Assessment of the Patient with Cardiac Disease

To the Editor:—We read with interest Dr. Mangano’s paradigm for preoperative assessment of patients with cardiac disease. We have several concerns. First, the paradigm does not differentiate major surgery from minor surgery. Obviously, preoperative evaluation and perioperative treatment are different for patients undergoing cataract surgery, cholecystectomy, or abdominal aortic aneurysm resection. Second, the only management technique that has been proven to reduce perioperative morbidity is β blockade, and this should be included in the paradigm for patients with coronary artery disease or suspected coronary artery disease who are scheduled for intermediate or major surgery (unless contraindicated). Third, there is no substantial evidence that 24–48 h postoperative hemodynamic and ischemic monitoring will benefit patients with mild to moderately positive stress test results. Intensive care unit monitoring is costly and should be reserved for patients undergoing major surgery. Fourth, most patients with coronary artery disease and impaired functional status should not bypass stress testing and automatically undergo coronary angiography. A patient may have impaired functional status as a result of previous myocardial infarction, yet have a minimal amount of residual myocardium at risk. Also, impaired functional status may result from many nonischemic causes, including obesity and emphysema. A specialized stress test, such as an adenosine thallium scan or dobutamine echocardiography, assesses functional myocardium at risk in this subset, compared with angiography, which delineates only anatomic information.

Unfortunately, a randomized study that proves whether preoperative testing improves patient outcome has yet to be performed. It is unknown whether the risk-stratification costs (delays in surgery; money for testing; complications from angiography, angioplasty, and coronary artery bypass surgery) are offset by improved patient care.

Because patient history, physical examination, and electrocardiography adequately assess which patients will benefit from β blockade, there is unproven benefit to specialized testing until we demonstrate that other management techniques improve perioperative outcome.

Stewart J. Lustik, M.D.
Assistant Professor
stewart_lustik@urmc.rochester.edu
James Eichelberger, M.D.
Assistant Professor
Department of Anesthesiology
University of Rochester Medical Center
Strong Memorial Hospital
Rochester, New York 14612

References


In Reply:—I would first like to extend my appreciation to all of the individuals who have expressed interest in this area of medicine. Your insights and suggestions have been most appropriate. In the first of the letters here, Drs. Hepner and Bader suggest anesthesiologists should assume a greater role as primary caregivers—specifically, as perioperative physicians. I could not agree more with my colleagues in this regard. Anesthesiologists truly are uniquely qualified to care for high-risk patients undergoing surgery because only with such specific training and experience can the clinician appropriately integrate diverse recommendations provided by multiple specialists, enabling synthesis of a comprehensive perioperative care plan. To suggest a preoperative assessment paradigm, for example, without a comprehensive understanding of the perioperative stress response—be it precipitated by sympathetic, inflammatory, thrombotic,
or hydraulic phenomena—is not optimal. Thus, the anesthesiologist, as a unique caregiver in this setting, is truly the perioperative specialist—a role that we now have the opportunity of assuming and—I believe—that we have the responsibility of seizing, both for the benefit of our patients and for our specialty.

Regarding the suggestion that the type of surgery be considered in the overall assessment of risk, I fully agree. Clearly, there are a number of relatively minor operations that require only monitored anesthesia care, local anesthesia, or unconscious sedation. The stresses associated with emergence from such procedures certainly are less than those associated with more invasive procedures. For the most part, patients with stable symptomatology and reasonable functional capacity who undergo such minor procedures require little or no additional preoperative assessment or change in care. In contrast, however, for patients with progressive or unstable symptoms or current ventricular dysfunction, even “minor” stress responses associated with such procedures may trigger a cascade of untoward events, leading to irreversible injury. In such patients, it is difficult, if not impossible, to predict the degree of sympathetic, inflammatory, or thrombogenic stress that could “tip the scales” —that is, “destabilize the plaque.” Therefore, I believe that, for elective procedures, even if “minor,” stabilization of the disease state before surgery is prudent. For “nonminor” surgical procedures, which constitute the majority of surgeries, perioperative injury is not only determined by the preoperative disease state, but also by the type, magnitude, and duration of stresses associated with surgery. Thus, the optimal paradigm for care should address all of these considerations, and, in that sense, I agree with Drs. Hepner and Byard.

The comments of Dr. Lustik and Eichelberger also address surgery type, and, as such, the previous responses also apply. Regarding the importance of their second suggestion, intensive perioperative β-adrenergic blockade, I cannot help but agree with their conclusion that β blockade remains the only proven pharmacologic approach that allows reduction of perioperative morbidity and improvement of long-term survival after surgery. Interestingly, my colleagues suggest that intensive perioperative β blockade may be even more effective than use of sophisticated (and expensive) preoperative testing regimes. They may be right. However, I believe it is unwise to deemphasize the importance of preoperative risk assessment in light of the many benefits achieved by perioperative intensive β blockade—appropriately used, they may complement one another.

Our colleagues’ third comment addresses perioperative monitoring for ischemia. Although it is rational (and consistent with my personal biases), the application of such monitoring to even a subset of patients undergoing surgery is expensive, to say the least. For example, if applied to only 10% of patients undergoing surgery in the United States, we can surmise that at least $6 billion will be added to our health care bill annually. Nor can one suggest, without criticism, that such monitoring be applied only to patients undergoing major surgery. Clearly, patients with unstable disease, which indicates greater plaque instability, may be even more likely to have cardiovascular complications that those with stable disease who undergo far more invasive surgery. How, then, do we best tailor a cost-effective approach to individual patients, given the above limitations? Who merits more intensive monitoring? Patients with unstable disease, which indicates greater plaque instability, may be even more likely to have myocardial infarction precipitated by increases in oxygen demand, indicating that exercise treadmill or dobutamine stress testing may be most appropriate for these patients. Whereas for patients with unstable symptomatology, the choice of test is far less clear because untoward events can be precipitated by any one of a number of relatively dissimilar factors, including plaque instability, platelet aggregation, endothelial dysfunction, inflammation, or hypercoagulation. To model any of these stresses in awake, ambulatory patients is difficult, if not impossible. Furthermore, the relative importance of these factors varies by patient and by disease stage, making their relative contribution to perioperative injury difficult to predict. Thus, for this group of patients, selection of the most specific preoperative test enabling prediction of postoperative outcome is inherently limited.

Finally, I cannot fault our colleagues’ conservative approach to preoperative testing or their recommendation that comprehensive scientific data be amassed to allow rational selection of preoperative tests. However, as clinicians, we make decisions not only based on the comprehensive scientific data at hand, but also based on our individual experiences. Therefore, although the plea for more comprehensive databases is well-justified, we should recognize the critical importance of our clinical intuition as applied to medicine, for such is the art of its practice.

**Dennis T. Mangano, Ph.D., M.D.**
Founder
McSPI Research Group
San Francisco, California

**References**


(Accepted for publication March 22, 2000.)