PREOPERATIVE EVALUATION OF THE SURGICAL PATIENT
IT’S ABOUT OPTIMIZATION….. NOT CLEARANCE
RENEE ROBINSON, RN, FNP
UNIVERSITY OF ROCHESTER
DECLARATIONS: NONE EXCEPT....

Cute kids
Back Ground Relevance

- Future of U. S. Healthcare Market is Changing from volume based to value based
- Affordable Health Care Act
- Triple Aim of Healthcare :
  - improving the individual experience of care
  - Improving the health of populations
  - Reducing the per capita costs of care for populations.
- Bundled Payments: Retrospective Bundled payments
- Part of the value based initiative to improve healthcare
Detailed Preoperative Evaluation
The most important tool in evaluation is....

The History
Components of History

- Past Medical
- Past Surgical
- Social History
- Anesthesia
- Proposed Surgical Procedure
- Medication Reconciliation
Risk Calculators

ACC/AHA Guidelines for management of non cardiac surgery patients

Goldman Revised Cardiac Risk

NSQIP

ARISCAT
Screening Questionnaire

• Preoperative screening questionnaires available that are validated and designed to detect diseases specifically known to be associated with increased perioperative events.

• Look for things such as chest pain, kidney disease, history of heart attack or stroke, etc.

• At URMC we have developed a detailed telephone triage screening questionnaire that is used by our Anesthesia screening nurses to help detect these problems.

• At URMC when patients are found to have concerning medical and/or anesthesia problems through the preoperative screen they are reviewed by an Advanced Practice Provider for further evaluation.
### URMC Adult Screening Form

**Cardiac**
- Have you been to see a Cardiologist? [Yes, No]
- Have you ever had a cardiac catheterization? [Yes, No]
- Have you been hospitalized for a heart attack? [Yes, No]
- Do you have a cardiac device? [Yes, No]
- Have you had chest pain lasting greater than 5 minutes? [Yes, No]
- Have you been treated more than twice for chest pain? [Yes, No]
- Have you ever had an echo or stress test? [Yes, No]
- Have you been treated more than three times for high BP? [Yes, No]

**Cardiac Notes**

**Pulmonary**
- Have you ever used oxygen at home? [Yes, No]
- Have you ever been treated more than twice for wheezing? [Yes, No]
- Have you ever been treated more than twice for difficulty breathing? [Yes, No]
- Do you use a CPAP when sleeping? [Yes, No]

**Pulmonary Notes**

**Vascular**
- Have you been treated more than once for a bleeding problem? [Yes, No]
- Have you ever had a stroke? [Yes, No]
- Have you been treated more than three times for high BP? [Yes, No]

**Vascular Notes**

**Neuromuscular**
- Do you have Myasthenia Gravis? [Yes, No]
- Do you have Parkinson’s Disease? [Yes, No]
- Do you have Multiple Sclerosis? [Yes, No]
- Have you been treated more than twice for difficulty breathing? [Yes, No]

**Neuromuscular Notes**

**Anesthesia**
- Have you been told by anesthesia that you have a difficult airway? [Yes, No]
- Have you been told you have Malignant Hyperthermia? [Yes, No]

**Anesthesia Notes**

**Substance Abuse**
- Have you used cocaine in the last month? [Yes, No]
- Have you used methamphetamines in the last month? [Yes, No]

**Substance Abuse Notes**

**Chronic Pain**
- Do you take prescription medication for pain on a regular basis, including methadone? [Yes, No]

**Chronic Pain Notes**

**Additional Notes**

**Additional Notes**

Anesthesia history

Type Anesthesia
Malignant Hyperthermia
Pseudocholinesterase deficiency
Significant nausea/emesis
Airway complication
Medication Reconciliation

Social History

Drugs, alcohol, smoking and environment

Which patient do you think will succeed?
Medical Problems:

Detailed review of all Medical Problems including Present symptoms and current disease management.
If you want to know the answer you have to ask the question

