Holy Crap! Why is a Cardiologist Speaking at a GI Meeting?

Jonathan A. Rapp, MD, FACC, FSCAI
Cardiologist, Mercy Heart Institute
Cincinnati, OH

Goals and Objectives

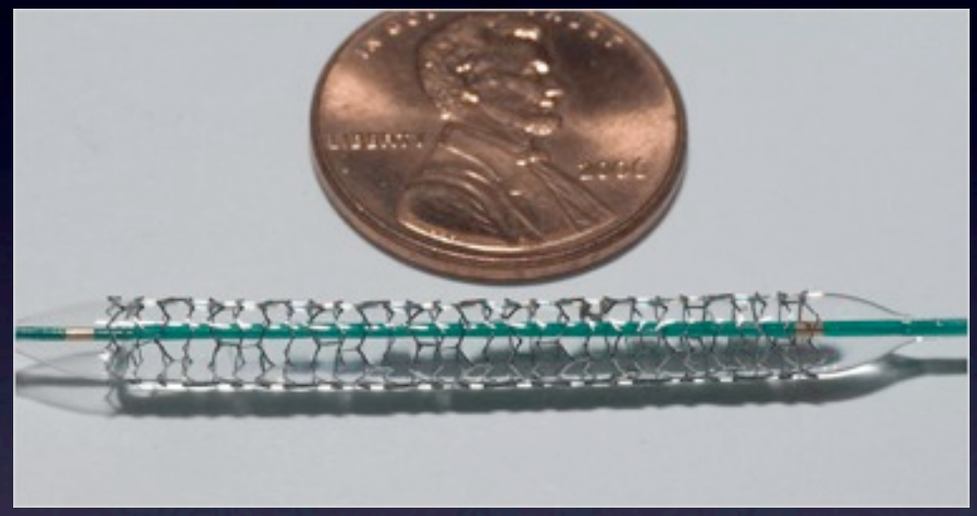
- Discuss cardiac considerations for patients undergoing endoscopic procedures
  - Patients with coronary artery disease
  - Oral anticoagulation and artifical heart valves
  - Congestive heart failure
  - Endocarditis prophylaxis
  - Pacemakers and ICDs
- Questions and Answers

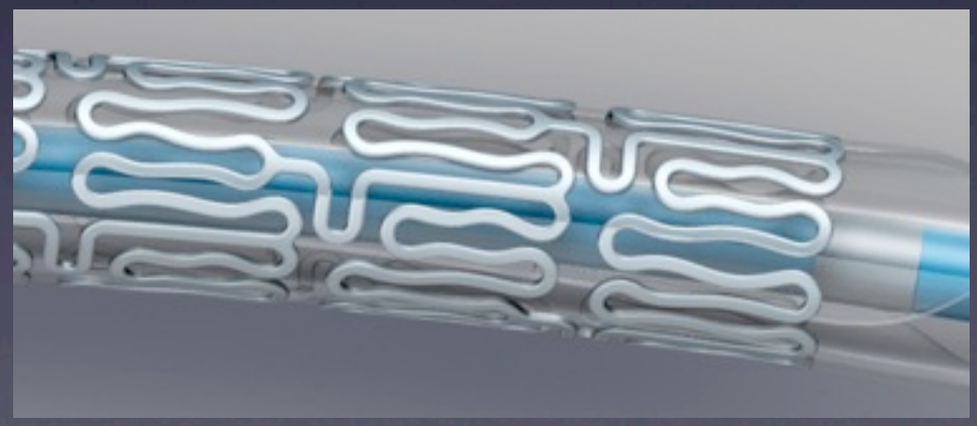
Coronary Artery Disease: Antiplatelet Therapy

- What medications constitute antiplatelet therapy?
  - Aspirin
  - Clopidogrel (Plavix)
  - Prasugrel (Effient)
  - Ticagrelor (Brilinta)

Coronary Artery Disease: Antiplatelet Therapy

- WHY is your patient on antiplatelet therapy?
  - Chronic therapy or recent problem?
  - Stent or no stent?





Recent Stent?

