POST OPERATIVE RISK STRATIFICATION IN GERIATRIC ORTHOPEDIC TRAUMA PATIENTS:

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Disclosures:

- Grant through the Donald W. Reynolds Foundation to disseminate Geriatric Education among sub specialists
- Serve as a Geriatric Consultant with Depuy Synthes
- Would like to mention “The Geriatric Fracture Course” by Dan Mendelson and his team from University of Rochester, NY which helped me learn the concepts and do the job I do!
Overview:

- Why is this topic worth discussing?
- Strategies to reduce post operative complications in geriatric patients
- Important post operative medical issues
- Important consideration on blood transfusion in the geriatric fracture patients.
Important Facts:

- US: ~ 330,000 hip fractures / year.
- Expected to increase to 550,000 by 2040.
- 1-year mortality = 20% to 24%
- Many patients will lose their independence after hip fracture.
- The cost of caring for hip fractures was reported to be $17 billion in 1997, and it is estimated that it will grow to $62 billion by 2040.

All fractures are associated with morbidity

One year after a hip fracture:
- Death within one year: 20%
- Permanent disability: 30%
- Unable to walk independently: 40%
- Unable to carry out at least one activity of daily living: 80%
Outcome after hip fracture
The situation one year after fracture

- Loss of function: 50%
- Mortality: 20%
- Regained functional capacity: 30%
Geriatric Fracture Patients:

- Most patients benefit from surgical stabilization of their fractures
- The sooner patients have surgery, the less time they have to develop iatrogenic illness
- Goal is to have surgery ideally within 24 hours
  - less decubitii (1)
  - reduce major medical complications (2)
  - decreased preoperative pain (3)
  - decreased average LOS by 2 days (3)
  - earlier ambulation
  - reduced delirium (4)

Strategies to improve post operative risks in the Geriatric Fracture Patients:
Basic guidelines of Post operative care:

- Hydration
- Quality pain control
- Early activity
- Remove tethers quickly
- Avoid sedatives-hypnotics
- DVT prophylaxis
- HCT > 26 and stable
- Chemistries
- INR
- Beta Blockers (write holding parameters)
- Avoid poly pharmacy
Intra operative hypotension is common - anesthesia, blood loss, poor cardiovascular reserve

Intra operative hypotension is dangerous for elderly patients - Can result in stroke, MI, AKI
Anticipate Post Op Hypotension:

- Hold BP meds unless pt demonstrate a need
- Holding parameters for BB
- Evaluate hydration status
- Correct severe anemia:
  - --clinical judgment based on acuity/ sx/ ongoing bleeding/percentage lost
  - --Keep Hct > 26 in the first 2-3 post op days
Anticipate Post Op Renal Insufficiency:

- Stop ACE-I/ NSAIDS/Diuretics (pre op)
- Stop all Oral hypoglycemic agents
- If pt on insulin, reduce dose to $\frac{1}{2}$ to $\frac{1}{3}$ to prevent hypoglycemia*
- Judicious resumption of diuretics POD 2-3
- Consider urinary retention/ bladder scan
Take home messages:

- Adequate post operative hydration is essential
- Rate control and thoughtful beta blockade
- Review and adjust meds in the post op setting
- Tolerate a risk for pulmonary edema, more manageable than hypotension and its consequences
Delirium: Important facts

- **Incidence**
  - Post-operative older adults = 15-53%
  - Acute or elective hip surgery = 5 – 45%
  - ICU = 70-87%

- **Mortality rate among hospitalized Pts:** 22-76%
  - This is as high as acute MI or sepsis
  - One year mortality rate associated with cases of delirium is 35-40%

Inouye, S K; NEJM 2006; Delirium in older persons
Galanakis, P; Int J Geriatr Psychiatry; 2001; Acute confusional state in elderly following hip surgery.
Anticipate Post Op Delirium:

- Fix reversible causes e.g.: fever, pain, urinary retention, constipation
- Get rid of the tethers (Foleys/IV/O2)
- Get rid of offending medications
- Continue pre op chronic psych meds/ ch opiates
Anticipate Post Op Delirium:

- Avoid restraints
- No need of neuro imaging
- Be patient and re-evaluate often, treat pain
- If pt restless or agitated use trazodone 12.5 mg-25 mgs po tid prn and 25 mgs po qhs
- Severe agitation: Haldol 0.25 mg PO/IV prn
Narcotics & Delirium

- Postoperative opioid consumption and its relationship to Cognitive Function in Older Adults with Hip Fracture.

