I Need Cardiac Clearance!

Preston Schneider, MD MSc
General Cardiology
Bozeman Health Cardiology
Pre-operative Cardiovascular Evaluation

● Patient Discussion
  ● Standardized risk scores
  ● What can we say and what can’t we say?

● Technical/Documentation
  ● ACC/AHA guidelines
  ● Role of stress testing
  ● Role of other testing
  ● Medication recommendations

● Timing of elective non-cardiac surgery
What can we say?

- Am I “cleared” for the OR?
  - What does that mean?
- Certainly not in line with modern pre-operative evaluation
- Modern pre-operative cardiovascular evaluation is about risk
- Can we provide a number (percent)?
  - Can we put that in context?
- Is there a reason for further testing or not?
What can’t we say?

● “Cleared” for the OR
  ○ Should discuss risk vs benefit with the patient
● If they accept the risk, then can proceed to the OR
● The OR is never without cardiovascular risk
Standardized Risk Scores

- RCRI
- NSQIP
- (Gupta)
Revised Cardiac Risk Index (RCRI)

- Easy to use
- Well validated
- Guideline supported
- High risk surgery, history of ischemic heart disease, history of CHF, history of cerebrovascular disease, pre-operative insulin therapy (home med), creatinine > 2
NSQIP

- Harder to use
- Only 1 validation study (though it’s quite large)
- Guideline supported
- 22 variables
Gupta

- Relatively easy to use
- NOT guideline supported (NSQIP and RCRI are the only validated risk scores supported by the ACC/AHA periop guidelines)
- Age, functional status, ASA class, creatinine, and surgery type
ACC/AHA perioperative guidelines

- 2014 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery
- Lots of information with many caveats
- Excellent flow charts regarding preoperative ischemic evaluation
  - This is really what anesthesia/surgery care about
- Remainder of recommendations are quite dense
ACC/AHA perioperative guidelines

- Emergent -> OR
- ACS -> standard management
- If the global risk is < 1% by a standardized risk assessment, no further testing is indicated
- If global risk is > 1% and the patient can perform > 4 METs, no further testing is indicated
- If global risk is > 1% and unknown METs or < 4 METs, then further testing may be indicated
  - Only if further testing will change operative management
Patient scheduled for surgery with known or risk factors for CAD* (Step 1)

- Emergency Yes
  - Clinical risk stratification and proceed to surgery

  No

  - ACS† (Step 2) Yes
    - Evaluate and treat according to GDMT†
Estimated perioperative risk of MACE based on combined clinical/surgical risk (Step 3)

- Low risk (<1%) (Step 4)
- Elevated risk (Step 5)

No further testing (Class III:NB)
Poor OR unknown functional capacity (<4 METs): Will further testing impact decision making OR perioperative care? (Step 6)

- Yes → Pharmacologic stress testing (Class IIa)
  - If normal
    - Proceed to surgery according to GDMT OR alternate strategies (noninvasive treatment, palliation) (Step 7)
  - If abnormal
    - Coronary revascularization according to existing CPGs (Class I)

- No
Role of stress testing

- To understand this rationale, take a step back and understand PCI
- Pathophysiology of acute MI
- PCI does not reduce risk of future events
- PCI *may* help with symptomatic management of stable angina
- CABG reduces risk of future events
Pathophysiology of Acute MI

- Acute MI is not a plumbing problem
- Plaque rupture is about inflammation
- Vulnerable plaques are non-obstructive lesions
- Large plaques that are high grade are calcified and stable
Elective PCI

- In the absence of symptoms does not meet appropriate use
- Does not reduce risk of future events
- Thought to improve symptoms more than medical management
  - Largely based on Spertus and others using observational data
- Clinician and patient understanding of outcome data is poor
Symptomatic management of stable angina

- Elective PCI *may* reduce symptom burden more than medical management
- Perception based primarily on observational data
- **Percutaneous coronary intervention in stable angina (ORBITA): a double-blind, randomised controlled trial**
  - Al-Lamee, RashaAl-Lamee, Rasha et al., The Lancet, Volume 391, Issue 10115, 31 – 40, January 6 2018
  - No difference between PCI and sham PCI for symptom management
Role of stress testing

- If there are no symptoms, then there is no further testing needed
- Even if you had a positive stress, would you do anything differently?
- Is it reasonable to delay this surgery for 30 days or 6 months?
Role of other testing

