UCSF Hip Fracture Protocol

Developed by the Hip Fracture LEAN Committee and Approved by the Departments/Divisions of Geriatrics, Hospital Medicine, Cardiology, Anesthesia, Emergency, and Orthopedic Surgery

Section One: Timing and Care Sequence:

1. **Presentation to the Emergency Room**
    a. Assessment by the ED
    b. Radiographs
        i. Low AP pelvis, AP of affected hip, AP and lateral of affected femur
        ii. MRI indicated if high suspicion but no clear fracture on x-ray, CT scan if MRI not available
    c. Preoperative labs drawn
        i. CBC, Chem 10, Coags, Vitamin D
        ii. Type and Cross for 2 units pRBCs
        iii. Type and cross for 2 units FFP if patient on Warfarin
    d. Chest radiograph if clinically indicated (hx of heart or lung problems or sx)
    e. ECG if clinically indicated (hx of heart problems or new sxs)
    f. Pain Control
        i. Fascia Iliaca block* see protocol below (The ED provider should page the Anesthesia Acute Pain Service 24/7 @ 443-6889 to notify them of the patient).
        ii. Tylenol 1000mg TID ATC (IV ok if pt unable to take po); 650mg po TID if liver problems
        iii. If age>70, start Oxycodone 2.5mg po Q 3 hours prn, Dilaudid 0.4mg Q2 hour prn severe pain
        iv. If age<70, start Oxycodone 5mg po Q 3 hours prn, Dilaudid 0.6 mg Q2 hours prn severe pain
        v. Avoid Fentanyl (short-acting)
    g. If patient on Warfarin and adherent to dosing schedule give Vitamin K 5mg PO x 1 ASAP (Do not wait for labs)
    h. Orthopedics/geriatrics or medicine consulted as soon as hip fracture known
    i. Geriatric service called if 8AM – 5PM (443-2690) for pts 65+, Medicine called if <65 5PM – 8AM (443-xxxx) for preoperative optimization.
    j. Admit patient to Orthopedics or Medicine and request 7L bed if available
    k. Delirium or "Agitation"
        i. Avoid benzodiazepines (or Benadryl/anticholinergics)!
        ii. Prefer consult Geriatrics or Medicine to manage in ED but if patient is at risk of harm to self or others follow *UCSF Delirium Harm Avoidance Protocol*:
            1. Age >70
                a. PO Seroquel 12.5mg po x 1 (can repeat x1 in 2 hrs)

b. If need IM or IV: Haldol 0.5mg IV/IM x 1 (can repeat x 1 in 1hr)

2. Age <70
    a. Per Seroquel 25mg po x 1 (can repeat x 1 in 2 hrs)
    b. If need IM or IV: Haldol 1mg IV/IM x 1 (can repeat x1 in 1 hr)

l. Other consults as warranted

2. Patient Admitted

a. Patient admitted to Orthopedics unless age > 90, multiple medical co-morbidities requiring active management, or significant active medical issue per current protocol.
b. Geriatrics co-follows/consults on all patients 65 and older and all patients in the ortho-bundled payment program no matter which service they are admitted to
c. Orthopedic On-call chief notifies attending on-call and covering trauma attending as well as University Service Chief and Intern (Attending covering case will depend on when case can go to the OR, if case goes from 1PM to 7PM then ortho trauma attending of the day will cover. If the case goes after 7PM or on weekends then general on-call attending will cover).
d. Orthopedic chief discusses all hip fractures admitted overnight or planned for surgery each day with E1 in the morning at approximately 7AM at the surgery board. This discussion will include any relevant co-morbidities that may affect surgical planning as well as any concerns raised by geriatric/medicine service.
e. Daily Hip Fracture Rounds at 1:30PM in Location 754L, attended by on-service geriatrician, orthopedic surgery intern, arthroplasty NP, case management, bedside nurse PT/OT, & primary team (if not on Med or Ortho). Email will be sent each morning to team members that should attend.
f. For patients admitted in the evening keep NPO after Midnight in anticipation of OR next day, for patients admitted in the morning keep NPO for possibility of OR the same day.
g. 100-150cc/hr normal saline maintenance fluids started early (monitor fluid status carefully)
h. Hold ACE inhibitors to prevent intraoperative hypotension and AKI, restart POD #1
i. Continue beta-blockers/rate control medications
j. Pain Control
    i. Tylenol 1000mg TID PO ATC, use IV only if unable to take PO
    ii. Call pain service for pre-op fascia iliaca block if not done in ED
    iii. If age>70, start Oxycodone 2.5mg po Q 3 hours prn, Dilaudid 0.4mg Q2 hour prn severe pain
    iv. If age<70, start Oxycodone 5mg po Q 3 hours prn, Dilaudid 0.6 mg Q2 hours prn severe pain
k. Delirium Order Set
l. PT/OT ordered pre-emptively to service aware of impending need

