PREOPERATIVE EVALUATION: A PRACTICAL APPROACH

MICAH BEACHY, DO, FACP, SFHM
GOVERNOR-ELECT NEBRASKA ACP
DISCLOSURES / DISCLAIMERS

• DISCLOSURES: NONE

• DISCLAIMER: NONE
OBJECTIVES

- Review guidelines and the different cardiac risk calculators
- Understand appropriate ordering of preoperative testing
- Discuss medication adjustment during the perioperative period
- Review unique surgical scenarios
Frank started to get a funny feeling that his doctor was a quack.
WHY DO WE PREOP?

- EVALUATE EXTENT OF KNOWN DISEASE PROCESSES
- UNCOVER NEW DIAGNOSES
- PREDICT WHICH PATIENTS ARE AT RISK FOR POSTOPERATIVE COMPLICATIONS
PREOPERATIVE EVALUATION

HISTORY

- EVALUATE CURRENT MEDICAL ISSUES
- UNCOVER ANY ACTIVE CARDIAC CONDITIONS (ANGINA/CHF/ETC.)
- PRIOR COMPLICATIONS WITH ANESTHESIA
- PRIOR SURGICAL COMPLICATIONS (HEMORRHAGE/DVT/PE)
- SCREEN FOR OBSTRUCTIVE SLEEP APNEA
- DETERMINE FUNCTIONAL CAPACITY
PREOPERATIVE EVALUATION

PHYSICAL

- VITALS
- CARDIAC: AUSCULTATION FOR MURMURS, S3, AND S4; CAROTID PALPATION AND AUSCULTATION
- RESPIRATORY: AUSCULTATION OF LUNGS
- EXTREMITIES: EXAMINE FOR EVIDENCE OF POOR CIRCULATION AND EDEMA
### Functional Capacity

- **1 MET = 3.5 ML O2 UPTAKE/KG/MIN**
- **INCREASED PERIOPERATIVE RISK IF UNABLE TO ACHIEVE >4 METS**

<table>
<thead>
<tr>
<th>Moderate-intensity Physical Activity (Approximately 3-6 METs)</th>
<th>Vigorous-intensity Physical Activity (Approximately &gt;6 METs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requires a moderate amount of effort and noticeably accelerates the heart rate.</td>
<td>Requires a large amount of effort and causes rapid breathing and a substantial increase in heart rate.</td>
</tr>
<tr>
<td>Examples of moderate-intensity exercise include:</td>
<td>Examples of vigorous-intensity exercise include:</td>
</tr>
<tr>
<td>- Brisk walking</td>
<td>- Running</td>
</tr>
<tr>
<td>- Dancing</td>
<td>- Walking / climbing briskly up a hill</td>
</tr>
<tr>
<td>- Gardening</td>
<td>- Fast cycling</td>
</tr>
<tr>
<td>- Housework and domestic chores</td>
<td>- Aerobics</td>
</tr>
<tr>
<td>- Traditional hunting and gathering</td>
<td>- Fast swimming</td>
</tr>
<tr>
<td>- Active involvement in games and sports with children / walking domestic animals</td>
<td>- Competitive sports and games (e.g. Traditional Games, Football, Volleyball, Hockey, Basketball)</td>
</tr>
<tr>
<td>- General building tasks (e.g. roofing, thatching, painting)</td>
<td>- Heavy shovelling or digging ditches</td>
</tr>
<tr>
<td>- Carrying / moving moderate loads (&lt;20kg)</td>
<td>- Carrying / moving heavy loads (&gt;20kg)</td>
</tr>
</tbody>
</table>
Review guidelines and the different cardiac risk calculators.
“Henry! Our party’s total chaos! No one knows when to eat, where to stand, what to.... Oh, thank God! Here comes a border collie!”
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†
   - No -> Estimated perioperative risk of MACE based on combined clinical/surgical risk (Step 3)

   - Low risk (<1%) (Step 4)
     - No further testing (Class III: NB)
     - Proceed to surgery
   - Elevated risk (Step 5)
     - Moderate or greater (≥4 METs) functional capacity
       - No or unknown
         - Poor OR unknown functional capacity (<4 METs): Will further testing impact decision making OR perioperative care? (Step 6)
           - Yes -> Pharmacologic stress testing (Class IIa)
             - Transformer
             - If normal
             - If abnormal
               - Coronary revascularization according to existing CPGs (Class I)
           - No -> Proceed to surgery according to GDMT OR alternate strategies (noninvasive treatment, palliation) (Step 7)
         - Moderate/Good (≥4–10 METs)
           - No further testing (Class IIb)
           - Proceed to surgery
     - Excellent (>10 METs)
       - No further testing (Class IIa)
       - Proceed to surgery

*See Sections 2.2, 2.4, and 2.5 for recommendations for patients with symptomatic HF, VHD, or arrhythmias.
†See UA/NSTEMI and STEMI CPGs (Table 2).