Drug-Eluting Stents

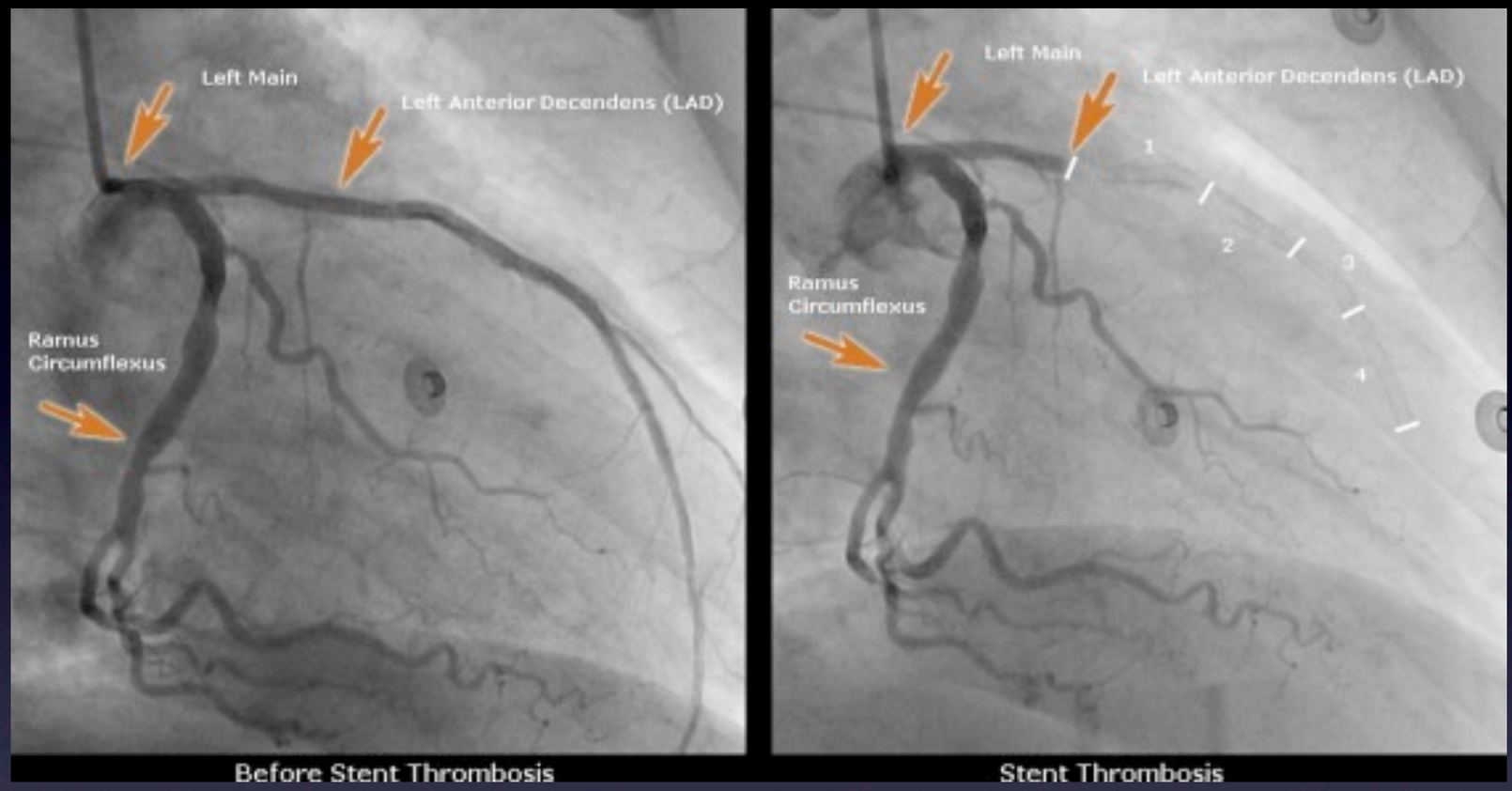
- Examples: Xience, Promus, Endeavor, Taxus
- Stents are coated with a drug that is slowly released into the artery that delays restenosis
- The drug also delays endothelialization and healing
- ***Requires ONE YEAR of dual antiplatelt therapy***

Bare-Metal Stents

- Examples: Vision, Integrity, Driver
- No drug on the stent
- Endothelialization and healing occur within a month
- ***Requires ONE MONTH of dual antiplatelt therapy (unless stent was for ACS-->then one year preferred).***

