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Denver Health Orthopedic Resident Manual: Common Orthopedic Trauma Scenarios and Inpatient Protocols

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Disclaimer: This handbook offers guidance in patient care and patient management for DHMC orthopedic surgery residents. Clinical management guidelines represent a safe and preferred approach based on our institutional and personnel capabilities. However, it must be recognized that individual patient circumstances may warrant deviating from these guidelines. Ultimately, the clinician's judgment should determine the course of action.

Documentation: Documentation is key!!! Not only to protect yourself but, most importantly, for patient care and communication with the patient's care team. You **MUST** document ANY interaction with a patient or patient's family (physical exam, phone conversation, consent process, etc). If it is not documented, then it did not happen. This is extremely important.

When in doubt, always remember the 5 rules of the CU Orthopedics Residency:

1. **Trust no one (not even yourself)**
2. **Do it yourself**
3. **Check it twice (see rule #1)**
4. **Expect sabotage (see rule #1)**
5. **Show no weakness**



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Frequently Called Numbers

Gray Surgery	461-9970	Rads OD	281-3869	ED Trauma	28100
Blue Surgery	206-6882	CT Tech	24149	ED Med	23397
Purple Surgery	461-9980	IR	24150	ED ESU	23200
Surgery Consult	206-3459	MRI	24123	DECC	23300
Neurosurgery	461-6123	Nuc Med	24124	AUCC	22900
Orthopedic	855-4363	GI Lab	21085		
Spine	206-6743	Social Work	67390	SICU Main	25800
Urology	See on call	SW weekend	See on call	MICU	21460
OB/GYN	855-8844	PT/OT	27310	PICU	29460
				PEDS	29440
Anesthesia	123-102	Main Lab	25200	L&D	29365
OR Bridge	21061	Chemistry	25242	MB	29280
OR room 210- (room #)	21001- 21012	Hematology	25243	3SD/PCU	21425
Pre Op	21030	Microbiology	25205	3B	21420
PACU	21020	Pathology	25221	4B	21250
		Cntrl Supply	27999	4A/Psych	26890
ED Trauma SR	23395	Bed Control	29245	5A	23810
ED Trauma JR	23396			6A	28900
ED Medicine JR	23397	Clinic	27609/27580	7A	27300
		Clinic Appt	64949	8A	28800
Help Desk	63777	Peds Surg Clinic	28340	9A	28700
		PACS	206-3173	CCMF	21700

Consultations

Trauma Alert/Activation Criteria

Criteria:

A. Trauma Alert:

- Open or depressed skull fracture, penetrating skull injury
- Pelvic fracture confirmed or suspected by physical exam
- Stab wound to neck, torso or groin
- Two or more long bone fractures with polytrauma mechanism
- Open long bone fracture with polytrauma mechanism
- Positive FAST exam in the setting of trauma
- New focal neurologic deficit with mechanism attributed to trauma
- Environmental hypothermia requiring active rewarming
- Significant trauma with age > 70
- High risk mechanism by EM MD discretion (i.e. ejection, high speed auto-ped)
- High energy electrical injury
- Burn > 10% BSA
- Drowning requiring resuscitation and/or field intubation
- EM MD or trauma surgeon discretion (high risk patients should be alerted prior to hospital arrival)

B. Trauma Activation:

- Glasgow Coma Score (GCS) less than nine (9) with mechanism attributed to trauma
- Respiratory compromise, obstruction, and/or intubation with mechanism attributed to trauma
- ANY trauma with a confirmed systolic blood pressure (SBP) less than 90 mmHg, or comparable level of hypotension in a child
- Mechanically unstable pelvic injury (open or obvious on physical exam)
- Gunshot Wound (GSW) penetrating the neck, chest, abdomen, or extremity proximal to elbow or knee
- Amputation proximal to the ankle or wrist
- Fall greater than or equal to 30 feet
- Transfer patients from other facilities receiving blood en route
- Environmental hypothermia with a temperature less than 30 degrees Celsius
- The EM attending or chief surgical resident suspects the patient is likely to require urgent operative intervention

C. Adult vs Pediatric:

- Under 15 years old in the DECC
 - However, pediatric patients of any age with penetrating trauma meeting Trauma Team Activation criteria are triaged to the Adult Emergency Department for proximity to the OR.
- 15 years old and over in the Adult ED

Consults and Collaboration with Other Teams

Consults:

- A. All consults associated with a trauma alert/activation need to be seen URGENTLY
 - Report to the charge nurse that orthopedics has arrived
 - Document time of page and time of arrival in the trauma bay in your note

- B. All non-trauma alert/activation consults should be seen in a reasonable time
 - Return page from the ED within 15 minutes, see the patient within 30 minutes, and give ED the final disposition within 90 minutes
 - There may be times that other clinical obligations or surges in consultations make it difficult to meet the above timeline goals. However, deviations from the timeline should be exceptions and not the norm. The expectation is that each of the consult services will be compliant with the above timeline for 80% of the consults
 - This does not mean the note has to be completed within this time
 - Do not allow consults to stack up (more than 2-3 consults behind)
 - It is ok to ask for help in order to ensure consults are being managed efficiently

- C. See ALL consults!
 - There is no such thing as a “curbside consult”
 - We are either consulted or not
 - Make sure this is clear when working with the ED or other services
 - See ALL “unnecessary” consults from the ED or inpatient teams
 - You will be surprised how many times these turn into, “I’m glad I saw that!”
 - Realize they are consulting us because they do not have our training and would like our expertise
 - Many times these types of consults can be used as an educational opportunity to teach the other service
 - And potentially avoid a similar consult in the future
 - An intern should NEVER see a consult by themselves
 - An upper level should see the patient at some point during their care
 - The level of oversight is dependent upon the current experience of the intern and time of year
 - The upper level MUST either addend the intern’s note or document a note of their own
 - Always remember we are here for patient care and to learn!

