Approach to Cardiovascular Perioperative Evaluation

Christopher King, MD, FACP

Disclosure

- I have no significant financial relationships with any corporation, including any that may be mentioned in this presentation.

Objectives

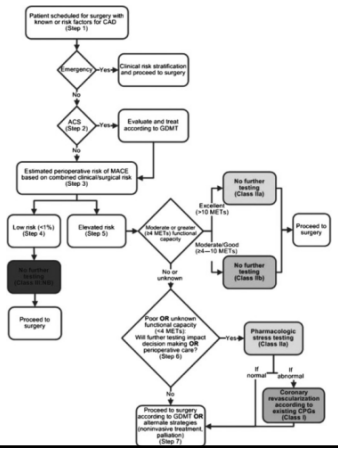
- By the end of this session, you will:
  - Understand the most updated recommendations of the ACC/AHA regarding perioperative cardiac evaluation.
  - Identify where the areas of controversy still exist in perioperative cardiac evaluation/management.
  - Define cardiac medications that can and cannot be started/continued in the perioperative period.

First off, why do we care?

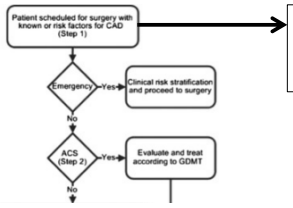
- CAD in patients undergoing surgery:
  - Increased risk of perioperative Major Adverse Cardiac Event (MACE)
  - Increased risk of perioperative stroke (especially as we get older)

First off, why do we care?

- Heart Failure in patients undergoing surgery:
  - 30 day post-op mortality for patients:
    - Non-ischemic HF: 9.3%
    - Ischemic HF: 9.2%
    - Atrial Fibrillation (AF): 6.4%
    - CAD: 2.9%
  - Risk of death increases with decrease in LVEF starting at 40% and is statistically significantly worse for patients with LVEF ≤29% compared to >29%.

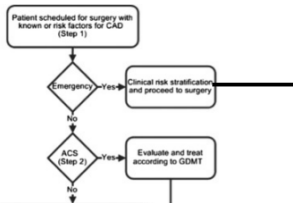


Step 1:



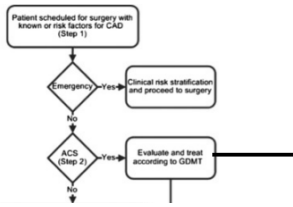
Are you concerned the patient might have CAD?
Hint: If you are seeing them, they are probably at risk.

Step 1:



- This is largely the same: if the patient is going to die without the surgery (mesenteric ischemia, etc.) it is an Emergency.
- Technically defined by the surgeon, so you can ask them.
- Risk stratify to help guide management *during and after* operation.

Step 2:

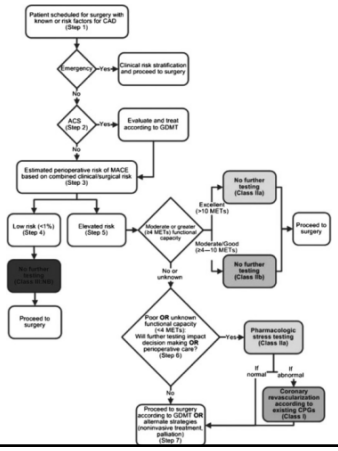


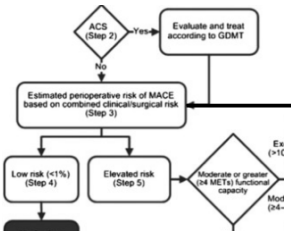
- If the operation is NOT an emergency, figure out if they are having a heart attack.
- If they are (UA, NSTEMI, STEMI), please treat that first.

OK, but when can they have their operation?

