Optimizing Outcomes with Preoperative Assessment

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Disclosure

• No real or potential conflict of interest to disclose.
• No off-label, experimental or investigational use of drugs or devices will be presented.

Objectives

• Upon completion of this program the participant will:
  – Demonstrate knowledge of the myths and facts related to preoperative clearance.
  – Apply to practice knowledge of current and future trends for surgical procedures done in the United States.
Objectives (continued)

- Upon completion of this program the participant will: (cont.)
  - Demonstrate knowledge of the American Society of Anesthesiologists risk stratification of patients undergoing surgery.

Objectives (continued)

- Upon completion of this program the participant will: (cont.)
  - Improve practice based on the knowledge learned from evidence-based recommendations for preoperative patient preparation, including: Diagnostic and ancillary testing needed according to patient comorbidities, age, and types of surgery proposed.

References

- Listed at the end of the program
True or False

• “Medical clearance” for surgery can imply that the surgery will go well.

False

• Even with proper evaluation, any surgical procedure can lead to complications.
• The purpose of the preoperative evaluation is to identify and treat the patient’s medical risks. It cannot predict surgical outcomes.

Fact (continued)

• Types of surgery most commonly performed in older patients include
  - TURP
  - Cataract repair
  - Orthopedic procedures
  - Abdominal aortic aneurysm repair
Fact (continued)

- The risk of death during surgery is 5–10% in those aged 65 years and above, compared to 0.9% up to age 65.

Fact (continued)

- People over age 65 years comprise 11% of the population.
- Persons older than age 65 years will increase 25–35% over the next 30 years and undergo 20–40% of surgical procedures and account for 50% of surgical emergencies.

Goals of Preoperative Assessment

- Optimize patient care and comfort.
- Minimize perioperative morbidity and mortality.
- Evaluate the patient’s health status, determining if any preoperative investigations and specialty consultations are required.
- Provide time-efficient and cost-effective patient evaluation.
Surgical Risk Classification

• **High risk**
  - High physiologic impact
  - EBL > 500 mL
  - Could place the patient in a critical care state
• **Examples:** AAA surgery, surgery with large fluid shifts, multiple orthopedic procedures

Surgical Risk Classification (continued)

• **Medium risk**
  - Moderate to significantly invasive procedure
  - EBL < 500 mL
• **Examples:** CEA, most orthopedic surgeries, open prostate surgery, intra-abdominal, endovascular, and intrathoracic procedures

Surgical Risk Classification (continued)

• **Low risk**
  - Minimal impact to patient
  - Minimally invasive procedure
  - Little or no blood loss
• **Examples:** Endoscopic procedures, cataracts, breast biopsy
Functional Class

• 1 = Normal healthy patient
• 2 = Patient with mild systemic disease
• 3 = Patient with severe systemic disease
• 4 = Patient with incapacitating disease that is a constant threat to life

ASA Assignment of Physical Classification

Class 1
- Normal healthy patient

Class 2
- Systemic disease that results in no functional limitations (well-controlled)
  - HTN
  - DM
  - Chronic bronchitis
  - Morbid obesity
  - Extremes of age (<1 yr and >70 yr)

ASA Assignment of Physical Classification (continued)

Class 3
- A patient with severe systemic disease that results in functional limitations
  - Poorly controlled HTN
  - DM with vascular complications
  - Angina pectoris
  - Prior MI
  - Pulmonary disease that limits activity
ASA Assignment of Physical Classification (continued)

- Class 4
  - A patient with severe systemic disease that is a constant threat of life
    - Unstable angina
    - Advanced pulmonary, renal or hepatic dysfunction

- Class 5
  - A moribund patient who is not expected to survive without the operation
    - Ruptured AAA
    - PE
    - Head injury with increased ICP

ASA Assignment of Physical Classification (continued)

- Class E Emergency
  - Any patient in whom an emergency operation is required

- Class 6
  - A declared brain dead patient whose organs are being removed for donor purposes
General Information

- Do the preoperative workup close enough to the date of surgery so that the test results are current for the anesthesia provider and surgeon.
- 10 days before surgery is a good time to start the workup.

General History

Nutritional Status

- Suboptimal nutrition is a main contributor to postoperative complications.
- Gradual weight loss may be experienced with aging.
- A rapid weight loss can indicate an underlying disease.
Nutritional Status
(continued)

• Malnourishment is defined as a greater than 5% weight loss in 1 month or greater than 10% over 6 months.
• Serum albumin less than 3.2 g/dL (32 g/L) or lymphocyte count <3,000 can indicate malnourishment.