YOU CLAIMED YOU HAD NO MEDICAL HISTORY

YOUR PRESCRIPTIONS FOR METOPROLOL, LITHIUM, ALBUTEROL, METFORMIN, HYDROCODONE, CRESTOR, SEROQUEL, LIPITOR, AND COUMADIN DETERMINED THAT WAS A LIE.
Important Considerations:

- CAD
- Stroke
- CKD
- Valvular heart disease
- Cardiac arrhythmias
- Diabetes
- Functional capacity
- Pulmonary Disease
- GERD
- Pregnancy
- Frailty **
- Nutrition **
Cardiac Disease

- Chest pain
- Dyspnea on exertion
- Coronary intervention
- Cardiac management
- CHF
- Arrhythmia/palpitations
- Valve problems
- Peripheral vascular disease
- Medical management
- Anticoagulants?
- Orthopnea
- Syncope
- Recent testing
- HTN
- Functional capacity
Pulmonary Disease

- COPD
- asthma
- Shortness of breath
- Dyspnea on exertion
- Obstructive sleep apnea
- smoking status and pack years
- Recent infections/exacerbations
- Pulmonary management
- Medical management
- Compliance ?
- Functional capacity
- **Heart failure
- Pulmonary hypertension
- Age ? >50 years old
- Albumin <3 or BUN >30
- Obesity ??? role

Surgical procedure
Can effect pulmonary risk too
Postoperative Pulmonary complications

Physiologic changes postoperatively after anesthesia that increase risk of developing postoperative pulmonary complications

- 30% decrease in vital capacity
- Decrease in functional reserve
- Thoracic and upper abdominal surgeries greater risk
Postoperative pulmonary complications

- Increased risk postoperative pulmonary complications Age >50 and progressive every decade thereafter
- Research regarding postoperative pulmonary complications variable 2-70% with 6.8% risk across all surgical group
- According to a NYSQIP review of 450,000 patients: COPD independent predictor for postoperative pneumonia, reintubation, failure to wean from ventilator and non pulmonary adverse events.
  No definitive degree of COPD that is prohibitive of surgery- it’s a risk /benefit decision.
  Thoracic and upper abdominal surgeries
Stroke or TIA

• Timing of event
• Medical management- ? Neurologist
• Medications? Asa or Plavix
• Residual deficits
Diabetes

- Type Diabetes
- Onset of disease
- Management - Endocrinologist
- Medication management vs Dietary Management
- Compliance
- Blood sugars
- HgA1C
Renal disease

- Stage of renal disease
- Etiology of disease
- Timing of onset
- Medical management ? Nephrologist
- Medications
- Dialysis and if so when is it scheduled
- Creatinine
- Potassium
Physical Examination

- Heart
- Lungs
- Airway
- General assessment
- Surgical site
- Vital signs
Mallampati Score

http://geiselmed.dartmouth.edu/radiology/images/mallampati.jpg
### ASA Classification

#### Table 10.1 ASA physical classification status system

<table>
<thead>
<tr>
<th>ASA class</th>
<th>Status</th>
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<tbody>
<tr>
<td>1</td>
<td>Normal healthy patient</td>
</tr>
<tr>
<td>2</td>
<td>Patient with mild systemic disease</td>
</tr>
<tr>
<td>3</td>
<td>Patient with severe systemic disease</td>
</tr>
<tr>
<td>4</td>
<td>Patient with severe systemic disease that is a constant threat to life</td>
</tr>
<tr>
<td>5</td>
<td>Moribund patient not expected to survive without operation</td>
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ASA: American Society of Anaesthesiologists.
ASA/AHA guidelines

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HF = heart failure; HR = heart rate; MI = myocardial infarction; NYHA = New York Heart Association. (Adapted from reference 6.)

