

**Preoperative Assessment**

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**Disclosure**

- None

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**Audience Response:**

**ttpoll.com**

**Session ID: ndafp**

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**My favorite runs can be found . . .**

- A. Off Swift Current . . . I am a "Mr. K" kind of a skier
- B. Off of Challenger – blacks/double blacks all day for me!
- C. Ram Charger – the bluer the better
- D. Moonlight - I like to cruise by the mansions

0% 0% 0% 0%

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**Objectives**

- Distinguish between preoperative assessment and preoperative clearance
- Define the goals of a thorough preoperative assessment
- Define risk based on type of surgery
- Recognize which testing is appropriate based on history and physical

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**Outline**

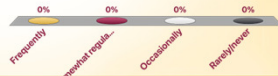
- Preoperative Evaluation
  - Defining goals
  - Evidence
  - How to choose the right tests
- Risks of anesthesia
- Surgical Risk
- Cardiac Testing
  - A look at risk calculation and an algorithmic approach
  - Lab tests
- Pulmonary evaluation
- A closer look at specific lab tests

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## I see patients for preoperative assessment

- A. Frequently
- B. Somewhat regularly
- C. Occasionally
- D. Rarely/never



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72-year-old male is being evaluated for an inguinal herniorrhaphy. He has OA, but jogs 3-5 miles several times per week. No meds and NKDA. Which preoperative tests are necessary?

- A. CBC
- B. PT/PTT
- C. ECG
- D. All of the above
- E. None of the above



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## Preoperative Evaluation

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**"The patient is cleared for surgery"**

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## "Clearance"

- Terminology is misleading
  - Implies absence of significant risk

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## Goal of Preop Evaluation

- Evaluate pt readiness
- Optimize health
- Reduce morbidity and length of stay
- Return pt to normal functioning

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## Issues to be addressed

- What is the pt's risk of complications?
- Would further risk stratification alter pt. management?
- Can anything be done to reduce the pt's risk?



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## Preoperative Lab Testing

- Routine laboratory testing should be avoided
- Unnecessary testing leads to:
  - Increased abnormal results
  - Delays or cancellations in surgery
  - Inconvenience for the patient
  - Unnecessary workup
    - Increased medical costs
    - Possible increased morbidity from interventions



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## Lab testing, cont.

- Stanford preop clinic
  - 55% reduction in preop tests ordered
  - 59% reduction in expenditures for preop tests
    - \$112 savings per patient
- Bernstein et al.
  - 250 patients for hip fx surgery
  - Any testing beyond "basic labs"
  - Mean time-to-surgery
    - 73 hrs vs. 37 hrs (additional preop testing vs. not)
    - Mean LOS 12 days vs. 9 days



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## Routine ECG

- No more predictive than H&P and patient's activity level (van Klei, et al.)
  - Assessed 2,400 pts over the age of 50



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## Special Article Preoperative Medical Testing in Medicare Patients Undergoing Cataract Surgery

Catherine L. Chen, M.D., M.P.H., Grace A. Lin, M.D., M.A.S., Naomi S. Bardach, M.D., M.A.S., Theodore H. Clay, M.S., W. John Boscardin, Ph.D., Adrian W. Gelb, M.B., Ch.B., Mervyn Maze, M.B., Ch.B., Michael A. Gropper, M.D., Ph.D., and R. Adams Dudley, M.D., M.B.A.

N Engl J Med  
Volume 372(16):1530-1538  
April 16, 2015



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## Preoperative Lab Testing

- 440,857 patients
- Expenditures on testing during that month before surgery were \$4.8 million higher (42%)
- Expenditures on office visits \$12.4 million higher (78% higher) than the mean monthly expenditures during the preceding 11 months.



Chen CL et al. N Engl J Med 2015;372:1530-1538

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## Study Overview

- Routine preoperative testing is not recommended before cataract surgery.
- In this analysis of Medicare claims data, preoperative testing was common and varied widely among ophthalmologists; the ophthalmologist performing the surgery was the strongest predictor of testing.

