Perioperative Management in the Elderly

Jean Storm D.O.

“A hospital bed is a parked taxi with the meter running.”

Groucho Marx
Past medical history of heart stuff and blah, blah, blah. Plan OR tonight.

--An orthopedic surgeon's H&P
Objectives

Know and understand:

- How age-related physiologic changes influence perioperative care
- Risk factors for cardiovascular, pulmonary, renal, and neurologic complications
- Elements of perioperative management of selected medical problems
- How to avoid iatrogenic complications

Topics Covered

- Overview of Operative Therapy for Older People
- Surgical Decision-Making
- Preoperative Assessment and Management
- Perioperative and Postoperative Management of Selected Medical Problems
SURGERY IS A COMMON TREATMENT FOR OLDER PATIENTS

- More than 55% of all surgeries are done in patients ≥65 years old
- Advances in care have lowered surgical risks and shifted the risk-benefit ratio to favor surgery in increasingly older patients with more complex conditions
- While surgery per se is safer, older adults experience a disproportionate majority of postoperative morbidity and mortality

PERIOPERATIVE MORBIDITY

- Perioperative morbidity increases with each decade of life
- In-hospital mortality is significantly higher in patients greater than 80 years of age
- Major and emergent surgeries carry the highest morbidity and mortality in the elderly
- Emergency abdominal surgery carries a 9.7% mortality for patients over 80 years of age

From Perioperative Care of the Elderly Patient, 2018
Preoperative Assessment

- Assess the patient’s cognitive ability and capacity to understand the anticipated surgery
- Screen the patient for depression
- Identify the patient’s risk factors for developing postoperative delirium
- Screen for alcohol and other substance abuse/dependence
- Perform a preoperative cardiac evaluation according to the American College of Cardiology/American Heart Association (ACC/AHA) algorithm for patients undergoing noncardiac surgery
Preoperative Assessment

- Identify the patient’s risk factors for postoperative pulmonary complications and implement appropriate strategies for prevention
- Document functional status and history of falls
- Determine baseline frailty score
- Assess patient’s nutritional status and consider preoperative interventions if the patient is at severe nutritional risk

Preoperative Assessment

- Take an accurate and detailed medication history and consider appropriate perioperative adjustments. Monitor for polypharmacy.
- Determine the patient’s treatment goals and expectations in the context of the possible treatment outcomes
- Determine patient’s family and social support system
- Order appropriate preoperative diagnostic tests focused on elderly patients
Cognitive Ability

- For any patient older than age 65 without a known history of cognitive impairment or dementia, a history and cognitive assessment, such as the Mini-Cog are essential.
- If possible, a knowledgeable informant, such as a spouse or a family member, should be interviewed about the evolution of any cognitive or functional decline in the patient.
- Postoperative cognitive decline is common in the elderly, that is why it is important to document the patient’s cognitive baseline.

**Mini-Cog:**

**Instructions for Administration & Scoring**

**Step 1:** Three Word Registration

- For each word, say in your own words, “I’m going to say these words and I want you to repeat back to me exactly the same words.” The words are: Clock, Drawer, Picture. (3 points)

- For each word, say in your own words, “Can you draw me a clock, a drawer, and a picture?” (3 points)

**Step 2:** Clock Drawing

- Draw the hands of a clock.

**Step 3:** Three Word Recall

- Ask the person to repeat the three words you taught in Step 1: “What were the three words I taught you?” (3 points)

**Scoring**

- **Clock Drawer**: 0-1 (out of 3 points)
- **Picture**: 0-1 (out of 3 points)
- **Total Score**: 0-6 (out of 10 points)

A score of 3 or more indicates a possible impairment in cognitive function, while a score of 2 or less indicates no impairment.
Decision Making Capacity

- The four legally-relevant criterion for decision-making capacity:
  1. The patient can clearly indicate his or her treatment choice.
  2. The patient understands the relevant information communicated by the physician.
  3. The patient acknowledges his or her medical condition, treatment options, and the likely outcomes.
  4. The patient can engage in a rational discussion about the treatment options.