*May include “stable” angina in patients who are unusually sedentary.
Clinical Risk Factors
ASA/AHA guidelines

- Diabetes
- Ischemic Heart Disease
- History of Congestive Heart Failure
- Cerebral Vascular Disease
- Chronic Kidney Disease (creatinine >2)
# Functional Capacity

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<td>&gt; 4</td>
<td>Climbing a flight of stairs, Walking on level ground at 4 miles per hour, Running a short distance, Doing heavy chores around the house (e.g., scrubbing floors, lifting furniture)</td>
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<tr>
<td>&gt; 10</td>
<td>Playing moderately strenuous sports (e.g., golf, dance, bowling), Playing strenuous sports (e.g., tennis, basketball)</td>
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1 MET = 3.5 ml oxygen uptake/kg/min.

Surgical risk

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<td><strong>ACC/AHA Guideline Summary: Cardiac Risk Stratification for Noncardiac Surgery</strong></td>
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*Abbreviations: ACC, American College of Cardiology; AHA, American Heart Association; MI, myocardial infarction.*
Goldman Revised Cardiac Risk Index

**Table 1. Revised Cardiac Risk Index**

- History of ischemic heart disease
- History of compensated or prior heart failure
- History of cerebrovascular disease
- Diabetes mellitus
- Chronic kidney disease with creatinine >2 mg/dL

*One Point per Item

*Source: American College of Cardiology/American Heart Association 2007 Guidelines*
ACS NSQIP Model

- Multivariate logistic regression analysis of risk factors for intra/postop MI or Cardiac Arrest (MICA) after NCS in ACS NSQIP database in 2007:
  - type of surgery
  - functional status
  - creatinine
  - ASA PS
  - age
- Validated in 2008, higher predictive accuracy than RCRI
- Free online calculator at www.surgicalriskcalculator.com

Gupta PK et al., Circulation 2011; 124:381
ARISCAT Risk Calculator

- Advanced age
- Low preoperative oxygen saturation
- Respiratory infection within past month
- Preoperative anemia
- Upper abdominal or thoracic surgery
- Surgery lasting more than two hours
- Emergency surgery

- Useful for evaluation of overall postoperative pulmonary complications
- Low risk (1.6%) vs intermediate risk (13.3% vs high risk (42.2%))
Testing and consults

benefit

risk
To test or not to test

No data to support the use of routine preoperative laboratory testing.

Practice advisory by ASA against routine preoperative laboratory testing in absence of clinical indications.

Laboratory testing should be used only as needed based on individual patient risk and ONLY if the testing will effect clinical decision making.

All women of childbearing age should undergo preoperative pregnancy testing.

Tests to consider:

Hemoglobin-useful with significant expected blood loss or anemia
Glucose
Potassium
Creatinine- for high risk surgery with age >50 or risk sever hypotension
PT/INR- if concern for bleeding based on history
ACC/AHA guidelines on Routine Preoperative EKG testing

Preoperative ECGs should be used for the following patients:

Patients with known coronary artery disease, significant arrhythmias, peripheral arterial disease, cerebrovascular disease or other significant structural heart disease undergoing an intermediate or high risk procedure.

May be considered for asymptomatic patients undergoing a high risk procedure or with elevated cardiac risk (>1 percent).

No benefit to EKGs for patients undergoing low risk procedures
surgical risk

- Procedure risk
- Alternatives

- Proposed benefits
- Patient preference
- Rationale
New things on the horizon in preoperative evaluation

• Frailty
• Nutrition
• Troponin
• BNP
Case Study

• 85 yr. old female presenting for left cataract surgery at hospital ambulatory surgical setting under proposed monitored anesthesia.

• **PMH:**
  Diabetes
  Hypothyroidism

• **PSH:**
  Left total hip arthroplasty
  Hysterectomy

• **Labs:**
  None available
Should the patient proceed with surgery?

Let’s discuss
Case Study 2

56 yr old man preoperative for bladder stone surgery under proposed general anesthesia.

