Baptist Health
HEART INSTITUTE

Preoperative Evaluation

Guidelines and Work up

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Disclosures: None

Case

An 80 year old woman with osteoarthritis of the hip, DM, CKD (Cr 2.1), and HTN is diagnosed with an obstructing colon mass and now requires hemicolectomy. She has been inactive and uses rolling walker for ambulation; she cannot walk more than ½ block without stopping due to hip pain and fatigue.

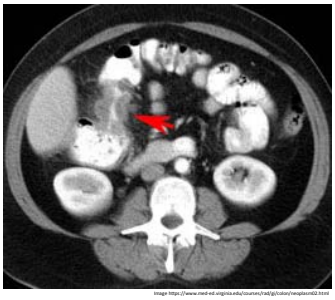

Image: https://www.med-ed.virginia.edu/courses/rad/gi/colon/neoplasm02.html

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What is next step?

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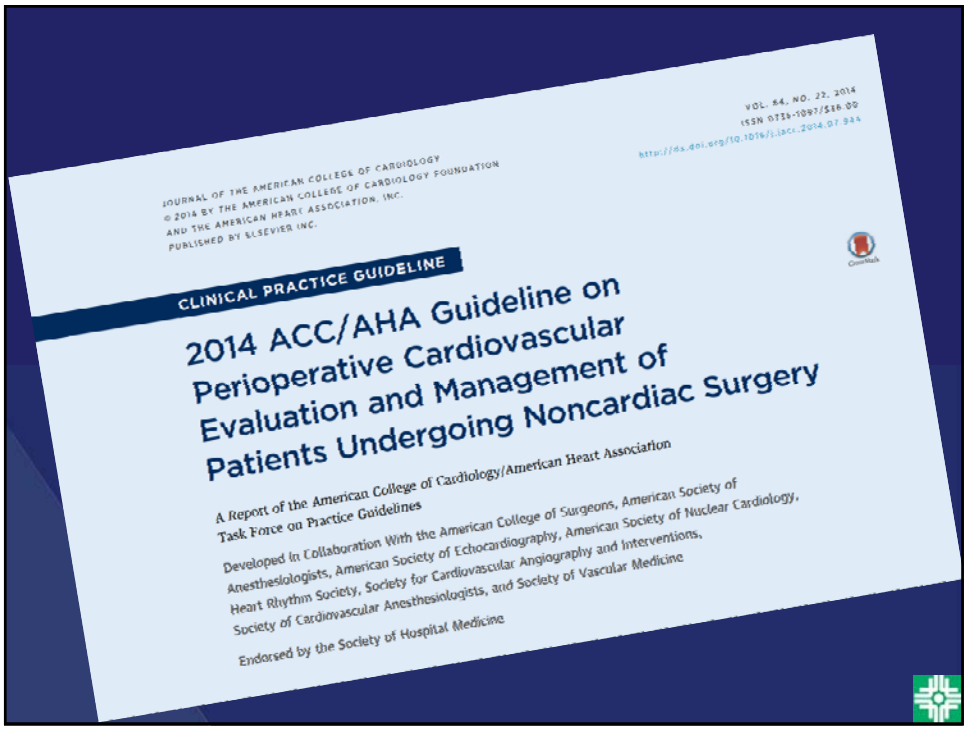
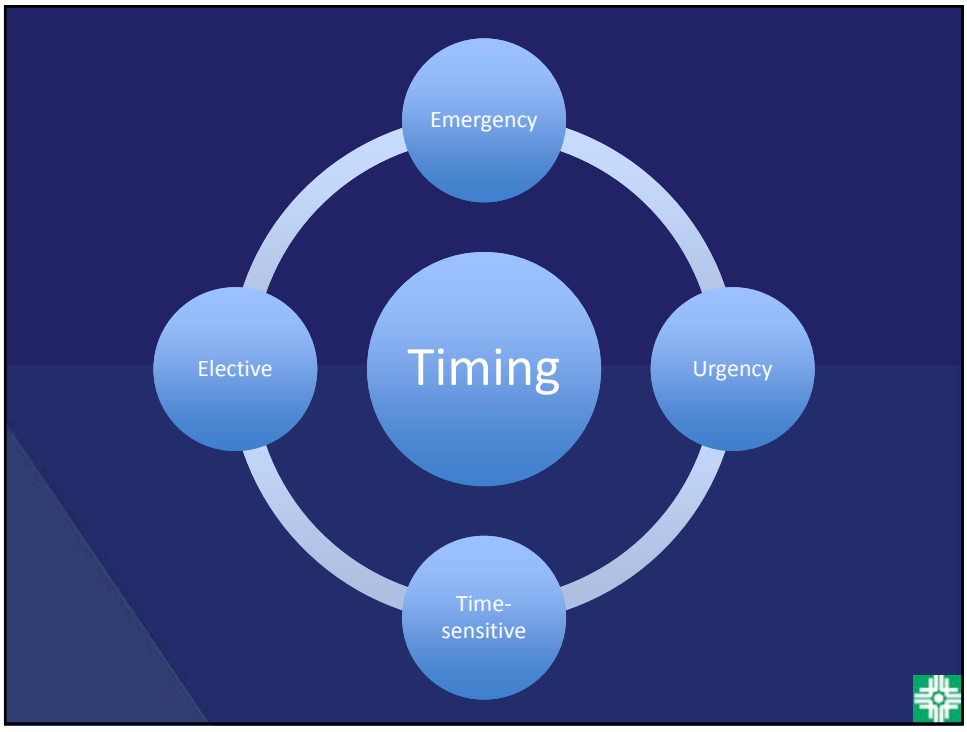
Adapted from Hanna, EB "Practical Cardiovascular Medicine" 1st Ed 2017