Kushner et al. Circulation 2009; 120: 2271-2306

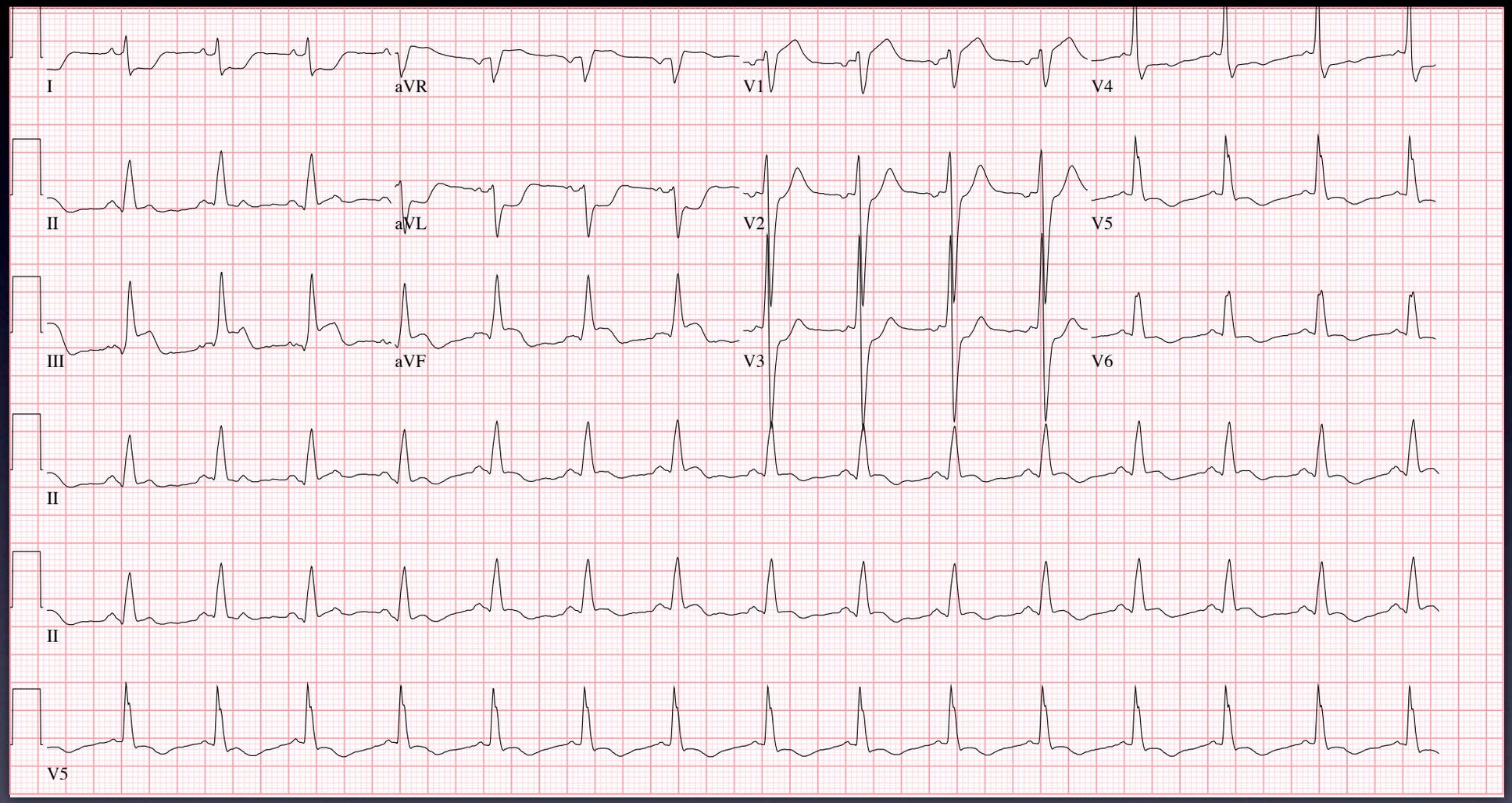
Stent Thrombosis



- 64% rate of death or MI
- 8.9% six-month mortality
- Unless there is an emergency (hemorrhage), do NOT STOP antiplatelet therapy in patients recently stented without a cardiology consult

Cutlip et al. Stent thrombosis in the modern era. Circulation 2001; 103: 1967-1971