- Narcotics do not cause DELIRIUM if used appropriately!

- Start slow, reassess frequently

Pain management

- Necessary to provide comfort and to prevent delirium
- Use standing pain meds like acetaminophen (IV acetaminophen is a great option)
- Use narcotics for breakthrough pain
- Start with short acting narcotics
- Consider scheduled narcotics (dementia pts)
- Transition to PO meds as soon as possible
- Avoid using combination meds like
  - Percocet (oxycodone/APAP),
  - Vicodin (hydrocodone/APAP)
Post Operative Pain Management:

- Morphine Sulfate 2-4 mg IV q 2 hours prn pain (NPO)
- Acetaminophen 1000 mg PO TID
- Oxycodone 2.5 mg PO q 3-4 hrs prn moderate pain (pain scale 4-6)
- Oxycodone 5 mg PO q 3-4 hrs prn severe pain (pain scale 7-10)
- No NSAIDS
Post Operative Pain Management:

- Re assess pain frequently
- Pts should transition off IV meds on POD #1
- If several prn doses of narcotics used, consider scheduling dose
- Schedule pain meds in pts with dementia
- Encourage pts to take narcotics prior to therapy
- Don’t forget about Ice/elevation/position changes
## Constipation:

<table>
<thead>
<tr>
<th>CAUSES:</th>
<th>TREATMENT:</th>
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<tbody>
<tr>
<td>Narcotic pain meds</td>
<td>Senna S 2 tabs PO qhs</td>
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<tr>
<td>Reduced ambulatory status</td>
<td>MOM prn daily (hold if renal insufficiency)</td>
</tr>
<tr>
<td>Decreased appetite</td>
<td>Miralax prn daily</td>
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<tr>
<td></td>
<td>Suppository prn daily</td>
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<td>Enema prn</td>
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Post Operative Tachycardia:

- Post operative pain
- Acute blood loss anemia
- Dehydration/low intravascular volume loss
- Fevers
- Medications (holding BB/CCB)
- Infection
Acute Blood Loss Anemia:

- Anticipate blood and hydration needs by:
  - Hb and the percent drop post surgery
  - Fracture type
  - Anticipated repair
    - THA; ~ 2 unit loss
    - ORIF: < 1 unit
  Experience (of surgeon)
Liberal or restrictive transfusion in high risk pts after hip surgery:

- Optimal transfusion threshold for perioperative transfusion was examined in the Transfusion Trigger Trial for Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair (FOCUS) trial.

- RCT, 2016 pts, all > 50 yrs, post op Hb <10 mg/dl

Liberal or restrictive transfusion in high risk pts after hip surgery:

- Liberal group received immediate transfusion of 1 unit and subsequent to maintain Hb >10 mg/dl

- Restrictive group received 1 unit only if the Hb dropped to <8 mg/dl or if they developed sx of anemia

- These were defined as chest pain, orthostatic hypotension, tachycardia, unresponsive to fluid resuscitation, or congestive heart failure
The primary outcome of the FOCUS study was death or inability to walk 10 feet at a 60 day follow up or to reduce in hospital mortality for high risk patients.

However, we are treating

- Post operative hypotension
- AKI, oligouria and renal hypoperfusion
- Prevent delays in possible discharge the next day esp. when the Hb is already trending downwards...
Post Operative Fever:
7 W’s of Post Op care:

- Wind – Day #1
- Water – Day #3
- Walk – Day #5
- Wound – Day #7
- Wonder where (abscess) – Day #10
- Weird drugs - any day

- Doesn’t warrant blood cultures in 1-2 episodes of post op fever*
Atelectasis:

- Remember, all crackles in the post op pt are not PNA
- Encourage frequent and regular incentive spirometry
- Use Accapella in older pts esp. females
- Encourage sitting up in bed vs. lying down
Other common complications:

- A fibrillation – evaluate/adjust meds
- Pneumonia, aspiration – precautions/family discussion
- Dysphagia
- Hyponatremia – think IVFs and psych meds
- Urinary retention – narcotic meds/constipation
- UTI – get a cx
- Alcohol withdrawal – benzo use
Asymptomatic bacteriuria

