Preoperative Evaluation from the Anesthesia Perspective

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Role of Preoperative Evaluation

- In 2013, MGMC employed an outside consultant group to evaluate OR utilization
- Surgical Services Executive Committee (SSEC)
  - Goals to improve operating room efficiency and patient satisfaction
    - Surgical Block Time
    - Turnover Time
    - Release of Block Time
    - Reduce cancellations / delays
Goals of Discussion

- To Improve preoperative evaluation of our patients by providing a systems based understanding of anesthetic concerns

- To create an open dialogue between preoperative evaluators, our nursing staff, the main OR and our Anesthesia Department
Role of the Anesthesiologist

“...and this is Ralph, your anesthesiologist.”
Role of Anesthesiologist

- Provide a thorough pre-anesthetic evaluation and treatments prior to surgical procedures
- Medically manage patients during their anesthetic procedures
- Provide post-anesthetic evaluation and treatment plans to optimize perioperative outcomes
Safety of Anesthesia

- In 1985, the Anesthesia Patient Safety Foundation was created to raise the levels of consciousness and knowledge of patient safety issues.
- In early 1986, ASA was the first medical specialty to adopt standards of care for its members.
- Today there are more than 30 standards of care.
- 50 years ago perioperative deaths due to anesthesia were 1:1500. Today they are 1:200,000.

www.asahq.org, Anesthesia Fast Facts
Role of Preoperative Evaluation

- To provide a thorough review of the patient’s medical profile:
  - Comprehensive description of current and past medical conditions
  - Previous surgeries and types of anesthesia the patient has experienced
  - Any anesthesia complications
  - A full review of prescription and OTC meds
Role of Preoperative Evaluator

- You are the FIRST line in setting the patient up for safe and satisfying surgical procedure

- Excellent opportunity to alter the long- and short-term consequences of disease

- Having the patient’s primary care provider as a part of their surgical care team is an excellent gateway to meeting patient expectations
What is **NOT** the role of the preoperative evaluator

- Guessing on the appropriate pre/intra/post anesthesia plan
- Please *do not* use the term “Cleared for Surgery” either verbally or in written form.
- You can avoid documenting ASA status or Airway Exams in your evaluation
- Please do not attempt to educate patients on regional anesthesia, intubation processes, or monitoring strategies
Surgery: Left knee scope

Allergies: Peanuts, Lincomycin, Penicillin, Erythromycin.

Medications: Enalapril 20 mg. QD, Simvastatin 10 mg. QD and Glucosamine 500 mg. QD.

Previous Surgeries: Right menisectomy, buninodecromy.

He is 66 years-old, B.P. 142/78, pulse 68, height 68 ½”, weight 190 lbs. and O2 is 97%.

Dolichocephalic type skull with no crepitis or ecchymotic areas. The eyes showed PERL with the conjunctiva and sclera normal. No funduscopic hemorrhages or cotton wool patches. The ears, nose and throat are normal. Cranial nerves II-XII and the cerebellum are intact and considered normal. The thyroid is small, palpable and non-tender in the midline with no carotid bruits or venous distentions. The skin is pale, dry and intact with no ecchymosis, cyanosis or ulcerations. The chest is bilaterally symmetrical with no pectus excavatum or congenital abnormality. The heart having a regular rate and rhythm with no arrhythmias, sternal heaves or bruits. There is a murmur over the aortic area III/VI with no trajectory to the carotids. The lungs are clear to auscultation with no wheezes, rhonchi or rales. The abdomen is flat with no organomegaly, guarding or rigidity. Good bowel sounds. Negative Cullen’s, Lloyd’s and Murphy’s signs. The extremities, except the left knee, have no lymphadenopathy, neurological defects or ecchymosis.