Fleisher LA, et al.
2014 ACC/AHA Perioperative Guideline
EMERGENCY
- LIFE OR LIMB IS THREATENED IF NOT IN THE OR
- <6 HOURS

URGENT
- TIME FOR LIMITED EVALUATION
- 6-24 HOURS

TIME SENSITIVE
- DELAYS OF >1-6 WEEKS WOULD NEGATIVELY AFFECT OUTCOME

ELECTIVE
- DELAYS UP TO A YEAR ACCEPTABLE
Estimating risk of major adverse cardiac event (MACE)

- Revised cardiac risk index (RCRI)
  - High risk surgery
  - CAD
  - CHF
  - Cr >2
  - TIA/CVA
  - IDDM
- NSQIP surgical risk calculator
  - [www.riskcalculator.facs.org](http://www.riskcalculator.facs.org)
- NSQIP MICA (Gupta)
  - [www.surgicalriskcalculator.com](http://www.surgicalriskcalculator.com)
REVISED CARDIAC RISK INDEX

- DEVELOPED IN 1999
- WIDELY USED
- EASY TO CALCULATE
- FACTORS INCLUDED
  - HIGH RISK SURGERY
  - CAD
  - CHF
  - CR >2
  - TIA/CVA
  - IDDM

<table>
<thead>
<tr>
<th>RCRI Score</th>
<th>Risk of major cardiac event*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.4%</td>
</tr>
<tr>
<td>1</td>
<td>0.9%</td>
</tr>
<tr>
<td>2</td>
<td>6.6%</td>
</tr>
<tr>
<td>≥3</td>
<td>11%</td>
</tr>
</tbody>
</table>

Incidence of major cardiac complications increases with the number of risk factors

[Bar chart showing the incidence of major cardiac complications with respect to the number of risk factors.]
- WEB BASED TOOL
- INCLUDES 20 INDICATORS PLUS THE SURGICAL PROCEDURE
- PREDICTS MORTALITY WELL
- 11 ADDITIONAL OUTCOMES REPORTED
- MORE CUMBERSOME TO USE
- NOT EXTERNALLY VALIDATED
American College of Surgeons: Surgical Risk Calculator

Procedure:
27447 - Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty)

Begin by entering the procedure name or CPT code. One or more procedures will appear below the procedure box. You will need to click on the desired procedure to properly select it. You may also search using two words (or two partial words) by placing a '+' in between, for example: "cholecystectomy + cholangiography"

Reset All Selections

Are there other potential appropriate treatment options?
- Other Surgical Options
- Other Non-operative options
- None

Please enter as much of the following information as you can to receive the best risk estimates. A rough estimate will still be generated if you cannot provide all of the information below.

Age Group
- Under 65 years

Sex
- Female

Functional Status
- Independent

Emergency Case
- No

ASA Class
- Severe systemic disease

Steroid use for chronic condition
- No

Ascites within 30 days prior to surgery
- No

Systemic Sepsis within 48 hours prior to surgery
- None

Ventilator Dependent
- No

Disseminated Cancer
- No

Diabetes
- Insulin

Hypertension requiring medication
- Yes

Congestive Heart Failure in 30 days prior to surgery
- Yes

Dyspnea
- No

Current Smoker within 1 Year
- No

History of Severe COPD
- No

Dialysis
- No

Acute Renal Failure
- No

BMI Calculation:
- Height: 70 in / 178 cm
- Weight: 220 lb / 99 kg

*American College of Surgeons: Surgical Risk Calculator*
### American College of Surgeons: Surgical Risk Calculator

#### Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Your Risk</th>
<th>Average Risk</th>
<th>Chance of Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious Complication</td>
<td>6.5%</td>
<td>3.7%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Any Complication</td>
<td>7.4%</td>
<td>4.3%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>0.3%</td>
<td>0.3%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Cardiac Complication</td>
<td>0.5%</td>
<td>0.2%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Surgical Site Infection</td>
<td>1.0%</td>
<td>0.7%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>1.3%</td>
<td>0.7%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Venous Thromboembolism</td>
<td>1.4%</td>
<td>1.2%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>0.4%</td>
<td>0.1%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Readmission</td>
<td>6.5%</td>
<td>3.0%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Return to OR</td>
<td>1.2%</td>
<td>0.9%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Death</td>
<td>0.1%</td>
<td>0.1%</td>
<td>Above Average</td>
</tr>
<tr>
<td>Discharge to Nursing or Rehab Facility</td>
<td>39.3%</td>
<td>21.0%</td>
<td>Above Average</td>
</tr>
</tbody>
</table>

**Predicted Length of Hospital Stay:** 4 days

*American College of Surgeons: Surgical Risk Calculator*
Moderate or greater (≥4 METs) functional capacity

- Excellent (>10 METs)
  - Proceed to surgery

- Moderate/Good (≥4–10 METs)
  - No further testing (Class IIb)

No or unknown

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
    - If abnormal
      - Coronary revascularization according to existing CPGs (Class I)

- No
  - Proceed to surgery according to GDMT OR alternate strategies (noninvasive treatment, palliation) (Step 7)
“Now open even wider, Mr. Stevens....Just out of curiosity, we’re going to see if we can also cram in this tennis ball.”
Understand appropriate ordering of preoperative testing
CASE

- 65 Y/O WHITE MALE PRESENTING FOR PREOP EVALUATION PRIOR TO ELECTIVE L TKA. HE STATES HE’S ABLE TO MOW HIS LAWN AND WALK FOR SEVERAL MILES WITHOUT CHEST PAIN OR PRESSURE.

- PMH: HTN, HL, CKD 4, AND DM
- MEDS: LISINOPRIL, NPH, ATORVASTATIN, ASA

- WHAT IS THIS PT’S RISK FOR MACE?
  - RCRI
  - NSQIP [NSQIP CALCULATOR](#)
  - NSQIP MICA (GUPTA) [GUPTA CALCULATOR](#)
WHAT PREOP TESTING IS NEEDED?

A) CBC, CMP, COAGS, A1C, EKG, URINALYSIS
B) CBC, BMP, COAGS, A1C, EKG
C) CBC, BMP, A1C, EKG
D) CBC, BMP, A1C
E) H/H, BMP, A1C
## Preoperative Lab Testing

<table>
<thead>
<tr>
<th>Organization</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Society of Anesthesiologists</td>
<td>Don’t obtain baseline laboratory studies in patients without significant systemic disease (ASA I or II) undergoing low-risk surgery – specifically complete blood count, basic or comprehensive metabolic panel, coagulation studies when blood loss (or fluid shifts) is/are expected to be minimal.</td>
</tr>
<tr>
<td>American Society for Clinical Pathology</td>
<td>Avoid routine preoperative testing for low risk surgeries without a clinical indication.</td>
</tr>
<tr>
<td>Society of General Internal Medicine</td>
<td>Don’t perform routine pre-operative testing before low-risk surgical procedures.</td>
</tr>
<tr>
<td>The Society of Thoracic Surgeons</td>
<td>Patients who have no cardiac history and good functional status do not require preoperative stress testing prior to non-cardiac thoracic surgery.</td>
</tr>
<tr>
<td>Procedure</td>
<td>CBC</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Open vascular procedures (peripheral bypass, carotid surgery)</td>
<td></td>
</tr>
<tr>
<td>Open aneurysm repair (cerebral, thoracic aortic, abdominal aortic)</td>
<td>X</td>
</tr>
<tr>
<td>Open cerebral vascular (aneurysm, AVM)</td>
<td></td>
</tr>
<tr>
<td>Endovascular repairs (cerebral, peripheral, aortic)</td>
<td>X</td>
</tr>
<tr>
<td>Craniotomy</td>
<td>X</td>
</tr>
<tr>
<td>Major head and neck surgery</td>
<td></td>
</tr>
<tr>
<td>Major spine surgery (≥ 3 levels)</td>
<td></td>
</tr>
<tr>
<td>Open abdominal cases (not vascular)</td>
<td>X</td>
</tr>
<tr>
<td>Major orthopedic surgery (joint revision, hemipelvectomy, pelvic fractures, large cancer resections)</td>
<td>X</td>
</tr>
<tr>
<td>Thoracotomy, VATs, lung resections</td>
<td></td>
</tr>
<tr>
<td>Cardiac surgery</td>
<td></td>
</tr>
<tr>
<td>Significant anemia (Hgb &lt;10) with surgical risk 3</td>
<td></td>
</tr>
<tr>
<td>Surgical risk class 4</td>
<td></td>
</tr>
<tr>
<td>Surgical risk class 5</td>
<td></td>
</tr>
</tbody>
</table>