Collaboration with Other Teams:

A. SICU/PICU:

- Patients in the SICU/PICU are under the primary management of the SICU/PICU teams
- **A resident must accompany a SICU/PICU patient back to the unit after undergoing a procedure in the OR**
 - If patient is going to PACU first, walk over to SICU to sign out to the SICU resident
 - Sign out should occur with the nursing staff and SICU/PICU resident regarding the procedure and postoperative orders and plan
 - This should also be clearly documented in the postoperative progress note
 - Confirm with the SICU/PICU resident who will be doing the postoperative orders
 - Never hurts to double check their orders
- Communicate with the SICU/PICU team when a patient is undergoing a procedure the day before (also ensure NPO status)
 - Subsequently, confirm that the patient is still able to proceed to the OR in the morning during rounds

B. When Orthopedics is not primary:

- All pediatric patients (18 years and younger) will be admitted to Pediatrics as the primary team
- ALWAYS stay in communication with the primary team
 - Inform the service when we plan to take a patient to the OR and the plan
 - Confirm NPO status with the team the day before
 - Discuss (either in person or by phone) the procedure performed and postoperative plan with the primary team after a patient comes out of the OR
 - WB status, antibiotics, DVT prophylaxis, pain control, diet, PT/OT, EBL, postoperative imaging, labs, etc
 - This should also be clearly documented in the postoperative progress note
 - Confirm with the team who will be doing postoperative orders
 - Never hurts to double check their orders

Common theme: COMMUNICATION IS KEY!!!

ASAP Emergency Department Tip Sheet

Documenting Plan Communicated for ED Consults

Consultants to the Emergency Department can use the Consults Report in the Consults ED Track Board view to document Plan Communicated.

1. From the ED Track Board, open the Consults Track Board view

ED Track Board (DHED)

Statu	Bed	Patient	Age	Complaint	TT	Cardiology	General Surgery	Orthopedics	Neurology
ESU		Airbrush, Angela (F)	60 y.o.	Vomiting Blood	07:48	—	—	—	—
ESU		Airdrill, Angela (F)	60 y.o.	Vomiting Blood	07:48	—	—	00:01	—
MEDI...		Airfilter, Angela (F)	60 y.o.	Vomiting Blood	07:48	—	—	—	—
MEDI...		Airhose, Angela (F)	60 y.o.	Vomiting Blood	07:48	—	—	—	—
MEDI...		Chisel, Angela (F)	60 y.o.	Vomiting Blood	07:48	—	—	—	—

2. Open the Consult report by:

a. Single-clicking the patient's name

b. Clicking Show Report on the bottom of the Track Board

ED Track Board (DHED)

Statu	Bed	Patient	Age	Complaint	TT	Cardiology	General Surgery	Orthopedics	Neurology	OMFS
ESU		Airbrush, Angela (F)	60 y.o.	Vomiting Blood	07:51	—	—	—	—	—
ESU		Airdrill, Angela (F)	60 y.o.	Vomiting Blood	07:51	—	—	00:04	—	—
MEDI...		Airfilter, Angela (F)	60 y.o.	Vomiting Blood	07:51	—	—	—	—	—
DISA...		ZZedscribe, Pheasant (M)	29 y.o.	Vision Change	1901...	—	—	—	19015:32	—
DISA...		Zzpesrmaster, Reggie (M)	29 y.o.	Suicidal; Anxiety	2501...	—	—	—	—	—

Show Report

3. Click the Consult Update task for your specialty to open the Consult Update form

Hide Report

← → ↻ 🔍 Consults Vitals I/O Labs Meds Handoff Cosign Facesheet Signed & Held

Airdrill, Angela #40000011 (Acct:1000014974) (60 y.o. F) PCP: None

Consult Event Tracking

Ordered 09/12/18 0748	Inpatient consult to gastroenterology - Once, Prio: STAT Scheduled 09/12/18 0750	Task Gastroenterology Consult Update
09/12/18 1522	Inpatient consult to Orthopedic Surgery - Once, Prio: STAT Scheduled 09/12/18 1523	Task Orthopedics Consult Update

4. Select the Plan Communicated button, leave any comments and click Accept.

Airdrill, Angela #400000011 - Orthopedics Consult Update

Inpatient consult to Orthopedic Surgery [CON52] (Order 411692) Consult

Date: 9/12/2018 Department: Dh Pav A Ed/Decc/Aucc/Pes Released By/Authorizing: Attending Physician Emergency, MD (auto-released)

Original Order

Ordered On: 9/12/2018 3:22 PM
Ordered By: Attending Physician Emergency, MD

Order Questions

Question	Answer	Comment
Reason for Consult?	Swelling of knee	
Did you contact the consultant?	Yes	

Additional Information

Associated Reports
[View Encounter](#)
[Priority and Order Details](#)

Consult: From: EMERGENCY, ATTENDING P... To: ...

Override restrictions

Consult Tracking: **Called** Re-Called Responded **Plan Communicated** Consult Completed Deferred

Comments: [Text Area]

Accept Cancel

Upper Extremity Trauma Allocation

Fractures

- Hand team:
 - Radial head fractures
 - Elbow fracture-dislocations/ terrible triad
 - Isolated radial or ulnar shaft fractures
 - Both bone forearm fractures
 - Distal radius, distal ulna fractures
 - All other wrist and hand trauma
- Trauma team:
 - Distal humerus fractures
 - Olecranon fractures
 - Humeral shaft fractures
 - Proximal humerus fractures
 - Scapula fractures (some may go with Sports depending on location)

**In the case that the hand team is unavailable, trauma team will assume care of any of the above injuries

Advanced Imaging

Computed Tomography

- A. Indications: Pelvic/Acetabular fractures, Periarticular fractures
- B. All CT scans should get 3D recons. For periarticular fractures request that the uninjured bone is subtracted to visualize joint

Open Fractures

A. Classification:

Table 1

Short Version of the Gustilo Classification System of Open Fractures ^a	
Type	Description
I	Wound <1 cm, clean
II	Wound >1 cm, no extensive soft tissue damage
IIIA	Extensive soft tissue damage with adequate coverage
IIIB	Extensive soft tissue damage with inadequate coverage
IIIC	Arterial injury requiring repair

