Editorial

Good Intentions, False Economy

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Details of our clinical work continue to receive the focused attention of "change agents" and "resource managers." Because no work performed by humans can be always perfect, opportunities for outcome improvement can be found in every specialty. It is hardly a secret that much attention is given to cost reduction, surely one particular kind of improvement. The new buzzword expression "picking the low-hanging fruit" has not become part of modern healthcare reform argot accidentally.

In my view, a valid definition of reform pairs the improvement or maintenance of care quality and responsible reduction of net care costs. Those of us involved in surgical care are particularly aware that numerous potential cost and quality issues await definition and resolution. As previously stated, frustration can accompany even sharply defined efforts to discover one incrementally improved care technique for a particular type of operation. Difficult challenges commonly arise from many directions. The list includes erroneous oversimplification in thinking about surgical-care steps, vexing semantic issues, term definition problems, the multifactorial relationships of a measured outcome to putative causal factors, the possible interference(s) introduced by various methodology problems, the differential fidelity of data gathered in surveillance work and in prospective scientific trials, and a looming concern to all but the naive that even carefully demonstrated, "statistically significant" improvement step(s) achieving publicity in some key journal may not, in fact, be generalizable to other healthcare institutions or patient types. One additional issue deserves separate commentary. When "reducing care costs" is the achieved goal of some logical care-plan change for a large or small series of patients, it is crucial (and maybe an ethical burden) to pose a reflexive question: *For the demonstrated dollar-saving care plan change, were coincident outcome issues of other types examined or acknowledged?*

I regularly tell fellow surgeons to trust Nelson's instructive concept[1] that every episode of care will have four interdependent outcome components—financial, clinical, patient satisfaction, and patient functional status. This scheme of component labeling is a useful abstraction that can powerfully organize process improvement thinking. Medical care could have used it decades ago! Curiously, if we accept the abstraction, its components exist for every case whether we measure them or not. A deliberate alteration of some care detail in a prospective series of cases—even under pristine, clinical trial conditions—that seems to produce a change in one outcome component may or may not have a detectable effect on one or more of the other three, and it hardly needs emphasis that the post hoc fallacy always potentially lurks in the background when we begin contemplating "what actually caused what." However, matters can be even stickier, because any single pairwise interaction of healthcare outcome components may become non-linear as some third component itself changes. An important principle can be found in pondering the mix of possibilities: *Given that some demonstrated change in a care step reliably produces a better financial outcome (eg, savings in net cost per case by use of a less-expensive drug or procedure component), the potential for concealed outcome component effects must be acknowledged by responsible workers, even if it is left to other groups to demonstrate later whether secondary outcome component changes are materially important, merely epiphenomenal, or nonexistent.* It seems self-evident, as well, that cost savings are safely presumed only to be immediate in scope unless long-term economic consequences are tallied or modeled. It is an emerging truism that care-

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plan changes based on good intentions may not assure authentic process improvement. The "guidelines movement," to its credit, has to date been characterized by an organized and evaluative approach, which in theory should at least minimize surprises.

Three seemingly unrelated articles in the current issue of this journal strike a common note by revealing that false economy may have accompanied surgical-care changes that were logical and motivated by good intentions. These articles deserve thoughtful analysis because of their rich epidemiological detail. We can hope that their publication stimulates the readership to consider more carefully how to find and study outcome component interactions in surgical-care settings where numerous, complex work steps characterize almost every definable process.

Cookson and coworkers[2] investigated bloodstream infections in surgical patients with modified central venous catheters (CVCs) in three intensive-care units of one hospital. The modification of interest was a needleless connector (SafSite, B Braun Medical Inc, Bethlehem, PA) used to attach intravenous lines to existing, implanted CVCs, and such connectors are popular because they clearly obviate the risk of needlestick injuries. Prior to the study, it had been observed over 3.6 months that bloodstream infections seemed to be increasing in patients whose CVC lines were fitted with the connectors. The careful, rigorous epidemiological study reported in this article revealed that there had been an "outbreak" of the infections in two intensive-care units but that improper infection control practices and incomplete education of nursing personnel—and not some flaw in the connector system itself—most likely were the major causal factors. For example, one third of interviewed nurses reported that they did not change end caps on the device in accordance with the manufacturer's published recommendations! This article concludes that increased attention to employee education might have allowed the hospital to benefit from the advantages of needleless CVC connectors without adding patient risk; it hardly needs to be emphasized here that a bloodstream infection is not a trivial outcome flaw. There can be little disagreement that the same common-sense approach should be reinforced when any new hardware item is adopted, regardless of its perceived added benefit to the patient-care process, the bottom line, or worker safety. Although beyond the article's scope, it would have been very instructive to show that a program of intensive nursing education regarding correct use of the connectors (ie, process improvement) subsequently was associated significantly with an acceptably lowered bloodstream infection rate (ie, outcome improvement). Such "closing-of-the-loop" studies will be increasingly important if we are to succeed in moving validated process improvements into the real world of daily practice.