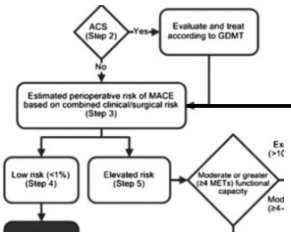
- Rate of Post-Operative MI and Death:

	Post-Op MI (%)	30 Day Mortality (%)
0-30 Days	32.8	14.2
31-60 Days	18.7	11.5
61-90 Days	8.4	10.5
91-180 Days	5.9	9.9

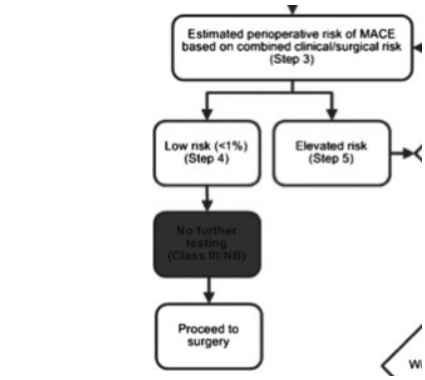


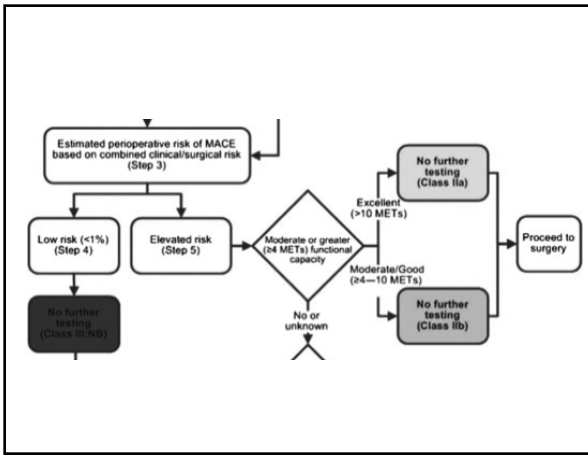


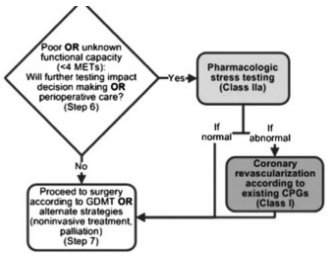
- Three Acceptable Risk Calculators:
  - RCRI
  - NSQIP MICA
  - NSQIP SRC
- Low Risk is defined as <1%



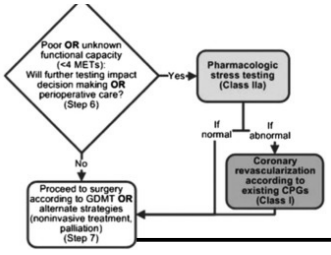
- Three Acceptable Risk Calculators:
  - RCRI
  - NSQIP MICA
  - NSQIP SRC
- Low Risk is defined as <1%
- Difference from Prior Algorhythm:
  - Risk calculation on ALL patients, regardless of MET ability.







- The more METS a patient can perform normally, the lower their risk of MACE.
- A reminder of what constitutes 4 METS:
  - Walking up a flight of stairs
  - Walking up a hill
  - Heavy housework (scrubbing floors, lifting heavy furniture)



- If the patient cannot tolerate 4 METS (or you can't determine) then it gets complicated

Patients that cannot perform 4 METS:

- If the patient cannot tolerate 4 METS (or you can't determine) then it gets complicated:
  - Determine if an alternate, non-surgical intervention is possible (i.e. radiation for cancer, or IR drainage of abscess).
  - If the patient only has a surgical option, the question is, will testing change your management (i.e. would the patient get CABG or PCI?)

Who Should Get Stressed?

- Cardiac Stress Testing is reserved for when it will *impact perioperative decision making or care*.
- Only patients that perform <4 METs (or unknown).
- Technically the data is in pharmacologic stress testing (though the 2014 guidelines state that MPI and Stress Echo likely perform similarly).

Who Should Get Stressed?

- Data on this subject are:
  - Old
  - Not of highest quality
  - Do not use standardized protocols or are older than the Bruce Protocol.