^aData from Gustilo and Anderson¹⁰ and Gustilo et al.¹¹

Table 2

Expanded Version of the Gustilo Classification System of Open Fractures ^a					
Feature	Fracture Type				
	I	II	IIIA	IIIB	IIIC
Wound size, cm	<1	>1	>1	>1	>1
Energy	Low	Moderate	High	High	High
Contamination	Minimal	Moderate	Severe	Severe	Severe
Deep soft tissue damage	Minimal	Moderate	Severe	Severe	Severe
Fracture comminution	Minimal	Moderate	Severe/ segmental fractures	Severe/ segmental fractures	Severe/ segmental fractures
Periosteal stripping	No	No	Yes	Yes	Yes
Local coverage	Adequate	Adequate	Adequate	Inadequate	Adequate
Neurovascular injury	No	No	No	No	Yes
Infection rate	0%-2%	2%-7%	7%	10%-50%	25%-50%

^aData from Gustilo et al,³ Gustilo and Anderson,¹⁰ and Gustilo et al.¹¹

B. Initial Management

- ATLS
- Physical exam and complete neurovascular exam
- Preliminary irrigation and debridement at bedside in the ED
- Wet-to-dry dressing (saline or dilute betadine) applied

C. Tetanus Prophylaxis

- Tetanus vaccine for incomplete/uncertain vaccination history
- Booster for vaccination history > 10 years or contaminated wounds with > 5 years
- Tetanus immune globulin for contaminated wounds with incomplete/uncertain history
 - Single intramuscular dose of 3,000-5,000 units

D. Antibiotics:

A. Timing: As soon as possible!

B. Duration

- Discontinue antibiotics 24 hrs after wound closure in type I and II open fractures
- In type III open fractures discontinue antibiotics 72 hrs after injury or 24 hrs after closure/coverage, whichever occurs **first**

C. Choice of antibiotics

- Cefazolin
 - 2 g in adult patients weighing less than 120 kg
 - 3 g in adult patients weighing 120kg or more
- Clindamycin – 900 mg

Recommended Systemic Antibiotic Prophylaxis	
Open Fracture Type (Gustilo and Anderson)	Recommended Systemic Antibiotic Prophylaxis
Type I & II	First-generation cephalosporin (cefazolin) Alternative: clindamycin with β lactam allergy
Type III and/or Fecal or soil contamination	Drug of choice: Zosyn (piperacillin/tazobactam) Alternatives: First-generation cephalosporin (or clindamycin with β lactam allergy) plus aminoglycoside (gentamycin)

References:

Redfern J, Wasilko SM, Groth ME, McMillian WD, Bartlett CS 3rd. Surgical Site Infections in Patients With Type 3 Open Fractures: Comparing Antibiotic Prophylaxis With Cefazolin Plus Gentamicin Versus Piperacillin/Tazobactam. *J Orthop Trauma*. 2016 Aug;30(8):415-9. doi:

Halawi MJ, Morwood MP. Acute management of open fractures: an evidence-based review. *Orthopedics*. 2015 Nov;38(11):1025-33.

Carver DC, Kuehn SB, Weinlein JC. Role of systemic and local antibiotics in the treatment of open fractures. *Orthop Clin North Am*. 2017 Apr;48(2):137-153.

Traction in the Acute Setting

Indications and Application of Traction:

A. Purpose:

- Stabilization/immobilization, restoring length/alignment/rotation, pain control, relieves muscle spasms, offloading of articular surfaces, allows tamponade of bleeding vessels
- Typically a temporizing measure

B. Indications:

- Unstable posterior wall acetabulum fractures after hip dislocation
- Medialization of the femoral head after acetabular fracture
- Subtrochanteric femur fractures
- Femoral shaft fractures
- Vertically unstable sacral/pelvic fractures (vertical shear injuries)

C. Traction weights

- Factors include age, bone quality, and body habitus
- Amount of traction applied must be less than the counter-traction weight

Types of Traction

A. Hare

- Portable device, quickly stabilizes femoral fractures
- Often used by emergency responders and the emergency department
- Provides distraction through the lower leg and counter-traction from the patient's ischium
- Often applied inappropriately
 - Causes pain to patient and skin breakdown
- Should be removed urgently for proper examination and imaging of the extremity
- Convert to Buck's or skeletal traction as necessary



B. Buck's

- Skin traction (pulling force is applied to the skin and soft tissue of the limb)
 - Usually through a soft boot
- Noninvasive and easy application
- Requires healthy soft tissue envelope, without open wounds or ligamentous compromise
- Can cause skin compromise and peroneal palsy when used for an extended amount of time
 - Especially in the elderly with frail skin/soft tissues
- Typically limited to **10 lbs** of weight and left in place for no more than **24 hrs**



C. Skeletal

- Direct pull on a bone through a placed pin/wire
- More invasive
- Able to use heavier weights compared to Buck's
 - Typically 15 to 30 lbs of weight depending on patient's body habitus
- Most common sites of placement
 - Distal femur, proximal tibia, and calcaneus
 - See Figures 1-3
- Pin should be parallel to any adjacent joint surface
- Post-traction radiographs often helpful for reassessing fracture and confirming pin placement.

Skeletal Traction Pin Set-up

- Traction Bow/Pin Set - OR storage (by OR 8)
- Synthes 4200 drill - OR storage
- Battery x2 - between OR 8 & 9
- Wire cutters - OR storage
- Traction cart with weights/equipment (ask ED faculty/nurse/tech)
- Other: End caps, 22ga spinal needle, 18ga needle, 20cc syringe, 1% lidocaine, Sterile gloves, Chux, Abd pads, 4x4s, Chloriprep, Skin marker, #15 blade, Sterile blue towels

*****New as of May 2019: Dr. Mauffrey now wants us to only place the actual pin itself in the ED. The bed frame, pulleys, and weights should all be assembled on the floor/SICU. This will help to expedite patient flow in the ED. If you anticipate that the patient will be down in the ED for a long period of time for other work-up (e.g TACS, OMFS, NSGY) then it's ok to build frame in ED. Exception to this is for posterior wall fracture dislocations. These patients should still have the frame built in ED as you need to confirm reduction with traction in place*****

D. External fixation pin care:

We recommend no pin site care for patients in external fixators beyond keeping them dry and clean.