Stent Thrombosis



Antiplatelet Agents in CAD Patients

- Emergency? Do what you need to do
- Old coronary stent (>1 year for DES, >30 days for BMS)? Continue aspirin at 81 mg daily
- No stent? Aspirin 81 mg if possible. On aspirin and plavix/effient/ticagrelor? WHY?
    - Recent MI: Continue both meds and delay procedure if possible (or perform without stopping medications)

Antiplatelet Agents in CAD Patients

- Recent stent: Refer to guidelines above
- What's the risk of stent thrombosis if stopping aspirin and plavix/effient?
    - We don't know. Unethical to study that but everyone has seen it!
- ***NEVER WRONG TO CALL A CARDIOLOGIST***

When to Stop Antiplatelet Drugs

- Aspirin: Should be OK to use 81 mg
- Clopidogrel (Plavix): 5 days
- Prasugrel (Effient): 7 days
- Ticagrelor (Brilinta): 5 days

Pre-Operative "Clearance"

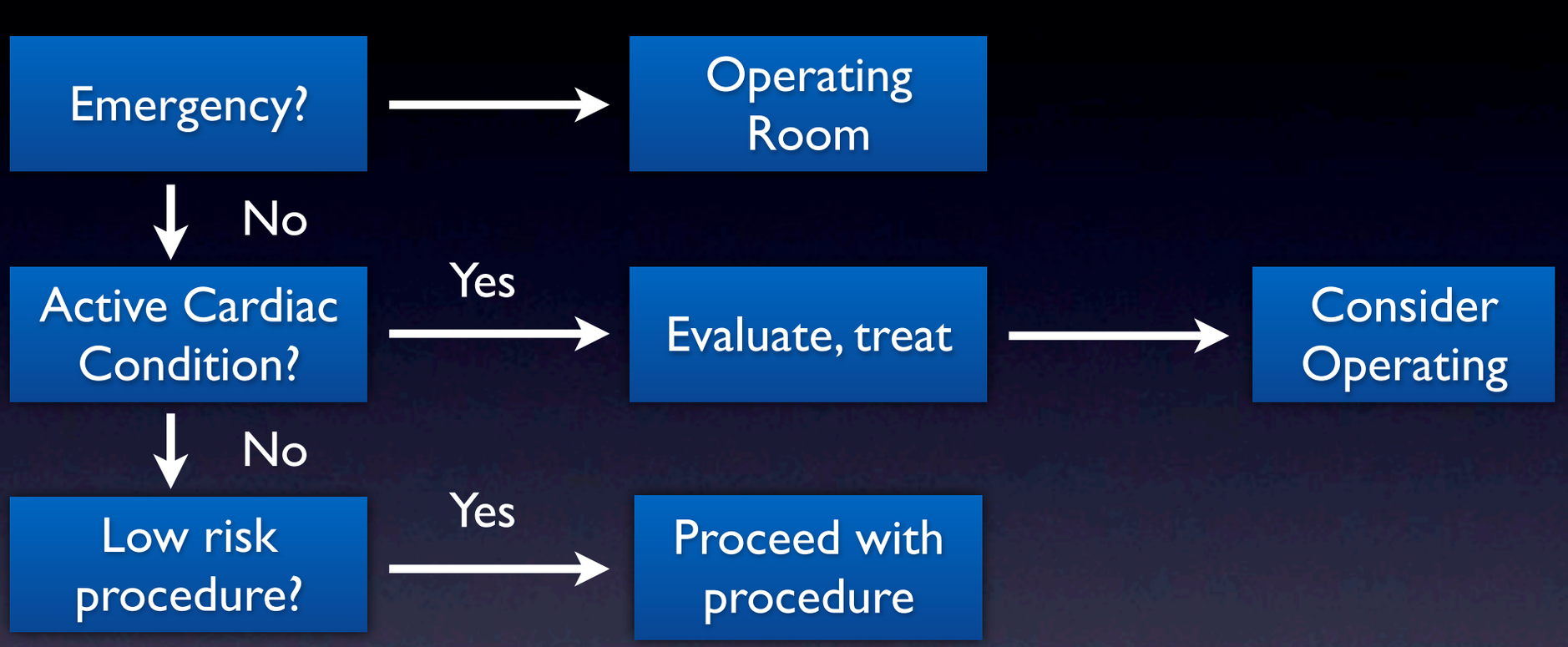
Step 1

Step 2

Step 3

Step 4

Step 5



Endoscopic procedures are low risk

Active Cardiac Conditions

Condition	Example
Unstable Coronary Syndromes	Unstable Angina, Recent MI
Unstable Arrhythmias	Mobitz Type II Block (or worse), SVT, Symptomatic bradycardia, VT
Decompensated Heart Failure	NYHA Class 4 CHF, Worsening CHF
Severe Valvular Disease	Severe AS, symptomatic MS

Anticoagulation: Which Cardiac Conditions Require It?

