SESSION OUTLINE

INTRODUCTION

Postoperative complications have significant morbidity and mortality effects on patients and often increase the length of their hospital stay. Despite appropriate surgical and medical care, postoperative complications occur. Often these complications such as cardiac ischemia will not have typical presentations. The management of these complications requires an understanding of the postoperative physiologic state and how it varies with time after surgery. A consulting medicine physician must understand the most likely etiologies of altered mental status, fevers, hypoxia, and chest pain and know how to efficiently and cost-effectively diagnose, evaluate, and treat the patient.

The overall goal of this session is to identify, learn the etiology of, and know how to manage the most common postoperative complications.

SESSION CONTENT

This session identifies, discusses differential diagnosis and explains the evaluation of the most common postoperative complications including: postoperative arrhythmias, cardiac ischemia/chest pain, delirium, dyspnea/hypoxia, fever, and hypertension/hypotension.

1. List the most common postoperative complications
2. Teach to the curricular milestones of:
   a. Patient Care:
      - Independently combine history and physical findings with relevant laboratory results to generate comprehensive problem lists and differential diagnosis
      - Make informed decisions about diagnostic and therapeutic plans based on patient information and preferences, up-to-date scientific evidence and clinical course
      - Procedures: Be able to interpret the following:
        Chest radiograph
        Electrocardiogram
   b. Medical Knowledge
      - Know, understand, and manage the above listed perioperative complications
3. Discuss the evaluation of postoperative complications
4. Review treatment of the postoperative complications
AGENDA & METHODS

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>TIME</th>
<th>DESCRIPTION OF CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-study</td>
<td>1.5 hr</td>
<td>Readings from <em>Perioperative Medicine</em> by Cohn Chapters 33-37, 44 SHM Modules Dx &amp; Management of Acute Mental Status Changes Management of Postoperative Atrial fibrillation Perioperative Infections and Fever</td>
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<tr>
<td>Small Groups</td>
<td>55 min</td>
<td>Review case vignettes and key points from SHM Modules.</td>
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<tr>
<td>Wrap-up</td>
<td>5 min</td>
<td>Answer any remaining questions</td>
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FACILITIES & EQUIPMENT

Small conference room
Access to powerpoint
Access to internet for SHM modules

HAND OUTS

1. Key Items to Know - Common Postoperative Complications

COURSE EVALUATION

The assessment procedures are aligned with the competency-based learning objectives. At the completion of this session participants will be assessed by and receive formative feedback on data acquired form the following:

1. Faculty as well as other members of the health care team will provide competency-based assessment which includes direct observation of patient management and chart review
2. Written exam of core content

REFERENCES

Key Items to Know – Common Postoperative Complications

Postoperative Arrhythmias
- Cardiac surgeries are greatest risk (30-40% incidence)
- Risk factors include increased age and PACs on preop EKG
- Atrial fibrillation is the most common postop arrhythmia (POD 2-4)
- Most common causes: electrolyte disturbance, hypoxia or ischemia, excess catecholamines, or direct trauma to the myocardium
- Often is associated with another underlying complication (infection, CHF)
- Evaluation: vitals, PE, EKG, BMP, Mag, echo to evaluate LV function
- Atrial fibrillation: tx with beta-blockers or non-dihydropyridine calcium channel blockers as first line in stable patients. Synchronized cardioversion if unstable
- Need to consider risks vs benefits of anticoagulation if atrial fibrillation lasts >24 hrs
- Other arrhythmias, please refer to AHA guidelines

Cardiac Ischemia/Chest pain
- The majority of postop MIs occur within 48hrs after surgery
- Chest pain is not typical of a postop MI
- At risk patients have preexisting CAD or risk factors and undergo emergency, vascular, thoracic or upper abdominal surgeries, or have prolonged intraoperative hypotension
- Differential dx of postop chest pain is broad
- Echocardiography is important to evaluate LV function and assess for WMA
- Only screen high risk patients undergoing vascular surgery for postoperative cardiac ischemia: Check EKGs POD 0, POD1, POD2
- Only check troponin I if symptoms or EKG is suggestive of ischemia
- If MI is confirmed, thrombolytics should not be used in the postoperative patient
- ASA, opioids, and bblockers should be administer in setting of acute MI
- Heart catheterization and PCI should be performed
- Patients with postoperative MI are at increased risk of further cardiac complications and require close follow-up with a cardiologist

