

Competitive Bidding for Interventional Cardiology Supplies: Lessons Learned During Round 2

Kim A. Eagle, MD; Bradley P. Knight, MD; Mauro Moscucci, MD; S. Adam Strickberger, MD; Claire S. Duvernoy, MD; Frank Pelosi, MD; Steven W. Werns, MD; Daniel T. Eitzman, MD; Fred Morady, MD; and Eric R. Bates, MD

Objective: To assess the magnitude of savings and develop concepts for "best strategies" in reducing costs in the purchasing of high-technology, high-cost materials used in coronary interventions and electrophysiologic treatments.

Study Design: Observational experience in competitive bidding for defibrillators, pacemakers, coronary stents, and coronary balloon catheters at a large, midwestern, publicly owned, academic cardiovascular center.

Methods: Iterative negotiation following a broad request for proposal sent to a diverse group of vending organizations in high-technology areas of cardiology. Product costs and volume usage were assessed before and after the process to estimate annualized cost reduction achieved.

Results: Using a combination of identification of preferred vendors; consignment of supplies; and collaborative consensus among physicians, administration, materials management, purchasing, and vendors, an annualized savings of more than \$1.3 million was achieved.

Conclusions: Aggressive, collaborative, fair, and competitive bidding for high-cost products used for coronary interventions and electrophysiologic treatments leads to substantial cost savings and can promote provider-industry partnerships that further enhance product use, provision, and tracking.

(*Am J Manag Care* 2002;8:384-388)

Reimbursement for cardiac care continues to feel the effects of the Balanced Budget Act of 1997. Pressure on physician groups and hospitals to reduce their costs continues to mount. Reduced reimbursement on a per-patient basis is further challenged by advances in technology that, if anything, tend to increase the prices of interventional supplies used in the treatment of advanced coronary disease and arrhythmias to even higher levels. In 1994, a physician-administration team at the University of Michigan Health System, Ann Arbor, completed a competitive bidding process to reduce the cost of supplies for coronary balloon angioplasty, coronary stenting, cardiac pacemakers, and internal cardiac defibrillators.¹ In this article, we

describe our subsequent experience, after completing a fair, competitive bidding process, in this high-technology area of cardiology.

... METHODS ...

The competitive bidding process began with creation of an administration-physician team that included representatives from key areas of the hospital, including materials management and purchasing, as well as key representatives from the cardiology department, including faculty in interventional cardiology and arrhythmia therapy. The team also included physician and administrative leadership from the Adult Heart Care Program at the University of Michigan.

In 1998, representatives from Adult Heart Care joined colleagues from other interventional care areas in a process of trying to catalog all supplies used in interventional cardiovascular diagnosis and therapy within all procedural areas in the hospital, including pediatric cardiology, adult cardiology, interventional radiology, and intensive care units throughout the hospital. The intended goal of this effort was to fully characterize all significant products used for interventional cardiovascular care for the purpose of completing a hospital-wide competitive bidding process that would leverage the volume of interventional therapies from a variety of locations within the institution to secure the lowest possible commodity price. However, because of constantly changing technology, the large number of

From the Division of Cardiology, Department of Internal Medicine, University of Michigan Health System, Ann Arbor.

Address correspondence to: Kim A. Eagle, MD, Division of Cardiology, University Hospital, 1500 E Medical Center Drive, Ann Arbor, MI 48109-0366. E-mail: Keagle@umich.edu.

product areas, and individual preferences surrounding each product, this task proved to be formidable. Finally, after wrestling with this cataloging effort for nearly 1 year, a decision was made to focus more narrowly. In adult cardiology, the target became a limited number of high-volume, high-cost commodity classes.

A request for proposal was sent to all eligible vendors in our region targeting internal cardiac defibrillators, pacemakers, defibrillator and pacemaker leads, coronary artery stents, coronary artery balloon catheters, guiding catheters and guide wires, and peripheral artery stents. The stated goal of this request was to secure the lowest possible overall price by reducing choice in each major area to 2 vendors where possible. In addition, we sought to guarantee a “preferred vendor” for most of our activity to lock in the best possible price. A second goal was to require consignment of all supplies in these targeted areas. Third, the competitive bidding process sought to create price protection from technology “drift” during the 2 years of the intended contract. Also, we sought to identify an immediate price negotiation if “breakthrough” technology was developed in the intervening 2 years. In addition, we sought to create a partnership with our vendors that included use of an automated inventory system to accurately track product usage and meetings every 3 months to review activity, purchases, and technology drift and to identify any potential breakthrough technology.