References:
2. Laboratory Monitoring Interval (in Months) Recommended for Chronic Medications, Table 2; Consult Pharm. 2008 May; 23(5): 387–395.
<table>
<thead>
<tr>
<th>Clinical Diagnosis</th>
<th>CBC w/o Diff</th>
<th>H&amp;H</th>
<th>PT/INR</th>
<th>BMP</th>
<th>CMP</th>
<th>K+</th>
<th>Glucose</th>
<th>Hgb A1C</th>
<th>TSH</th>
<th>UA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients on ACE/ARB</td>
<td></td>
<td></td>
<td></td>
<td>- Within 6 months if no recent dose adjustment - Within 30 days if recent dose adjustment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver disease (chronic, end-stage, or clinical concern for coagulopathy)</td>
<td>Within 30 days</td>
<td></td>
<td>- Within 30 days - DOS if receiving neuraxial anesthesia</td>
<td>Within 30 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Radiation therapy to neck and not taking thyroid supplement</td>
<td></td>
<td></td>
<td></td>
<td>Within 30 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal Insufficiency (not on dialysis)</td>
<td>Within 6 months</td>
<td></td>
<td></td>
<td>Within 60 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Suspected UTI</td>
<td></td>
<td></td>
<td></td>
<td>Within 90 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systemic Lupus</td>
<td></td>
<td></td>
<td></td>
<td>Collect during PAS visit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrombocytopenia (&lt;100K)</td>
<td>- Within 30 days - DOS if receiving neuraxial anesthesia</td>
<td></td>
<td></td>
<td>Within 6 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td></td>
<td></td>
<td>Within 90 days</td>
<td>DOS</td>
<td></td>
<td></td>
<td>Within 90 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PREOPERATIVE TESTING: EKG

- **CLASS IIA: REASONABLE TO PERFORM**
  - PREOPERATIVE RESTING 12-LEAD ELECTROCARDIOGRAM (ECG) IS REASONABLE FOR PATIENTS WITH KNOWN CORONARY HEART DISEASE, SIGNIFICANT ARRHYTHMIA, PERIPHERAL ARTERIAL DISEASE, CEREBROVASCULAR DISEASE, OR OTHER SIGNIFICANT STRUCTURAL HEART DISEASE, EXCEPT FOR THOSE UNDERGOING LOW-RISK SURGERY. *(LEVEL OF EVIDENCE: B)*

- **CLASS IIB: CONSIDER**
  - PREOPERATIVE RESTING 12-LEAD ECG MAY BE CONSIDERED FOR ASYMPTOMATIC PATIENTS WITHOUT KNOWN CORONARY HEART DISEASE, EXCEPT FOR THOSE UNDERGOING LOW-RISK SURGERY. *(LEVEL OF EVIDENCE: B)*

- **CLASS III: NO BENEFIT**
  - ROUTINE PREOPERATIVE RESTING 12-LEAD ECG IS NOT USEFUL FOR ASYMPTOMATIC PATIENTS UNDERGOING LOW RISK SURGICAL PROCEDURES. *(LEVEL OF EVIDENCE: B)*

FLEISHER LA, ET AL. 2014 ACC/AHA PERIOPERATIVE GUIDELINE
Discuss medication adjustment during the perioperative period.
WHAT PREOP TESTING IS NEEDED?