Outline

- Timing
- Procedural Risk
- Clinical Risk
- Functional Status
- Medical Optimization



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Level of risk

Procedural risks

Low risk MACE<1%		
Cataracts	Endoscopy	Plastic surgery

Intermediate risk MACE 1-5%					
Intraperitoneal	Intrathoracic	Carotid	Orthopedic	Head & Neck	Thoracic

Elevated risk MACE >5%	
Aortic	Major vascular

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Level of risk

Patient characteristics

Active cardiac conditions

- Unstable coronary syndrome
- Unstable arrhythmia
- Decompensated heart failure
- Severe symptomatic valve disease

Intrinsic clinical risk

- CAD
- CHF
- Diabetes
- prior CVA
- Creatinine >2

Historically, *high risk* if 2+ risk factors

Perioperative MI

Mechanisms

1. Plaque rupture
   - Catecholamine surge, tachycardia, hypertension, coronary shear stress
   - perioperative pro-coagulant state → coronary thrombosis
2. Demand-supply mismatch
   - Anemia, tachycardia, hypotension

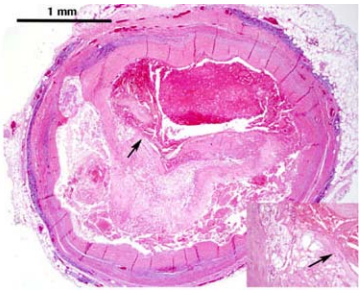
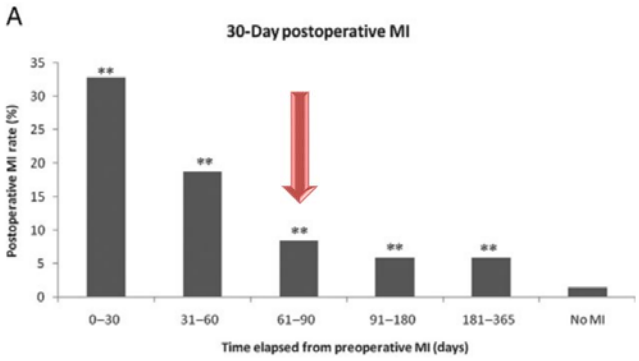