Depression Screening

- Preoperative depression has been associated with increased mortality after coronary artery bypass graft and longer postoperative length of stay after CABG and valve operations.
- Depression has also been associated with higher pain perception and increased postoperative analgesic use.
PHQ-2

- Patient Health Questionnaire-2:
  - 1. In the past 12 months, have you ever had a time when you felt sad, blue, depressed, or down for most of the time for at least two weeks?
  - 2. In the past 12 months, have you ever had a time, lasting at least two weeks, when you didn’t care about the things that you usually care about or when you didn’t enjoy the things that you usually enjoy?

Risk Factors for Post-Op Delirium

<table>
<thead>
<tr>
<th>Cognitive and Behavioral Disorders</th>
<th>Functional Impairments</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cognitive impairment and dementia</td>
<td>• Poor functional status</td>
</tr>
<tr>
<td>• Untreated or inadequately controlled pain</td>
<td>• Immobilization</td>
</tr>
<tr>
<td>• Depression</td>
<td>• Hearing or vision impairment</td>
</tr>
<tr>
<td>• Alcohol use</td>
<td></td>
</tr>
<tr>
<td>• Sleep deprivation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disease/Illness Related</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Severe illness/comorbidities</td>
<td>• Older age ≥ 70 years</td>
</tr>
<tr>
<td>• Renal insufficiency</td>
<td>• Polypharmacy and use of psychotropic medications (benzodiazepines, anticholinergics, and antihistamines)</td>
</tr>
<tr>
<td>• Anemia</td>
<td>• Risk of urinary retention or constipation, presence of urinary catheter</td>
</tr>
<tr>
<td>• Hypoxia</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metabolic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Poor nutrition</td>
<td></td>
</tr>
<tr>
<td>• Dehydration</td>
<td></td>
</tr>
<tr>
<td>• Electrolyte abnormalities</td>
<td></td>
</tr>
</tbody>
</table>
Alcohol Screening

CAGE Questionnaire for Detecting Alcoholism

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>C: Have you ever felt you should <strong>Cut down on your drinking?</strong></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>A: Have people <strong>Annoyed</strong> you by criticizing your drinking?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>G: Have you ever felt <strong>Guilty</strong> about your drinking?</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>E: Have you ever had a drink first thing in the morning (<strong>Eye opener</strong>)?</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

A total score of 0 or 1 suggests low risk of problem drinking
A total score of 2 or 3 indicates high suspicion for alcoholism
A total score of 4 is virtually diagnostic for alcoholism

American College of Cardiology/American Heart Association (ACC/AHA) Algorithm for Patients Undergoing Noncardiac Surgery
Emergency surgery?

No

Yes → Proceed to surgery

Any of the following major risk factors present?

unstable angina, myocardial infarction <6 mo ago, decompensated heart failure, moderate/severe valvular disease, dyspnea

No

Yes → Cancel or postpone surgery; correct acute cardiac conditions; reassess valvular function with echo; address dyspnea

Is procedure low risk, (eg, cataract, endoscopic, breast, plastic) or superficial surgery?

No

Yes → Proceed to surgery

Is patient able to do heavy housework, perform yard work, climb a flight of steps, walk up a hill, or run a short distance?

No or unknown

Yes → Proceed to surgery

Is patient medically appropriate for and willing to undergo testing for cardiac ischemia and revascularization before surgery? Will further information on cardiac risk impact decision to proceed with surgery or perioperative care?

No to either

Yes to both

Again discuss potential risks and benefits of surgery with surgeon and patient to decide whether or not to proceed with surgery

Calculate cardiac risk; consider/perform cardiac stress testing (pharmacologic or exercise) and if abnormal revascularize (CABG or PCI)

RISK FACTORS FOR POSTOPERATIVE PULMONARY COMPLICATIONS

Patient-Related Factors

- Age >60\(^{55,55,62,64}\)
- Chronic obstructive pulmonary disease (COPD)\(^{55,55,62,64}\)
- American Society of Anesthesiologists (ASA) class II or greater\(^{55,55}\)
- Functional dependence\(^{55,55,62,64}\)
- Congestive heart failure\(^{55,55}\)
- Obstructive sleep apnea\(^{55,62,64}\)
- Pulmonary hypertension\(^{55,62}\)
- Current cigarette use\(^{55,62,64}\)
- Impaired sensorium\(^{55,62,64}\)
- Preoperative sepsis\(^{55}\)
- Weight loss >10% in 6 months\(^{55,62,64}\)
- Serum albumin <3.5 mg/dL\(^{55,55,62,64}\)
- Blood urea nitrogen (BUN) ≥7.5 mmol/L (≥21 mg/dL)\(^{55,62,64}\)
- Serum creatinine ≥133 μmol/L (>1.5 mg/dL)\(^{55,62}\)