Nutritional Status
(continued)

• Normals
  – WBC: 6,000–10,000 $\times 10^3$/microliter
  – Lymphs: 20–40% WBC
  – Absolute lymphs: 1,000–3,500 cells/microliter
• Example
  – Total WBC: 2,800 $\times 10^3$/microliter
  – % lymphocytes: 15%
  – Absolute lymphocytes: 420 cells/microliter

Nutrition

• Causes of malnutrition can range from the surgical condition of the patient to social isolation, financial constraints, poor dentition, depression, occult malignancy, or severe infection.
Nutrition (continued)

- Obesity
  - A higher incidence of undiagnosed CV disease and diabetes in the obese population with a BMI of greater than 27 kg/m²
  - Increase wound dehiscence and infection as sub-Q fat layer enlarges

- Obesity (cont.)
  - Increased risk of pulmonary complications from abdominal content pressure on the diaphragm
  - Anesthesia difficulties

Emotional State

Legal State

- Depression, fear, and anxiety should be considered.
- Competency issues must be addressed prior to the patient signing an informed consent.
- Guardianship and power of attorney should be identified if necessary.
**Allergies**
- Latex
- Iodine, contrast dye, shellfish
- Antibiotics
- Adhesives
- Local anesthetics
- “Delineate true allergy from a known adverse effect”

**Past Medical History**
- CV/pulmonary/diabetes
- All past medical issues including a personal history of bleeding disorders/bleeding diathesis
- HIV/hepatitis
- Organ transplant/artificial joints
- Pregnancy

**Surgical History**
Immunizations

- Update immunizations at time of preoperative physical evaluation.

Social History

- Smoking history
- ETOH
- Recreational drugs
- Caffeine intake

Social History (continued)

- Smoking: Increased secretions, increased risk of pulmonary complications
  - Stop smoking 8 weeks prior to surgery.
Social History (continued)

- ETOH: Patients can develop postoperative withdrawal (delirium tremens).

Medications

- Medications patient is taking
- Opioids: Chronic use can build tolerance.
- Vasoactive drugs: In combination with MAOIs or TCAs can lead to HTN/ hypotension crisis and lethal hyperthermia

Family History
Anesthetic Implications

- Patient and blood relative anesthetic history
  - Malignant hyperthermia
  - G6PD deficiency
  - Neurological disorders
  - PONV
  - Sickle cell disease
  - Difficult intubation in past
  - Dentition
  - Neck or jaw immobility
  - Hoarseness

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Medical Evaluation

Cardiac Evaluation

- The most common adverse events following surgery are cardio-pulmonary.
  - Accounting for 40% of deaths
Cardiac Evaluation (continued)

- Patient’s capacity to increase cardiac output in response to intraoperative and postoperative stress is one of the most fundamental aspects of outcome after surgery.

- 50,000 patients experience perioperative MI/year.
- 1 million patients experience perioperative cardiac complications/year.
- Major postoperative complications include cardiac arrhythmias, CHF, acute MI, and cardiac death.

Cardiac Evaluation (continued)

- Is the surgery needed? Is it emergent or elective?
- Has the patient undergone revascularization in the last 5 years?
- Has the patient received a recent coronary evaluation?
Cardiac Evaluation
(continued)

- If procedure is emergent and the patient's life depends on it, the patient must proceed for surgery.
- If elective, further workup may be necessary to determine the presence of underlying cardiac disease (CAD, CHF, valvular disease, arrhythmias).

Cardiac Evaluation
(continued)

- Depending on the results of the workup, the patient may be cleared for surgery, treated medically, or referred for invasive testing.
- This may lead to coronary revascularization prior to an elective procedure.

Cardiac Evaluation

Cardiac Evaluation (continued)

• (*) Initial evaluation for elective surgery involves review of the patient’s medical history, physical examination, functional status evaluation

Cardiac Evaluation (continued)

• History
  – Preexisting cardiac disease
  – Disease severity, stability and prior treatment
  – Comorbidity: DM, CKD, CHF, AS, unstable angina, cerebrovascular disease, recent MI, *PAD
  – Type of surgery to be performed

Cardiac Evaluation (continued)

• Risk stratification: **High risk or unstable**: Need cardiac issues resolved before undergoing a surgical procedure
  – Revascularization within the past 6 weeks
  – CHF worsening or new onset
  – *EF of <35% at rest increases perioperative risk
Cardiac Evaluation (continued)