m. Patient admitted to 7 Long if possible
n. Order Vitamin D if not already done in ED
o. PMD contacted on admission to confirm medication list and co-morbidities (Geri/Med)

3. Patient taken to OR

a. Goal is < 24 hours from presentation to ED (time-stamp is when patient is roomed in the ED)
b. Orthopedic On-call chief notifies attending on-call and covering trauma attending as well as University Service Chief and Intern
c. Orthopedic chief discusses all hip fractures admitted overnight or planned for surgery each day with E1 in the morning. This discussion will include any relevant co-morbidities that may affect surgical planning.
d. Patients are optimized by 11AM if they present overnight, ASAP if they present during the day, but no later than 11AM the following day
    i. Statement to be placed in chart when optimized
        1. "This surgery is urgent and patient is medically optimized for the proposed procedure and requires no further medical evaluation at this time. Please discuss with anesthesia that spinal anesthesia is preferred if appropriate and safe."

4. Postoperative Course

a. Daily Hip Fracture Rounds at 1:30PM in Location 754L, attended by on-service geriatrician, orthopedic surgery intern, arthroplasty NP, case management, bedside nurse PT/OT, & primary team (if not on Med or Ortho). Email will be sent each morning to team members that should attend.
b. Standard postoperative antibiotics x 1 dose (orthopedics orders)
c. Postop CBC, Chem 10 x 1, other labs as needed or based on medical co-morbidities
d. Lovenox for VTE prophylaxis x 4 weeks to start POD#1
e. Bone Health Labs ordered: f/u Vitamin D level or order if not done earlier
    i. If level is:
    20-30 ---> start 2000IU daily
    31-40 ---> start 1000IU daily
    < 20 ---→ start 50,000IU weekly x 8 weeks then 2000IU daily
    ii. Start Calcium Carbonate at 1250mg po daily
f. Delirium order set
g. Patient seen by PT/OT the morning after surgery
h. Foley out POD #1, straight cath if retention
i. Goal discharge to home or facility is < 48 hours

5. Discharge: (3 appointments need to be made: bone health, orthopedics, primary care)

a. <u>BONE HEALTH:</u> Primary team schedules bone health appointment for 1-2 months after discharge: Place UCSF Skeletal Health Referral or contact initiated with patient's PMD for bone health care if patient not local
b. <u>ORTHOPEDICS FOLLOW UP:</u> Orthopedics team schedules Orthopedic Surgery Follow up (based on surgical type):

i. ORIF: follow-up in Trauma Clinic with Advanced Health Provider for first visit
    1. Referral and Orthopedic Intern emails Orthopedic Institute Scheduling Desk for Trauma Clinic follow-up in 2 weeks with radiographs

ii. Hemiarthroplasty or total hip arthroplasty: follow-up with Arthroplasty Fellow for first visit
    1. Referral and Orthopedic Intern emails Orthopedic Institute Scheduling Desk for Arthroplasty Fellow Clinic follow-up in 2 weeks with radiographs

iii. Non-Local patient**:** follow-up with a local orthopedic surgeon in 2 weeks with radiographs

c. PRIMARY CARE: Primary team makes appointment with PCP within 2-4 weeks

d. Ortho Bundled Payment (OBP) program: If patient meets criteria for the OBP, a Care Support Program Nurse Practitioner will connect with patient before discharge to ensure continuity