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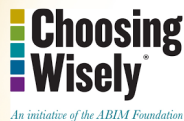
## ABIM – Choosing Wisely

### Our Mission

- The mission of *Choosing Wisely* is to promote conversations between clinicians and patients by helping patients choose care that is:
  - Supported by evidence
  - Not duplicative of other tests or procedures already received
  - Free from harm
  - Truly necessary

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## Preoperative Lab Testing



An initiative of the ABIM Foundation

Don't obtain baseline laboratory studies in patients without significant systemic disease (ASA I or II) undergoing low-risk surgery.

Don't perform stress cardiac imaging or advanced non-invasive imaging as a pre-operative assessment in patients scheduled to undergo low-risk non-cardiac surgery.

Don't obtain baseline diagnostic cardiac testing (trans-thoracic/esophageal echocardiography – TTE/TEE) or cardiac stress testing in asymptomatic stable patients with known cardiac disease (e.g., CAD, valvular disease) undergoing low or moderate risk non-cardiac surgery.

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## Preoperative Lab Testing



An initiative of the ABIM Foundation

Avoid admission or preoperative chest x-rays for ambulatory patients with unremarkable history and physical exam.

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## Preoperative Lab Testing

- Preoperative Laboratory testing should be based on H&P, review of medical records, and type of procedure
- Routine coagulation studies are not recommended
- Avoid testing in healthy patients and those having low risk procedures

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## Risks and Benefits of Different Anesthetic Plans



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"First Operation Under Ether" by Robert C. Hinckley

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## Risks and Benefits of Different Anesthetic Plans

- "In the advent of new anesthesia techniques, drugs, and enhanced training, anesthesia-mortality risk has declined from about"
  - 1 death in 1000 anesthesia procedures in the 1940s
  - 1 in 10,000 in the 1970s
  - 1 in 100,000 in the 1990s and early 2000s.

[Anesthesiology. 2009 Apr; 110\(4\): 759-765.](#)

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## Risks and Benefits of Different Anesthetic Plans

- General Anesthesia
- Neuraxial Anesthesia
- Other Regional Anesthesia
- Monitored Anesthesia Care

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Low surgical risk (<1%)	Intermediate surgical risk (1-5%)	High surgical risk (>5%)
<ul style="list-style-type: none"> <li>• Breast</li> <li>• Dental</li> <li>• Endocrine: thyroid</li> <li>• Eye</li> <li>• Gynaecological: minor</li> <li>• Orthopaedic: minor (meniscectomy)</li> <li>• Reconstructive</li> <li>• Superficial surgery</li> <li>• Urological: minor (transurethral resection of the prostate)</li> <li>• VATS: minor lung resection</li> </ul>	<ul style="list-style-type: none"> <li>• Carotid asymptomatic (CEA or CAS)</li> <li>• Carotid symptomatic (CEA)</li> <li>• Endovascular aortic aneurysm repair</li> <li>• Head or neck surgery</li> <li>• Intraoperative: splenectomy, hiatal hernia repair, cholecystectomy</li> <li>• Intrathoracic: non-major</li> <li>• Neurological or orthopaedic: major (hip and spine surgery)</li> <li>• Peripheral arterial angioplasty</li> <li>• Renal transplant</li> <li>• Urological or gynaecological: major</li> </ul>	<ul style="list-style-type: none"> <li>• Adrenal resection</li> <li>• Aortic and major vascular surgery</li> <li>• Carotid symptomatic (CAS)</li> <li>• Duodenal-pancreatic surgery</li> <li>• Liver resection, bile duct surgery</li> <li>• Oesophagectomy</li> <li>• Open lower limb revascularization for acute limb ischaemia or amputation</li> <li>• Pneumectomy (VATS or open surgery)</li> <li>• Pulmonary or liver transplant</li> <li>• Repair of perforated bowel</li> <li>• Total cystectomy</li> </ul>

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## Cardiac Testing

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## ECG

- Consider in CAD, arrhythmia, PAD, CVD, structural heart dz
  - ST depression and baseline tachycardia = predictors of increased morbidity/mortality
- Not useful for asymptomatic pts undergoing low risk sx
- Reasonable to accept ECG within 1 year

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## Preoperative Cardiac Assessment



- 2014 ACC/AHA Guideline on Perioperative Cardiovascular Evaluation and Management of Patients Undergoing Noncardiac Surgery: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines
- Major Adverse Cardiac Event (MACE)
  - Myocardial Infarction
  - Nonfatal Cardiac Arrest
  - Cardiac Death

J Am Coll Cardiol. 2014 Dec 9;64(22):e77-137

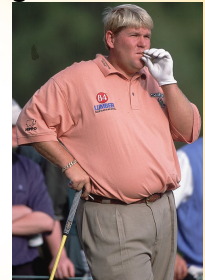
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## Preoperative Cardiac Assessment – Stress Testing



- 2014 ACC/AHA Guideline
- Patients who are at elevated risk for MACE AND
- METS < 4 can be considered for preoperative cardiac stress testing
- Will further testing impact decision making or perioperative care?