• MI in last 3 months
  – Risk of reinfarction after an elective procedure performed within 3 months of the MI exceeds 30% and decreases to 4.6% after 6 months.
• CABG<6 weeks prior to elective procedure
• Malignant or symptomatic arrhythmias/high grade AV blocks
• Age>70 years

Cardiac Evaluation (continued)

• Severe valvular disease aortic stenosis with valve area of <1 cm square or symptomatic mitral disease

Cardiac Evaluation (continued)

• Intermediate risk patients:
  – Generally can proceed to surgery if their functional status is adequate
    • Functional capacity ≥ to 4 METS
• Hx of ischemic heart disease
• Controlled CAD
Cardiac Evaluation (continued)

• Hx of compensated CHF or prior heart failure
• Cerebral vascular disease (hx of stroke or TIA)
• DM
• Renal insufficiency
• *Low ejection fraction at rest <35%

Low risk:
- Patients can proceed to surgery without additional cardiac workup, unless scheduled for high-risk procedures or have poor functional capacity.
- Prior CABS/PCI > 6 yrs without ischemic symptoms

Low risk (cont.):
- Recent revascularization > 3 months, negative stress test in past 2 years
- HTN – Controlled
- LVH – Stable
Cardiac Evaluation (continued)

• Functional status
  – Can you take care of yourself?
  – Walk indoors around the house?
  – Walk a block or 2 on level ground at 2–3 mph?
    • Equivalent 1–4 METs

• Functional status (cont.)
  – Can you climb up a flight of stairs or walk up a hill?
  – Run a short distance?
  – Do heavy work around the house?
  – Golfing, bowling, dancing?
    • Equivalent of 4–10 METS

• Functional status (cont.)
  – Can you participate in strenuous sports like swimming, football, basketball or skiing?
    • Equivalent of greater than 10 METs
Cardiac Evaluation
(continued)

• Physical examination
  – Overall appearance
  – Funduscopic examination
  – Neck: JVD, bruits
  – Heart: Heart sounds, murmurs, LVH, BP
  – Lungs
  – Abdomen
  – Extremities: Edema
  – Neurologic

Cardiac Testing

• *Preoperative resting 12-lead ECG is reasonable in persons with known CAD, significant arrhythmia, PAD, CVD or significant structural heart disease, except if undergoing low-risk procedures.
• Preoperative resting 12-lead ECG may be reasonable in asymptomatic patients without known CAD, except for those undergoing low-risk procedures.

• Preoperative resting 12-lead ECGs are not indicated in asymptomatic persons undergoing low-risk surgical procedures.

• ECG findings of significance include:
  - High-degree AVB
  - Arrhythmias
  - Bradycardia
  - BBB
  - Prolonged QT
  - LVH
  - ST depressions
Cardiac Evaluation (continued)

- Optimal interval between obtaining a 12-lead ECG and elective surgery is ?.
- In general 1 to 3 months interval is adequate for stable patients.

Cardiac Evaluation (continued)

- Holter monitoring
  - Holter monitoring is useful in documenting arrhythmias.

Cardiac Evaluation (continued)

- *Exercise stress testing
  - If elevated risk and excellent functional capacity (>10 METs), it is reasonable to forgo further exercise testing and cardiac imaging and proceed to surgery.
  - If elevated risk and unknown functional capacity, it may be reasonable to perform exercise stress test to assess functional capacity if it will change management.
Cardiac Evaluation
(continued)

• *Exercise stress testing (cont.)
  – If elevated risk and moderate functional capacity (4 to 10 METs), it is reasonable to forgo exercise testing with cardiac imaging and proceed to surgery.

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Cardiac Evaluation
(continued)

• *Exercise stress testing (cont.)
  – If elevated risk and poor (<4 METs) or unknown functional capacity, it is reasonable to perform exercise testing with cardiac imaging to assess for ischemia if it will change management.
  – Routine screening is not useful for patients at low risk for noncardiac surgery.

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Cardiac Evaluation
(continued)

Pharmacological stress testing

• *Reasonable if elevated risk and poor functional capacity (METs <4), dobutamine stress echocardiogram or pharmacological stress test (adenosine or dipyridamole) with thallium and/or technetium-99 and rubidium-82

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Cardiac Evaluation (continued)

**LV function**

- It is reasonable for patients with dyspnea of unknown origin to undergo preoperative LV function testing.