i. Inpatient Case Manager & OBP Program Coordinator will be in communication to ensure collaboration with the UCSF complex care management team

ii. NP from Care Support will often meet patient in house before discharge

e. Primary service ensures detailed instructions for patient and family in the AVS:

iv. UCSF follow-up visits scheduled & listed *with clinic addresses and phone numbers*
    1. Orthopedic Surgery
    2. Skeletal Health
    3. PCP

v. Post-op instructions
    1. Wound care/dressing
    2. PT/Activity

vi. Follow up anticipatory guidance
    1. Specific instructions on when to call the doctor (PCP vs Orthopedic Surgeon)

vi. Updated medication list

Section Two: Specific Considerations for Anesthesia and Surgery

6. Anesthesia

a. Neuraxial strongly preferred in all patients
    i. INR < 1.3
    ii. Must provide adequate relaxation for fracture reduction
        1. Contraindications or neuraxial + regional anesthesia :Refer to: https://anesthesia.ucsf.edu/clinical-resources/guidelines-use-antithrombotic-agents-setting-neuraxial-procedures

b. GETA for patients with INR > 1.3 but able to go to surgery otherwise

c. Basic Preoperative Workup
    i. CBC, Chem 10, Coags
    ii. Chest radiograph if clinically indicated (hx of heart or lung problems or sx)
    iii. ECG if clinically indicated (hx of heart problems or new sxs)
d. Standard Preoperative antibiotics as a weight based dose of Cefazolin
    i. Vancomycin for Cephalosporin allergic patients
    ii. Vancomycin for penicillin allergic patients if the allergy was anaphylaxis
e. Tranexemic Acid 10mg/kg IV at the beginning and end of the case
    i. Any specific concerns for contraindications to be discussed between attendings

7. Surgery

a. Coverage
    i. The Trauma Attending of the Day covers the case from 1PM until 7PM start time
    ii. If the case can go after 7PM the general on-call attending covers
    iii. If the case requires a total hip arthroplasty the arthroplasty attending on call or arthroplasty fellow will cover depending on availability. If the on-call attending or fellow is not available and the case can go then any arthroplasty faculty available will cover.
b. Standard Preoperative antibiotics as a weight based dose of Cefazolin
    i. Vancomycin for Cephalosporin allergic patients
    ii. Vancomycin for penicillin allergic patients if the allergy was anaphylaxis
c. Tranexemic Acid 10mg/kg IV at the beginning and end of the case
d. INR 1.5-1.8, give one unit FFP on call to OR
e. Hip Fracture Booking
    i. All cases that will be going for ORIF will be booked as: HIP FRACTURE ORIF (HIPT3045)
    ii. All cases that will be going for CRPP will be booked as HIP FRACTURE CRPP
    iii. All cases requiring a Hemiarthroplasty or Total Hip Arthroplasty will be booked as: HIP FRACTURE HEMIARTHROPLASTY (HIPT3044)

Section Three: Anticoagulation, Co-Morbidities and Specific Conditions

1. Anticoagulation

a. Continue Aspirin at all doses
b. Warfarin
    i. Hold Warfarin, give Vitamin K 5mg PO x 1 ASAP
    ii. Type and cross for 2 units FFP
    iii. Goal INR for OR is 1.5 or less for surgery, Goal INR for neuraxial anesthesia is 1.3 or less
    iv. Re-check INR 12 hours after vitamin K dose
    v. Can proceed with surgery if INR 1.8 or less and patient can get FFP on the way to the OR (patient will receive GETA)
c. Clopidogrel, prasugrel, ticagrelor, cilostazol

i. Continue any Acute Coronary Syndrome (treated medically or with stent) within last 12 months
ii. Continue if drug-eluding stent in last 6 months (in non-ACS)
iii. Continue if bare metal stent within last 1 month (in non-ACS)
iv. No need to delay surgery (patient will receive GETA)

d. NOACs (dibigatran, rivaroxaban, apixiban, edoxaban)
    i. Hold, record time of last dose taken clearly. Clearance dependent on renal function.
    ii. Generally hip fracture surgery with general anesthesia only can be undertaken 24 hours after last dose for all medications and normal renal function (48 hours for Dabigatran and Apixiban and high risk of bleeding). Risks and benefits should be weighed by teams (ortho, medicine, geriatrics, and anesthesia) for delaying surgery more than 24 hours.