Figure 1: Demonstrating anatomic landmarks for pin site insertion for distal femoral and proximal tibial skeletal traction. Pin placement should be from medial to lateral for the distal femoral traction and no more than 2 cm or 1 finger breadth above the patella to avoid neurovascular bundle

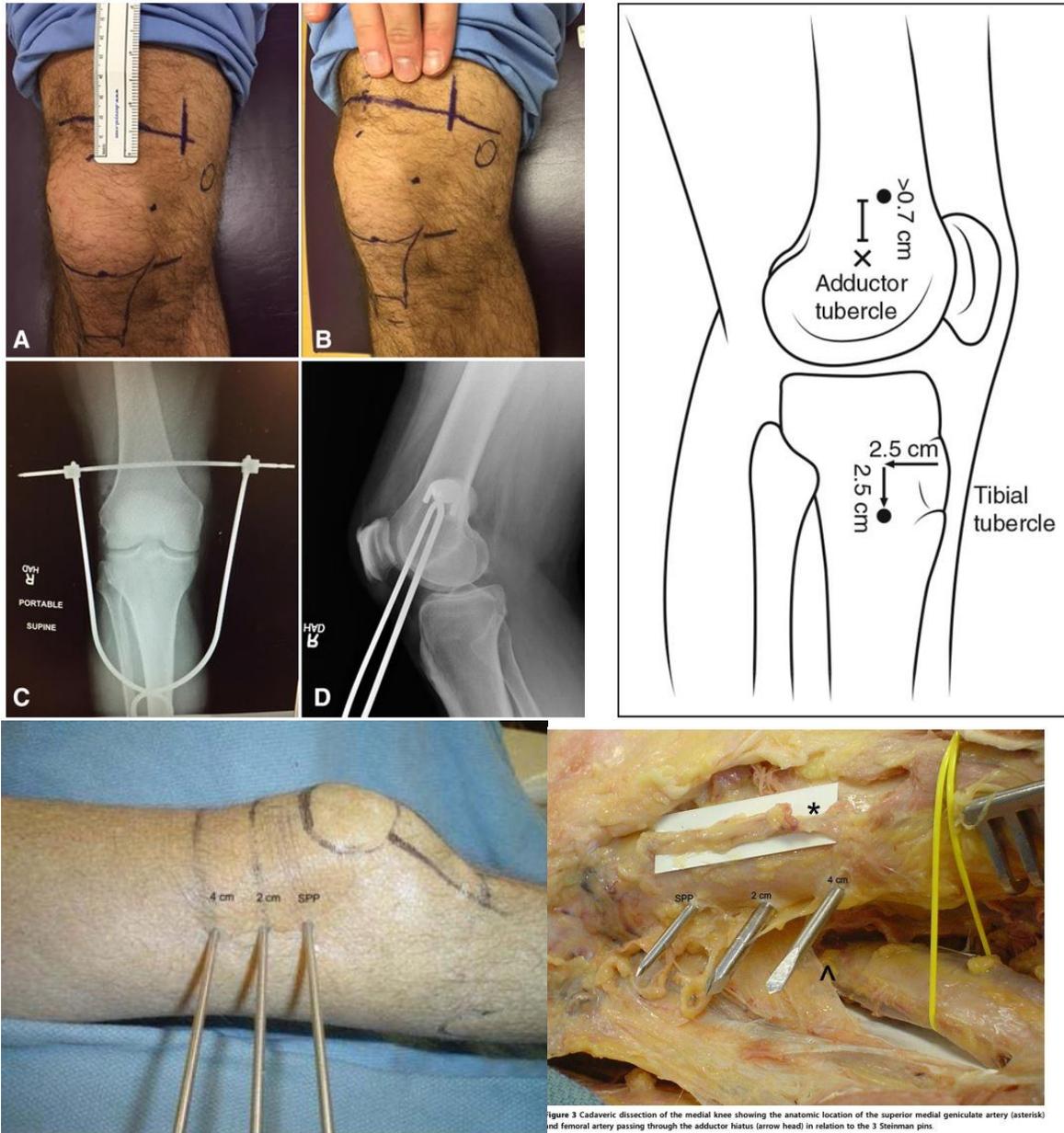


Figure 3 Cadaveric dissection of the medial knee showing the anatomic location of the superior medial geniculate artery (asterisk) and femoral artery passing through the adductor hiatus (arrow head) in relation to the 3 Steinman pins.

Figure 2: Demonstrating landmarks for pin placement for proximal tibia skeletal traction. Pin should be placed lateral to medial.

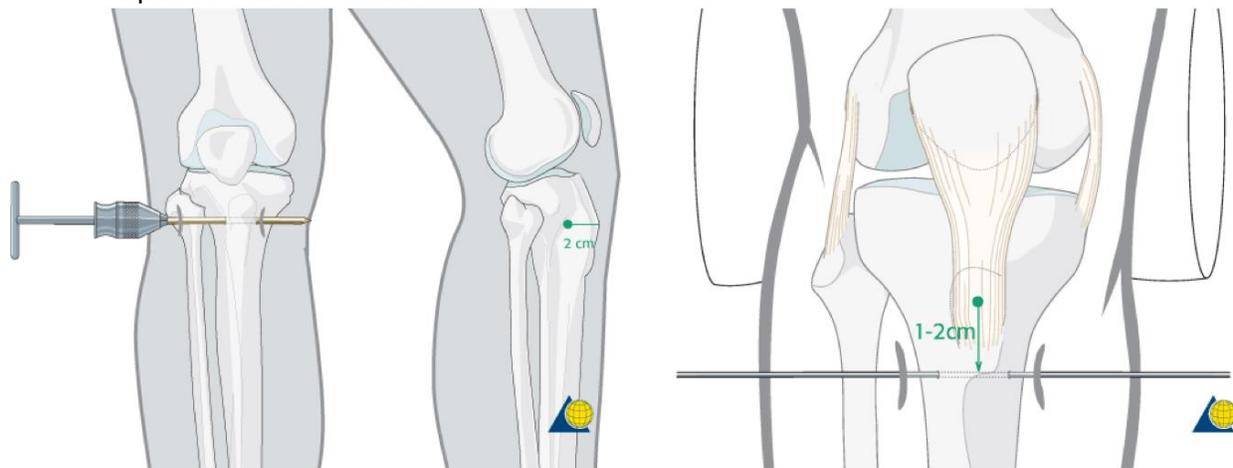


Figure 3: Demonstrating anatomic landmarks of calcaneal skeletal traction. Pin should be placed from medial to lateral.