**Echocardiogram**

- It is reasonable in patients with heart failure with worsening dyspnea or other change in clinical status to undergo preoperative evaluation of LV function.

- Reassessment of LV function in clinically stable patients with previously documented LV dysfunction may be considered if there has been no assessment within a year.

- Routine preoperative evaluation of LV function is not recommended.
Timing of elective noncardiac surgery in patients with previous PCI

- Elective noncardiac surgery should be delayed within 14 days after balloon angioplasty, 30 days of bare-metal stent implantation or within 12 months of drug-eluting coronary stent implantation.

Timing of elective noncardiac surgery in patients with previous PCI (cont.)

- Elective noncardiac surgery after DES may be considered after 180 days if risk of further delay is greater than the expected risks of ischemia or stent thrombosis.
Cardiac Evaluation (continued)

• *Timing of elective noncardiac surgery in patients with previous PCI (cont.)
  - Elective noncardiac surgery should not be performed within 30 days after BMS or within 12 months after DES when dual antiplatelet therapy will need to be discontinued postoperatively.

Cardiac Evaluation (continued)

• *Timing of elective noncardiac surgery...(cont.)
  - Elective noncardiac surgery should not be performed within 14 days of balloon angioplasty in patients in whom ASA will need to be discontinued postoperatively.
Cardiac Evaluation (continued)

• PCI before noncardiac surgery should be limited to patients with left main disease whose comorbidities preclude CABG and those with unstable CAD who would be appropriate candidates for emergency or urgent revascularization.

Cardiac Evaluation (continued)

• Patients whose evaluation recommends CABG surgery should undergo coronary revascularization before an elevated-risk surgical procedure.

Cardiac Evaluation (continued)

• Antibiotics
  - Antibiotic prophylaxis for bacterial endocarditis is utilized for
    • Prosthetic cardiac valve or prosthetic material used for cardiac valve repair
    • Previous infective endocarditis
    • Congenital heart disease
    • Cardiac transplantation recipients
Cardiac Evaluation (continued)

- Hypertension
  - Controlled HTN does not appear to increase perioperative risk, uncontrolled HTN does.
  - Uncontrolled HTN increases risk of bleeding during surgery and hematoma formation.

Cardiac Evaluation (continued)

- Patients with pacemakers or defibrillators should be identified.

Pulmonary Evaluation

- Postoperative pulmonary complications occur more often in patients
  - Age 60 years and older
  - Respiratory symptoms (URI, asthma COPD)
Pulmonary Evaluation (continued)

- Postoperative pulmonary complications occur...
  (cont.)
  - Abnormal findings on PE
  - Abnormal chest x-ray
  - Current smoking history
  - Longer than 3 hours anesthetic time
  - Surgery at upper abdomen or thoracic site

Pulmonary Evaluation (continued)

- Patients with COPD or asthma must have those conditions stabilized before undergoing surgery.
- Pulmonary consult may be necessary.

Pulmonary Evaluation (continued)

- An ABG analysis, chest x-ray, and PFTs should be ordered for all patients with pulmonary disease.
- Explain to the patient with severe pulmonary disease that a respirator could be necessary after surgery.
- Patients with URI may need to have surgery cancelled until infection has cleared due to increased respiratory complications.
Pulmonary Evaluation (continued)

- Predicting airway difficulty by history
  - Surgery in and around the airway
  - Recent trauma face, neck, chest
  - Tumor/irradiation
  - Nasal fracture
  - Goiter
  - Obesity

Mallampati airway assessment: Evaluation of airway difficulty
- Patient sitting erect, have them open mouth and look in posterior pharynx
  - Mallampati
    - Class 1
      - Soft palate, uvula, pillars present

Mallampati airway assessment: (cont.)
- Mallampati (cont.)
  - Class 2
    - Soft palate, uvula
  - Class 3
    - Soft palate, base of uvula present
  - Class 4
    - Hard palate visible only
Mallampati Airway Assessment

Pulmonary Evaluation (continued)

- The patient who smokes should stop smoking at least 8 weeks before surgery.

Endocrine Evaluation

- The objectives of the endocrine evaluation
  - To rule out the existence of DM, thyroid disease, or other endocrine issues
• Diabetes mellitus
  – How well is the disease controlled?
  – Consequences of poorly controlled disease

True or False
• You would advise your patient to take his/her normal oral diabetic medications the day of a planned surgery. **False!**

• Oral diabetic medications should not be administered the day of a planned surgery in type 2 DM.
• Elevated BS will be covered by short-acting regular insulin.
Endocrine Evaluation (continued)

• Type 1 diabetics will have their BS managed by boluses of regular insulin; their AM regular insulin dose will be held and in most; 1/3 dose of their AM long-acting will be given DOS.