e. Bridging
    i. Bridging therapy with heparin indicated if any of the very high risk conditions below:
    ii. Very high risk conditions
        1. Mechanical heart valve
            a. Mitral prosthesis
            b. Caged ball/tilting aortic prosthesis
            c. Stroke/TIA within 6 months
        2. Atrial Fibrillation
            a. CHADS-VASC score 7-9 + absence of additional bleeding risk
            b. Stroke/TIA or systolic embolism within 3 months
        3. VTE
            a. VTE within 3 months
            b. Severe thrombophilia
            c. History of VTE during discontinuation of anticoagulation

2. Co-morbidities: Only unstable conditions should delay going to the OR (Active ACS, Unstable Arrhythmia, Decompensated CHF with new symptoms, and Known Moderate/Severe Aortic or Mitral stenosis [a-d]) below:

a. Active Acute Coronary Syndrome (ischemic EKG changes or elevated troponin)
    i. Cardiology consult and OR delay until optimized

b. Unstable Arrhythmia (hypotension or significantly uncontrolled)
    i. Cardiology consult and OR delay until optimized

c. Decompensated CHF with new symptoms: see “Patients requiring an echo”
    i. New symptoms or severe decompensation needs an echo before OR

d. Valvular Stenosis: see “Patients requiring an echo”
    i. Known Mod/Severe Aortic stenosis
    ii. Known Mod/Severe Mitral stenosis
        1. TTE if none in past 12 months or new sxs for anesthesia

e. Pulmonary Compromise
    i. COPD/Asthma
        1. Continue inhaled bronchodilators/steroids
        2. Acute exacerbation
            a. Delay surgery, give steroids for 24-48 hours
        3. Acute bronchitis/PNA
            a. Assess for sepsis/SIRS/bacteremia and treat as necessary
            b. Surgery delay based on team discussion
        4. Stress does steroids for significant chronic use
    ii. OSA
        1. Continue CPAP
        2. If OSA suspected but not diagnosed consult respiratory therapy
f. Anemia
    i. Transfusion trigger is Hgb < 8
g. Diabetes/Elevated blood sugar
    i. Goal blood sugar 100-180 (too low increases falls, too high impedes repair)

3. Patients Requiring an Echo

a. A recent Echo is defined as in the last 12 months
b. Only patients with the following conditions require a new echo
    i. CHF with new symptoms/signs of decompensation
    ii. Mod/severe aortic stenosis or mitral stenosis
        1. With new symptoms
        2. If no echo in last 12 months
c. Coordinate with cardiology to have echo done within 12 hours of admission

4. Cardiac Anesthesia

a. **<u>Only</u>** a requirement at the discretion of the anesthesia service (Medicine, Cardiology, or Geriatrics should NOT recommend)

References: **Regional Anesthesia and Pain Control for Acute Hip Fractures in the ED**
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Pedram Aleshi, MD; Anesthesia and Perioperative Care
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Policy

All patients with hip fractures should receive timely, effective, multi-modal analgesia. As part of this the Departments of Anesthesia and Perioperative Care, Emergency Medicine, Orthopedic Surgery recommend all patients receive an ultrasound-guided fascia iliaca block (FIB) as soon as appropriate and possible as this has been shown to decrease pain, need for opioids, and assist in timely transfer to OR.

Note: When possible, it is preferred that these patients receive a FIB catheter placed so that a continuous infusion of anesthetic can be initiated during the hospitalization.

As soon as a patient with acute hip fracture is identified, Orthopedic Surgery consult should be notified by the ED provider.

The ED provider should page the Anesthesia Acute Pain Service 24/7 (at 443-6889) to notify them of the patient.