An EKG and CBC were performed and are normal. An INR was performed≈0.9. He is cleared for surgery.
Systems Based Evaluation

- Rarely, is a simple notation of diseases or symptoms adequate: HTN, CAD, COPD, etc.
  - The dreaded “see Epic”
- Equally important in identifying the presence of disease is to establish:
  - Severity of the disease
  - Current or Recent exacerbations
  - The stability of the disease
  - Previous treatment of the condition or planned interventions
- Within each system context I will try to provide why we are concerned of the condition

Miller’s Anesthesia, 7th Edition
Previous Anesthesia

- Has the patient had prior General Anesthesia
  - If so, were there any issues
    - Post Operative Nausea Vomiting (PONV)
    - Malignant Hyperthermia (MH)
    - Pseudocholinesterase Deficiency
  - If patient has not undergone a GA, is there any family history of MH or Pseudocholinesterase deficiency?
    - If MH, **PLEASE** give us a call and let us know. Patient will need to be the first case with a properly prepared operating room.
Central Nervous System

- Depression/Psychiatric Disorders
  - What is the degree
  - How much anxiety
  - What meds are they taking and how often
    - Chronic anxiolytics can induce tolerance which might make the perioperative period challenging
Central Nervous System

- History of Strokes/TIA’s
  - What is the etiology
    - Idiopathic/thromboembolic/atherosclerosis/tumor/Aneurysm/hypotension?
    - What was done to resolve the issue
    - How long ago did it occur
    - Are there any residual effects

- Spinal Cord Injury
  - What level and how long ago did injury occur
  - Has there been episodes of Autonomic Dysfunction
  - What are respiratory mechanics and previous response to narcotics or anxiolytics
Central Nervous System

- Migraines
  - It's helpful to have an understanding of their frequency and exacerbating features
  - Anesthesia, without rhyme or reason, can cause a migraine
  - Knowing details of effective treatments can provide a guideline for care in the perioperative period
Pulmonary

- **COPD**
  - Emphysema vs Chronic Bronchitis
    - Is the patient on maintenance MDI’s
    - Is there use of rescue MDI’s and how often are they required
    - Home oxygen: nocturnal or intermittent PRN
  - Ventilation strategies can differ in the OR based on the surgery, positioning, and fluid dynamics as it relates to their level of pulmonary compromise
Pulmonary

- Asthma
  - This is a disease with a wide spectrum of clinical significance
    - How severe
    - What are the triggers?
    - Frequent ER visits or hospitalizations?
    - How often are they using rescue MDI’s and are they effective?
    - Does the patient need maintenance meds?
  
  - With intubation and extubation we can experience acute exacerbations
Pulmonary

- Other Conditions
  - Congenital issues
    - Was child born Term or Premie?
    - Was ventilation required as a neonate?
    - Was RSV an issue?
    - History of diaphragmatic hernia?

- Cancellation or delay conditions with URI
  - In general elective cases should be delayed 2-3 weeks to recover from URI
  - Antibiotics?
  - It is RARE to need PFT’s prior to surgery
Pulmonary

- Obstructive Sleep Apnea and Obesity
  - Often under diagnosed
  - If it is diagnosed it’s helpful to know
    - When was the diagnosis made
    - How compliant is the patient with CPAP
  - A treated patient is obviously a different patient than one lacking a diagnosis
Cardiovascular

- It is EXTREMELY helpful to quantify and qualify the severity of cardiovascular conditions.
- This organ system is by far the most important aspect of preoperative evaluation; therefore it deserves the most attention.
- There are several aspects that can be nebulous and may require consultation with an anesthesiologist for final direction.
Simplified cardiac evaluation for noncardiac surgery, Miller’s Anesthesia, 7th Edition
<table>
<thead>
<tr>
<th>MET</th>
<th>Functional Levels of Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eating, working at a computer, dressing</td>
</tr>
<tr>
<td>2</td>
<td>Walking down stairs or in your house, cooking</td>
</tr>
<tr>
<td>3</td>
<td>Walking 1-2 blocks</td>
</tr>
<tr>
<td>4</td>
<td>Raking leaves, gardening</td>
</tr>
<tr>
<td>5</td>
<td>Climbing 1 flight of stairs, dancing, bicycling</td>
</tr>
<tr>
<td>6</td>
<td>Playing golf, carrying clubs</td>
</tr>
<tr>
<td>7</td>
<td>Playing singles tennis</td>
</tr>
<tr>
<td>8</td>
<td>Rapidly climbing stairs, jogging slowly</td>
</tr>
<tr>
<td>9</td>
<td>Jumping rope slowly, moderate cycling</td>
</tr>
<tr>
<td>10</td>
<td>Swimming quickly, running or jogging briskly</td>
</tr>
<tr>
<td>11</td>
<td>Skiing cross country, playing full-court basketball</td>
</tr>
<tr>
<td>12</td>
<td>Running rapidly for moderate to long distances</td>
</tr>
</tbody>
</table>