- Common in most post menopausal females
  - asymptomatic bacteriuria increases with age
- High threshold for starting antibiotics WITHOUT + urine Culture
- Associated with antibiotic resistance and C-Diff infection

Don’t use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present. Cohort studies have found no adverse outcomes for older men or women associated with asymptomatic bacteriuria. Antimicrobial treatment studies for asymptomatic bacteriuria in older adults demonstrate no benefits and show increased adverse antimicrobial effects. Consensus criteria has been developed to characterize the specific clinical symptoms that, when associated with bacteriuria, define urinary tract infection. Screening for and treatment of asymptomatic bacteriuria is recommended before urologic procedures for which mucosal bleeding is anticipated.
Use of Foley catheters in hip fracture patients

- Increasing numbers of orthopedic programs are electing to not systematically insert Foley catheters for perioperative hip fracture management
  - Urinary catheter placed only if patient unable to void postoperatively;
  - If placed, discontinued by 10 a.m. post-op day 1

POST OPERATIVE CONSIDERATION: USE OF WARFARIN IN THE GERIATRIC PATIENTS:
Warfarin:

- Warfarin is a vitamin K antagonist with a long half life
- Common uses:
  - Cardiac: arrhythmias, valvular heart disease, thrombus, MI
  - Cerebrovascular: stroke/ TIA
  - Thromboembolic disease: DVT/P.E
Post op care for pts on warfarin:

- Restart 12-24 hrs after surgery
- INR goal (ACCP): 2-3
- Takes 3-4 days to reach target levels
- Bridge based on individual cases
Mechanical Heart Valves:

- Typical goal INR is between 2.5 and 3.5
- High risk of thrombosis with Mitral heart valves
- Typically bridge with heparin drip
  - Preferred over therapeutic LVX
  - Hold drip usually 4-6 hours pre-operatively
  - Recommended to restart heparin drip after hemostasis achieved (12 – 24 hrs)
- Can consult cardiology if have additional questions
Discharge Planning:

- Thoughtful medicine reconciliation

- Typically BP meds may not be restarted until patient is well into rehab, if at all

- Be proactive with pt/family about possible complications esp. delirium
Case 1:

- 96 yr old female admitted from ALF s/p fall and resultant left intertrochanter fracture.
Case 1:

PAST MEDICAL HX:

- HTN
- HLP
- Seizure disorder
- Urinary incontinence
- CAD s/p pacemaker

MEDICATIONS:

- Amlodipine 5mgs
- Lasix 20 mgs
- Lisinopril 20 mgs
- Depakote 500 mg bid
- Detrol LA 4 mgs
Physical Exam:

- VS: 100/48, pulse 84, 20 RR pulse ox 96%, 97.6F
- Frail looking, elderly, slightly agitated
- No jvd, + 2/6 SEM
- Clear but very shallow breaths
- Flat, NT, ND, +BS
- + foley catheter in place
- No edema
- Awake, conversant, agitated
Labs:

- **WBC**: 10.5 K; **Hb/HCT**: 8.2/24.6; **Plt**: 139

- **Cr**: 1.08 (baseline 0.8), **BUN**: 39

- **EKG**: NSR with ectopy, no ST abnormalities

- **CXR**: normal
What are your recommendations?
Recommend:

- OK to go for surgery
- Hold all BP meds, monitor BP
- Low Hb/HCT: transfuse before / intra Op
- Monitor electrolytes
POD # 1

• VS: 104/47, HR 103, RR 20, 100% on 2L O2, 100F

• Labs: BUN 49; Cr 1.74; Na 135; K 5.9; Cl 103 Co2: 23;

• WBC 14.9; Hb/ Hct ; 6.7/19.3; Plts 128

• UO: 100 cc/overnight; none since 5 am
What are your recommendations?
Recommend:

- **Severe acute blood loss anemia**: transfuse more PRBCs

- **Acute kidney injury**: hold BP meds, transfuse PRBCs followed by IVFs

- **Hyperkalemia**: EKG, repeat K, insulin + dextrose
Recommend:

- **Hypotension**: continue to hold BP meds
- **Tachycardia**: treat anemia
Any other thoughts?
Recommend:

• Review the medications, again!

• On pharmacy profile, the pt’s Depakote was not given (though ordered)

• Depakote level was checked and was low

• Depakote was loaded and rechecked again
Questions?