The competitive bidding process also sought to create “system pricing” where possible for percutaneous coronary interventions, initial cardiac defibrillator implants, internal cardiac defibrillator replacements, pacemaker implants, and battery changes. The goal was to simplify the overall supply process by identifying the average number of supplies used for a given case and assigning an estimated budget based on this estimate. Owing to remarkable fiscal pressure during the contracting process, we also sought to backdate contracts where possible.

Before negotiation, all faculty involved with interventional products were asked to submit information regarding consultantships, research grants, or other relationships with industry that might pose a potential conflict of interest or the appearance of same. Individuals with such relationships were excluded from direct

negotiation with vendors. Contrariwise, all faculty involved in the placement of interventional supplies were asked to provide advice about clinical acceptability, vendor performance, and any potential new and desirable technologies that were known to be available in the near future.

The negotiation team that worked directly with each vendor included the chief of cardiology, the administrator of cardiology, and a leader from the hospital purchasing team.

To gauge the range of current costs for each of the general categories in question, the lead physician completed a series of informal benchmarking telephone calls with other leading cardiovascular programs in the country. These informal telephone calls sought to identify overall price ranges for various products used in interventional cardiology.

Potential vendors for each product area were given 6 weeks to respond to the request for proposal. Subsequently, the negotiation team met with interventional physicians to identify major potential vendors, followed by direct negotiation face to face with preferred vendors for each product area.

... RESULTS ...

As shown in **Table 1**, competitive bidding for coronary interventional cases moved from an approach in which each catheter, stent, or guide

Table 1. Price Comparisons Before and After the Competitive Bidding Process

| | Price, \$ | |
|-------------------------------------|------------|-----------|
| | Before Bid | After Bid |
| Percutaneous coronary intervention* | | |
| Stent “case” | 3177 | 2465 |
| Balloon only “case” | 716 | 512 |
| Peripheral stent | 1455 | 1250 |
| Tachy | | |
| Defibrillator implant [†] | 26,950 | 20,469 |
| Replacement [†] | 22,989 | 16,465 |
| Brady | | |
| Dual chamber | 5800-6325 | 5000-6095 |
| Single chamber | 4800-5995 | 4000-5000 |

*System pricing includes all guide catheters, wires, and stents per case. Price assumes use of 1.6 stents per case where wire stents are used.

[†]Includes all leads and device(s).

wire was priced individually to a per-case pricing system, which allowed further discounting with a “preferred” vendor who was guaranteed 90% of overall activity. This vendor also provided a catheter laboratory inventory system that uses a bar code system and handheld wand scanning. Based on the previous year’s activity and mix of balloon angioplasty to stent cases, the estimated annualized savings resulting from the successful competitive bid was \$356,730, assuming a case volume of 700 coronary interventional procedures.

Similarly, competitive bidding for the relatively modest volume of peripheral arterial interventions performed in our cardiac catheter laboratory identified a savings of approximately \$10,000. These products were priced on a per-item basis.

Competitive bidding for defibrillators and defibrillator leads was also completed using a “systems” approach. The bid identified a fixed price for initial defibrillator implantation procedures and replacement procedures based on previous use patterns for single-chamber and dual-chamber defibrillators and

higher-cost vs lower-cost units. A “preferred” vendor was guaranteed 90% of activity to achieve an overall cost savings for defibrillators of \$807,767. For pacemakers, a “systems price” was achieved using previous patterns of use for single- and dual-chamber pacemakers. The faculty agreed to curb choice to 2 preferred vendors, with one being guaranteed 65% of activity to achieve an annualized savings of approximately \$70,000. This part of the contract prespecified that if a patient was referred for a specific type of pacemaker because the referring physician had capabilities for tracking only a certain brand of pacemaker, that these devices would be exempt from the contract analysis. Devices used in research cases were also exempt from the agreement. Table 1 shows the types of products that were targeted in the competitive bidding effort. Table 2 shows the annual estimate of dollars saved as a result of the competitive bidding process. An additional feature of the successful bid was the agreement that new technology in a given area would be provided at the same price or have a price increase of not more than