MET, metabolic equivalent of the task. 1 MET = consumption of 3.5 mL O₂/min/kg of body weight.
Simplified cardiac evaluation for noncardiac surgery, Miller’s Anesthesia, 7th Edition
BOX 34-2
Revised Cardiac Risk Index

High-risk surgery (intraperitoneal, intrathoracic, or suprainguinal vascular procedures)*
Ischemic heart disease (by any diagnostic criteria)
History of congestive heart failure
History of cerebrovascular disease
Diabetes mellitus requiring insulin†
Creatinine >2.0 mg/dL

Cardiovascular

- Step 5: Clinical Predictors

  - The RCRI is incorporated in the 2007 ACC/AHA Guidelines
  - Incidence of major cardiac events are as follows:
    - Zero predictors = 0.4%
    - One predictor = 0.9%
    - Two Predictors = 7%
    - Three Predictors = 11%

  - When unsure, you always have the option of consulting a member of our department by call x2151
Cardiovascular

- Dyspnea on Exertion (DOE)
  - SOB, PND, Orthopnea and DOE might require evaluation to rule out cardiac etiology

- Angina now or in the past?
  - If a workup has occurred for MI what did it include?
    - ECG
    - Stress testing and if so what kind and what did it show?
    - Angiography – what was the result?
    - Echo – what was in the report?
Cardiovascular

- Known Coronary Artery Disease (CAD)
  - When was it diagnosed
  - What interventions have taken place
    - Medical Conservative vs. Interventional
  - How is it being managed and your thoughts on compliance
  - If seeing cardiologist, what is the frequency and what do their last notes indicate?
- If history of CABG
  - How many vessels and which vessels?
  - How long ago?
  - Most recent Echo – Please indicate or include the results
Cardiovascular

- Cardiac Stents?
  - When were they placed and under what circumstances
    - Bare metal
    - Drug Eluting (DES)
  - It is extremely helpful to know when they were placed, under what circumstances, and which kind they were
  - What is the anticoagulation regimen and what are cardiology recommendations with regards to surgery.
Patients with aspirin (75–150 mg/day)

Primary prevention

Secondary prevention after MI, ACS, stent, stroke, PAD

Intracranial neurosurgery

Stop 7 days before operation as needed

Patients with aspirin (75–150 mg/day) + clopidogrel (75 mg/day)

High-risk situations:
- <6 weeks after MI, PCI, BMS, stroke
- <12 months after DES
- High-risk stents*

High-risk situations:
- <6 weeks after MI, PCI, BMS, stroke
- <12 months after DES
- High-risk stents*

Low-risk situations**

All surgery

Risk of bleeding in closed space***

Stop clopidogrel
Maintain aspirin

Only vital surgery

Operation under continuous treatment

All surgery

*High-risk stents: long (>36 mm), proximal, overlapping, or multiple stent implantation, stents for chronic total occlusions, stents in small vessels or bifurcated lesions.

