PREOP EVALUATION AND OPTIMIZATION

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Disclosure of Potential Financial Conflicts of Interest

None

But am open to any and all offers
Agenda

What is a Preoperative Evaluation
Risk Assessment
Co-morbid conditions
What tests should be ordered
Preop medications
Summary
The preoperative evaluation is not simply clearing the patient for surgery.

“Avoid hypotension, tachycardia”
“General anesthesia contraindicated”
“Continue current medications”
An preoperative evaluation is a collaborative, multidisciplinary process.

Not a substitute for preventive services, but an opportunity to address preventive services.
What is the goal of the Preoperative Evaluation?

Prevent anesthesia from cancelling a case the day of surgery.
What is the goal of a Preoperative evaluation?

The patient maximally benefits from our care

- Perioperatively
- Postoperatively
- Longitudinally

Safe, efficient, humane, and cost-effective

http://www.mdconsult.com.liboff.ohsu.edu/das/article/body/3133540...l&sp=11626630&sid=0/N/247202/1.html?issn=0889-8537&printing=true
Financial implications will become increasingly important.

[Links to CMS and AAMC resources for hospital-acquired conditions and bundled payments]
Starting the preoperative assessment in anesthesia clinic is too late
The decision to proceed with surgery begins with assessing risks & benefits

Risks associated with the planned surgery
Preoperative (perioperative) risk factors


1.8 million Medicare patients ≥ age 65 who died in 2008
  32% had surgery during the year before death
  18% in their last month of life
  8% during their last week of life.
  Varied by region
    Highest in Indiana, lowest in Honolulu

Lancet 2011; 378: 1408 -13,
Surgery and cardiac risk

10 - 40% postop mortality due to MI

Generalized inflammatory response
- C-reactive protein, interleukin 6, and tumor necrosis factor α.
- Can lead to coronary lumina narrowing and possible plaque rupture
- Hypercoagulability

Laparoscopic procedures
- Cause minimal incisional tissue damage
- Pneumoperitoneum reduces VR and CO, increases SVR
- Increases risk of thrombus formation and growth.

In the absence of active cardiac conditions, cardiovascular testing in stable patients rarely results in a change in management

Estimating Cardiac Risk

Revised Cardiac Risk Index

- Ischemic heart disease
- CHF
- Cerebrovascular disease
- High risk surgery
- Insulin requiring DM
- Preop creatinine > 2 mg/dL

>3 risk factors – 11% risk

- Age > 68yrs
- Active CHF
- BMI > 30 kg/m2
- Emergency surgery
- Previous cardiac intervention
- Cerebrovascular disease
- Hypertension
- Operative duration > 3.8 hrs
- One or more units of PRBCs

3+ risk factors – 17% risk

NSQIP Predictors

Circulation 2007; 116:e418-e500
Anesthesiology 2009; 110:58 – 66
ACC/AHA 2007 Guidelines on Perioperative Cardiovascular Evaluation and Care for Noncardiac Surgery

1. Need for emergency noncardiac surgery? (Class I, LOE C)
2. Active cardiac conditions* (Class I, LOE B)
3. Low risk surgery (Class I, LOE B)
4. Functional capacity greater than or equal to 4 METs without symptoms‡ (Class IIa, LOE B)
5. No or unknown

- Vascular surgery
  - Class IIa, LOE B
  - Consider testing if it will change management
- Intermediate risk surgery
- 1 or 2 clinical risk factors
- No clinical risk factors

- Vascular surgery
- Intermediate risk surgery
- Proceed with planned surgery with HR control (Class IIa, LOE B) or consider noninvasive testing (Class IIb, LOE B) if it will change management
- Proceed with planned surgery †

- Perioperative surveillance and postoperative risk stratification and risk factor management

*Class I, LOE B
†Class IIa, LOE B
‡Class I, LOE B
§Class IIa, LOE B
¶Class IIb, LOE B

Circulation 2007, 116:e418-e500
Consider cardiology consult instead of ordering specific tests

Cardiologist with understanding of anesthesia issues will determine most appropriate testing plan and follow-up care.
Poorly controlled HTN -- one of the most common reasons for delaying elective surgery

Stage 3 (Severe) HTN
SBP > 180 or DBP > 110

Increased risk if end organ changes
LVH with strain on EKG
Renal insufficiency
Headache

Consider delaying elective surgery to determine cause and / or optimize medications.
5% have 2o cause – renovascular, endocrine, drugs
Decreased risk requires weeks for regression of vascular changes
Lowering BP too much or too quickly may cause ischemia.

http://circ.ahajournals.org/content/early/2007/04/19/CIRCULATIONAHA.106.183095.citation, J Tinker 2006, S Aronson 2012
Diabetes Mellitus

Hyperglycemia

Increased mortality, length of stay, infection, subsequent nursing home care
NICE-SUGAR – too aggressive control may increase morbidity / mortality

Goals

Avoid significant variability, hypoglycemia, or hyperglycemia > 180 mg/dL
Identify undiagnosed DM (Fasting BG > 140 mg/dl, HbgA1C > 6.5%)
Schedule as first case in AM if possible to minimize NPO and insulin issues.