Stress Testing Summary:

- This is the largest grey area of the ACC/AHA recommendations.
- Ultimately this is where a justification can be made either way and a discussion with the surgeon and anesthesiologist is likely high value.
- Pulling the trigger will depend largely on what procedure is being considered and if it can be put off, because…

OK, I stressed them and…

- They have an area of demand ischemia, NOW what??
- Stress showing areas of reversible defect should be treated according to the type of surgery the patient needs.
- If surgery can wait (i.e. hernia repair), then they should get treated as with any other positive stress: cath lab and stenting if warranted.*

*

- PCI and stenting is just for their overall health.
- CARP trail showed NO DIFFERENCE between those getting PCI with stent before operation versus those with optimal medical management.
- The exception is those with Left Main Disease, LVEF <20%, and those with severe AS.

What if it shows old infarct?

- Old infarct without areas of *reversible* defect (so rest images) is not of any predictive value to their perioperative course.
- But they should probably be counseled and managed as you would with anyone that you discover an old infarct in.

I assume a negative stress is good?

- That is correct. A negative stress has very high *negative* prognostic value for perioperative MACE.

When can they go to the OR after PCI?

- If you have a patient that has come to have an operation and they recently had PCI, it is critical to know the type of stent AND the type of surgery.

OR Timing after PCI

- What type of stent did they have put in?
  - BMS: Ideally wait at least 30 days.
  - DES: Ideally wait 1 year.
  - If they need a surgery now, talk to cardiologist about doing balloon angioplasty, then OR, then back for stenting post-operatively.
  - Preoperative Balloon Angioplasty: wait 14 days.

OR Timing after PCI

- What type of operation is the patient having?
  - If dual antiplatelet therapy can be continued and they are within the normal window for DAPT, continue it.
  - If one has to be stopped, stop the clopidogrel.
  - Only stop both IF the risk of perioperative bleeding consequences is GREATER than the risk of in-stent thrombosis (usually bad, but non-fatal).
  - So if they need a brain operation or urgent spine surgery.

Other considerations:

- If the patient had a DES, elective surgery can be considered after 180 days with cessation of clopidogrel.
- Do NOT stop both agents within 30 days of BMS.
- Do NOT stop ASA within 14 days of balloon angioplasty.
- If your patient needs the procedure AND revascularization NOW, consider CABG combined with the needed non-cardiac surgery.

Whew, that was a lot…

Wait, what about meds!?

- Common cardiac medications you can safely continue in the perioperative period:
  - ACE Inhibitor/ARB: These are safe to continue, and if they are stopped, then they are safe to resume as soon as clinically feasible.
  - Statin: These are safe to continue perioperatively.
    - Consider starting them in patients undergoing vascular surgery that are not already on them, may reduce MACE.

Beta-Blockers

- Things to do with beta-blockers:
  - Keep 'em if they got 'em already (but feel free to hold for hypotension, bradycardia, etc.)
  - If the patient should be started on them, please do it >1 day before surgery.
- Things NOT to do with beta-blockers:
  - Do NOT start them on the day of surgery (increased strokes).
  - Do NOT use the DECREASE Trials (probably) to guide your decisions.

A Quick Word About Anticoagulation

- Bridging should be considered for patients with mechanical valves. Especially with:
  - Mitral Valves
  - Older Aortic Valves
  - Aortic Valves and Clotting Risk (prior clot, AF, etc.)
- Bridging is NOT warranted for patients with AF.
  - We can debate about CHADS-Score of 5+ later…

A Quick Word About Arrhythmias

- Post-Operative Atrial Fibrillation:
  - Treat like any new onset AF
  - Rate control (BB probably best, some evidence for quicker return to sinus rhythm)
  - Don't need to anti-coagulate, at least not right away.
  - The closer the operation is to the heart, the more likely this is (i.e. esophagectomy or lobectomy)

Cardiac Devices

- Pacemakers and ICDs:
  - The patient should see their electrophysiologist BEFORE the OR, and get a script for reprogramming their device.
  - Usually they will stop tachy escape programming.
  - Make sure this is turned back on before they leave the hospital.
  - Keep them on tele as long as it is turned off.
- VADS and Mechanical Hearts:
  - They should have a cardiologist involved!!!

Thank You!

- Questions?

- Christopher.king@ucdenver.edu