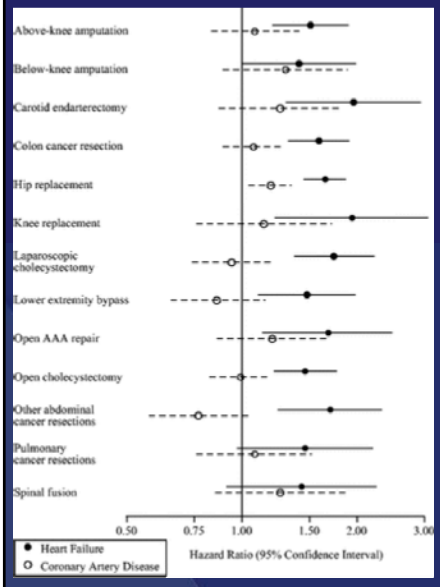
Image: Arq. Bras. Cardiol. vol.94 no.2 São Paulo Feb. 2010

Noncardiac surgery in patients with CAD



Annals of Surgery. 253(5):857–864, MAY 2011

Noncardiac surgery in patients with CHF



- For any given noncardiac procedure, there is higher mortality risk for patients with preexisting CHF.
- Stability matters! Mortality rates after surgery for patients with stable HF equivocal to control group

"Impact of Heart Failure on Patients Undergoing Major Noncardiac Surgery" Anesthes. 2008;108(4):559-567

Noncardiac surgery in patients with valvular heart disease

Significant valvular heart disease increases cardiac risk perioperatively

- Severe aortic stenosis
- Severe mitral stenosis
- Severe mitral regurgitation
- Severe aortic regurgitation

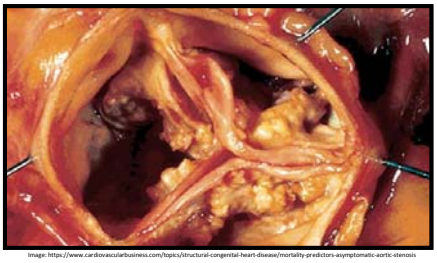


Image: https://www.cardiovascularbusiness.com/topics/structural-congenital-heart-disease/mortality-predictors-asymptomatic-aortic-stenosis

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Functional Capacity

Functional Capacity

Metabolic Equivalents

Excellent	• >10 MET • rowing
Good	• 7-10 MET • Short run, singles tennis, basketball
Moderate	• 4-6 MET • Raking leaves, push mower, 1 flight steps, walk 4 blocks
Poor	• < 4 MET • Slow dancing, golf w/cart, walk 2mph

Combined Risk (Gupta model)

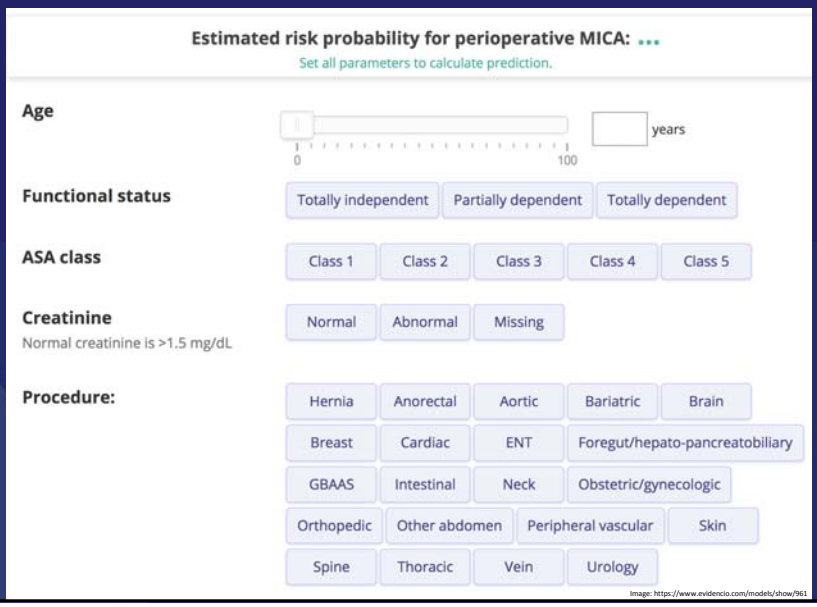

Image: https://www.evidencio.com/models/show/961

Who needs testing?

