Preoperative Evaluation

Tyler Schwiesow MD
UnityPoint Central Iowa Hospitalists
(no conflict of interests to disclose)
Case

• 100 y/o WF, presents to ER after fall. Found to have hip fracture. Admitted to Orthopedic Surgery service. IM consult requested for “medical clearance for surgery”.
Purpose of such consultation request?

• Eliminate the need for tedious informed consent?
• Transfer of medical-legal risk from surgeon to internist?
• Generation of H&P required to be on chart?
Iowa City, IA – The University of Iowa Orthopedic Department has gone ‘all-in’. At 13:36 on Thursday, Orthopedic Surgery finally took the plunge from the on again off again relationship with Internal Medicine to a full symbiotic relationship. Bill Hutchins, the orthopedic surgeon, consulted Medicine for an H&P. “I called them to create my history and physical,” said Dr. Hutchins. “Internal medicine couldn’t be happier. Plus I don’t think Internal Medicine is allowed to turn down consults...”
Clearance?
Clearance?

• Implies NO risk
Purpose of preoperative evaluation

• To help guide a truly informed consent
• Clear outline of what is wrong, and how bad
• Determine if at optimal condition prior to procedure, and if not, develop plan to intervene
• Develop plan to prevent complications, including plan for chronic medications
Outcomes of consultation

• Proceed, with risk management strategies in place
• Postpone for more testing
• Cancel, offer alternative treatment

In most cases pre-op eval won’t result in delay or cancellation.
General components

- History focusing on:
  - cardiopulmonary dysfunction, including assessment of exercise ability
  - Bleeding tendency
  - Substance use
- Medications
- Focused physical exam
- Limited preoperative testing
Labs

• No overarching guideline
• Audience input?
Type of surgery

• Influences level of our investigation
• Estimate risk of death or MI with:
  – High risk surgery
  – Intermediate risk surgery
  – Low-risk surgery
Type of surgery

• Influences level of our investigation
• Estimate risk of death or MI with:
  – High risk surgery:  > 5%
  – Intermediate risk surgery:  1 to 5%
  – Low-risk surgery:  < 1%

• New guidelines focus more on Low risk and Elevated risk (intermediate and high risk categories combined)
Type of surgery

• High risk surgeries include aortic and peripheral vascular surgery
• Intermediate risk surgeries include intraperitoneal, intrathoracic, carotid endarterectomy, head and neck, orthopedic, and prostate surgeries
• Low risk surgeries include endoscopic and superficial procedures, cataract surgery, breast surgery, and ambulatory procedures
Cardiovascular risk stratification

• First considerations:
  – Active coronary syndrome, decompensated heart failure, uncontrolled arrhythmia, severe valvular disease
  – Recent PCI

• Risk class of the planned procedure

• Risk class of the patient
  – RCRI (Revised Cardiac Risk Index)
  – NSQIP (National Surgical Quality Improvement Program)
Risk stratification tools

- RCRI

### Table 1

**Independent Predictors of Major Cardiac Complications and Estimation of Risk**

**Revised Cardiac Risk Index (RCRI)²**

1. High-risk surgery
2. Ischemic heart disease
3. History of congestive heart failure
4. History of cerebrovascular disease
5. Insulin therapy for diabetes
6. Preoperative serum creatinine >2.0 mg/dL

**Risk of Major Perioperative Cardiac Event Based on Predictors in the RCRI⁹**

<table>
<thead>
<tr>
<th>No. of Risk Factors</th>
<th>Risk of Cardiac Event, % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.4 (0.1–0.8)</td>
</tr>
<tr>
<td>1</td>
<td>1.0 (0.5–1.4)</td>
</tr>
<tr>
<td>2</td>
<td>2.4 (1.3–3.5)</td>
</tr>
<tr>
<td>≥3</td>
<td>5.4 (2.8–7.9)</td>
</tr>
</tbody>
</table>

*Abbreviation: CI, confidence interval.*

²Includes vascular surgery and any open intraperitoneal or intrathoracic procedures.

³History of myocardial infarction or a positive exercise test, current complaint of chest pain considered secondary to myocardial ischemia, use of nitrate therapy, or ECG with pathological Q-waves.

⁴Includes cardiac death, nonfatal myocardial infarction, and nonfatal cardiac arrest.
Risk stratification tools

- NSQIP  riskcalculator.facs.org
Risk stratification tools

- NSQIP  riskcalculator.facs.org
Cardiovascular risk stratification

• Who DOESN’T need extensive eval:
  – Emergency surgery
    • Life or limb threatened if not in OR within 6 hours
  – No active cardiac condition, low risk surgery
  – No active cardiac condition, no cardiac symptoms, good exercise capacity
“Heads, you get a quadruple bypass. Tails, you take a baby aspirin.”
2014 ACC Guidelines

FIGURE 1 Stepwise Approach to Perioperative Cardiac Assessment for CAD
Metabolic equivalents (METs)

• 1 MET: resting oxygen consumption
• 4 METs:
  – Climbing flight of stairs
  – Walking up a hill
  – Walking on level ground at 4 mph
  – Heavy house work
• < 4 METs:
  – Slow ballroom dancing
  – Golfing with a cart
  – Playing musical instrument
  – Walking slower than 4 mph
2014 ACC Guidelines
ECG