References:

DeFroda SF, Gil JA, Born CT. Indications and anatomic landmarks for the application of lower extremity traction: a review. *Eur J Trauma Emerg Surg.* 2016;42:695-700.

Matullo KS, Gangavalli A, Nwachuku C. Review of Lower Extremity Traction in Current Orthopaedic Trauma. *J Am Acad Orthop Surg.* 2016;24:600-606.

Colton C, Krikler S, Schatzker J. *AO Surgery Reference.* AO Foundation. <https://www2.aofoundation.org>. 2017

Kwon JY, Johnson CE, Appleton P, Rodriguez EK. Lateral femoral traction pin entry: risk to the femoral artery and other medial neurovascular structures. *J Orthop Surg Res.* 2010;5:4. Published 2010 Jan 22. doi:10.1186/1749-799X-5-4

Compartment Syndrome

Etiology, Diagnosis, and Management:

A. Have high suspicion in the following scenarios:

- Fractures – Tibia, distal radius, both bone forearm
- Crush injuries
- Bleeding disorders
- Burns
- Post-ischemic swelling
- Gun shot wounds
- Tight cast/dressings

B. Symptoms:

- Increasing severe pain is typically the earliest sign (with increasing analgesics)
 - This can be unreliable, especially in the setting of trauma
- Pain with passive stretch, tight compartments
 - Also unreliable
 - Unfortunately symptoms can be vague and are poorly defined and require serial examination

C. Diagnosis:

- Early diagnosis is key
 - Delay may cause irreversible muscle/nerve damage
- Serial examinations required when suspicion is high
- Compartment syndrome is a clinical diagnosis
- Measure compartments in the intubated/sedated/intoxicated patient or patient with neurologic injury (spinal cord injury)
 - Diastolic differential pressure (delta p) < 30
- When in doubt discuss with senior resident or attending

D. Treatment:

- Emergent fasciotomy when diagnosed in timely manner
- If delayed diagnosis (>6 hours): Observation (equivocal topic)

References:

Mauser N, Gissel H, Henderson C. Acute lower-leg compartment syndrome. *Orthopedics*. 2013 Aug;36(8):619-24.

Prasarn ML, Ouellette EA. Acute compartment syndrome of the upper extremity. *J Am Acad Orthop Surg*. 2011 Jan;19(1):49-58.

Olson SA, Glasgow RR. Acute compartment syndrome in lower extremity musculoskeletal trauma. *J Am Acad Orthop Surg*. 2005 Nov;13(7):436-44

Unstable Pelvic Fractures

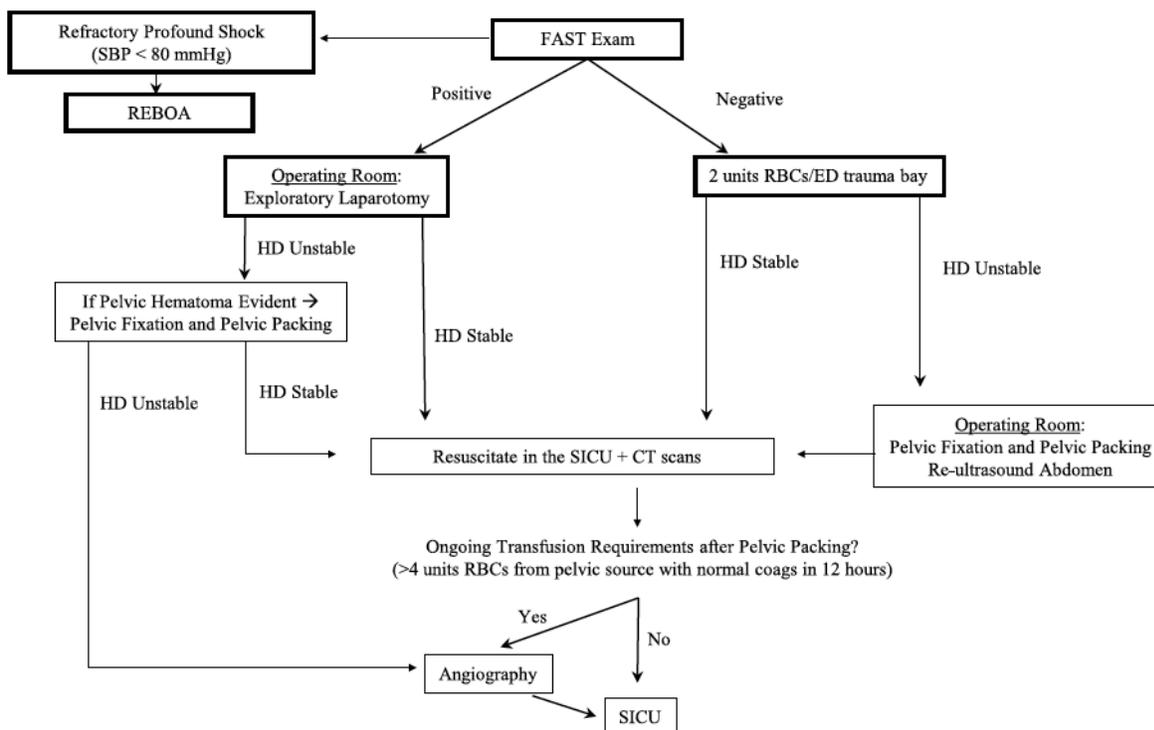
For all pelvic and acetabulum fractures

- 1) Pre-surgery – order appropriate imaging
 - a. Acetabulum: AP, Judets
 - b. Pelvic ring: AP, Inlet, outlet
 - c. Order CT pelvis with 3D recon
- 2) Post-surgery
 - a. All pelvic surgeries require post-op CT scan
 - b. Order appropriate x-ray views of pelvis

Protocol regarding initial management of patients with unstable pelvic fractures upon arrival in the emergency department.