Surgical Procedure-Related Factors

- Prolonged operation ≥3 hours\(^{55,55,62}\)
- Surgical site\(^{55,55,62,64}\)
- Emergency operation\(^{55,55,62,64}\)
- General anesthesia\(^{55,62,64}\)
- Perioperative transfusion\(^{55,55,62,64}\)
- Residual neuromuscular blockade after an operation\(^{55,70}\)
Evaluating Functional Status

Ask the patient the following four questions:

1. Can you get out of bed or chair yourself?
2. Can you dress and bathe yourself?
3. Can you make your own meals?
4. Can you do your own shopping?

Don’t Forget to Ask About Falls

Elderly Person: *falls*
Their pelvis:

Man it hurts to be this hip
Fraility

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrinkage</td>
<td>Unintentional weight loss ≥10 pounds in past year</td>
</tr>
<tr>
<td>Weakness</td>
<td>Decreased grip strength</td>
</tr>
<tr>
<td>Exhaustion</td>
<td>Self-reported poor energy and endurance</td>
</tr>
<tr>
<td>Low physical activity</td>
<td>Low weekly energy expenditure</td>
</tr>
<tr>
<td>Slowness</td>
<td>Slow walking</td>
</tr>
</tbody>
</table>

**Interpretation of the Frailty Score**

The patient receives 1 point for each criterion met.

0–1 = Not Frail
2–3 = Intermediate Frail (Pre-frail)
4–5 = Frail

Frail patients are at much higher risk of adverse health outcomes.
Intermediate frail patients are at elevated risk (less than frail ones) but are also at more than double the risk of becoming frail over three years.

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Nutritional Risk

- BMI < 18.5
- Serum albumin < 3.0 g/dL (without evidence of renal or hepatic dysfunction)
- Unintentional weight loss > 10-15% over the last 6 months
Medication Management

- **Discontinue before surgery:**
  1. **Nonessential medications** that increase surgical risk
  2. **Medications with potential for drug interactions with anesthesia** should be discontinued or substituted
  3. **See Beers Criteria** for additional list of medications that may need to be discontinued
  4. **Herbal medications** should be stopped at least 7 days before a surgical operation

- **Continue perioperatively:**
  1. **Medications with withdrawal potential**, including selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, benzodiazepines, antipsychotics, monoamine oxidase inhibitors (MAOIs), beta blockers, clonidine, statins, and corticosteroids.
  2. **Angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers** should be continued unless their only indication is for hypertension and the patient’s blood pressure is well controlled.
ACC/AHA GUIDELINES FOR PERIOPERATIVE BETA BLOCKERS

- The guidelines support administration of beta blockers to:
  - Patients who are already on beta blockers, particularly those with independent cardiac indications for these medications.
  - Patients undergoing intermediate risk or vascular surgery with known coronary artery disease or with multiple clinical risk factors for ischemic heart disease.

Anticoagulation
# Perioperative Anticoagulation Management

- 1. Evaluate procedural bleed risk
- 2. Evaluate thromboembolic risk
- 3. Determine whether or not anticoagulation will be interrupted and whether bridging is indicated
- 4. If interruption of anticoagulation is indicated, determine when to stop and resume therapy

