Cardiovascular Module

Date	Session	M&M Chapters	Speaker
Oct-19	Hemodynamic Monitoring	13, 14	Kuo
Oct-26	Preoperative Cardiovascular Assessment	18, 20, 21	DSK
Nov-2	Electrophysiology (Pacemakers, ICDs)	15	Lai
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Contents

Hemodynamic Monitoring

Pre-Reading

- Morgan & Mikhail, Chapters 13 and 14

Content outline

- End Organ Perfusion (What do I mean when I talk about hemodynamics?)
- Global Perfusion, Cardiac Output
- Invasive Arterial Pressure Monitoring
- Invasive Venous and Pulmonary Pressure Monitoring

Questions

- You take over care of a 71M with bacteremia and from urosepsis and ARDS, who is having ureteral stents placed. His blood pressure reads 132/68, and he is on norepinephrine and vasopressin. List at least 5 ways (more is fine) that, despite a "normal" blood pressure, he may have inadequate tissue perfusion. What could you do to determine whether these are in play?
- How would CVP be affected by non-venous-hemodynamic factors: Obesity? Ventilation pressures? Tricuspid regurgitation? Third degree heart block? Etc?

Preoperative Cardiovascular Assessment

Pre-Reading

- Morgan & Mikhail, Chapters 18, 20, 21

Content outline

- Identify critical, “can’t-miss” conditions during pre-operative cardiac assessment
    - Acute coronary syndromes, critical valvular lesions, malignant unstable arrhythmias and acute decompensated heart failure
    - What history/physical exam/diagnostic findings would be concerning
- Review of AHA/ACC pre-operative assessment flowchart

Questions

- 72M with diabetes and hypertension who is wheelchair bound at home accidentally falls from his wheelchair to the ground and fractures his hip. He is brought the hospital with a plan for operative management. He has been unable to ambulate for years due to severe hip and knee osteoarthritis. He has no other relevant past medical, surgical, or social history.
    - What further cardiovascular testing should be pursued? Why?
    - A stress test is ordered and finds an area of moderate inducible anterior ischemia. An echocardiogram is performed and is otherwise normal. How should you proceed?
    - You decide to proceed without further testing or intervention. How would you manage this patient?

Electrophysiology (Pacemakers, ICDs)

Pre-Reading

- Morgan & Mikhail, Chapter 15

Content outline

- Basics of electrophysiology
- Pacemakers
- ICDs
- “Magnet Mode”
- Approach to management
- You’ll learn how to answer these questions
    - When is a pacemaker or AICD indicated?
    - What does the nomenclature mean?
    - How does a magnet affect the function of a pacemaker or AICD?
    - What is the basic perioperative management of these devices?

Questions

- 76M presenting for an emergent ex lap for free air under diaphragm who presents with this CXR. You do not have any further past medical history. EKG shows AV pacing at 60. What do you anticipate this patient’s medical history to be? Do you think this patient is pacemaker-dependent? If so, how would you manage this patient? If his EKG shows ApVs at 60, does that change your management? What about AsVp at 74? Where would you place the bovie pad?
- Your patient is a 62F presenting for a craniotomy for a subdural hemorrhage. She is on anticoagulation for atrial fibrillation. Her EKG shows AF at 68 and this is her CXR. What would you like to do with the device? What if the patient is pacing at 60, how would that change your management?
- You have a patient with DDD pacer, set to 60 ppm, coming in for a thoracotomy. He is 70% paced. Magnet mode is DOO at 98. How do you want to proceed? Would this change if he were 5% paced? What about 100%? What if the patient had severe aortic stenosis?

Downers

Pre-Reading

- Morgan & Mikhail, Chapter 44

Content outline

- Why drop blood pressure / end organ damages due to hypertension
- Defining “downer”- decreasing preload / contractility / afterload
- Different classes of downers and pharmacokinetics
    - Nitrates
    - Calcium channel blockers
    - Hydralazine
    - Dopamine agonist
    - Anti-adrenergic
        - Central alpha 2
        - Beta blockers

Questions

- 69M with hypertension on hydrochlorothiazide, lisinopril who is coming in for a colectomy presents preoperatively with a blood pressure of 170/100mmgHg. Do you cancel the case? Would you treat this blood pressure? If so, what kind of medications would you use? If you choose to treat this blood pressure, would you treat it preop or after induction? If you decide to proceed with surgery, how would you manage the fluid status of this patient? How would your answers to all the preceding questions change if he had severe mitral regurgitation?
- 74F for shoulder surgery in the beach chair position. During surgery, her blood pressure reaches 220/120 mmHg. Are you concerned? Why or why not? Would you treat this blood pressure? If so, what would you choose (venodilator? arterial dilator?) and what would be your target pressure?

Uppers

Pre-Reading

- Morgan & Mikhail, Chapter 5

Content outline

- Physiology of the sympathetic nervous system
- Pressor agents
- Management of shock based on underlying etiology

Questions

- A 25M patient presents with polytrauma for an emergent hemicraniectomy. His BP on transport is reported as 60/40. Which pressors would you use? If it depends on other findings, what would you want to know, and how would different answers change your choice of pressor?
- You are called to a RICU for a patient with severe pulmonary hypertension and R-sided heart failure. What are your hemodynamic goals for this patient? What agents will you use to achieve them while emergently intubating?