The cost and value of cardiothoracic procedures

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The United States has the highest per capita expenditure for medical care in the world.¹ This is very likely due in part to the greater per capita delivery of new expensive high technology in medicine. The delivery of medical care in the United States is addressed through a profound and increasing redistribution of wealth. In 2003, 46% of our \$1.68 trillion health bill was paid by public funds (32% federal, 13% state and local) and only 54% from private funds (private health insurance, out-of-pocket payments).² The delivery system must be held accountable for these societal costs and keep track of the value it adds to the American economy. This financial stewardship must be added to our long-term follow-up systems.

Cardiothoracic surgery has been a pioneer in accurate reporting of long-term results using prospective systems with aggressive follow-up on a regular basis. Through our national organizations, we surgeons have developed guidelines and standards that allow useful comparisons. To fulfill this work, we must now add information concerning costs and economic value.

The number of articles published on cost-benefit analysis has increased enormously in just the past few years, but the medical costs thus identified provide only a part of the economic picture. Cost-effectiveness ratios (CER) do not address the economic value of the intervention under study. The actual cost would determine the value in a free market system. However, in the vast majority of medical transactions a free market system does not operate¹ and an administrative pricing system prevails.

The end product of a cost-effectiveness analysis in the medical domain, the CER for a new or proposed therapy, is the incremental dollars needed to “produce” one incremental (quality-adjusted) life-year. After this number is determined, it is compared with somewhat arbitrary thresholds: less than \$20K is considered very cost-effective, \$20K to 50K is probably cost-effective, and greater than \$100K is not cost-effective. The vagueness of these cut points derives from our reluctance or inability to put a price on a year of life.

Under these circumstances, however, it is possible to look to other areas of the economy, where market forces do operate to determine the economic value of a life-year and the value of a statistical life (VSL), and to use these determinations in our economic value calculations. Fortunately, economists have addressed these issues, and their methods of analysis are now ready for medical use. Thus, a great departure from the usual cost-effectiveness analysis, which ends with the cost of producing a life-year, is to use these innovative econometric methods to put a value on each life-year and to compare that value to its cost of production (ie, the CER).

The economists have used such VSL evaluations to assign a monetary value to the increases in US life span since 1970 (about \$2.8-\$3.2 trillion per year), to the reduction in heart disease mortality (about \$1.5 trillion per year), and to a hypothetical future 10% reduction in cardiac mortality (about \$5.0-\$5.7 trillion per

From Providence Heart and Vascular Institute, Providence Health System, Portland, Ore.

Received for publication April 17, 2006; accepted for publication April 24, 2006.

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J Thorac Cardiovasc Surg 2007;133:601-2
0022-5223/\$32.00

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doi:10.1016/j.jtcvs.2006.04.027

year).³ These assessments and projections use the “top-down” approach, the big picture. We, cardiothoracic surgeons, working in the engine room of the medical delivery system, are in a position to apply these econometric methods in a “bottom-up” approach to assess the monetary value of our surgical procedures.

The two companion papers^{4,5} published in this issue of the *Journal* address the cost and value of aortic valve replacement, an increasingly performed procedure especially in the aged. These articles are presented as a stimulus for our future long-term outcomes reporting to include cost and especially the economic value created by the high technology procedures performed by our specialty.

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Notice of Correction

Stasik CN, Goldberg CS, Bove EL, Devaney EJ, Ohye RG. Current outcomes and risk factors for the Norwood procedure. *J Thorac Cardiovasc Surg.* 2006;131:412-7.

Due to an inadvertent omission in authorship, Dr Gelehrter's name is now added to the authorline. The reference should now read: Stasik CN, Gelehrter S, Goldberg CS, Bove EL, Devaney EJ, Ohye RG. Current outcomes and risk factors for the Norwood procedure. *J Thorac Cardiovasc Surg* 2006;131:412-7.