<table>
<thead>
<tr>
<th>Low Bleed Risk Procedures</th>
<th>Moderate Bleed Risk Procedures</th>
<th>High Bleed Risk Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental cleanings, fillings</td>
<td>Minor dental procedures (ex. Simple extractions)</td>
<td>Multiple tooth extraction</td>
</tr>
<tr>
<td>Ophthalmologic, cataract</td>
<td>Bronchoscopy with biopsy</td>
<td>Major Cardiovascular/Thoracic surgery</td>
</tr>
<tr>
<td>Bronchoscopy, BAL, without biopsy</td>
<td>Pleural biopsy</td>
<td>Cardiac catheterization via femoral artery</td>
</tr>
<tr>
<td>Skin biopsy</td>
<td></td>
<td>Major Intra-abdominal/peri-rectal surgery</td>
</tr>
<tr>
<td>Cardiovascular/Thoracic Procedures</td>
<td></td>
<td>Major Orthopedic surgery</td>
</tr>
<tr>
<td>SVT ablation &amp; ICD implant</td>
<td>Interventional Radiology Procedures</td>
<td>Major Trauma surgery</td>
</tr>
<tr>
<td>Interventional Radiology Procedures</td>
<td>Abcess drainage</td>
<td>Thoracic, gastrostomy</td>
</tr>
<tr>
<td>PCI (line insertion/removal)</td>
<td>Biopsies (lung, liver, kidney, and deep abdominal)</td>
<td>Neurosurgery</td>
</tr>
<tr>
<td>THA, pancreatectomy</td>
<td>Central line placement</td>
<td>Spinal surgery/Lumbar puncture*</td>
</tr>
<tr>
<td>Tube exchange</td>
<td>Cholecystectomy &amp; Nephrostomy tube placement</td>
<td>Interventional Radiology Procedures</td>
</tr>
<tr>
<td>Superficial fluid collection</td>
<td>Tumor ablation</td>
<td>TIPS</td>
</tr>
<tr>
<td>aspiration/drainage</td>
<td>Radial angiograms</td>
<td>Biliary drainage</td>
</tr>
<tr>
<td>Superficial PNA (lymph node, thriadic)</td>
<td>Cancer Surgery</td>
<td>Femoral angiograms</td>
</tr>
<tr>
<td>Cancer Surgery</td>
<td>Multiple procedures (ex. local excision of melanoma, breast, etc.)</td>
<td>Lumbar puncture*</td>
</tr>
<tr>
<td>Minor dermatologic cancer surgery (ex. excision of melanoma in-situ or other small lesions)</td>
<td></td>
<td>Cancer Surgery</td>
</tr>
<tr>
<td>Breast biopsy (fine needle aspiration or core needle)</td>
<td></td>
<td>Major intra-abdominal and peri-rectal surgery (ex. hepatectomy, pancreaticoduodenectomy, etc.)</td>
</tr>
<tr>
<td>GI Procedures</td>
<td>Colonoscopy with polypectomy</td>
<td></td>
</tr>
</tbody>
</table>
| Colposcopy, EGD with or without biopsy | ERCP with sphincterotomy | *See the Regional Anesthesia Guidelines for Patients Receiving Anticoagulant Therapy posted on the Clinical Pathways and Guidelines page for more information on anticoagulant timing pre and post catheter placement and removal.
CHA2DS2-VASc Score for Atrial Fibrillation Stroke Risk

A score of 0 is "low" risk of stroke, 1 is "moderate", and any score above 1 is a "high" risk.

<table>
<thead>
<tr>
<th>Stroke risk factors</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive heart failure/LV dysfunction</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>Aged ≥75 years</td>
<td>2</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1</td>
</tr>
<tr>
<td>Stroke/TIA/TE</td>
<td>2</td>
</tr>
<tr>
<td>Vascular disease (prior MI, PAD, or aortic plaque)</td>
<td>1</td>
</tr>
<tr>
<td>Aged 65–74 years</td>
<td>1</td>
</tr>
<tr>
<td>Sex category (i.e. female gender)</td>
<td>1</td>
</tr>
</tbody>
</table>
### Table 4: Anticoagulant Timing Pre and Post-Op