Manian and Meyer studied surgical-site infection (SSI) rates for patients undergoing operations with or without same-day admission to St John's Mercy Medical Center in St Louis.[3] A retrospective examination of SSI rates for all cases revealed that, for 1990, the infection risk was lower for the same-day admission cohort (0.4%) than for patients with 1 or more days of inpatient status prior to elective operations or with emergent operations of any kind (1.3%). The authors report that this dichotomy disappeared in 1994 SSI data (1.8 % and 1.6%). A further, specialty-wise examination of 1994 SSI data revealed that 511 neurosurgical operations during 11 months were, surprisingly, complicated by SSI more frequently in the same-day admission cohort (3.4%) compared to neurosurgery patients with conventional inpatient status (0.4%). The authors considered various potential explanations for this "rate discrepancy" and found an association with climate factors. Apparently, during hot and muggy weather in St Louis, the risk of acquiring a neurosurgical SSI is higher for patients with same-day admission status than for equivalent patients with contemporaneous inpatient status. The authors showed that this risk differential was not explainable by NNIS risk index calculations for the two cohorts. As neurosurgical operations are mostly "clean" cases, it was natural to speculate that the patient group with higher SSI rates had improper skin hygiene and higher residual flora counts as a major, but unproven, factor secondary to increased sweating.

Every reader will have to examine, and then reexamine, this complex article to develop answers to three critical questions: Is it any surprise that there will be "statistically significant rate discrepancy" discoveries when huge SSI data sets for two time periods are retrospectively plowed with multiple furrows? What unmentioned factors might have been responsible for the disappearance of the all-specialty SSI rate discrepancy noted in 1990 when compared to 1994? Should neurosurgical professionals at St John's Mercy Hospital immediately assemble a process-improvement team to focus on preoperative patient-care steps in the same-day admission category, perhaps beginning with the implementation of a "night before" home shower with chlorhexidine gluconate solution or other accepted adjuncts?

There is no doubt that same-day surgery is here to stay. In 1996, 25 million operations were per-

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formed in the United States, and approximately two thirds of these procedures involved patients who had not spent the preoperative night in a hospital. The intent to save healthcare dollars by eliminating costly inpatient stays before operations has produced success. The hard work that now lies ahead is to examine very carefully whether negative outcome features have accompanied this economy. To date, the picture regarding SSI risk specific to the outpatient surgery venue is murky, because few airtight studies exist with a usefully narrowed focus, sufficient control, and data integrity. The article by Manian and Meyer is the kind of necessary first step of curiosity-based probing that must be taken by centers with large SSI surveillance enterprises. Clearly, two clichés are appropriate: Much work needs to be done in this area, and many questions persist.

Herwaldt and coworkers studied a well-recognized, and sometimes lethal, outcome flaw in cardiac surgical procedures during 1991 to 1992 at the University of Iowa.[4] Two elegant case-control studies were accomplished to identify risk factors for hemorrhage after cardiothoracic operations. The work was prompted by the surveillance finding that 93 of 511 cardiothoracic patients (18%) suffered a perioperative hemorrhage in fiscal year 1992. It was found that substitution of hetastarch for albumin solution as a bypass pump-priming agent was associated significantly with hemorrhage, as was patient age. The apparent cost-savings of eschewing albumin were dwarfed completely by the extra costs associated with the care of patients who bleed excessively.

This excellent article's results speak for themselves and illustrate crisply why we never can assume that some perfectly logical step taken in the interest of saving money will not add complications that initially are concealed. Most readers of this journal have never provided care to cardiothoracic patients in the early postoperative days, but may have visited a relative in some cardiac surgery ICU. Chest tubes routinely drain blood from the mediastinum and pleural cavities in the first few postoperative days; this drainage is necessary, it usually ebbs steadily, and mercifully the tubes are removed as soon as practical. Sometimes—pretty rarely nowadays in most practices—patients bleed postoperatively in spectacular (and unnerving) fashion. Expensive blood-bank component therapy or a rush back to the operating room may be required. It bears retelling that the latter circumstance almost always places patients at increased risk for sternal wound infection, which can have its own extraordinary additional care costs and a nontrivial specific mortality. In sum, the Herwaldt study is first-class work that precisely illustrates the need to monitor carefully at least our high-risk, high-volume operations.[4] Surveillance led by knowledgeable professionals who are personally familiar with patient care will reveal those low-profile negative events that erode care value by adding net cost, impairing ultimate clinical outcome, or doing both simultaneously.

REFERENCES

1. Nelson E, Splaine M, Batalden P, Plume S. Measuring clinical outcomes at the front line. In: Caldwell C, ed. *The Handbook for Managing Change in Health Care.* Milwaukee, WI: ASQ Quality Press; 1997.
2. Cookson ST, Ihrig M, O'Mara EM, Denny M, Volk H, Banerjee SN, et al: "Increased bloodstream infection rates in surgical patients associated with variation from recommended use and care following implementation of a needleless device. *Infect Control Hosp Epidemiol* 1998;19:23-27.
3. Manian F, Meyer L. Surgical-site infection rates in patients who undergo elective surgery on the same day as their hospital admission. *Infect Control Hosp Epidemiol* 1998;19:17-22.
4. Herwaldt LA, Swartzendruber SK, Edmond MB, Embrey RP, Wilkerson KR, Wenzel RP, et al. The epidemiology of hemorrhage related to cardiothoracic operations. *Infect Control Hosp Epidemiol* 1998;19:9-16.

Calendar

March 25-27, 1998. "Training in Basic Infection Control" is an intensive, three-day course oriented to new practitioners in long-term and acute care. The course will be held at Miller-Dawn Medical Center in Duluth, Minnesota.

Participants will be given credit for 25 contact hours.

For additional information, please contact Linda Kinnear, Education Coordinator, Miller-Dwan Foundation, 502 E Second St, Duluth, MN 55805, 800-766-8762, ext 1429, or 218-720-1429.