIs are a growing problem. In 1992, the Centers for Disease Control and Prevention (CDC) estimated that HAIs cost approximately $4.5 billion a year–a lot of money no matter how you look at it![1] With adjustments for inflation, that would be more than $6.5 billion in today's dollars. The 1992 figure is based on infection rates reported by the Study on the Efficacy of Nosocomial Infection Control (SENIC) conducted in the mid-1970s.[2] It is likely that technologic advances in health care since that study was conducted have driven HAI costs even higher. All health care costs are rising. In 2003, the latest year for which figures are available, apprxoximately 15.3% of the United States' gross domestic product was spent on health care. That number is projected to reach 18.4% by 2013.[3] What that means for infection control professionals (ICPs) is that there will be increased pressure to establish cost-effective services.

In our attempts to lessen the burden of diseases, especially those caused by HAIs, we currently employ a wide variety of technologies and treatments. What we need now is solid evidence as to which of these interventions are most cost-effective. Because institution-specific cost-accounting data are not generally available, most of us have to rely on the literature.

Several years ago, my colleagues and I undertook a systematic review of the literature on HAI costs published from 1990 through 2000.[4] We found 55 articles that met our study criteria. There was wide variation in the HAI costs reported. Those associated with bloodstream infections (BSIs), for example, varied from $3500 to $40,000 per survivor. We concluded that the wide range of values was probably not so much because of actual differences in costs or patient populations as to differences in the cost-accounting methods.

When asked to update our review, we were therefore aware of the importance of assessing both the quality of the research and the quality of the economic evaluations reported. As in the first study, we began by conducting a systematic computer search, this time of the literature published from January 2001 through June 2004. We used PubMed, which accesses MEDLINE, EconoLit, and HealthSTAR, as our primary search engine and input key words such as ''health care-associated infections'' and ''cost-effectiveness'' in various

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combinations for cross-reference. Of the 152 articles retrieved, 70 met our criteria for inclusion in the study.[5]

In keeping with the CDC guidelines on how to audit economic evaluations,[6] each article was assigned to 2 readers, who then completed a survey form. The form was a refined version of the one used in our first review, which we obtained from the Harvard Center for Risk Analysis and modified to suit our own needs. Each article was rated on a 1 to 7 Likert-type scale as to the quality of research and evaluation methods employed. Further details of our methods and findings will be described in a separate article to be published along with a summary of these proceedings (see pp 501-9).

Over all, the quality of the articles was not as good as one might have hoped. Some of the authors did not even say how they determined whether an infection was health care associated. In approximately 29% of cases, researchers reported the cost of a specific intervention but failed to provide a comparator–they apparently did not look at the cost of any other, or no, intervention. Some of the studies were more comprehensive than others. Those looking at all costs attributable to the HAI, rather than the costs of the intervention alone, tended to be of higher quality.

Most of the articles were written from a hospital perspective, which may differ from that of an insurance company, a government agency, or a product manufacturer. Inherent bias was not always easy to detect. Nearly 20% of the articles were funded by industry–including our own publications. When the funding source was not stated, our surveyors had no way of knowing whether the authors had no funding or were choosing not to reveal their sources. One would suspect, however, that, if an author praised the cost-effectiveness of some new software, he or she might be funded by that software's developer.

There have been national and international efforts to standardize economic evaluations. Specific criteria were first published in the United States in 1996[6] but have not been widely adopted. The National Institute of Nursing Research recently held a 3-day workshop to help nurse researchers understand how to conduct economic evaluations. Something similar could be done for ICPs and hospital epidemiologists. More training is needed to even read the literature on evidence-based practice and accounting, much less apply it. We know that ''money talks,'' but what many of us are still coming to grips with is that we are not as conversant in money matters as we need to be.

EDWIN C. HEDBLOM: HEALTH ECONOMICS AND HAI CONTROL PROGRAMS

Our objective in this part of the discussion is to gain a general understanding of the basic principles of health economics and how they can be used to demonstrate the financial and clinical value of infection control programs. As is generally recognized, resources are limited, wants and needs exceed resources, and choices must be made.

Efforts to control health care costs through aggressive contracting, reducing employee benefits, and shifting costs to others have resulted in some short-term savings. Such savings can rarely be sustained because inflation and the increasing use of expensive technologies eventually offset the gain. Health care managers are consequently looking for new ways to cut costs and get more value for their money (Fig 1).

John Wennberg, one of the fathers of evidence-based medicine, was among the first to address these issues. In the course of his 30-plus years of research, he noticed differences and incongruities in health care delivery throughout the United States. He then asked 2 simple questions: Why are there differences? Who is right? In 1996, for example, the rate of breast-sparing surgery for women with breast cancer varied from 1.4% in Rapid City, South Dakota, to 48% in Elyria, Ohio.[7] Why were there differences? Which of the procedures were most clinically effective? Which were most cost-effective?

Health economics is the assessment of the most effective and efficient use of available resources. A useful model for this type of assessment was developed at the University of South Carolina. Called the *ECHO Model*, it takes into account economic outcomes along with clinical and humanistic outcomes. Economic outcomes include both direct and indirect costs, whether related to products, materials, labor, or loss of employment or productivity. Clinical outcomes pertain to the patient's health and humanistic outcomes to the patient's quality of life.

There are basically 3 types of health care analysis: (1) In cost minimization analysis, the effectiveness of 2 products or 2 therapies is assumed to be the same. The analysis is aimed at determining which can be delivered least expensively; (2) In cost-effective analysis, the aim is to discriminate between products or therapies that may not be equal either in effectiveness or expense. This type of analysis is often used to bolster the argument that even small improvements in health care will justify the costs of running a new program or using a new product; (3) In cost-utility analysis, the aim is to determine which therapies or products will improve the patient's quality of life, which some say should be the gold standard in health economics research. This method is preferred when comparing the cost-effectiveness of disparate interventions such as infection prevention and postmyocardial infarction treatment.

Many health care managers and clinicians are still reluctant to use health economic analyses in their