**Examples of low-risk situations: >3 months after BMS, stroke, uncomplicated MI, PCI without stenting.

***Risk of bleeding in closed space: intracranial neurosurgery, intra-medullary canal surgery, posterior eye chamber ophthalmic surgery. In these situations, the risk/benefit ratio of upholding vs withdrawing aspirin must be evaluated for each case individually; in case of aspirin upholding, early postoperative re-institution is important.
Cardiovascular

- Hypertension (HTN)
  - Description of the chronicity and severity of HTN will give a surrogate understanding of possible end organ damage
    - Ischemic heart disease
    - Renal insufficiency
    - Cerebrovascular disease
  - There is no evidence supporting cancellation of surgery with BP less than 180/110
    - A snapshot value is less important than what is the usual BP for the patient
Cardiovascular

- **Atrial Fibrillation**
  - New Onset, Chronic, or Paroxysmal
    - What is evaluation schedule and what do those reports say
    - Rate control?
    - Anticoagulation?
    - If they are not on meds what is the reason?

- **Aortic Aneurysms**
  - What is their location and what is the size
  - Is it stable or enlarging?
  - When was it last evaluated
Cardiovascular

- Pacemaker / AICD’s
  - When was it placed
  - Why was it placed
  - What are the settings and what did the last interrogation indicate
    - Last interrogation must be within last 3 months
    - Extremely important to know:
      - Current battery life
      - Chambers sensed and paced
      - What mode is it in
      - What happens when a magnet is placed
This is a preoperative evaluation of an implanted cardiac device in anticipation of surgery.

Date of Service: 11/5/2013

The patient is a 64 y.o. yo male who is implanted with a dual chamber pacemaker who is to undergo deep brain stimulator generator replacement. Device was last interrogated on 8/13/2013 at implant. Records of patients last clinic visit and device interrogation were reviewed. Recommendations for device management during surgery are provided below.

Device: Medtronic Advisa MRI A2DR01: serial number: PVY208212H implanted for sinus node dysfunction with a heart rate in the 40's.

Battery Life: Adequate

Programming: DDDR with lower rate of 70 ppm and upper sensor rate of 130 ppm.

Per Heart Rhythm Expert Consensus, patient does not need reprogramming. If pauses are noted with electrocautery, a ring magnet may be applied. This will activate an automatic pacing mode of 85 bpm DOO.

Recommendations for the intraoperative monitoring of patients with cardiac implantable electronic device (CIED):

- External defibrillation equipment is required in the OR and immediately available for all patients with pacemakers having surgical and sedation procedures or procedures where EMI (electromagnetic interference) may occur.
- Some patients may need to have pads placed prophylactically during surgery (e.g. high risk patients with pacemakers and patients in whom pad placement will be difficult due to surgical site.)
Cardiovascular

- Valvulopathy / Murmurs
  - When was diagnosis
  - Benign vs. Malignant
  - If followed by imaging what did the last echo indicate?
  - Most specifically it is important to know status of Aortic Stenosis and Mitral Stenosis

- Carotid Stenosis
  - If present without intervention what was the degree of occlusion
  - Has the patient been symptomatic?
Hepatic

- Presence of liver disease
  - Please qualify
    - Many of the commonly used drugs during anesthesia rely on hepatic clearance, therefore liver dysfunction might affect pharmacodynamics and pharmacokinetics of these agents.
Gastrointestinal

- Gastroesophageal Reflux (GERD)
  - Please indicate severity
  - If on H2 or PPI are they effective and what happens if they miss a dose
  - When was it diagnosed?
  - Is there evidence of a hiatal hernia?
    - Understanding GERD in detail provides great insight into aspiration potential and will guide a decision in airway management using an endotracheal tube (ETT) vs. a laryngeal mask Airway (LMA)
Gastrointestinal

- Inflammatory Bowel Syndrome
  - What type?
  - Are symptoms well controlled?
  - Frequency of diarrhea?
  - Steroids or anti-inflammatory regimens
    - Will patient need stress dosing in perioperative period?
    - Should we avoid NSAIDs as pain control modality?
Renal

