Preoperative Cardiac Risk Assessment/Stratification for Non-Cardiac Surgery

Goals
1. Determine patients current health status
2. Establish surgical risk profile
3. Determine whether further cardiac testing is indicated
4. Identify actions or recommendations that might reduce perioperative risk

Determining Health Status
1. History: cardiovascular disease, previous cardiac testing
2. Current medical status: comorbid disease processes, current functional status, age
3. Physical Exam: vitals signs, murmurs, S3, JVD, rales
4. EKG
5. Chest x-ray, Chem 10, CBC, Coags

Risk Stratification
1. Low risk - proceed to surgery without further cardiac evaluation
2. Intermediate risk - noninvasive testing and/or prophylactic medical therapy
3. High risk - likely will need invasive testing

Published Guidelines
1. ACC/AHA (updated in 2002); ACP (1997); Revised Cardiac Risk Index

ACC/AHA Guidelines
1. Patients clinical predictors
2. Patients functional capacity
3. Individual risks of specific types of surgeries

Clinical Predictors
1. Major Clinical Predictors
   a. Unstable angina
   b. Recent MI (last 30 days)
   c. Decompensated CHF
   d. Significant arrhythmias (high grade A-V block, symptomatic ventricular arrhythmia with underlying heart disease, SVT with uncontrolled rate)
   e. Severe valvular disease
   - Most likely will need further evaluation before any surgery

2. Intermediate Clinical Predictors
   a. Mild angina
   b. Previous MI (by history or EKG)
   c. Compensated or previous CHF
   d. Diabetes
   e. Chronic Renal Insufficiency
   - Requires assessment of functional capacity and type of surgery

3. Minor Clinical Predictors
   a. Advanced Age
   b. Abnormal results on EKG (LVH, LBBB, ST-T wave abnormalities)
   c. Rhythm other than sinus (a fib)
   d. Poor functional capacity
   e. History of stroke
   f. Uncontrolled htn (diastolic > 110)

Info and tables from aafp, cleveland clinic journal of medicine, ACC/AHA
Functional Capacity - METS (Metabolic Equivalents) classification
1. Poor: < 4 METS: Vacuuming, activities of daily living, walking 2mph, writing
2. Moderate: 4-7 METS: Cycling, flight of stairs, golf, walking 4mph, yard work
3. Excellent: >7 METS: Squash, jogging (10 minute mile), scrubbing floors, tennis

Surgery-specific Risk
1. High Risk Surgeries (Predicted cardiac complication rate >5%)
   a. Emergency Surgery
   b. Aortic surgery
   c. Peripheral Vascular surgery
   d. Prolonged surgical procedures (fluid shifts/administration, blood loss)
2. Intermediate Risk Surgeries (Predicted cardiac complication rate 1% to 5%)
   a. Orthopedic
   b. Urologic
   c. Uncomplicated abdominal
   d. Thoracic
   e. Head and neck
3. Low Risk Surgeries (Predicted cardiac complication rate < 1%)
   a. Endoscopic
   b. Dermatologic
   c. Breast
   d. Cataract

Noninvasive Procedures: Echo, Exercise/Pharmacologic with nuclear/echo stress testing
Invasive Procedures: CABG, PCI

Algorithm Summary
Step 1: Need for non-cardiac Surgery
a. if urgent, then to OR
b. if non urgent, then determine coronary revascularization last 5 years (Step 2)
   a. yes, then recurrent symptoms, if no then to OR, if yes then to Step 3
   b. no, then recent coronary evaluation (Step 3)
      i. if no, then go to step 4, if yes, favorable then to OR, unfavorable then to Step 4
Step 4: Identify Clinical predictors
a. if major, then delay and treat or coronary angiography
b. if intermediate, then do functional status
   a. if < 4 METS, then noninvasive testing
   b. if >4 METS, then identify surgical risk
      i. if high risk surgery then noninvasive testing
      ii. if low or intermediate surgery then to OR
c. if minor, then do functional status
   a. if <4 METS, then identify surgical risk
      i. if high risk surgery, then noninvasive testing
      ii. if low or intermediate surgery, then to OR
Info and tables from aafp, cleveland clinic journal of medicine, ACC/AHA