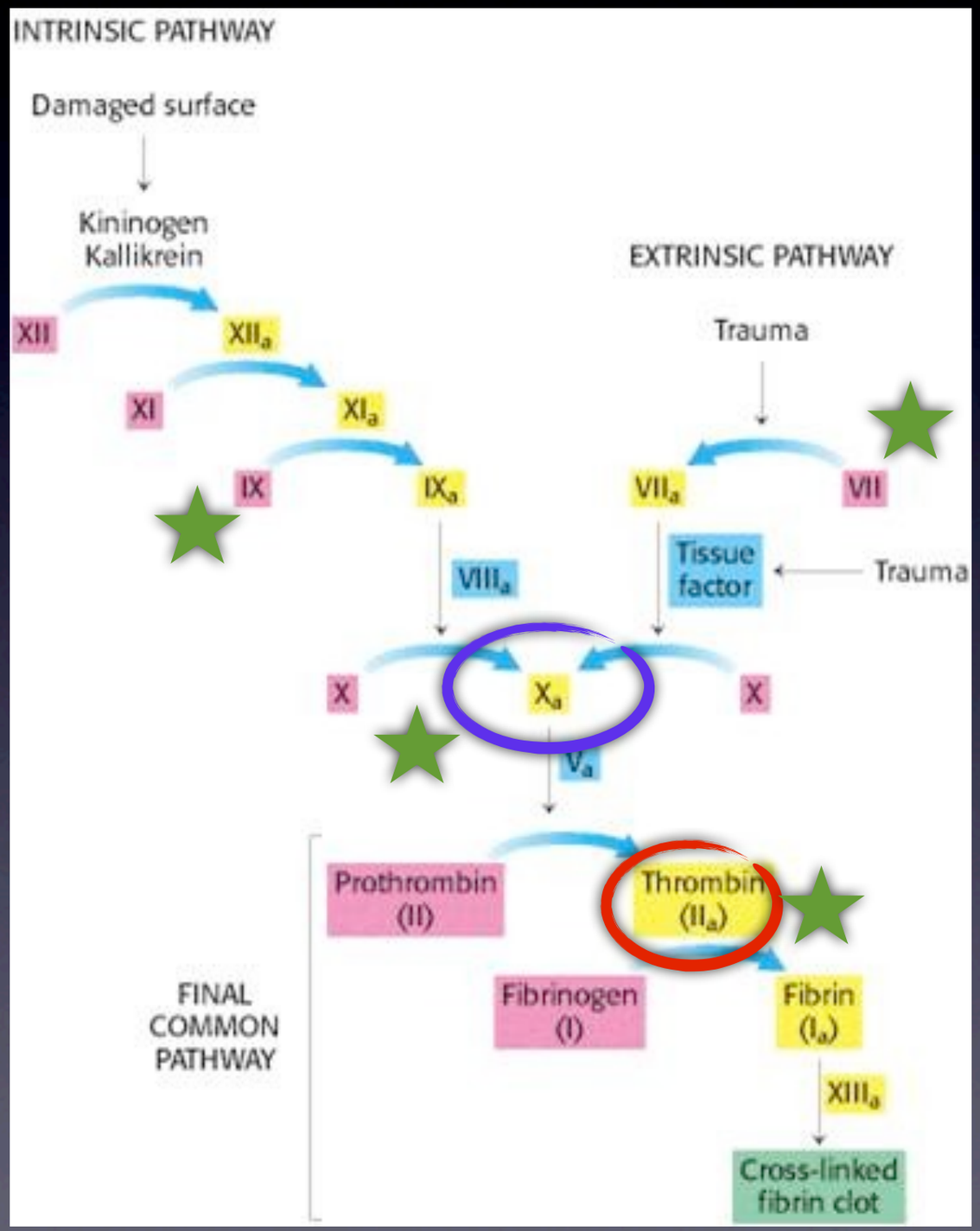
- Atrial Fibrillation (risk of stroke ~6-7%/ year; 0.016% per day)
- DVT/PE
- Artificial heart valve
- Recent large anterior MI
    - No good data but we do it anyway