1. If the APS or regional anesthesia team is able to perform the procedure within 2 hours (Mon-Fri, 8am-5pm), then the ED will request placement of a FIB catheter (or one-time FIB, at discretion of APS or Regional Anesthesia team performing the block).
    - If a catheter is placed, the APS or Regional Anesthesia team will administer a one-time dose of anesthetic; continuous infusions of anesthetic will only be done once the patient is admitted to an appropriate inpatient unit

2. If the APS cannot respond within a reasonable amount of time (outside of Mon-Fri, 8am-5pm; or if APS team is otherwise unavailable), then the ED provider should proceed to performing a one-time FIB (or placement of a catheter, at discretion of ED provider).
    - During off hours, the APS may consider requesting assistance from the E1, as appropriate and notifying the ED provider if an Anesthesia provider can respond urgently

3. If the APS cannot respond urgently and the ED provider cannot perform the FIB, then the APS will collect the patient's information and perform a timely consultation at the earliest opportunity to assess ongoing need for FIB. The APS consult will normally not come in from home during weekends or evenings/overnights specifically to perform the procedure.

4. If a FIB catheter is placed, then the APS will follow the patient as a consult service.

Note: The FIB should be performed after call to the Orthopedic Surgery consult resident. While it is preferred that the consult resident evaluate the patient prior to or during FIB being performed, the ED or APS teams should proceed to performing the block as quickly as possible in the event of a delay to Orthopedic consultation. Unless there are specific concerns, the FIB should not be delayed until the patient is staffed with or evaluated by the Orthopedic Surgery senior resident or attending physician.

Fascia Iliaca Block Procedure/Protocol and Management of Toxicity

Contraindications to FIB:

- Coagulopathy or anticoagulant use, refer to : https://anesthesia.ucsf.edu/clinical-resources/guidelines-use-antithrombotic-agents-setting-neuraxial-procedures
- Allergy to local anesthetic
- Pre-existing peripheral neuropathy/neuromuscular disease or neuropathy as a result of trauma/injury
- Combative patients or any scenario where the block cannot be performed safely
- Signs of infection overlying injection site

Equipment

1. Order in Apex (medications are not stocked in block cart):
   Ropivacaine 0.2% 40cc OR Ropivacaine 0.5% 20cc + NS 20cc
   Lidocaine 1% 10cc (for skin infiltration)
2. Point-of-care ultrasound with high-frequency linear transducer
3. From block cart:
   Block needle
   20cc syringe x 2, 3-way stop-cock
   Needles/syringes for drawing up meds and performing skin infiltration
4. Chlorhexidine swab
   Ultrasound probe cover
   Sterile gloves

Local Anesthetic Systemic Toxicity

Protocol based on American Society for Regional Anesthesia and Pain Medicine: Checklist for Treatment of Local Anesthetic Systemic Toxicity
https://www.asra.com/advisory-guidelines/article/3/checklist-for-treatment-of-local-anesthetic-systemic-toxicity

- Call for Code Team.
- Ventilate with 100% oxygen; prepare for intubation.
- Administer benzodiazepines for seizure activity.
- Initiate ACLS, if necessary.
  AVOID vasopressin, calcium channel blockers, beta-blockers, or local anesthetic
  REDUCE individual epinephrine doses to <1 mcg/kg
- Administer 20% lipid emulsion therapy (Intralipid 20%).
- 1.5 cc/kg bolus over 1 min, followed by 0.25 cc/kg/min infusion
  Repeat bolus every 5 min if hemodynamic instability persists; max 3 doses
- May increase infusion to 0.5 cc/kg/min (max 10 cc/kg in first 30 mins of treatment)
- Continue infusion for at least 10 mins after return of hemodynamic stability

Additional considerations:

- Consider ECMO/cardiopulmonary bypass
- Prolonged CPR (>60 min) may be necessary
- AVOID: propofol, vasopressin, calcium channel blockers, beta-blockers, and lidocaine
- Consider amiodarone first line for arrhythmias
- After resuscitation, transfer patients to ICU for observation

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