<table>
<thead>
<tr>
<th>Anticoagulant</th>
<th>Half-life</th>
<th>Time to Hold Prior to Surgery</th>
<th>Time to Restart Post-operatively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apixaban (Eliquis®)</td>
<td>8–15 hours</td>
<td>At least 24 hours</td>
<td>Moderate Bleed Risk Surgery: 24 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High Bleed Risk Surgery: 48–72 hours</td>
</tr>
<tr>
<td>Rivaroxaban (Xarelto®)</td>
<td>5–9 hours</td>
<td>At least 24 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elderly 11–13 hours</td>
<td>Mod-High Bleed Risk Surgery or CrCl &lt; 50 mL/min or elderly: 48 hours</td>
<td></td>
</tr>
<tr>
<td>Edoxaban (Savaysa®)</td>
<td>10–14 hours</td>
<td>At least 24 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CrCl &lt; 50 mL/min or elderly: 48 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Betrixaban (Brevrix®)</td>
<td>19–27 hours</td>
<td>At least 4 days</td>
<td></td>
</tr>
<tr>
<td>Dabigatran (Pradaxa®)</td>
<td>12–17 hours</td>
<td>CrCl &gt;50 mL/min: at least 24 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CrCl &lt;50 mL/min: at least 72 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;5 days if major surgery</td>
<td></td>
</tr>
<tr>
<td>Enoxaparin (Lovenox®)</td>
<td>4.5–7 hours</td>
<td>12 hours (prophylaxis)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 hours (treatment)</td>
<td></td>
</tr>
<tr>
<td>Unfractionated Heparin</td>
<td>1–2 hours</td>
<td>4–6 hours</td>
<td></td>
</tr>
<tr>
<td>Fondaparinux (Nextrip®)</td>
<td>17–21 hours</td>
<td>4–5 days</td>
<td></td>
</tr>
<tr>
<td>Warfarin (Coumadin®)</td>
<td>20–60 hours</td>
<td>5 days (see Table 3)</td>
<td></td>
</tr>
<tr>
<td>Argatroban</td>
<td>39–51 minutes</td>
<td>3–4 hours</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Bleeding Risk

**HAS-BLED score**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Points</th>
<th>HAS-BLED score</th>
<th>Bleeds per 100 patient-years</th>
</tr>
</thead>
<tbody>
<tr>
<td>H - Hypertension</td>
<td>1</td>
<td>0</td>
<td>1.13</td>
</tr>
<tr>
<td>A - Abnormal renal or liver function (1 point each)</td>
<td>1 or 2</td>
<td>1</td>
<td>1.02</td>
</tr>
<tr>
<td>S - Stroke</td>
<td>1</td>
<td>2</td>
<td>1.88</td>
</tr>
<tr>
<td>B - Bleeding</td>
<td>1</td>
<td>3</td>
<td>3.74</td>
</tr>
<tr>
<td>L - Labile INRs</td>
<td>1</td>
<td>4</td>
<td>8.70</td>
</tr>
<tr>
<td>E - Elderly (&gt; 65 years)</td>
<td>1</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>D - Drugs or alcohol (1 point each)</td>
<td>1 or 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: HAS-BLED has been validated for warfarin, but not for the new anticoagulants.*

VTE Prophylaxis Guidelines

CHEST
Supplement
ANTITHROMBOTIC THERAPY AND PREVENTION OF THROMBOSIS, 9TH ED. ACCP GUIDELINES

Prevention of VTE in Orthopedic Surgery Patients
Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines
Yvonne Field-Yates, MD; Charles W. Francis, MD; Norman A. Johnson, MD; Catherine Guarley, MD; Lila E. Dahl, MD; Sara Schahmane, MD, PhD; Thomas L. O'Beirne, MD, PhD; Stephen G. Fullmer, MD; and Clifford W. Colwell Jr, MD

Background: VTE is a serious, but decreasing complication following major orthopedic surgery. The guidelines focus on optimal prophylaxis to reduce postoperative pulmonary embolism and PE.

Methods: The methods for this guideline follow those described in Methodology for the Development of Antithrombotic Therapy and Prevention of Thrombosis Guidelines: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines in this supplement. Dosing for thromboprophylaxis and the use of non-vitamin K antagonist oral anticoagulants (NOAKs) is based on the guideline for Prevention of VTE in Orthopedic Surgery Patients, with some modifications. The guidelines recommend the use of one of the following rather than no antithrombotic prophylaxis: low-molecular-weight heparin, fondaparinux; dabigatran, rivaroxaban, edoxaban (total hip arthroplasty or total knee arthroplasty), and apixaban (total hip arthroplasty or total knee arthroplasty). Low-dose unfractionated heparin adjusted-dose vitamin K antagonist, aspirin (off-label), and an interventional pneumatic compression device (IPC) (Grade 1C) for a subset of patients (Grade 1C). For patients with a high risk for VTE (≥3%) who are at high risk for major bleeding complications, we recommend low-molecular-weight heparin (LMWH) (Grade 2B), low-dose unfractionated heparin (Grade 2B), or mechanical prophylaxis with IPC (Grade 2C). No prophylaxis is recommended for patients at high risk for VTE (≥4%) who are at high risk for major bleeding complications.