Anticoagulation

★ Warfarin

Direct Thrombin Inhibitors

Anti Xa



Other Anticoagulants

- Warfarin (Coumadin)
  - Vitamin K antagonist
- Dabigatran (Pradaxa)
  - Direct thrombin inhibitor
- Riveroxaban (Xarelto), Apixaban (Eliquis)
  - Factor Xa inhibitor

Oral Anticoagulants

Class	When to Stop	Reversal Agent
Warfarin	5 Days Prior	Vitamin K, FFP
Direct Thrombin Inhibitors	48 Hours Drug-Free	NONE
Factor Xa Inhibitors	≥ 24 Hours	NONE

Problem ⟶ Strategy

Atrial Fibrillation?	⟶	Stop anticoagulation, resume after
DVT/PE	⟶	Stop anticoagulation, **BRIDGE** before and after procedure

Bridging: Anticoagulate with drugs with shorter half-life than the oral drug which gives the full effect while oral drug "wears off."

Heart Valves and Anticoagulation

	Aspirin (75–100 mg)	Warfarin (INR 2.0–3.0)	Warfarin (INR 2.5–3.5)	No Warfarin
Mechanical prosthetic valves				
AVR—low risk				
Less than 3 months	Class I	Class I	Class IIa	
Greater than 3 months	Class I	Class I		
AVR—high risk	Class I		Class I	
MVR	Class I		Class I	
Biological prosthetic valves				
AVR—low risk				
Less than 3 months	Class I	Class IIa		Class IIb
Greater than 3 months	Class I			Class IIa
AVR—high risk	Class I	Class I		
MVR—low risk				
Less than 3 months	Class I	Class IIa		
Greater than 3 months	Class I			Class IIa
MVR—high risk	Class I	Class I		

- Everyone gets a baby aspirin (indefinitely)

Bonow et al. ACC/AHA 2006 Guidelines for the Management of Patients with Valvular Heart Disease.

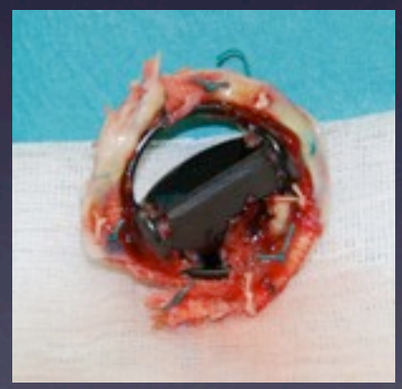
Bioprosthetic Valves

- Valves made from bovine or porcine tissue
- < 3 months after surgery ⟶ Coumadin
- > 3 months after surgery ⟶ No coumadin
- If a procedure is needed and the patient is in the "coumadin window," bridge with IV heparin if possible

Mechanical Heart Valves

Mechanical Heart Valve → Stop anticoagulation, bridge before and after procedure

Thrombosis →



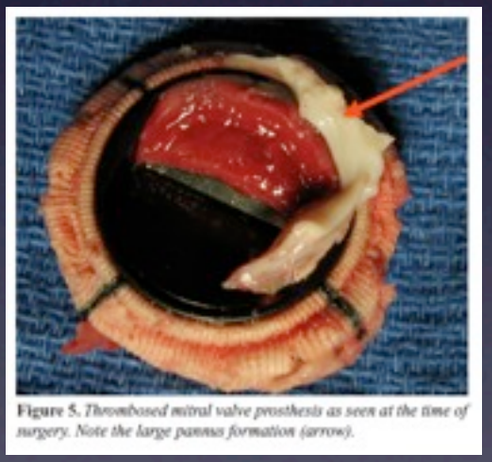


Figure 5. *Thrombosed mitral valve prosthesis as seen at the time of surgery. Note the large pannus formation (arrow).*