Peacehealth criteria for postponing elective surgery:

Absolute

Severe Dehydration
Ketoacidosis
Hyperosmolar nonketotic state
HbgA1C > 9%

Relative

Poor control
HbgA1C > 7 or 8%

Obesity

34% of US adults obese
67% of US adults overweight

Co-Morbidities

- OSA and hypoventilation syndrome
- Pulmonary dysfunction
- Cardiac dysfunction
  - HTN
  - Pulmonary HTN
  - Diastolic dysfunction
- Metabolic syndrome

Increased risk of perioperative complications

4th National Audit Project, Royal College of Anaesthetists, 2011    J Trauma 2005; 59:1048-1051    National Kaiser Joint Replacement Registry
Obstructive Sleep Apnea

AHI > 5
2 x postop complication rate

ASA Guidelines:
“These patients should not be discharged from the recovery area to an unmonitored setting until they are no longer at risk for postoperative respiratory depression.”

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<td>8. Male gender?</td>
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Preop anemia > 29% associated with increased risk of 30-day morbidity / mortality

NSQIP study of major non-cardiac surgery in 227,000 patients

Mortality 5-14x risk

Morbidity 3-7x risk
Heart, respiratory, CNS, renal, wound, sepsis, DVT/PE

Perioperative transfusion
Increased morbidity and mortality, even with one unit PRBC

“In elective surgical cases, the treatment of preoperative anaemia before surgical intervention should be strongly considered”

Lancet 2011:378;1396-407
Renal Insufficiency

Perioperative issues
- Metabolic acidosis
- Volume overload
- Electrolyte disturbances
- Altered anesthetic drug effects

Creatinine level > 2 mg/dL
- Risk factor for postop cardiac complications and renal dysfunction

Dialysis within 24 hours but not immediately before surgery

K < 6 mEq/dL OK if within patient’s usual range.

*Circulation* 2007, 116:e418-e500

B Sweitzer, 2012
Pulmonary disease more likely than cardiac issues to predict postop long-term mortality

Preop pulmonary function test (PFT)
  Helpful for diagnosis and guiding treatment
  Value before extra-thoracic surgery unclear

Preop CXR
  Impacts care 0.1-3%

Preop steroids and bronchodilators
  Lower risk of bronchospasm with intubation
  May shorten hospital and ICU stay.

Smoking cessation
  Unclear if beneficial within 2 months of surgery
  Important for longitudinal health

Anesthetic and surgical technique
  Epidural analgesia and short acting neuromuscular blockers beneficial
  No clear benefit with particular anesthetic type or surgical technique
Periodontal Disease

6 billion microbes in human mouth

Normal daily activities may result in bacteremia 90 hours a month

   Periodontal disease increases incidence & magnitude of bacteremia

Predominant oral microbes causing endocarditis and septic prosthetic joints are viridans (α-hemolytic) streptococci

Consider dental consult to address poor oral hygiene before elective surgery that involves fusion or implantation

   Treatment of inflammatory periodontal disease requires 4 to 6 weeks

What preop tests are required?

Laboratory & diagnostic tests including EKG are NOT necessary for low risk procedures unless a specific indication is present.

Will the test result impact care?

False positives and false negatives may result in wrong conclusions and / or further testing

Controversy if age should be a criteria for lab testing. Risk factor for abnormal EKG is age > 65

History of increased DOE, new onset chest pain, or syncope more important than ECGs or blood tests.

## Peacehealth preop testing guidelines

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<th>Condition</th>
<th>Hemogram</th>
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<th>ECG</th>
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Medications

Diabetes
   Hold oral agents, give insulin day of surgery

Beta Blockers
   Continue for patients already on them
   Start preop for vascular surgery patients with positive stress test

Coumadin
   Bridge patients at thromboembolic risk
      Afib, mechanical valve, within 3 mo of bio-prosthetic valve, mitral repair, VTE

Statins
   Acute cessation can cause rebound increase in platelet aggregability

ACE-I and ARBs
   Hold day of surgery unless for CHF

Herbals
   Hold week prior to surgery

Antiplatelet Recommendations

- Patients with aspirin (75–150 mg day\(^{-1}\))
  - Primary prevention
    - Intracranial neurosurgery
      - Stop 7 days before operation as needed
  - Secondary prevention after MI, ACS, stent, stroke, PAD
    - Operation under continuous treatment
- Patients with aspirin (75–150 mg day\(^{-1}\)) + clopidogrel (75 mg day\(^{-1}\))
  - High-risk situations:
    - <6 weeks after MI, PCI, BMS, stroke
    - <12 months after DES
    - High-risk stents
      - Risk of bleeding in closed space
        - Stop clopidogrel Maintain aspirin
  - Low-risk situations
    - All surgery
Summary

Goal of the preoperative evaluation
Minimize risk and maximize benefit to the patient.

The evaluation
Multidisciplinary, collaborative process
Should start BEFORE sending patient to anesthesia

Testing and consultation
Not necessary unless result will impact perioperative or longitudinal care.
Screening for diabetes cost effective
Involve PCP and cardiology in the process

Assessment and optimization of co-morbid conditions
Necessary to decrease perioperative risk
Delay elective surgery for unstable or unaddressed significant co-morbidities

The perioperative period is an opportunity
to impact longitudinal health