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Short communication

Cardiology consultation for non-cardiac surgery: Medical and legal explorations for clinicians

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ABSTRACT

Cardiologists performing preoperative cardiac evaluations for non-cardiac surgery have a unique opportunity to assess and optimize the patient’s baseline and general health; determine the patient’s inherent surgical risk based upon a comprehensive history, physical examination and pertinent laboratory data; ensure the patient has made an informed choice regarding surgery, and identify post-operative risks that must be considered to reduce the potential for major adverse cardiovascular events. There is always a small but inherent risk in surgical procedures. When an adverse outcome occurs there is potential for an allegation of negligence resulting in a detailed autopsy of the medical record. The best defense to an allegation of negligence is comprehensive documentation and a detailed rational for the cardiologist’s management decisions.

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1. Introduction

Preoperative assessment of patients prior to noncardiac surgery is a common issue confronted by cardiologists. Since 1996, the American College of Cardiology/American Heart Association (ACC/AHA) has published four guideline documents addressing this issue, most recently in 2014 [1]. The goal of the clinician is to quantify the risk of surgery, which can help optimize the timing of the surgery, and manage the cardiac risk to hopefully reduce the morbidity and mortality of the procedure. However, less clear is the legal responsibility the clinician takes on, and what should be included in the documentation for a patient sent for “cardiac clearance”.

2. Cardiac morbidity and mortality

There are three major parameters to help determine the risk of cardiac morbidity and mortality for patients with whom non-cardiac surgery is planned: (1) the urgency of the procedure, (2) the inherent cardiac risk of the planned surgical procedure, and (3) the patient’s clinical markers assessing risk and functional status. The clinician should integrate and synthesize this information to develop an estimate of perioperative cardiac risk, and determine the need for additional testing or specific pharmacologic therapy prior to the surgery [2].

3. Medical necessity and timing

For any procedure, consideration of its medical necessity and timing are important. Procedures are categorized as emergent, urgent, time-sensitive, and elective. An emergent procedure is one in which life or limb is threatened if the patient is not taken to the operating room within 6 h. An urgent procedure is one in which life or limb is threatened if the patient does not have the procedure between 6 and 24 h. A time-sensitive procedure means a delay of greater than one to six weeks will negatively affect outcome. Finally, an elective procedure is one that could be delayed up to one year. Non-cardiac surgery should proceed as soon as possible for emergent procedures without extensive preoperative cardiac assessment, as such testing could delay potentially life-saving surgery [1,2].

4. The proposed surgery - specific inherent risk

The cardiologist should consider the surgery-specific risk; the inherent risk associated with the procedure. The ACC/AHA criteria for a low risk procedure is one that has a cardiovascular risk of <1%. Procedures that fall into this category include: endoscopic, ophthalmologic, dermatologic, and breast surgical procedures. A procedure with a cardiovascular risk >1% is identified as having an elevated risk. The ACC/AHA no longer classifies risk as low, intermediate or high because recommendations for the latter two are identical [1–3].
5. Clinical predictors and physical examination findings

Recommendations regarding surgical risk and management are based upon the clinical predictors identified in patient’s history and physical examination. During the preoperative evaluation cardiologists would be prudent to inquire about cardiovascular symptoms and any past history of cardiac, cerebrovascular, peripheral arterial disease, hypertension, diabetes, or chronic kidney disease.

The physical examination should focus on the cardiovascular system. Important findings include carotid artery bruits, evidence of heart failure, murmur suspicious for hemodynamically significant valvular heart disease, pulmonary hypertension, and evidence of significant peripheral vascular disease.

6. Cardiac conditions that elevate risk

The presence of certain cardiac conditions increase the risk of cardiac morbidity and mortality, and are referred to by the ACC/AHA guidelines as active cardiac conditions including: (1) acute (<7 days), or recent (>7 but ≤30 days) myocardial infarction, or unstable angina identified as Canadian cardiovascular society class 3 or 4, (2) decompensated heart failure, (3) severe valvular lesions, especially aortic and mitral stenosis, and (4) significant arrhythmias, including high grade atrioventricular block and ventricular arrhythmias [1,2].

7. Other cardiac risk factors

If there are no active cardiac conditions to preclude surgery the clinician should investigate clinical risk factors that have been associated with an increased risk of cardiac events for non-cardiac surgery. The clinical cardiac risk factors used in the ACC/AHA guidelines are derived from the Revised Cardiac Risk Index, which uses a six-point index score for assessing the risk of complications with non-cardiac surgery [4]. The Revised Cardiac Risk Index (RCRI) includes the following variables and risks:

- Ischemic heart disease
- Congestive heart failure
- History of cerebrovascular disease
- Diabetes requiring insulin therapy
- Preoperative serum creatinine level higher than 2 mg/dL
- High-risk surgery (intrathoracic, intraabdominal, or suprainguinal vascular).