Anticoagulation Strategy for Mechanical Valves

- High Risk of Thrombosis (any mitral, older aortic): Stop coumadin for 2-3 days, bridge with heparin after INR < 2
- Low Risk of Thrombosis (aortic bileaflet): Stop coumadin for 2-3 days, NO bridge with heparin unless other risk factors present
- AFTER procedure, start heparin and warfarin, and administer heparin until INR at goal
- What about lovenox? Probably OK but not studied so heparin is recommended

Congestive Heart Failure

NYHA Class	Description
I	No symptoms
II	Slight limitation of activity; activity causes mild symptoms
III	Comfortable at rest, minor activity causes significant symptoms
IV	Symptoms at rest, severely limited physical activity

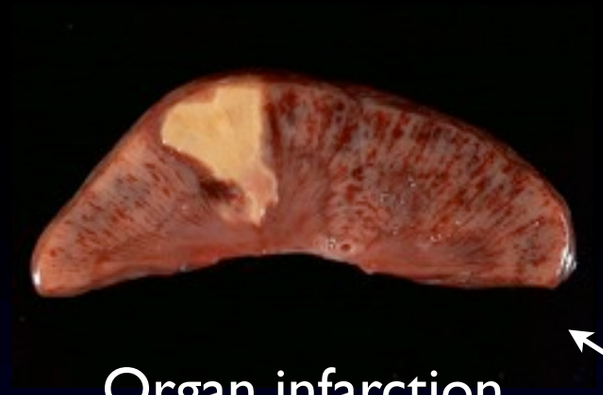
CHF Considerations

- Blood pressure may already be low (BB, ACE-i, low C.O., etc.)
    - Be careful with sedation
- Oxygenation may already be low
    - Be careful with sedation
- If you have a problem, they may be harder to "get back"
    - Be careful with sedation
- They may be very sensitive to IV fluids and can be "tipped over" easily

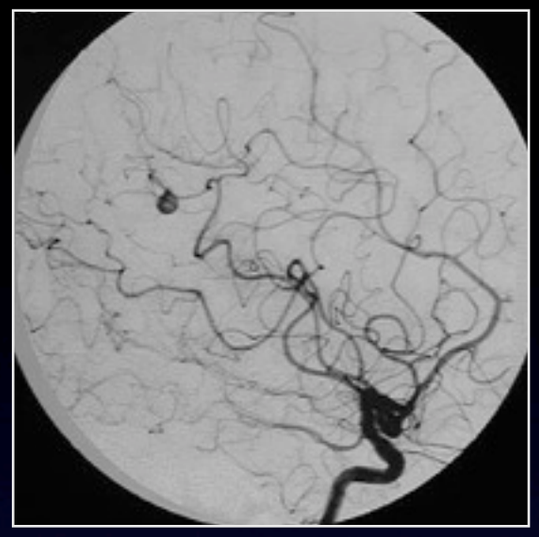
Endocarditis Prophylaxis

- Controversial topic
- There are AHA/ACC guidelines; some people just don't follow them
- We probably don't need it as much as we use it
- Endocarditis is life-threatening and possibly disastrous, so we probably over-treat

Endocarditis



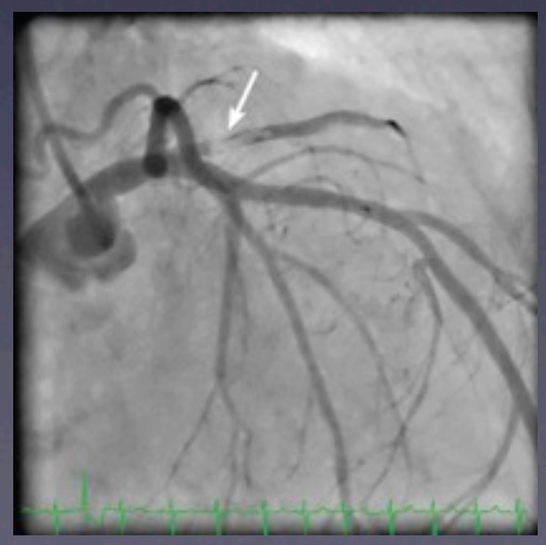
Organ infarction



Mycotic aneurysm

CHF

MI



Death

Prophylaxis is Recommended for:

- Prosthetic valves or prosthetic material used for valve repair
- Previous endocarditis
- Congenital heart disease
- Cardiac transplant

"Administration of antibiotics solely to prevent endocarditis is not recommended for patients who undergo a GU or GI tract procedure."