- Chronic Renal Failure
  - Is the dysfunction worsening?
  - Has there been episodes of Acute Renal Failure (ARF)?
  - If the patient is dialysis dependent:
    - What is the schedule of treatment?
    - How long have they been dialysis dependent?
    - Is there an access fistula?
    - What is the plan in the perioperative period?
Musculoskeletal

- Joint disorders
  - Particularly shoulders, hips and knees which will guide us to intraoperative positioning

- Scoliosis
  - Is it severe enough to cause pulmonary compromise

- Down’s and Chronic Rheumatoid Arthritis
  - Both of these disorders have a probability of Atlantoaxial Subluxation (AAS) or Atlantoaxial Instability (AAI)
    - We will rarely delay a case for flexion/extension films, but it is helpful to know if the patient experiences paresthesias with pronounced neck movements
Endocrine

- Diabetes Mellitus
  - Type I or Type 2
  - Well, moderate or poor control?
  - For Type 2 are they using insulin
  - If using a pump we need details on basal rate and common bolus regimen
  - How long has the patient been diagnosed

- Hypothyroid
  - Stable dose of replacement or are adjustments underway

- Steroid Use for any condition
  - When and how much of a pulse?
Hematology

- Dyscrasias
  - Chronic Anemia
    - Please qualify. Having an understanding of baseline compensation will influence decisions to transfuse
  - Thrombocytemia or Thrombocytosis
    - What are your thoughts on cause and chronicity?
  - Previous DVT/PE?
    - Workup and description of PE (how much of lung was affected)
    - When did the event occur
    - Is the patient Factor V Leiden, Protein C or S dependent?
Hematology

- Anticoagulation
  - Coumadin
    - When is last dose planned to be held
    - Will the patient be bridged with lovenox or heparin
    - What is the usual INR?
Testing

- Handout illustrating our standards for labs
  - We would like to limit unnecessary testing
- Handout regarding indications for obtaining ECG
- Handout regarding indications for preoperative echocardiography
**BOX 34-3**

**Recommendations for Preoperative Resting 12-Lead Electrocardiogram**

**Class I**

A preoperative resting 12-lead ECG is recommended for patients with at least one clinical risk factor who are undergoing vascular surgical procedures

A preoperative resting 12-lead ECG is recommended for patients with known congestive heart failure, peripheral arterial disease, or cerebrovascular disease who are undergoing intermediate-risk surgical procedures

**Class IIa**

A preoperative resting 12-lead ECG is reasonable in persons with no clinical risk factors who are undergoing vascular surgical procedures

**Class IIb**

A preoperative resting 12-lead ECG may be reasonable in patients with at least one clinical risk factor who are undergoing intermediate-risk operative procedures

**Class III**

Preoperative and postoperative resting 12-lead ECGs are not indicated for asymptomatic persons undergoing low-risk surgical procedures

Class I recommendations: the procedure *should* be performed; class IIa: it is reasonable to perform the procedure; class IIb: the procedure may be considered; class III: the procedure *should not* be performed because it is not helpful.

BOX 34-4
ACC/AHA Guideline Summary—Echocardiography in Asymptomatic Patients with Cardiac Murmurs

Class I—There is evidence or general agreement (or both) that echocardiography is useful in asymptomatic patients with the following cardiac murmurs:

- Diastolic murmurs
- Continuous murmurs
- Late systolic murmurs
- Murmurs associated with ejection clicks
- Murmurs that radiate to the neck or back
- Grade 3 or louder systolic murmurs

Class IIa—The weight of evidence or opinion is in favor of the usefulness of echocardiography in asymptomatic patients with the following cardiac murmurs:

- Murmurs associated with other abnormal physical findings on cardiac examination
- Murmurs associated with an abnormal electrocardiogram or chest radiograph

Class III—There is evidence or general agreement (or both) that echocardiography is not useful in asymptomatic patients with the following murmurs:

- Grade 2 or softer midsystolic murmurs considered innocent or functional by an experienced observer

References

- American Society of Anesthesiologists
- American College of Cardiology
- American Heart Association
- Miller’s Anesthesia, 7th Edition