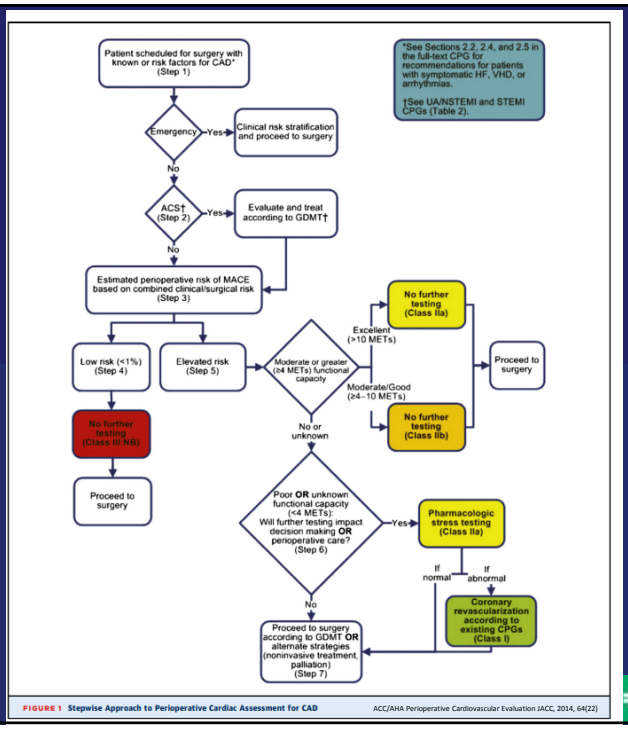

FIGURE 1 Stepwise Approach to Perioperative Cardiac Assessment for CAD — ACC/AHA Perioperative Cardiovascular Evaluation JACC, 2014, 64(22)

Targeted preoperative cardiac testing

- Electrocardiogram
  - If known arrhythmia, CAD or equivalent
- Echocardiogram
  - Postoperative heart failure correlates with preop LVEF.
- Stress test
  - If elevated risk of MACE and unknown/poor functional capacity, if it would change management (i.e. delay surgery)
  - Mod-large area of ischemia → increased perioperative MI/death
  - Normal study → very high negative predictive value
  - Old MI scar → little predictive value for MACE
- Coronary angiography

Outline

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Perioperative therapy considerations

Patients with previous PCI

- Delay elective procedures
  - 14 days for balloon angioplasty
  - 30 days for bare metal stent
  - 365 days for drug-eluting stent (I) or 180 days if risk of delay outweighs risk of instent thrombosis or ischemia (IIb).
- Dual Antiplatelet Therapy
  - Harm of withholding DAPT

Image: http://www.mojosells.com/blog/fast-5-prospecting-tips/

Perioperative therapy considerations

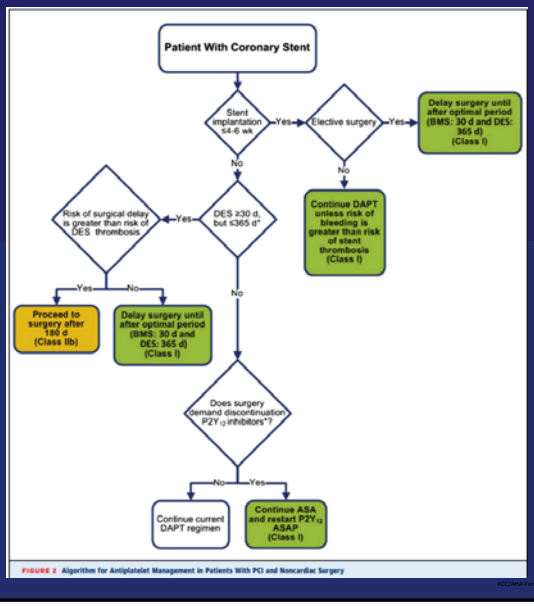

FIGURE 2 Algorithm for Antiplatelet Management in Patients With PCI and Noncardiac Surgery