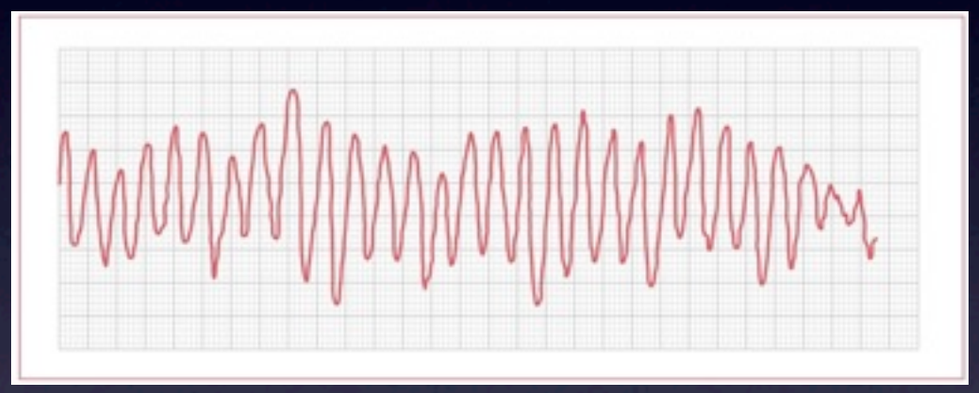
Nishimura et al. ACC/AHA 2008 Guideline Update on Valvular Heart Disease: Focussed Update on Infective Endocarditis

Pacemakers and Implantable Cardioverter-Defibrillators (ICDs)

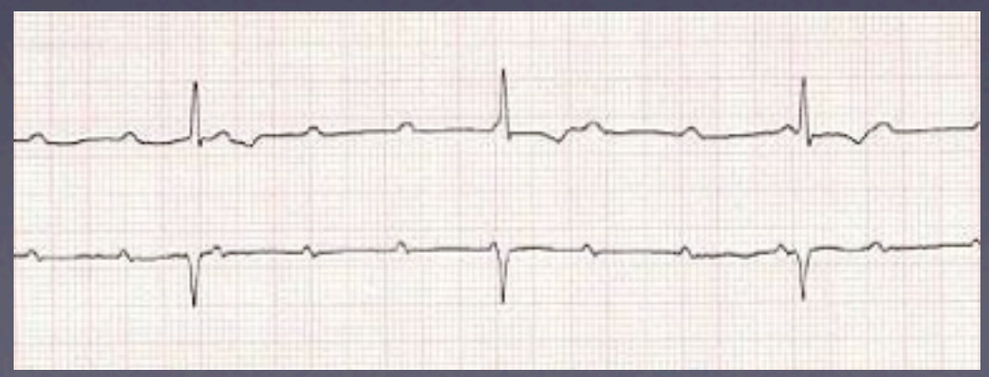
- Get a good history
- Is the device a packemaker or ICD (all ICDs have pacing functions)
- "Why do you have it?"
    - Heart failure, prior sudden cardiac death
- What brand is it?

Adjust Settings

- If electro-cautery is used during a procedure, the device may interpret the electricity as ventricular fibrillation and give an inappropriate discharge



- If the patient is pacemaker dependent, the device may think it "hears" electricity from the heart when it is really sensing electrocautery



Magnet

- Pacemaker: Usually places in asynchronous mode
    - Different for each device
        - Pacemaker will discharge at steady rate regardless of what it "hears" from the heart
- ICD: Disables ICD function (does not necessarily alter pacing function)

Summary

- Cardiac problems can complicate the treatment of GI problems
- If there is an immediate threat to life, do what you have to do
- Unless there is an immediate threat to life, do NOT stop antiplatelet medications or antithrombotic agents without a thorough history or, better yet, a cardiology consult.
    - Transfusing 1-2 units of blood beats death or MI
    - Thombosed heart valves are disastrous

Summary

- Only the most unstable patients are truly at risk for cardiac events from GI procedures
- CHF patients require special attention in the endoscopy lab
- ACC/AHA Guidelines do NOT endorse endocarditis prophylaxis anymore (but we do it anway)
- Pacemakers and ICDs should be appropriately adjusted before procedures

Thank You