Delerium/Acute Changes in Mental Status
- Defined by “acute onset with a fluctuating course and presence of inattention and either presence of disorganized thinking or altered level of consciousness”
- Preoperative cognitive impairment is largest risk for postop delirium
- >40% of cases are related to medications
- Confusion Assessment Method (CAM) is the recommended diagnostic tool
- Evaluation includes physical exam, CBC, BMP, consider EKG
- Best treatment is prevention: maintain normal sleep-wake cycle, control pain, avoid unnecessary catheters, ensure patient’s glasses/hearing aids are available
- In severe cases, consider haloperidol po/IM/IV 0.25-0.5 mg Q4hrs or risperidone 0.25-1mg po Q12 Hr
**Dyspnea, acute/hypoxia**
- Etiology may be cardiac, pulmonary, infectious or vascular in nature
- Perform physical exam and review history
- Need to rule out acute ischemia (see *Cardiac ischemia, chest pain*)
- Evaluate for PE, CHF, Pneumothorax
- Consider infectious etiology – PNA
- Atelectasis – Dx on CXR, goal of therapy is to increase lung expansion
- Review pain medications
- Make sure OSA is being treated appropriately

**Fever & Postoperative Infections**
- Definition: Temp >100.4°F (38°C)
- Differential diagnosis is influenced by time from surgery
- Noninfectious pathophysiology within 48hrs post-op is caused by release of cytokines from surgical trauma
- Most common infectious causes include (1) UTI, (2) surgical site infection, and (3) pneumonia
- Must perform a thorough physical exam including the surgical site
- Order laboratory and imaging studies as indicated. Often low yield within 48 hrs of surgery
- Only administer empiric antibiotics if infection is highly suspected based on PE and studies

**Hypertension/Hypotension**

**Hypertension**
- Risks for post-op HTN
  - History of uncontrolled HTN is more significant that admission BP
  - Diastolic BP >110
  - Vascular surgery
- Home antihypertensives should be continued as able
- Post-op BP goals depend on patient’s baseline prior to surgery
- Underlying cause of post-op HTN varies based on time from surgery
- HTN immediately post-op: reversal of anesthesia leads to vasoconstriction, volume overload, increased norepinephrine secondary to pain, hypothermia
- HTN <24 hrs of surgery: removal of epidural anesthesia, rebound HTN due to holding of beta-blockers or clonidine, pain, respiratory distress, bladder distention
- HTN 24-48 hrs after surgery: holding of home antihypertensives (lack of po access), pain, hypoxia, hypercarbia, EtOH withdrawal, volume overload
- Access for end organ damage/hypertensive emergency: chest pain, pulmonary edema, AKI, mental status changes, papilledema, risk of hemorrhage from vascular anastomoses
- Try to identify and treat an underlying cause if present
- Initiate additional tx if BP is >20% of patient’s baseline. Use parenteral agents if necessary
Hypotension

- Caused by blood loss, fluid shifts, drugs
- Risk for cardiac complications
- Hypovolemic hypotension = decreased intravascular volume
- Distributive hypotension = decreased SVR, vasodilation often due to sepsis. May be due to adrenal insufficiency
- Cardiogenic hypotension = decreased cardiac output due to pump failure.
- Assessment: Confirm BP manually, examine pt for blood loss, infection, etc. Check I&Os, EKG, CXR, and Hgb if indicated
- Initial treatment = Fluids, fluids, fluids
- Place foley catheter for adequate UOP
- Further treatment as indicated: blood transfusion, tx of PTX, MI, vasopressors