CHEST
Supplement
ANTITHROMBOTIC THERAPY AND PREVENTION OF THROMBOSIS, 9TH ED. ACCP GUIDELINES

Prevention of VTE in Nonorthopedic Surgical Patients
Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines
Michael K. Gould, MD, FCCP; David A. Garcia, MD; Sherry M. Wenn, MD; Paul J. Krumholz, MD, PhD; John J. Arcelus, MD, PhD; John A. Hitt, MD; and Charles M. Samaras, MD, PhD, FCCP

Background: VTE is a common cause of preventable death in surgical patients. The guidelines for nonorthopedic surgical patients are based on systematic methods as described in Methodology for the Development of Antithrombotic Therapy and Prevention of Thrombosis Guidelines: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines in this supplement.

Methods: We developed recommendations for thromboprophylaxis in nonorthopedic surgical patients by using systematic methods as described in Methodology for the Development of Antithrombotic Therapy and Prevention of Thrombosis Guidelines. Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines in this supplement. The guidelines recommend the use of one of the following rather than no antithrombotic prophylaxis: low-molecular-weight heparin (LMWH) (Grade 2B), low-dose unfractionated heparin (Grade 2B), or mechanical prophylaxis with IPC (Grade 2C). No prophylaxis is recommended for patients at high risk for VTE (≥4%) who are at high risk for major bleeding complications.
VTE Prophylaxis Guidelines

- Optimal thromboprophylaxis in nonorthopedic surgical patients will consider the risks of VTE and bleeding complications as well as the values and preferences of individual patients. CHEST 2012; 141(2)(Suppl):e227S–e277S
- Optimal strategies for thromboprophylaxis after major orthopedic surgery include pharmacologic and mechanical approaches. CHEST 2012; 141(2)(Suppl):e278S–e325S

Screening Tests

- Recommended for all:
  - Hemoglobin, renal function, serum albumin
- Not recommended for all:
  - WBCs, Platelets, Coagulation studies, electrolytes, serum glucose, UA, CXR, EKG
AGS Recommendations for Managing Post Operative Delirium

- Multicomponent nonpharmacologic interventions delivered by an interdisciplinary team should be administered to at-risk older adults to prevent delirium.
- Ongoing educational programs regarding delirium should be provided for health care professionals.
- A medical evaluation should be performed to identify and manage underlying contributors to delirium.
Post Operative Delirium

- Pain management (preferably with nonopioid medications) should be optimized to prevent postoperative delirium.
- Medications with high risk for precipitating delirium should be avoided.
- Cholinesterase inhibitors should not be newly prescribed to prevent or treat postoperative delirium.

Post Operative Delirium

- Benzodiazepines should not be used as first-line treatment of agitation associated with delirium.
- Antipsychotics and benzodiazepines should be avoided for treatment of hypoactive delirium.
- The use of antipsychotics (eg, haloperidol, risperidone, olanzapine, quetiapine, or ziprasidone) at the lowest effective dose for the shortest possible duration may be considered to treat delirious patients who are severely agitated or distressed or who are threatening substantial harm to self and/or others.
Case Study

- 89 y/o male who presented to facility for skilled stay after acute hospitalization for gangrenous appendicitis
- Med Hx: HTN, CAD, CHF, DM
- No opioid, benzodiazepine, or antipsychotic medications (just antihypertensives, antibiotics, and supplements)
- On initial exam resident is grabbing at the air, cannot answer questions or follow commands

Son at bedside says patient was “sharp as a tack” before hospitalization and drove himself to the hospital
- Confusion started a few days after surgery
- Patient did not eat or drink well following surgery
Case Study

- Patient was “alert and oriented x 3” several days after admission
- Patient attended meeting with social worker, physician, and multiple family members a week after admission and asked “what am I required to do to be discharged?”
- Patient’s Na did remain mildly elevated, but no intervention was done (i.e. IVF) because resident was IMPROVING CLINICALLY

Post operative Pain Management
Post-op Opioids

January 2018

Defining Optimal Length of Opioid Pain Medication Prescription After Common Surgical Procedures


“Ideally, opioid prescriptions after surgery should balance adequate pain management against the duration of treatment. In practice, the optimal length of opioid prescriptions lies between the observed median prescription length and the early nadir, or **4 to 9 days for general surgery procedures, 4 to 13 days for women’s health procedures, and 6 to 15 days for musculoskeletal procedures.**"

Opioids

Should Hospitals Be Punished For Post-Surgical Patients’ Opioid Addiction?