• Patients on insulin pumps should be managed with endocrine and anesthesia consult.
  – Basal rate should be continued.

• A general target for intraoperative maintenance of blood glucose is 140–180 mg/dL (7.77–9.99 mmol/L).

• Complications of poorly controlled DM include DKA and HHNK/HHS and higher risk of postoperative infection.
Endocrine Evaluation
(continued)

• Chronic hyperglycemia can lead to glycosylation of tissue proteins and a limited-mobility joint syndrome.

Endocrine Evaluation
(continued)

• Thyroid
  – Patients should be euthyroid before surgery.
  – Patients who are mildly hypothyroid can proceed to surgery.
  – Patients with hyperthyroidism should be made euthyroid unless surgical emergency.

Endocrine Evaluation
(continued)

• Thyroid and anti-thyroid medications should be taken through the morning of surgery.
Endocrine Evaluation (continued)

- Adrenal cortical disorders
  - Adrenal insufficiency (deficiency of adrenal cortical function) can be triggered in corticosteroid-dependent patients who do not receive increased doses of corticosteroid during periods of stress (surgery).

Endocrine Evaluation (continued)

- Symptoms of adrenal suppression include:
  - Cardiovascular collapse
  - Hyponatremia
  - Hyperkalemia
  - Severe volume depletion
  - Mental status changes

Endocrine Evaluation (continued)

- All patients who have received the equivalent of 5 mg of prednisone by any route (topical, inhalation, or oral) for more than 2 weeks any time in the past 12 months should be considered unable to respond to surgical stress.
Acute renal failure is the cause of death in 20% of elderly patients post-operatively.

Renal disease can contribute to bleeding because of a functional platelet deficit associated with renal impairment. Renal dysfunction leads to:
- Anemia
- Electrolyte disturbances
- Peripheral neuropathy

When vasodilatation and hypotension occurs during surgery, these patients can experience cardiac arrest and renal failure.
Renal Evaluation (continued)

- Most accurate reflection of renal reserve (GFR) is creatinine clearance. It reflects the ability of glomeruli to excrete creatinine into the urine at a given blood concentration.

GI Evaluation

- GI diseases increase the risk for
  - Aspiration of gastric content
  - Dehydration
  - Electrolyte disturbance
  - Anemia

GI Evaluation (continued)

- In a patient with a history of liver disease, PT and INR testing are warranted to rule out coagulopathy.
Hematology Evaluation

• A CBC is probably indicated in most surgical patients, although it is not always ordered.

(continued)

• PT, INR, PTT, ACT, and platelets are indicated if there is evidence of
  – A bleeding disorder in the H&P
  – A family history of coagulopathy
  – If the patient is on antithrombolytic therapy
  – If high risk surgical procedures are entertained

WBC Differential

• Infection
• Disease of WBCs
• Undergoing radiation or chemotherapy
• Hypersplenism
• Aplastic anemia
Neurologic Evaluation

• Patients with neurologic diseases can undergo surgery, but the specific condition and medical management must be carefully noted.

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Neurologic Evaluation (continued)

• High risk patients include those with bruits or cardiovascular disease.
  – Can require duplex ultrasound of the carotids to evaluate for significant stenosis > 70%

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Neurologic Evaluation (continued)

• Therapeutic medical management preoperatively may or may not prevent a seizure during surgery.
• Continue patients on their anti-seizure medications up until the day of surgery.

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• Patients with dementia or preoperative delirium are at greater risk for developing postoperative delirium.

• Independent risk factors for delirium include:
  – Advanced age
  – MI
  – Hypoxia
  – Hypotension
  – Dementia
  – Stroke
  – Constipation
  – Ulcer
  – Bleeding
  – Trauma
  – Pain
  – Infection

• Independent risk factors for delirium include (cont.):
  – Hypoalbuminemia
  – Medications
  – Sensory deprivation
  – Urinary retention
  – Electrolyte abnormalities
### Ancillary Testing

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#### ECG
- Rheumatic fever/heart murmurs
- Heart disease
- Known or suspected cardiac abnormalities
- SOB with climbing 1 flight of stairs or running a short distance
- HTN