Denver Health Unstable Pelvic Fracture Management

Resuscitate with 2 L crystalloid – measure base deficit – rule out thoracic source – sheet the pelvis.
 Transfuse fresh frozen plasma (FFP) and RBC 1:2; 1 apheresis unit of platelets for each 5 units RBCs; perform thromboelastography.
 Place 7Fr Terumo catheter in the right common femoral artery
 Immediate notification: Attending Trauma Surgeon, Attending Orthopedic Surgeon, Operating Room, Blood Bank



[Type text]

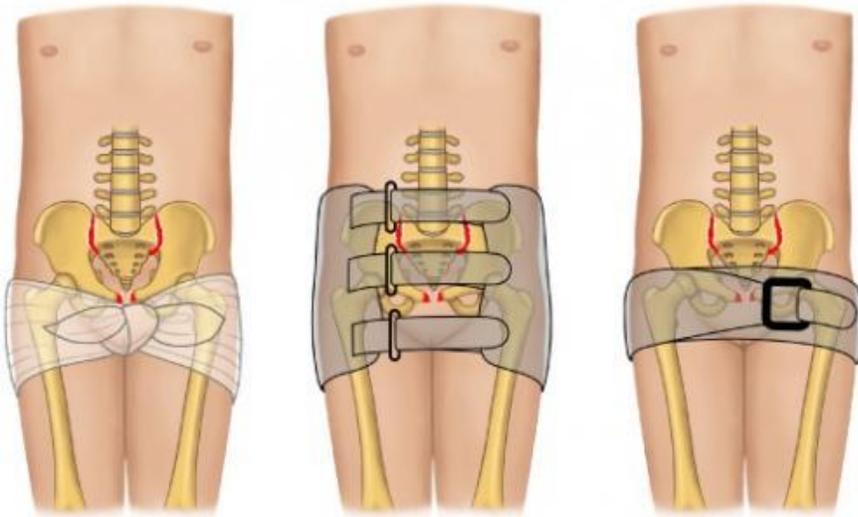
Pelvic Binders

A. Purpose

- Stabilizes pelvis, which subsequently decreases bleeding at the fracture site
- Diminishing pelvic volume also thought to tamponade venous bleeding
- Promotes clot formation
- Have found to decrease mortality and transfusion requirements
- Effective, easy application, cost-effective, and non-invasive

B. Types and Application of Binders

- Commercial binders and bed sheets
- To be applied over the greater trochanters of the proximal femur (not over the abdomen)
- Can also tape thighs and internally rotated feet together



C. Indications

- APC, vertical shear, LC III, and combined mechanism type pelvic ring injuries
- Typically applied in the pre-hospital setting or in the ED
- Evidence to support application if unstable pelvis on exam or found on radiographs
- To be used early and in a short term period
 - Support hemodynamically unstable patients until they receive external or definitive fixation of the pelvis

D. Contraindications

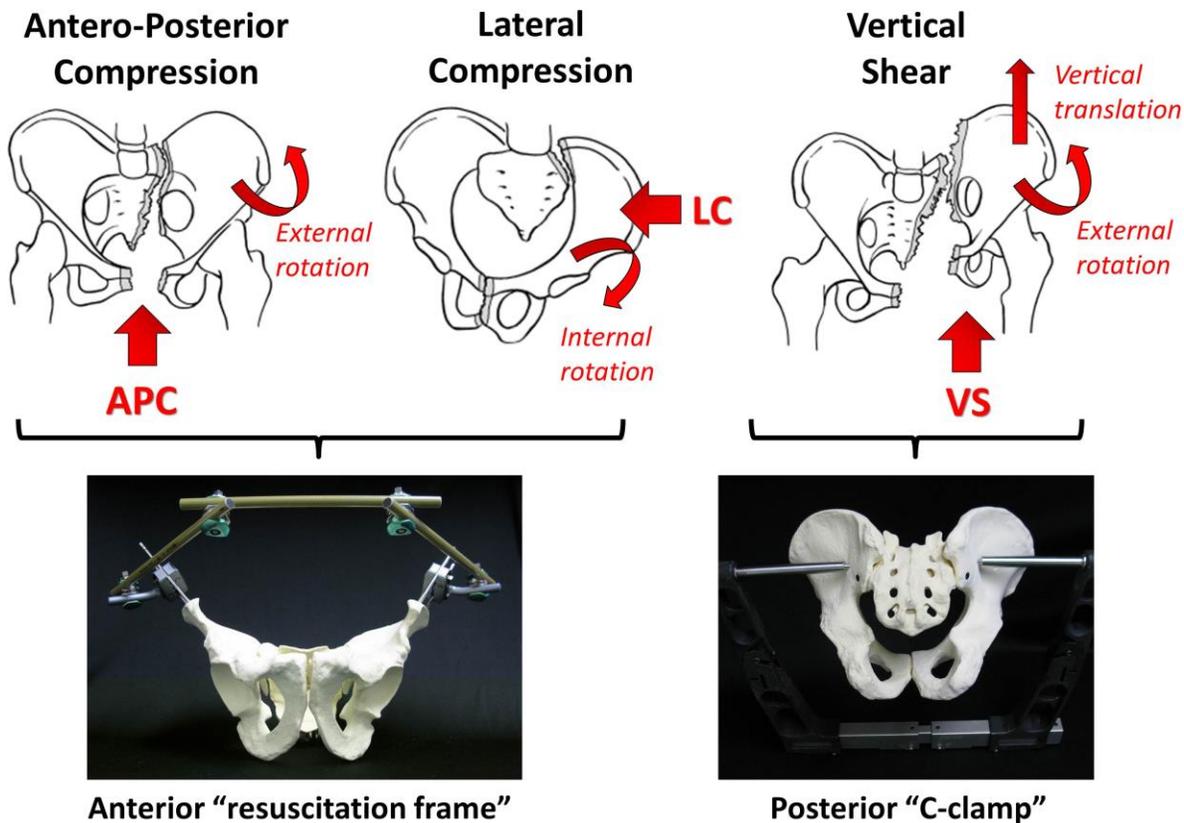
- LC I and LC II type pelvic injuries
- Soft tissue damage at binder site