A) CBC, CMP, COAGS, A1C, EKG, URINALYSIS
B) CBC, BMP, COAGS, A1C, EKG
C) CBC, BMP, A1C, EKG
D) CBC, BMP, A1C
E) H/H, BMP, A1C
CASE: CONTINUED

- 65 Y/O WHITE MALE PRESENTING FOR PREOP EVALUATION PRIOR TO ELECTIVE L TKA. HE STATES HE’S ABLE TO MOW HIS LAWN AND WALK FOR SEVERAL MILES WITHOUT CHEST PAIN OR PRESSURE.
- PMH: HTN, HL, CKD 4, AND DM
- MEDS: LISINOPRIL, NPH, ATORVASTATIN, ASA

SHOULD A BETA BLOCKER BE STARTED PRIOR TO SURGERY?
PERIOPERATIVE BETA BLOCKAGE

- CONTINUE CHRONIC BETA BLOCKERS (CLASS I/LOE B)
- MANAGE BETA BLOCKER USAGE BASED ON CLINICAL COURSE REGARDLESS OF WHEN THERAPY STARTED (CLASS IIA/LOE B)
- ≥3 RCRI REASONABLE TO START BETA BLOCKER (CLASS IIB/LOE B)
- INITIATION OF BETA BLOCKAGE SHOULD LIKELY START >1 DAY PRIOR TO SURGERY (CLASS IIB/LOE B)
- BETA BLOCKER SHOULD NOT BE STARTED ON DAY OF SURGERY (CLASS III/LOE B)
PERIOPERATIVE BETA BLOCKER USAGE

• WHY THE SHIFT AWAY FROM BETA BLOCKERS?
  • DECREASE I/IV
    • LARGE RCTS FAVORABLE TOWARDS PERIOP BB
    • POLDERMANS-CONCERNS ABOUT SCIENTIFIC MISCONDUCT
  • POISE-1
    • LARGE RCT CRITICAL TOWARDS PERIOP BB
    • BB PREVENTED MI, BUT INCREASED RISK OF DEATH, STROKE, HYPOTENSION, AND BRADYCARDIA
    • CONCERNS ABOUT UNCONVENTIONAL BB DOSING

• ACC/AHA CONVENE A SEPARATE EVIDENCE REVIEW COMMITTEE
EVIDENCE REVIEW COMMITTEE

• 17 ELIGIBLE STUDIES (16 RCT/1 COHORT)

• SUBGROUP ANALYSIS

  • DECREASE I/IV AGAINST OTHER STUDIES

<table>
<thead>
<tr>
<th>RR for all fields</th>
<th>MI</th>
<th>Stroke</th>
<th>CV Death</th>
<th>All Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>* significant difference</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DECREASE vs. Others</td>
<td>0.68*</td>
<td>1.79</td>
<td>0.17*</td>
<td>0.42*</td>
</tr>
<tr>
<td>POISE-1 vs. Others</td>
<td>0.72</td>
<td>1.93</td>
<td>1.25</td>
<td>1.30</td>
</tr>
</tbody>
</table>
CASE: CONTINUED

- 65 Y/O WHITE MALE PRESENTING FOR PREOP EVALUATION PRIOR TO ELECTIVE L TKA. HE STATES HE’S ABLE TO MOW HIS LAWN AND WALK FOR SEVERAL MILES WITHOUT CHEST PAIN OR PRESSURE.
- PMH: HTN, HL, CKD 4, AND DM
- MEDS: LISINOPRIL, NPH, ATORVASTATIN, ASA

ADJUSTMENTS NEEDED FOR HIS OTHER MEDS?
**ORIGINAL RESEARCH**

**Prospective Randomized Evaluation of Preoperative Angiotensin-Converting Enzyme Inhibition (PREOP-ACEI)**

*J. Hosp. Med.* 2018 October;13(10):661-667. Published online first July 25, 2018

By: Jason F. Shiffermiller, MD, MPH, Benjamin J. Monson, MD, Chad W. Vokoun, MD, Micah W. Beachy, DO, Michael P. Smith, MD, James N. Sullivan, MD, Andrew J. Vasey, MD, Purnima Guda, PhD, Elizabeth R. Lyden, MS, Sheila J. Ellis, MD, Huiling Pang, MD PhD, Rachel E. Thompson, MD, MPH

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**NEBRASKA MEDICINE ACE-I STUDY**