Each of the six risk factors is assigned one point. Patients with 0, 1, 2, and ≥3 risk factors are associated with 0.4%, 1%, 2.4%, and 5.4% of adverse cardiac events. This index is simple, has been extensively validated, and provides a good estimate of the preoperative risk. Patients with 0–1 clinical risk factors are low risk and require no additional cardiovascular testing. Patients with ≥2 risk factors are higher risk and may require additional cardiovascular evaluation depending on their functional capacity [4].

8. Functional capacity

Determining a patient’s functional capacity is vital, as exercise capacity is a reliable predictor of future cardiac events. It is usually expressed in metabolic equivalents (METs), where one MET is defined as the oxygen consumption of a 70-kg man at rest. A functional capacity of 4 METS is generally the cutoff for acceptable functional capacity to undergo surgery because it is typically equivalent to the physiologic stress of most noncardiac surgical procedures requiring general anesthesia. For example, walking on level ground at about 4 miles per hour, or walking up a flight of stairs expends approximately 4 METs of activity. In patients who can perform ≥4 METs of activity the recommendations suggest no additional testing is needed. Patients whose functional capacity cannot be assessed due to limitations in their activity level may benefit from additional cardiac testing [2].

9. Supplemental preoperative evaluation

Supplemental preoperative cardiac evaluation may include an ECG, assessment of LV function, and exercise or pharmacological stress testing [1,2].

9.1. ECG

- No benefit (Class 3) of ECG for asymptomatic patients undergoing low risk surgery
- For patients undergoing elevated risk surgery: ECG is reasonable (Class 2a) in patients with known CAD, significant arrhythmia, PVD, CVD, or other significant structural heart disease, and may be considered (Class 2b) in asymptomatic patients.

9.2. Assessment of LV function

- Reasonable (Class 2a) in patients with dyspnea of unknown origin, or patients with a history of heart failure with a change in clinical status

9.3. Stress testing

- Stress testing is not indicated in 2 circumstances: (1) patients at low risk for noncardiac surgery (Class 3), (2) patients with elevated risk and excellent (>10 METS) functional capacity (Class 2a), or moderate to good (4–10 METS) functional capacity (Class 2b)
- Stress testing with dobutamine stress test or myocardial perfusion imaging is reasonable (Class 2a) for patients with poor or unknown functional capacity. Exercise stress testing may also be considered (Class 2b) for patients with poor or unknown functional capacity. In either case stress testing should be performed only if the results would change management.

10. A short piece deliberating on general principles for discontinuing anticoagulants and antiplatelet agents prior to surgery

A frequent question posed for cardiovascular clearance for non-cardiac surgery is when to discontinue anticoagulants and antiplatelet agents. This is a broad topic and beyond the scope of this writing. There are general principles to guide management decisions regarding the use of anticoagulants and antiplatelet agents preoperatively and postoperatively [6]. It is crucial for the consulting physician to stay abreast of the evolving changes.

11. Discussion

Medical and legal considerations for clinicians performing pre-op evaluations for cardiac clearance of non-cardiac surgery are imperative. Pre-op risk assessment for cardiac clearance for non-cardiac surgery is frequently complex, and like any predictive process is imperfect and saddled with a degree of uncertainty. When an adverse outcome occurs there is potential for an allegation of negligence. The allegation of negligence will result in a detailed review of the medical record.

The best defense to an allegation of negligence is comprehensive documentation in the medical record of the patient’s assessment and clinical conditions, the clinical rationale for the decision-making, and the potential risks associated with the non-cardiac surgery [5]. The medical record should outline succinctly and concisely the known inherent cardiac risk of the planned surgical procedure, and a description of the patient’s functional capacity – outlining whether they meet the time honored activity level of 4 METS requirement. Additionally the
record should reflect a review of the six clinical risk factors impacting decisions regarding the use of medical therapy or the need for further evaluation for cardiac disease: including the presence or absence of: 1) ischemic heart disease, 2) heart failure, 3) cerebrovascular disease, 4) diabetes, 5) renal dysfunction and 6) the level of risk associated with the planned surgery. The medical record should note any pre- and postoperative recommendations.

Ultimately the medical record is the best defense against any allegations of negligence. If there is no documentation in the electronic medical record, it will be assumed that the proper evaluation did not occur, even if it did occur. This documentation will likely reduce the physician’s risk for allegations of negligence [7].

Conflict of interest

No conflicts of interest.

References