**PMH:**
Peripheral vascular disease with claudication
Active smoker with 90pk year history
HTN
DM 2 on metformin and lantus insulin
CAD with MI and cardiac stent

**PSH:**
Tonsillectomy and cholecystectomy
Should the patient proceed with surgery?

Let’s discuss
Perioperative Surgical Home

• Model proposed by American Society of Anesthesiologist

• Innovative approach to management of surgical patient

• Shift from fragmented patient care to a holistic multi-disciplinary approach throughout the perioperative experience
Patient needs to be the center of care

Surgical management

Anesthesia Management

Not the same as booking for surgery
Patient Centered Care

- APPs
- Surgeon
- Anesthesiologist
- Nursing
- Nutrition
- Social Work
- PT/OT
- Care Coordinator
Anesthesia Role

<table>
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<tr>
<th>Preoperative</th>
<th>Intraoperative</th>
<th>Postoperative</th>
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<td>Optimization</td>
<td>Patient Anesthetic Management</td>
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<td>Surgical timing</td>
<td>Management</td>
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Preoperative Surgical Home

- Preoperative Evaluation by Anesthesia Clinic has been proven to improve patient care and cost effectiveness
- Significant improvement in reduction of patient cancellations and surgical case delays on day of surgery
- Significant improvement in reduction in unnecessary laboratory and EKG testing preoperatively
- Current models in practice that are working:
  - UC Irvine
  - Michigan Surgical Quality Collaborative Program
  - UAB Model
University of Rochester

- **Current PSH initiatives:**
  - Anemia Optimization Pilot with Cardiac Surgery
  - Preoperative Screening Assessments
  - Sawgrass Surgical Center
  - Telemedicine Initiative for Airway examinations
  - MCIC Best Practice
  - Central pager for consults/questions to a provider

- **Newly initiated efforts:**
  - Working with Surgery APP Manager
  - Working with Pediatric Orthopedics
  - Working to improve our Perioperative Clinic access to patients and providers
  - Central pager for consults/questions to a provider
  - Working to spread our

• Cohn, S. & Fleisher, L. (2016) Evaluation of Cardiac Risk prior to Noncardiac Surgery. *Up to Date*.


1. Emergency surgery?
   - Yes: Proceed with surgery. Optimize medical management.
   - No:

2. Active cardiac conditions?
   - Yes: Treat these conditions first prior to surgery.
   - No:

Active cardiac conditions:
- Unstable or severe angina
- Recent MI (within 30 days)
- Decompensated heart failure
- Significant arrhythmias (High grade, 3° degree, or Mobitz II AV block; symptomatic ventricular arrhythmias, supraventricular arrhythmias with HR>100 at rest; symptomatic bradycardia, newly recognized ventricular tachycardia)
- Severe valvular disease (Severe AS—mean gradient >40 mm Hg, valve area <1.0 cm², or symptomatic mitral stenosis)

3. Low risk surgery?
   - Yes: Proceed with surgery.
   - No:

Surgical risk (estimated cardiac risk)
- Low (<1%)
  - Endoscopic
  - Superficial procedures
  - Breast
  - Cataract
  - Ambulatory surgery
- Intermediate (1-5%)
  - Carotid endarterectomy
  - Intraperitoneal
  - Intrathoracic
  - Head and Neck
  - Orthopedic
  - Prostate
- High (>5%)
  - Major vascular surgery

4. Good functional capacity?
   - Yes: Proceed with surgery.
   - No: Assess number of Clinical Risk Factors:

   0: Proceed with surgery.
   1-2: Consider perioperative beta-blockade. (See “Perioperative Beta Blockers”) Consider non-invasive stress testing only if it will change management.
   3+: Consider non-invasive stress testing, especially for patients undergoing vascular surgery. Consider perioperative beta blockade. (See “Perioperative Beta Blockers”)

5. All other situations:
   - Clinical Risk Factors:
     - Diabetes
     - Ischemic heart disease
     - History of congestive heart failure
     - Cerebrovascular disease
     - Chronic kidney disease
Table 2. Active Cardiac Conditions for Which the Patient Should Undergo Evaluation and Treatment Before Noncardiac Surgery

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