E. Risks

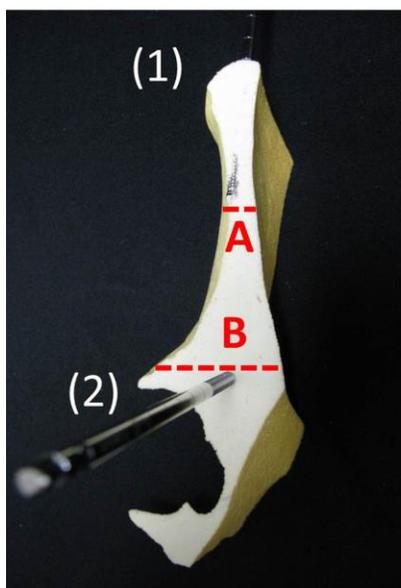
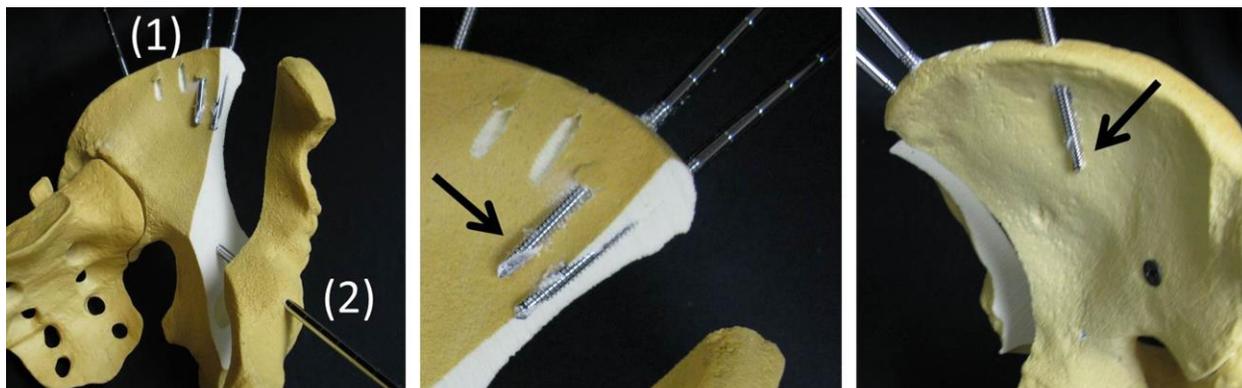
- Soft-tissue or skin damage if left on for too long
- Can give you a false sense of the severity of the injury if imaging taken after binder was placed
 - May require EUA in the OR for better understanding of the injury

External Fixation Indications and Techniques

- A. Decision making for acute external fixation of pelvic ring disruptions guided by the underlying injury mechanism.



- B. Technical options for anterior external fixation of pelvic ring injuries. Advantages and shortcomings of iliac crest versus supraacetabular modalities of pin placement.



(1) Iliac crest route

Pros:

- Fast application for “damage control”
- No fluoroscopic guidance required

Cons:

- Small surgical corridor (**A**)
- High incidence of pin misplacement (**arrows**)
- Multiple pins required due to poor purchase
- Higher risk of failure of fixation/reduction

(2) Supra-acetabular route

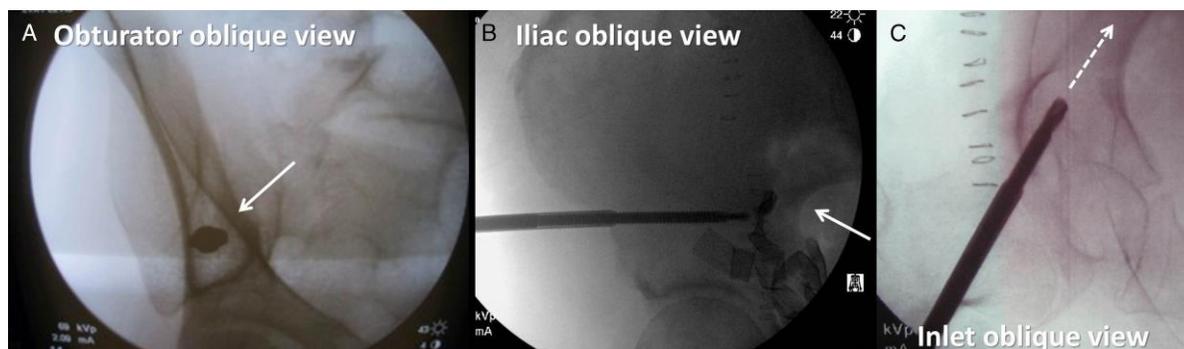
Pros:

- Large surgical corridor (**B**)
- Excellent purchase with low risk of failure
- Single pins are sufficient
- Low incidence of pin misplacement

Cons:

- Fluoroscopy-guided, time consuming

- C. Fluoroscopy-guided supraacetabular external fixator application. Two oblique “Judet views” are required to ensure accurate and safe pin placement. While the obturator oblique view outlines the “teardrop” configuration (arrow in A), which reflects the “perfect” surgical corridor, the iliac oblique view denotes the sciatic notch (arrow in B), which must be protected from accidental perforation owing to the risk of neurovascular complications. In addition, the inlet oblique view is helpful for guiding the pin through the supraacetabular corridor (dotted arrow in C).



