Bulk buying

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Conventional wisdom holds that the quality of coronary artery bypass graft (CABG) operations is higher, and the unit cost lower, if performed by high-volume surgeons in high-volume institutions. This belief has led some health care policy advisors, insurance purchasers, and hospital marketers to urge the public to choose surgeons or institutions on the basis of the numbers of cases done annually.

For example, the most recent "Consumers' Guide to Cardiac Surgery in Pennsylvania" advises readers that a surgeon's case volume is an important determinant of risk of perioperative mortality, but it does not specify the magnitude of the effect.¹ It is surprising how weak this association is. Linear regression of case-mix-adjusted data in this report shows that about 10% of the observed variation in surgeon-specific mortality rates is attributable to a case volume effect. The same data set shows no relationship between volume and outcome at the hospital level. The most recent publicly available data from New York document a shrinking volume/mortality rate relationship.^{2,3} Case-mix-adjusted, institution-specific, Medicare beneficiary CABG mortality rates from a popular Web site⁴ show no volume/outcome correlation in the 6 New England states. The Northern New England Cardiovascular Disease Study Group has been unable to document any relationship between volume and outcome for patients undergoing CABG in Maine, New Hampshire, and Vermont for the past 6 years.

Quality of clinical outcome is only part of the value equation for patients having CABG. Shahian, Heatley, and Westcott⁵ carefully document in this issue of the *Journal* that there is currently no detectable relationship between unit cost and case volume among hospitals performing CABG in Massachusetts. This finding will be questioned, because it contradicts conventional wisdom. Critics may argue that using hospital charges in the formula to determine cost of CABG introduces a number more reflective of what the local market bears than the actual dollars spent in providing a service. However, market pressures are a reality of a free market economy, as is the regional nature of how those services are provided. The "cost" of a CABG in southern California is a meaningless concept to patients seeking care in Massachusetts. Others might argue that conclusions drawn from the small and homogeneous Massachusetts marketplace cannot be generalized. In fact, the homogeneity of the studied group serves as an asset for discovering or, as in this case, discarding a putatively causative variable. Geographic variations in how health care is delivered mandate that they be studied in regional units. From our patients' perspective, it is more important to understand whether there is a volume effect within a regional market than whether there are differences among regional markets.

We owe thanks to Shahian, Heatley, and Westcott for casting new light on a mistaken element of the conventional volume dictum and for using a meaningful regional analysis to describe this finding. It is increasingly clear that aggregate proxy measures like case volume contribute little to our understanding of the determinants of outcome. Our obligation is to improve the value of our work by reducing mortality and morbidity rates and by eliminating wasteful practices, regardless of current results and regardless of the size of our individual practices or institu-

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tional programs. We must continue to concentrate our efforts on understanding what causal elements of process specifically relate to the outcomes that are important to our patients.

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