ACC/AHA Perioperative Cardiovascular Evaluation JACC, 2014, 64(22)

Perioperative therapy considerations

Stroke

Ischemia/MI

Afib

Beta blockers

- Continue existing BB (I)
- Perioperative BB for intermediate-high risk preop stress test or multiple clinical risk factors (IIb)
- Allow time to evaluate tolerability and safety (IIb). Avoid starting day of surgery (III)

Perioperative therapy considerations

Statins	Alpha-2 Agonist	ACE/ARB
• Continue existing statin (I) • Start statin for vascular procedures (IIa) or at high risk (IIb)	• Do not start clonidine (III) • Do not abruptly withdrawal clonidine	• Continue existing ACE/ARB (IIa) • If held, continue postoperatively (IIa)

Perioperative therapy considerations

Anticoagulation

- Procedural bleeding risks vs benefit of preventing thromboembolism
- Low risk procedures, continue anticoagulation
- No bridging needed: bileaflet AVR w/o risk factors
- high risk groups: AVR + RF, MVR, prior stroke

Perioperative therapy considerations

Anticoagulation

NOAC	Renal function (CrCl, ml/min)	Half-life (hr)	Number of skipped doses before day of surgery:	
			Standard risk for bleeding	High risk for bleeding
dabigatran	> 50	12 – 18	2	4
dabigatran	30 to 50	13 – 23	4	8
rivaroxaban	> 30	7 – 13	1	2
apixaban	> 30	7 – 13	2	4

Abbreviations: CrCl = creatinine clearance; hr = hour(s); ml/min = milliliter per minute; NOAC = non-vitamin K antagonist oral anticoagulants.

https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/noac

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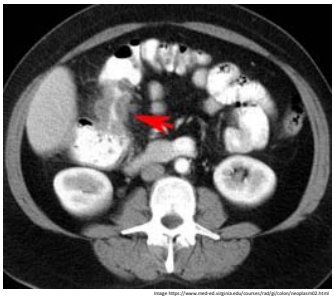

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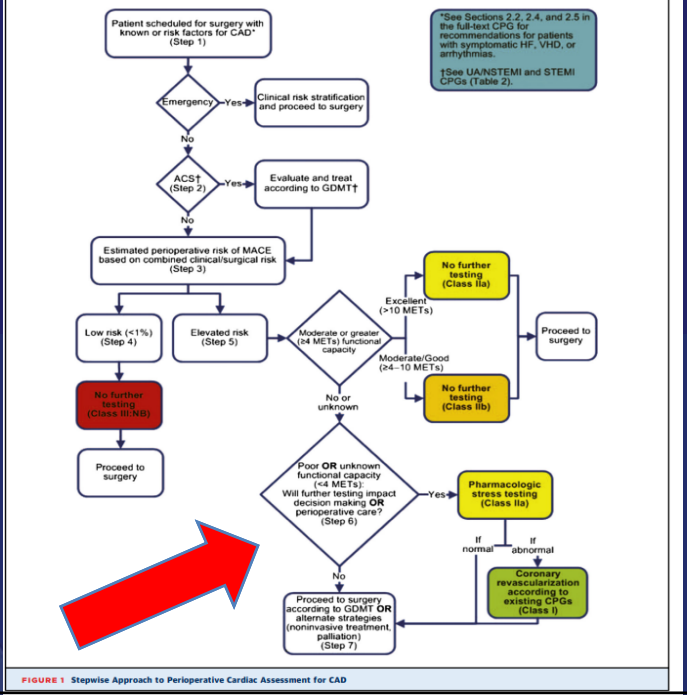

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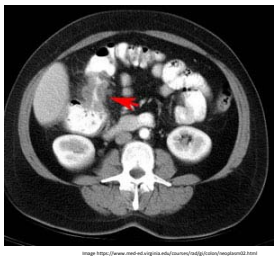

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Image: Monkey Business Images/Shutterstock.com

Thank You