Table 2. Annual Estimate of Dollars Saved as a Result of the Competitive Bidding Process

| Procedure/Device | Annual Volume | Previous Vendor | Volume | Price, \$ | New Vendor | Volume, % | Price, \$ | Annualized Savings, \$ |
|--------------------------|-----------------|-----------------|--------|-------------------|------------|-----------|-------------------|------------------------|
| Coronary stenting* | 550 stent cases | A | 85% | 3177 | A | 90 | 2465 | 332,860 |
| | | B | 10% | | | | | |
| | | C | 5% | | | | | |
| Coronary balloon* | 150 cases | A | 35% | 716 | A | 90 | 614 | 13,770 |
| | | C | 65% | | | | | |
| Peripheral stenting | 50 | A | | 1455 | A | 90 | 1250 | 10,100 |
| | | D | | 1455 | | | 1250 | |
| Pacemakers | | | | | | | | |
| Dual-chamber | 125 | B | 61/125 | 6400 | B | 65 | 6095 | 24,781 |
| | | A | 31/125 | 6325 [†] | A | 25 | 5963 [†] | 11,222 |
| | | E | 33/125 | 5800 | | | 5000 | 8000 |
| Single-chamber | 46 | B | 18/46 | 5350 | B | 65 | 5000 | 10,465 |
| | | A | 14/46 | 6325 [†] | A | 25 | 5963 | 3982 |
| | | E | 14/46 | 4800 | | 10 | 4000 | 10,000 |
| Defibrillators | | | | | | | | |
| Initial + implant | 110 | A | 90% | 26,950 | A | 90 | 20,649 | 641,619 |
| | | B | 10% | 24,500 | | 10 | 18,500 | 44,000 |
| Replacement [‡] | 30 | A | 90% | 22,989 | A | 90 | 16,465 | 122,148 |
| | | B | 10% | | | 10 | | |
| Total | | | | | | | | 1,232,947 |

*Price reflects per-case pricing, including guide wires, balloons, guide catheters, indeflators, and stents.

[†]Reflects blended pricing.

[‡]Price reflects per-case pricing, including leads, defibrillator, etc.

Some percentages do not total to 100% due to variability in whether or not the entire product grouping was represented in the bidding.

3% above the previous model used by our faculty. This agreement reduces the potential negative impact of technology drift on budgeting for expected hospital costs in the future.

Beginning in 1994 and continuing to the present, careful tracking of complications following percutaneous coronary intervention, pacemaker placement, and defibrillator placement for all patients has been routinely performed at our institution. Acquisition of newer device technology has allowed a reduction in complication rates even as competitive bidding has allowed cost reductions in the purchase of high-priced devices.

... DISCUSSION ...

In 1994-1995, we completed a successful competitive bidding process. As shown in **Table 3**, this effort achieved an annualized savings of \$439,000 in the cost of balloon catheters and savings of \$746,745 per year in expenses for defibrillators and pacemaker supplies.¹ In that experience, we learned several valuable lessons. First, vendors were willing to consign their products. Second, faculty were willing to limit choice to 2 vendors if they were actively engaged in the process of vendor evaluation and selection. Third, substantial savings were possible if physician and administrative leaders in an institution worked together to identify the lowest possible price.

This second round of competitive bidding provided a variety of new insights that were not apparent following our first experiences. In our latest activities, we learned that attempting to catalog and competitively bid all products throughout the hospital system was extraordinarily difficult. We ultimately abandoned that effort to focus on a limited number of high-cost items. During this second negotiation, we discovered potential advantages of seeking “partnerships” with vendors in selected areas. For instance, during round 2 we negotiated the acquisition of an inventory system and agreed on a quarterly meeting to review activity and opportunities and to make sure that both parties were honoring the contract. Finally, we protected price against technology drift and the development of breakthrough technology.

The need to protect against technology drift was an especially important lesson for us to learn. During 1998, the technology of cardiac defibrillators advanced significantly with the creation of dual-chamber devices. As was appropriate, we quickly incorporated this technology into the treatment of a

substantial percentage of patients receiving internal defibrillators at our institution. Unfortunately, we had projected a future hospital budget that reflected a completed competitive bidding process and stable product selection. Ironically, because the previously described competitive bidding process took a great deal of time and technology drift toward dual-chamber devices led to significant increases in cost, our commodities budget was far higher than estimated and was the source of great frustration on the part of both the hospital and the faculty.

Last, this particular process reconfirmed that vendors are willing to consign, are willing to give credit for existing inventory if the group makes a decision to rearrange the percentage of supplies it uses, and are prepared to backdate contracts when necessary to assist with budgetary challenges.

Because the University of Michigan Health System is a public institution, it is extraordinarily important that the competitive bidding process be open, fair, and free of potential conflict. We dealt with this by seeking disclosure from our faculty as to any relationship they had with industry that might potentially conflict with interactions with vendors (or create the perception of apparent conflict). Although these individuals were encouraged to provide opinions about a given product or vendor performance, they were exempt from the direct negotiation effort to reduce any potential effects of consulting or research relationships. This activity, the creation of some degree of distance between faculty with a potential conflict and the direct negotiation, is one method of trying to balance the impact of an individual faculty member’s relationships with industry vs an institution’s contract with a given vendor.