#### CBC
- Potentially bloody operation
- Known anemia
- Bleeding disorder
- Hematologic malignancy
- CRF
- Undergoing radiation and chemotherapy
Electrolytes

- Age over 60 years
- Use of diuretics
- Renal disease
- HTN/cardiac disease, DM
- Fluid or electrolyte abnormality (SIADH, DI, liver disease, fever, diarrhea)

Comprehensive Chemistry Profile

- Age >60 years
- DM
- Renal disease
- Cardiac disease
- Adrenal, pituitary, liver, GI, pancreatic, parathyroid disease, radiation or chemotherapy

Coagulation Testing

- Known or suspected coagulation disorder
- Anticoagulant therapy
- Hemorrhage or anemia
- Thrombosis
- Liver disease, renal disease
- Malabsorption or poor nutrition
Urinalysis

- DM
- UTI
- Renal disease
- Electrolyte and some endocrine disorders

Thyroid

- Routine thyroid studies—TSH

Pregnancy Test

- Urine or serum pregnancy test in all women of childbearing age with intact ovaries and uterus
Chest X-ray

- All patients with pulmonary/cardiac disease
- Surgery near or at the level of thorax and diaphragm
- Age > 50 years (questionable)
- Smokers with no other risk factors age 50 years and beyond

Medications – General Guidelines

- *Give beta blockers the AM of surgery if previously on them.
- *ACEI and ARBS
  - Consider continuing or discontinuing the AM of OR
- *Continue CA channel blockers
- Continue statins

(continued)

- Clopidogrel (Plavix®) & other P2Y12 Inhibitors
  - Consult surgeon/cardiology
  - Discontinue 7 days before OR
  - Do not discontinue clopidogrel (Plavix®) with drug-eluting stent (DES) until they have completed 12 months of anti-platelet therapy.
Medications—General Guidelines (continued)

• Clopidogrel (Plavix®) & other P2Y12 Inhibitors (cont.)
  – Do not discontinue clopidogrel (Plavix®) with bare-metal stent (BMS) until they have completed 1 month of antiplatelet therapy.

Medications—General Guidelines (continued)

• Warfarin should be discontinued 5 days prior to OR.
  – Check INR– Must be 1.5 or below especially if undergoing surgery with high-risk bleeding risk
  – Consult with surgeon

Medications—General Guidelines (continued)

• ASA/ASA containing products
  – Follow guidelines for management of antiplatelet therapy for discontinuation
  – Continue if patient has a cardiac stent
Medications—General Guidelines (continued)

• Factor Xa Inhibitors (dabigatran [Pradaxa®]) should be discontinued 1–2 days before OR if GFR is normal or 3–5 days before OR if GFR is decreased.
  - Consult with surgeon/cardiologist

• Atrial fibrillation
  - Warfarin can be discontinued without interim use of heparin except in high-risk patients with A-Fib.
    • Hx of previous embolization, known atrial thrombus
    • Consult cardiology

• Patients with heart-valve prosthesis substitute unfractionated heparin or LMWH (bridging) for warfarin
  - Discontinue heparin 6 hours before surgery
  - Monitor PTT
  - With LMWH—Discontinue 12–24 hours before surgery with general anesthesia
Medications– General Guidelines (continued)

• NSAIDs
  – COX-1 inhibitors—Discontinue 7 days before OR
  – COX-2 inhibitors have no effect on platelets.

Medications– General Guidelines (continued)

• Corticosteroids
  – Chronic steroid use prior to surgery will require additional doses to prevent adrenal crisis.
  – Chronic use of steroids can also delay wound healing and increase the risk for infection.

Medications– General Guidelines (continued)

• Contraceptives
  – For major surgeries if on contraception (combined estrogen and progesterone)
    • Switch to alternative contraception 4–6 wks before OR
    • Continue combined estrogen and progesterone and receive LMWH
Medications—General Guidelines (continued)

• Psychotropic agents
  – Continue SSRIs, SNRIs, neuroleptics, and benzodiazepines before OR

• OTC products with antiplatelet/anticoagulation properties: 4Gs, 3Fs, L&C and others
• Discontinue 2 weeks before an elective surgical procedure

• 4Gs
  – Garlic, ginger, ginseng, gingko

• 3Fs
  – Feverfew, fish oil, fenugreek

• L&C
  – Licorice, coenzyme Q10
Advanced Directives

• If patient is severely or terminally ill discuss with them a plan in case they can no longer make decisions!

End of Presentation
Thank you for your time and attention.

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References


References (continued)


References (continued)


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