- Every patient needs an EKG
- Actually, no one needs an EKG for low risk surgery (global risk < 1%)
- EKG “is reasonable” in patients with known CAD, PAD, structural heart disease, significant arrhythmia, or cerebrovascular disease (except low risk surgery)
- EKG “may be considered” in asymptomatic patients without known disease undergoing other than low-risk surgery
Role of other testing

- Echocardiogram probably has a wider recommendation than EKG
- However, the broadest recommendation is a IIb (LOE C)
- Note that this is LV function evaluation, not necessarily echo

### Assessment of LV function

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is reasonable for patients with dyspnea of unknown origin to undergo preoperative evaluation of LV function</td>
<td>IIa</td>
</tr>
<tr>
<td>It is reasonable for patients with HF with worsening dyspnea or other change in clinical status to undergo preoperative evaluation of LV function</td>
<td>IIa</td>
</tr>
<tr>
<td>Reassessment of LV function in clinically stable patients may be considered</td>
<td>IIb</td>
</tr>
<tr>
<td>Routine preoperative evaluation of LV function is not recommended</td>
<td>III: No Benefit</td>
</tr>
</tbody>
</table>

- It is reasonable for patients with dyspnea of unknown origin to undergo preoperative evaluation of LV function: IIa, C
- It is reasonable for patients with HF with worsening dyspnea or other change in clinical status to undergo preoperative evaluation of LV function: IIa, C
- Reassessment of LV function in clinically stable patients may be considered: IIb, C
- Routine preoperative evaluation of LV function is not recommended: III: No Benefit, B
Medication recommendations

- Try to separate this from timing of surgery
- Antiplatelet and anticoagulation are the most vexing questions
- Beta-blockers
- ACE/ARB
- Statin
- Other blood pressure medications
- Nitrates
- Diuretics
Antiplatelet therapy and risk

● Determine the indication
  ○ If the indication is post MI or post PCI, then make sure timing is appropriate
  ○ Stable CAD or PAD (including CVD), prefer continuation of aspirin
  ○ If the indication is for something else, then it should be continued if at all possible
  ○ Otherwise minimize the interruption

● Valves!
  ○ All artificial valves like aspirin (bioprosththetic or mechanical)
  ○ Antiplatelet therapy is extremely important for non-aortic valves
  ○ Antiplatelet should be continued if at all possible regardless of valve position
Anticoagulation and bridging

- This is another hour lecture
- Short version is use the available tools, ask for expert advice if unclear
- For non-valvular atrial fibrillation
  - [https://tools.acc.org/bridgeanticoag](https://tools.acc.org/bridgeanticoag)
  - Also available as an iPhone and Android app
Beta-blockers

- Largely confusing because recommendations have changed multiple times
- Current guidelines and data say continue!
- Do not start a new beta-blocker solely because of surgery
- Start if otherwise clinically indicated
ACE/ARB

- This seems to remain clinically controversial
- Best data and current guidelines say continue
- This changed with the 2014 guidelines
Statin

- This is the most commonly ignored recommendation
- Current guidelines and data say continue
- Seems to get lumped in with “other” medications in practice
- Protective against MI and stroke, possibly AKI
Timing of non-cardiac surgery

- Emergent -> assess risk and proceed to the OR
- Urgent -> assess risk and discuss risk/benefit with the patient
- Elective -> wait as long as possible
Timing of elective non-cardiac surgery

- At least 2 weeks after elective POBA
- At least 30 days after elective BMS
- At least 365 days after elective DES
  - Here the peri-op guidelines lag behind the PCI guidelines
  - Reasonable to proceed 6 months after elective PCI with DES placement
- Observational data from the VA and others suggest waiting as long as possible, though regardless of stent type risk stabilizes at 6 months

Timing of elective non-cardiac surgery

● Guidelines recommend uninterrupted dual antiplatelet therapy for 12 months after MI
  ○ Does not matter if there was revascularization or not
  ○ Type of revascularization does not matter (POBA, BMS, DES, or CABG)

● Non-cardiac surgery within 6 months after MI is associated with significantly higher risk of MACE
Bottom line

- The ACC/AHA guidelines are easy to follow
- Use a validated risk score
- Less is more
- When considering further testing:
  - 1) Would I do this anyway?
  - 2) Is this going to change management?