- **Assessed for eligibility (n=453)**
  - **Excluded (n=162)**
    - Inclusion criteria not met (n=86)
      - ACEI therapy < 6 weeks (n=5)
      - Low risk surgery (n=45)
      - High risk surgery (n=36)
    - Exclusion criteria present (n=29)
      - Preoperative SBP ≥ 160 mmHg (n=18)
      - LVEF < 40% (n=8)
      - ESRD (n=3)
    - Declined to participate (n=47)

- **Randomized (n=291)**
  - **Allocated to omit ACEI (n=146)**
    - Lost to follow-up (n=0)
      - Surgery cancelled (n=6)
      - Excluded from analysis (n=3)
      - Analyzed as omission group (n=137)
        - Adhered to allocated intervention (n=120)
  - **Allocated to continue ACEI (n=145)**
    - Lost to follow-up (n=0)
      - Surgery cancelled (n=4)
      - Excluded from analysis (n=3)
      - Analyzed as continuation group (n=138)
        - Adhered to allocated intervention (n=127)
NEBRASKA MEDICINE ACE-I STUDY
ACE-I

- Prolonged intraoperative hypotension is associated with increased risk of complications and mortality. Mascha, Monk

- Omission of the final preoperative ACEI dose was associated with a significant reduction in the risk of intraoperative hypotension

- Consider holding preoperative dose of ACE-I
- Continue statin if patient is currently taking (Class I, LOE B)

STATINS

- Concerns of increased risk of myopathy/rhabdomyolysis haven’t been supported to date

*Association of Perioperative Statin Use With Mortality and Morbidity After Major Noncardiac Surgery*

Martin J. London, MD; Gregory G. Schwartz, MD, PhD; Kwan Hur, PhD; William G. Henderson, MPH, PhD
Aspirin in Patients With Previous Percutaneous Coronary Intervention Undergoing Noncardiac Surgery

**Figure 2.** Effect of aspirin on risk for composite of death and nonfatal myocardial infarction among patients with a history of percutaneous coronary intervention.

- RCT >10,000 PATIENTS RANDOMIZED TO ASA OR PLACEBO
- CONTINUATION COHORT (PRIOR ASA EXPOSURE RANDOMIZED TO ASA/PLACEBO)
- INITIATION COHORT (NO PRIOR EXPOSURE RANDOMIZED TO ASA/PLACEBO)
- PRIMARY OUTCOME NONFATAL MI OR DEATH
- ASA: 7%
- PLACEBO: 7.1%
- INCREASED RISK OF MAJOR HEMORRHAGE IN ASA GROUP

CONCLUSION: ASA IN THE PERIOPERATIVE PERIOD DOESN'T REDUCE RISK OF MI/DEATH

Devereaux, PJ. et al, NEJM. 370:16
Review unique surgical scenarios
CASE

- 60 Y/O WHITE MALE PRESENTS FOR PREOP PRIOR TO REPAIR OF A LEFT RADIAL FX NON-UNION. HE TOLERATED SURGERY WELL IN MARCH AT OSH. HIGHEST LEVEL OF EXERTION WAS CLIMBING A GRAIN ELEVATOR.

- PMH: DM, HL

- MEDS: METFORMIN, ROSUVASTATIN

- EXAM: 4/6 HOLOSYSTOLIC MR >EST RUSB. S2 IS AUDIBLE. NO RADIATION TO THE CAROTIDS. NO PULSUS TARDAS.

WHAT IS THE NEXT STEP?
SEVERE/SYMPTOMATIC AORTIC STENOSIS

CLASS I ADOPT PRACTICE

- IT IS RECOMMENDED THAT PATIENTS WITH CLINICALLY SUSPECTED MODERATE OR GREATER DEGREES OF VALVULAR STENOSIS OR REGURGITATION UNDERGO PREOPERATIVE ECHOCARDIOGRAPHY IF THERE HAS BEEN EITHER 1) NO PRIOR ECHOCARDIOGRAPHY WITHIN 1 YEAR OR 2) A SIGNIFICANT CHANGE IN CLINICAL STATUS OR PHYSICAL EXAMINATION SINCE LAST EVALUATION. (LEVEL OF EVIDENCE: C)

- FOR ADULTS WHO MEET STANDARD INDICATIONS FOR VALVULAR INTERVENTION (REPLACEMENT AND REPAIR) ON THE BASIS OF SYMPTOMS AND SEVERITY OF STENOSIS OR REGURGITATION, VALVULAR INTERVENTION BEFORE ELECTIVE NON-CARDIAC SURGERY IS EFFECTIVE IN REDUCING PERIOPERATIVE RISK. (LEVEL OF EVIDENCE: C)

