Episode 91: Perioperative Evaluation for Non-Cardiac Surgery with Tom Metkus

On this episode: Dr. Jed Wolpaw With Dr. Tom Metkus

In this episode, episode 91, I welcome Dr. Tom Metkus back to the show to discuss how we risk-stratify patients for non-cardiac surgery.

References: https://www.ahajournals.org/doi/10.1161/CIR.0000000000000104 http://www.onlinejacc.org/content/64/22/e77 https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/ESC-ESA-Guidelines-on-non-cardiac-surgery-cardiovascular-assessment-and-managemhttp:// www.onlinejacc.org/content/accj/69/14/1861.full.pdf

Questions & Notes

Click → jump to answers/notes.

Perioperative Cardiac Evaluation

1:17-8:52

- Does not apply to cardiac surgery or patients undergoing solid organ transplantation
- Goal: to identify the risk of perioperative cardiac complications before surgery & treat
    - Perioperative MI, peri-op HF/pulmonary edema, cardiac arrest, death
    - MACE: major adverse cardiac/cerebral event
- MACE events are rare
    - i.e. highest risk of MACE in open AAA repair is about 10%
- Understand pre-test probability before ordering a test to evaluate patient
    - Post-test probability: influenced by pretest probability and test characteristics
    - low pretest probability → low posttest probability of disease, even with a great test
    - Not perfect tests, so negative stress test can still have a MACE, OR vise-versa

Perioperative testing algorithm

8:53-20:04

- Based on ACC & AHA guidelines
- Tools to assess cardiovascular risk:
    - History & physical exam
    - EKG
    - Discussion with anesthesiologist and surgeon
        - i.e. differences between general anesthesia vs. regional block OR risk of surgery

Question #1: Assess urgency of surgery

- Urgent or Emergent
    - Emergent: threatening life or limb if surgery not performed within 6 hours
    - Urgent: threatening life or limb if surgery not performed within 6-24 hours
        - Risk of waiting for cardiac testing is outweighed by benefit of surgery
        - Go to OR and deal with consequences

- Elective: can be deferred indefinitely (i.e. knee surgery for osteoarthritis)
    - Is there an unstable cardiac condition that merits treatment before the OR?
    - History, physical exam, EKG
        - Decompensated heart failure (rales, pulmonary edema on X-ray)
        - Unstable ACS/acute MI
        - Uncontrolled arrhythmia (atrial, ventricular)
        - Symptomatic severe heart valve disease (mainly stenotic)
    - Identify and treat

- Time sensitive: in between urgent & elective (i.e. cancer surgery)

Question #2: Assess risk of procedure

20:05-29:59

- Low-risk: it's hard to further improve risk (risk of peri-op complication NSQUIP < 1%)

    - dermatology, peripheral extremity surgery (regional), breast, endoscopy
    - go to OR without further testing
- Intermediate: intraperitoneal (colon, laparoscopy incase of convert to open), intrathoracic (lobectomy)
- High risk: AAA, Bypass surgery
- Intermediate/High risk → look at functional capacity
    - Greater than 4 Mets
        - Patient can do 4 Mets comfortably (walk up 2 flights stairs or 4 city walks w/o stops)
        - Think of "stress of surgery" as being about 4 Mets of cardiac work
        - Go to OR
    - Less than 4 Mets OR functional capacity is unknown
        - Calculate RCRI (Revised Clinical Risk Index) - includes patient-specific factors
            - hx of CAD, HF, insulin-dep DM, CKD w/ Cr > 2.0, or stroke/TIA
            - 0 or 1 = low risk, don't need further cardiac testing
            - ≥2 or more = high risk, consider further cardiac testing IF alters management
    - Cardiac stents
        - Bare metal stent: dual antiplatelet therapy for 1 month followed by single antiplatelet therapy alone
        - Balloon angioplasty: 2 weeks
        - Drug eluting stent: 6-12 months
            - i.e. you wouldn't put this in a patient with colon cancer that know will need surgery soon
            - multi-disciplinary discussions are really important in these situations

Stress Tests

30:00-34:27

- To rule out ischemia
- Choose a stressor and an imaging modality
    - Stressors:
        - Exercise (if they can exercise, they should)
        - Pharmacologic (i.e. dobutamine)
    - Imaging modality:
        - Nuclear imaging: more sensitive
        - Echo: more specific