Apart from competitive bidding, a variety of other strategies can be used to reduce the costs associated with interventional cardiology programs. In arrhyth-

Table 3. Estimated Savings From Competitive

| Category | Annualized Savings, \$ | |
|---------------------------|------------------------|----------------------|
| | 1995* | 2000 |
| Balloon catheters/stents | 439,000 | 356,730 [†] |
| Pacemakers/defibrillators | 746,745 | 876,217 |
| Total | 1,185,745 | 1,232,947 |

*See Eagle et al.¹

[†]Included peripheral vascular supplies.

mia therapy, using the electrophysiology laboratory to implant defibrillators rather than operating suites seems to be cost saving.² Careful selection of pacer type for appropriate clinical situations allows the use of less expensive pacing technology in patients unlikely to benefit from dual-chamber pacing capability.^{3,4} In some locations, reuse of explanted but functional devices is a method of reducing costs, but this is not a common practice in this country.⁵

In coronary interventions, studies^{6,7} suggest that an increasing rate of stent use is not only cost effective but may be cost saving. Also, the ability to obtain stents at a more reasonable price is improving as the number of manufacturers with approved stents increases.^{8,9}

Based on the past 6 years of competitive bidding efforts in cardiovascular care, we offer 10 simple "suggestions for success":

1. Focus on high-ticket items.
2. Enlist involvement and input from all faculty involved in the product areas being evaluated.
3. Seek true partnerships with vendors to improve surveillance opportunities, adopt value-added features, and secure the best possible price.
4. Seek price protection against new technology drift and breakthrough technologies that may emerge during the contract.
5. Limit the number of products in a given area to drive down the price.
6. Insist on consignment.
7. Seek credit for existing inventory when turning over products at the completion of the competitive bidding process.
8. Be prepared to backdate the contract if necessary to deal with a current budgetary issue.
9. Arrange disclosure for faculty members or other parties involved in the negotiation process to separate individuals with potential conflict of interest from the direct negotiation activities.
10. Seek a close partnership with the hospital to maximize depth of cost savings and the speed with which these may be achieved.

... FINAL COMMENTS ...

As noted, successful competitive bidding of interventional cardiovascular supplies can lead to significant savings. In our first round, completed in 1995, we realized an annualized savings estimate of more than \$1.2 million.¹ In a second round, once again by focusing on high-ticket items, we realized an expected savings of greater than \$1.3 million per year. These observations highlight an important area for cost reduction in an era when reimbursement is dropping and the cost of new technology is rising.

Acknowledgments

We are indebted to Robert Lederman, MD, Lloyd Jacobs, MD, Karen Swan, Jill Olsen, Patricia Schmidt, RN, and Patricia Barry for assistance in the competitive bidding process and to Lisa Hackbarth for assistance with manuscript preparation.

... REFERENCES ...

1. **Eagle KA, Moscucci M, Kline-Rogers E, et al.** Evaluating and improving the delivery of heart care: The University of Michigan experience. *Am J Manag Care* 1998;4:1300-1309.
2. **Vorperian VR, Lawrence S, Chlebowski K.** Replacing abnormally implanted defibrillators: Effect of procedure setting on cost. *Pacing Clin Electrophysiol* 1999;22:698-705.
3. **De Belder MA, Linker NJ, Jones S, Camm AJ, Ward DE.** Cost implications of the British Pacing and Electrophysiology Group's recommendations for pacing. *BMJ* 1999;305:861-865.
4. **Eagle KA, Mulley AG, Singer DE, et al.** Single chamber and dual chamber cardiac pacemakers: A formal cost comparison. *Ann Intern Med* 1986;105:264-271.
5. **Havia T, Schuller H.** The re-use of previously implanted pacemakers. *Scand J Thorac Cardiovasc Surg* 1978;22:33-34.
6. **Farshid A, Leong B, Pitney M, McCredie RM, Allan R.** Impact of an aggressive stenting strategy on initial and one-year follow-up costs in patients undergoing angioplasty. *Aust N Z J Med* 1999;29:243-248.
7. **Moscucci M, Kline-Rogers E, Karavite D, et al.** Reducing costs and improving outcomes of percutaneous transluminal coronary interventions [abstract]. *J Am Coll Cardiol* 1999;33:249A.
8. **Hensley S.** Stent prices starting to retreat [letter]. *Mod Healthc* 1999;29:34.
9. **Anonymous.** Price survey: Stent prices down, but not enough. *Hosp Materials Manage* 1999;24:13-15.