FLEISHER LA, ET AL. 2014 ACC/AHA PERIOPERATIVE GUIDELINE
CASE: CONTINUED

- ECHO PERFORMED
  - AVA OF 0.7 CM²
  - PEAK GRADIENT 102 MMHG
CASE: CONTINUED

- SEVERAL SMALL STUDIES SUGGEST 10-30% RISK
  - MI
  - HYPOTENSION
  - CHF
  - ARRHYTHMIAS
  - DEATH
  - INCREASED BLEEDING (ACQUIRED VON WILLEBRAND)

- AS IS NOT INCLUDED IN MOST RISK CALCULATORS
CASE

- 55 Y/O MALE PRESENTING FOR ELECTIVE TKA. HE HAD A NSTEMI 9 MONTHS AGO WITH DRUG ELUDING STENT PLACED. DENIES ANY CHEST PAIN WHEN HE’S RIDING HIS BIKE.

- PMH: MI, CAD S/P STENTING, HTN, HL, SYSTOLIC HF

- MEDS: ASA, CLOPIDOGREL, ATORVASTATIN, METOPROLOL, LISINOPRIL

- WHAT IS THE NEXT STEP IN PATIENT’S CARE?
  A) “CLEAR” HIM FOR SURGERY, CONT DAPT
  B) PROCEED TO SURGERY WITH ASA ONLY
  C) PROCEED TO SURGERY WITHOUT DAPT
  D) CANCEL HIS SURGERY
ACC/AHA FOCUSED UPDATE

2016 ACC/AHA Guideline Focused Update on Duration of Dual Antiplatelet Therapy in Patients With Coronary Artery Disease

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines
"Whoa! That was a good one! Try it, Hobbs — just poke his brain right where my finger is."
MEDICATIONS: RHEUMATOLOGIC AGENTS

2017 American College of Rheumatology/American Association of Hip and Knee Surgeons Guideline for the Perioperative Management of Antirheumatic Medication in Patients With Rheumatic Diseases Undergoing Elective Total Hip or Total Knee Arthroplasty

- 7 recommendations on withholding, continuing, and restarting anti-rheumatic medications
- Recommendations based on low-medium quality of evidence given paucity of evidence
- Recommendations are specific for THA/TKA patients
- Includes following rheumatologic diseases
  - Rheumatoid arthritis
  - Spondyloarthritis
  - Juvenile idiopathic arthritis
  - Systemic Lupus Erythematosus
MEDICATIONS: RHEUMATOLOGIC AGENTS

• NON-BIOLOGIC DMARDS
  • CONTINUE MTX, LEFLUNOMIDE, HYDROXYCHLOROQUINE, AND/OR SULFASALAZINE

• BIOLOGICS
  • WITHHOLD BIOLOGIC AGENTS PRIOR TO SURGERY AND PLAN THE SURGERY AT THE END OF THE DOSING CYCLE FOR THAT SPECIFIC MEDICATION
  • WITHHOLD TOFACITINIB FOR AT LEAST 7 DAYS PRIOR TO SURGERY
  • RESTART BIOLOGIC ONCE THE WOUND SHOWS EVIDENCE OF HEALING (TYPICALLY ~14 DAYS)

Goodman SM et al., Arthritis & Rheumatology, Vol 69, No. 8, Aug 2017, pp1538-1551
MEDICATIONS: RHEUMATOLOGIC AGENTS

• SEVERE LUPUS
  • CONTINUE MTX, MYCOGENOLATE MOFETIL, AZA, CYCLOSPORINE, OR TACROLIMUS

• NON-SEVERE LUPUS
  • WITHHOLD MYCOGENOLATE MOFETIL, AZA, CYCLOSPORINE, OR TACROLIMUS 1 WEEK PRIOR

• STEROIDS
  • CONTINUE HOME GLUCOCORTICOIDES RATHER THAN ADMINISTERING PERIOPERATIVE SUPRA-PHYSIOLOGIC GLUCOCORTICOID DOSES

Goodman SM et al., Arthritis & Rheumatology, Vol 69, No. 8, Aug 2017, pp1538-1551