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## Risk Calculators for MACE



- Revised Cardiac Risk Index (RCRI)
- American College of Surgeons' National Surgical Quality Improvement Project (NSQIP) risk calculator

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## Risk Calculators for MACE



- RCRI
  - In use since 1999
  - Externally validated
  - Only estimates cardiac risk
  - Only 6 criteria
  - Most common risk calculator used currently

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## Risk Calculators for MACE



- Revised Cardiac Risk Index (RCRI)
  - Coronary Artery Disease
  - Congestive Heart Failure
  - Cerebrovascular Disease
  - Insulin dependent diabetes
  - High Risk Surgery
  - Preoperative Cr > 2

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## Risk Calculators for MACE



- RCRI
  - Low Risk (1, 0.9%)
  - Moderate Risk (2, 6.6%)
  - High Risk (3, >11%)

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## Troponins

- May have some utility preop, but more studies needed



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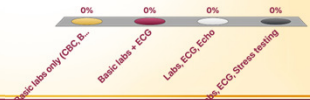
A 71 year-old male presents to the preoperative clinic in preparation for a left total hip replacement. Hx of DM 2, HTN, obesity, arthritis, and GERD. The patient lives on a 1<sup>st</sup> story apartment and rarely does any physical activity due to arthritis.

- Basic labs only (CBC, BMP)
- Basic labs + ECG
- Labs, ECG, Echo
- Labs, ECG, Stress testing



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## Pulmonary



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## Chest X-ray

- Routine CXR not indicated
- New or unstable cardiopulmonary sx's
  - May require intervention or delay sx



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## PFT's

- Not indicated routinely
- Should not be used to deny sx
- May be useful in pts with dyspnea or exercise intolerance unexplained by clinical exam
- May also help determine if pts with obstructive dz are at baseline



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## OSA

- STOP-BANG
  - Recommended screening
  - OSA pts should be treated with CPAP preop
    - Continue perioperatively



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## Labs

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## Hemoglobin/Hematocrit

- Likelihood of anemia?
  - Liver dz, extremes of age, hx of anemia, hemotologic disorder
- Type of surgery

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## Coagulation Studies

- On anticoagulants?
- Hx of coagulopathy?
- Liver dz/renal dz?

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## Urinalysis

- Not recommended routinely (ASA Task Force)
- Certain Urologic procedures
- Signs of infection
- Prosthesis implantation

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## Glycosylated Hgb A1C

- Reflective of 3-months of control
- Useful in known diabetics undergoing moderate-to-high risk sx
  - Healing, infection, etc.
- ADA – goal of less than 7%

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## Renal Function

- Not routine
- Medical history
  - HTN, CHF, CKD, poorly-controlled DM, liver dz
- Medications
  - Diuretics, ACEI's, ARB's, digoxin, NSAIDS

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## Pregnancy Test

- Routine testing is justifiable!
  - Patients are unreliable
  - H&P often insufficient
  - Management often changes if pt is pregnant
- Gray areas
  - IUD's, early menopause, etc.



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## Which of the following is most likely to aid clinical decision making for a lap chole?

- CXR in 43y F with asthma
- ECG in 71y M with HTN
- Pregnancy test in 18y F with amenorrhea
- PT in 51y M with anemia
- UA in 67y F with DM



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## Summary

- Risk of anesthesia is low . . . but not zero
- Evidence does NOT support routine preoperative testing, even for high-risk surgical procedures
  - Targeted H&P and comorbidities
- Preop cardiac testing should only be performed if it affects mgmt of patients with increased risk and poor exercise capacity
  - Routine ECG not supported



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Thank you!!



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