Transplant Patients

34:28-36:23

- Solid organ transplants (liver, lung, kidney) have a separate guideline for cardiovascular evaluation
    - Disease processes are different than most other non-cardiac surgery
    - Tests for CAD have a different specificity/sensitivity in these patients
    - Little high quality prospective data about risk in these patients
    - Higher risk patients (sicker, fluid shifts, advanced disease)
    - Center-specific variability on guidelines for these patients

Value of Routine Preoperative Testing

Electrocardiograms

36:24-39:59

- Do all patients need an ECG?
    - Probably not needed in everyone in someone with a normal history and physical
    - From literature, healthy patients < 50 coming for low-risk surgery, they don't need an ECG
    - By the time a cardiologist is seeing them, they will probably get an ECG
    - Find out your personal institution protocol for who needs an ECG
    - If protocol unclear or borderline, better to get ECG

Beta-Blockade

40:00-46:00

POISE Trial

- BB dosing: 200-400 mg of extended-release metoprolol at the time of surgery (BB naive patients)
- Randomized patients before cardiac surgery
    - BB group
        - higher risk of periop stroke, death, adverse outcomes
        - lower risk of MI
    - Placebo group
- Trial Interpretations: dosing of BB was bad

DECREASE-IV Trial

- BB started 30 days before surgery titrated to HR 55-70, then surgery
- Reduced adverse events

Few other observational studies

- RCRI 3-4 group had benefits of beta blockers
- Lower risk groups didn't have benefits

Conclusion of Beta-Blockers in the Perioperative Period

- If you're on a beta blocker for another reason → continue to avoid BB withdrawal
- If you're on a BB for HF, CAD → start and continue through perioperative period
- If you're going to start BB for perioperative risk reduction (level of evidence 2A or 2B), start it far in advance of surgery (more than 7 days, longer the better, titrate gradually)
- Do not start BB on day of surgery based on the Poise trial

Beta-blockers for Sinus Tachycardia?

- If your patient is tachycardic in the OR, should you start a beta blocker?
    - If you see sinus tach in operating room, first understand the pathophysiology
        - Tamponade? Volume depletion? Sympathetic stimulus?
    - 5 mg labetalol or esmolol OK as long as they're on monitoring

Revascularization

46:01-50:34

CARP Trial

- Patients undergoing vascular surgery (high risk) with coronary disease on angiogram
- MI and unstable angina patients ruled out
- Stenting/bypass vs medical therapy
- No outcomes between the two groups
- Shouldn't revascularize a stable CAD patient solely for the purpose of preventing periop events

Look for critical CAD on perioperative stress test

- If you find CAD on perioperative angiogram, follow CAD guidelines
    - i.e. diabetics with multivessel disease in proximal LAD → indication for bypass
    - i.e. distal diagonal branch stenosis causing stable angina → medical therapy

Takeaway for revascularization

- If you make it to Cath-lab preoperatively for non-cardiac surgery patients and you find CAD
    - Use clinical practice guidelines
- At Least 1 trial shows no benefit for routine revascularization before noncardiac surgery

Stenting vs CABG prior to non-cardiac surgery

- No clear guidelines how long to wait after CABG prior to non-card surgery
- Most people wait 4-6 weeks for non-cardiac surgery after surgical revascularization (i.e. CABG)

Urgent Surgery in a patient with cardiac disease

50:35-end

How to manage demand ischemia

- Keep perfusion pressure up, HR down, O2 up
- Routine aspirin around the time of cardiac surgery (non-cardiac patient)
- Vascular surgery literature showing possible role of statins
- Controversial: routine checking of troponins, ST segment monitoring, etc.
- If worried about MI in the OR, could do echo to look for wall motion abnormality, check troponin, watch telemetry

References

Please visit the reference for full details, algorithms, and more:
https://www.ahajournals.org/doi/10.1161/CIR.0000000000000104
http://www.onlinejacc.org/content/64/22/e77 https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/ESC-ESA-Guidelines-on-non-cardiac-surgery-cardiovascular-assessment-and-managemhttp:// www.onlinejacc.org/content/accj/69/14/1861.full.pdf