November 26, 2017 6:19 AM ET

Heard on Weekend Edition Sunday

- "We have many clinicians prescribing opioids without any understanding of opioid withdrawal symptoms," says Dr. Andrew Kolodny, director of Physicians for Responsible Opioid Prescribing and co-director of the Opioid Policy Research Collaborative at Brandeis University’s Heller School

- Sometimes that dependence leads to full-blown addiction. The majority of street drug users say they switched to heroin after prescribed painkillers became too expensive.
Opioids

Now, a handful of doctors and hospital administrators are asking, if an opioid addiction starts with a prescription after surgery or some other hospital-based care, should the hospital be penalized? As in: Is addiction a medical error along the lines of some hospital-acquired infections?

"It arises during a hospitalization, is a high-cost and high-volume condition, and could reasonably have been prevented through the application of evidence-based guidelines," write Drs. Michael Schlosser, Ravi Chari and Jonathan Perlin.
Factors influencing long term opioid use

- Days supply of first prescription in opioid naïve patients is a major prognostic factor for continued opioid use after controlling for pain types, patient demographics, and mental disorders
- The days supply demonstrates a dose-response relationship with the likelihood of opioid discontinuation
- The more days supply that is given in the initial prescription, the more likely that individual will be taking the opioid a year later
- Persons prescribed 11-14 days initially are 3x more likely to continue the opioid compared to persons prescribed 2 days or less

Factors influencing long term opioid use

- **Regardless of indication, patients initially prescribed long acting opioids or tramadol had the lowest probability of opioid discontinuation**
- Chronic pain diagnosis had the highest probability of continued opioid use at 1 and 3 years
- Initial opioid use after an inpatient admission had the next highest probability of continued use at 1 and 3 years
- Initial prescriptions for opioids should be no longer than necessary to avoid the risk of continued use
But what about Tramadol????

HOW TO SOLVE THE OPIOID EPIDEMIC

MORE OPIOIDS
Tramadol all cause mortality

- Eligible participants taken from the Health Improvement Network (THIN) derived from the records of GPs in the UK
- Participants were 50 years or older and had a diagnosis of knee, hip, or hand osteoarthritis
- 5 cohort studies compared all cause mortality between participants who received an initial prescription of tramadol and participants who received 1 of the following: naproxen or diclofenac, celecoxib or etoricoxib, or codeine
- The primary outcome was all cause mortality 1 year after initial prescription
Tramadol all cause mortality

- 88,902 patients were included in the analysis, mean age 70.1
- Participants in the tramadol cohort were older, had higher BMI, had a longer duration of OA, and had higher prevalence of comorbidities (though after matching the cohorts were well balanced)
- Patients with cancer or opioid use disorder were excluded
- The time frame was 1/2000-12/2015 (the time frame was divided up into 16 1-year blocks)

Mortality was higher in the tramadol cohort compared to naproxen cohort (278 deaths for tramadol, 164 for naproxen)
- Mortality was higher in the tramadol cohort vs the diclofenac cohort
- Mortality was higher in the tramadol cohort vs the celecoxib cohort
- No statistically significant difference between the tramadol cohort and the matched codeine cohort
Tramadol all cause mortality: unclear biological mechanism

- Higher mortality may be due to tramadol’s inhibition of serotonin and norepinephrine uptake (serotonin syndrome and seizures)
- Tramadol may increase the risk of post-op delirium
- Tramadol may lead to respiratory depression or fatal poisoning when other substances are used (alcohol)
- Tramadol may increase risk of hypoglycemia, hyponatremia, fracture, and falls

Take Home Points

- The majority of the operative procedures are now being done on geriatric patients.
- Due to increased risk factors, a tailored approach should be used in pre-operative screening of elderly patients.
- The geriatric population is at risk of post operative delirium and other adverse reactions and these risk factors can be mitigated.
- Opioid pain medications should be prescribed post operatively according to evidenced based guidelines.
Questions?

IT AIN'T OVER TILL IT'S OVER

Yogi Berra

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