- Known CAD, significant arrhythmia, peripheral arterial disease, cerebrovascular disease, other significant structural heart disease, EXCEPT for those undergoing low-risk surgery
- Considered for asymptomatic patients without known CAD, not having low risk procedure
  - Most authorities recommend for those with risk factors of CAD, some use age cut off
  - Most of the value is likely as a baseline to measure against any post-op changes
  - Time interval 1-3 months preop
Cardiology help needed:

- Recent coronary stenting
  - Bare metal stent
  - Drug eluting stent

- Severe aortic stenosis
  - Surgical repair
  - Management in emergency

- Unstable angina
Cardiac valve dysfunction

• In known or suspected moderate or greater valve dysfunction, get echocardiogram if:
  – No prior echo within 1 year
  or
  – Significant change in clinical status or exam since last echo
• To decrease perioperative risk, should have valve surgery if indicated
• If no time for, or can’t tolerate, valve surgery:
  – Higher level of periop monitoring
  – IV fluid volume support
  – Alpha agonist (phenylephrine)
Recent coronary stenting
Recent coronary stenting

• “In patients in whom noncardiac surgery is required, a consensus decision among treating clinicians as to the relative risks of surgery and discontinuation or continuation of antiplatelet therapy can be useful”
“...if you want a profession in which everything is certain you had better give up medicine.”

-Osler
Beta blockers

• Don’t stop them

• Don’t start indiscriminately
  – Suspected ischemia, or 3 or more RCRI risk factors, IF risk of stroke felt to be low and no other contraindications
  – If choose to start, preferable to start more than 1 day ahead of surgery; titrate to effect. Should NOT be started on day of surgery.
Statins

• Don’t stop them
• Consider starting statin in at-risk patients, especially before vascular surgery
ACE inhibitors

• Guidelines: continuation is “reasonable”, and if stopped, it is “reasonable” to restart as soon as clinically feasible post-op

• Jury is out, some experts suggest that they should be held pre-op
Pulmonary risk assessment

• Pulmonary complications just as, if not more, likely to cause periop morbidity and mortality
  – More costly than cardiac, thromboembolic, and other infectious complications
  – Longest length of stay
Pulmonary risk assessment

• Primary considerations:
  – COPD severity, and if at maximum compensation
  – Smoking status
  – Asthma controlled?
  – OSA present?
  – Location and duration of proposed surgery
Pulmonary risk assessment

• Smoking cessation, does timing matter?
  – Stopping within a few weeks of surgery harmful?
    • No, subsequent meta-analyses found no increase in risks of post-op respiratory complications with short-term (< 4 weeks) smoking cessation compared with continued smoking
  – Quitting > 4 weeks before surgery = lower risk of pulmonary complications
Pulmonary risk assessment

• Role of PFTs (FEV1 and FVC)
  – Not for routine assessment
  – Reserve for thoracic or upper abdominal surgery, in patients who have unexpected dyspnea or unexplained poor exercise tolerance
  • No evidence that PFTs helpful when H&P clearly identifies cause of dyspnea/poor exercise tolerance
Pulmonary risk assessment

• Role of CXR
  – ?

• Role of arterial blood gas
  – ?
Pulmonary risk assessment

- Role of CXR
  - Not indicated routinely
- Role of arterial blood gas
  - Not indicated routinely

These are needed ONLY if another indication present independent from need for surgery
Pulmonary risk assessment

• Optimize COPD treatment before surgery if possible
• Optimize asthma treatment before surgery if possible
• OSA
  – Preop eval
  – Continued treatment if already diagnosed
  – Role of empiric treatment?
• Chest physiotherapy and incentive spirometry
Preoperative medication management

• Diabetic management
  – Level of control in risk stratification
  – Insulin management
  – Oral medications
Preoperative medication management

• “Essential” medications:
  – ?

• Medications to withhold:
  – ?
Preoperative medication management

• “Essential” medications:
  – Beta blockers, clonidine, calcium channel blockers

• Medications to withhold:
  – ACE inhibitors, ARBs, and diuretics the morning of surgery
  – NSAIDs stopped 1 week prior to surgery

• Antiplatelet medications: depends on indication and type of surgery/bleed risk
Does medical preoperative evaluation affect outcome?

• Periop mortality: conflicting studies, either showing no difference, or increased risk. No study has shown a decrease in periop morbidity associated with medical consultation

• Cost and LOS: Studies have shown decrease LOS and cost, while others have demonstrated increased LOS and cost

Overall, strong evidence for improved outcomes not present
Does medical preoperative evaluation affect outcome?

– Huge variation in practice, and limited well-done studies

– Biggest value is likely in discussion of risk with patients and referring physicians, and targeting of expected concerns during periop period
I'm sorry man, but we just can't trust you...
Back to the case:

• 100 y/o WF, presents to ER after fall. Found to have hip fracture. Admitted to Orthopedic Surgery service. IM consult requested for “medical clearance for surgery”.

• History:

• Exam:

• Outcome:
Another case

- 81 y/o WF, presents to MWH after mechanical trip and fall, found to have hip fracture.

- History:
- Exam:
- Testing:
- Outcome:
Pearls

• Collaborative approach, better informed consent (consider NSQIP to guide counseling further)
• Framework for monitoring
• CV risk important, and best structured by guidelines, but don’t forget pulmonary risk
• Myriad of condition specific problems to also consider
References

• 2014 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery, JACC vol 64, no 22, December 9, 2014: e77-137
• ACP SmartMedicine, select modules from Perioperative Medicine: smartmedicine.acponline.org
• riskcalculator.facs.org
• www.mdcalc.com/revised-cardiac-risk-index-for-pre-operative-risk
• UpToDate, multiple modules