Preferred method of supraacetabular pin placement

- 1) Obturator oblique outlet (“Teepee view”)
- 2) Iliac oblique
- 3) Obturator oblique inlet

References:

Mauffrey C, Cuellar DO 3rd, Pieracci, et al. Strategies for the management of haemorrhage following pelvic fractures and associated trauma-induced coagulopathy. *Bone Joint J.* 2014 Sep;96-B(9):1143-54.

Burlew CC, Moore EE, Stahel PF, et al. Preperitoneal pelvic packing reduces mortality in patients with life-threatening hemorrhage due to unstable pelvic fractures. *J Trauma Acute Care Surg.* 2017 Feb;82(2):233-242.

Stahel PF, Mauffrey C, Smith WR, et al. External fixation for acute pelvic ring injuries: decision making and technical options. *J Trauma Acute Care Surg.* 2013 Nov;75(5):882-7.

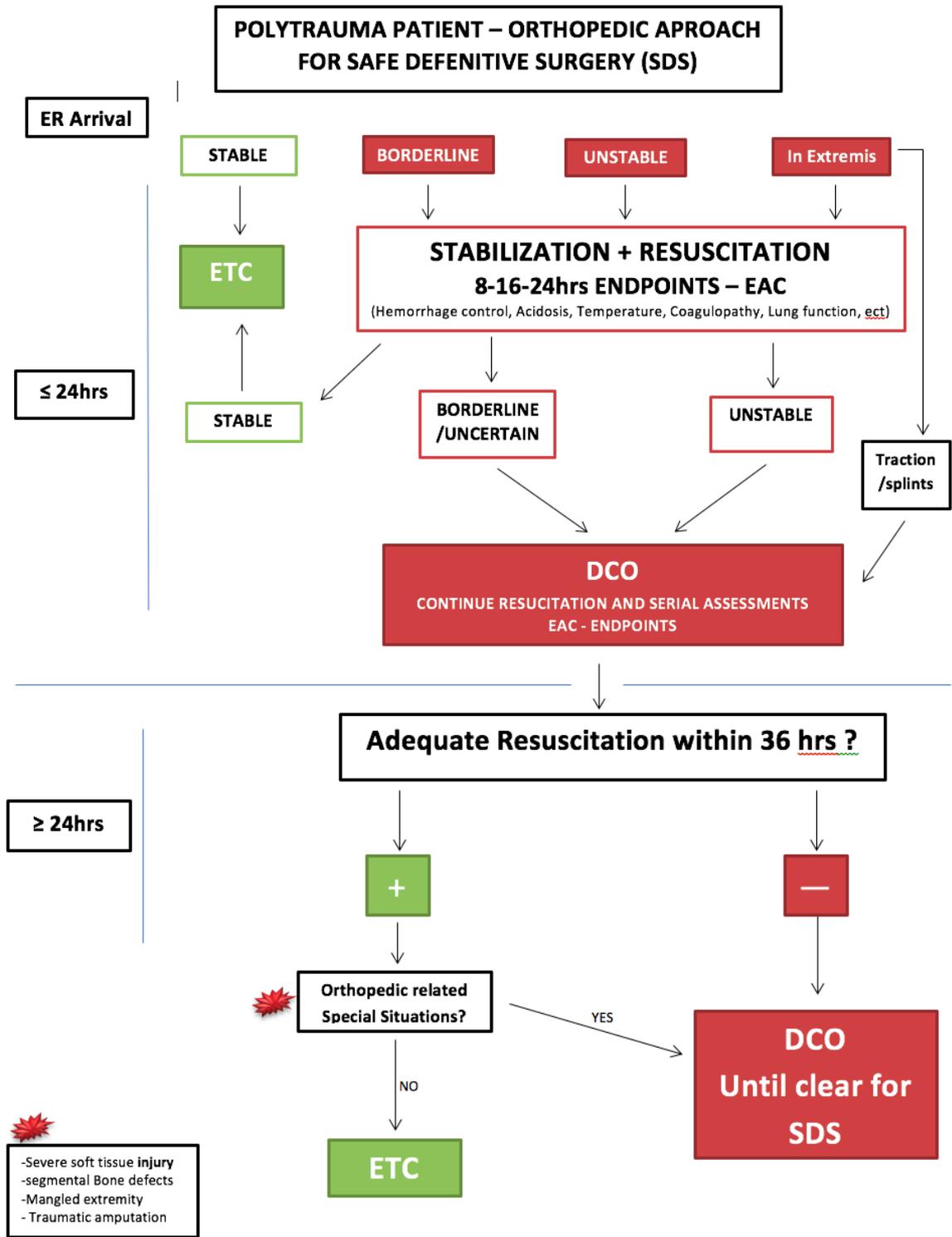
White CE, Hsu JR, Holcomb JB. Haemodynamically unstable pelvic fractures. *Injury.* 2009;40(10):1023-30.

Vaidya R, Roth M, Zarling B. Application of circumferential compression device (binder) in pelvic injuries: room for improvement. *West J Emerg Med.* 2016 Nov;17(6):766-774.

Morris R, Loftus A, Friedmann Y. Intra-pelvic pressure changes after pelvic fracture: A cadaveric study quantifying the effect of a pelvic binder and limb bandaging over a bolster. *Injury.* 2017 Apr;48(4):833-840.

Polytrauma Patients

Algorithm for the Polytrauma Patient: Damage Control vs Early Definitive Fixation



Early Appropriate Care (EAC) Protocol:

- A. Timing of definitive fracture fixation based on presence and severity of metabolic acidosis
 - Fractures of the femur, pelvis, acetabulum, and spine
 - Goal is to prevent deleterious reactive systemic inflammatory response
- B. Definitive fixation within 36 hours of resuscitated patient
 - Defined by at least one of the follow:
 - Venous lactate <4.0 mmol/L
 - BE > -5.5 mmol/L
 - or pH >7.25
- C. EAC protocol associated with fewer complications and shorter length of stay in the hospital
- D. Polytrauma patient:
 - Multiple procedures in the same surgical setting have been shown to be safe in the resuscitated patient
 - Additionally, definitive fixation in the same setting may reduce complications and hospital stay

References:

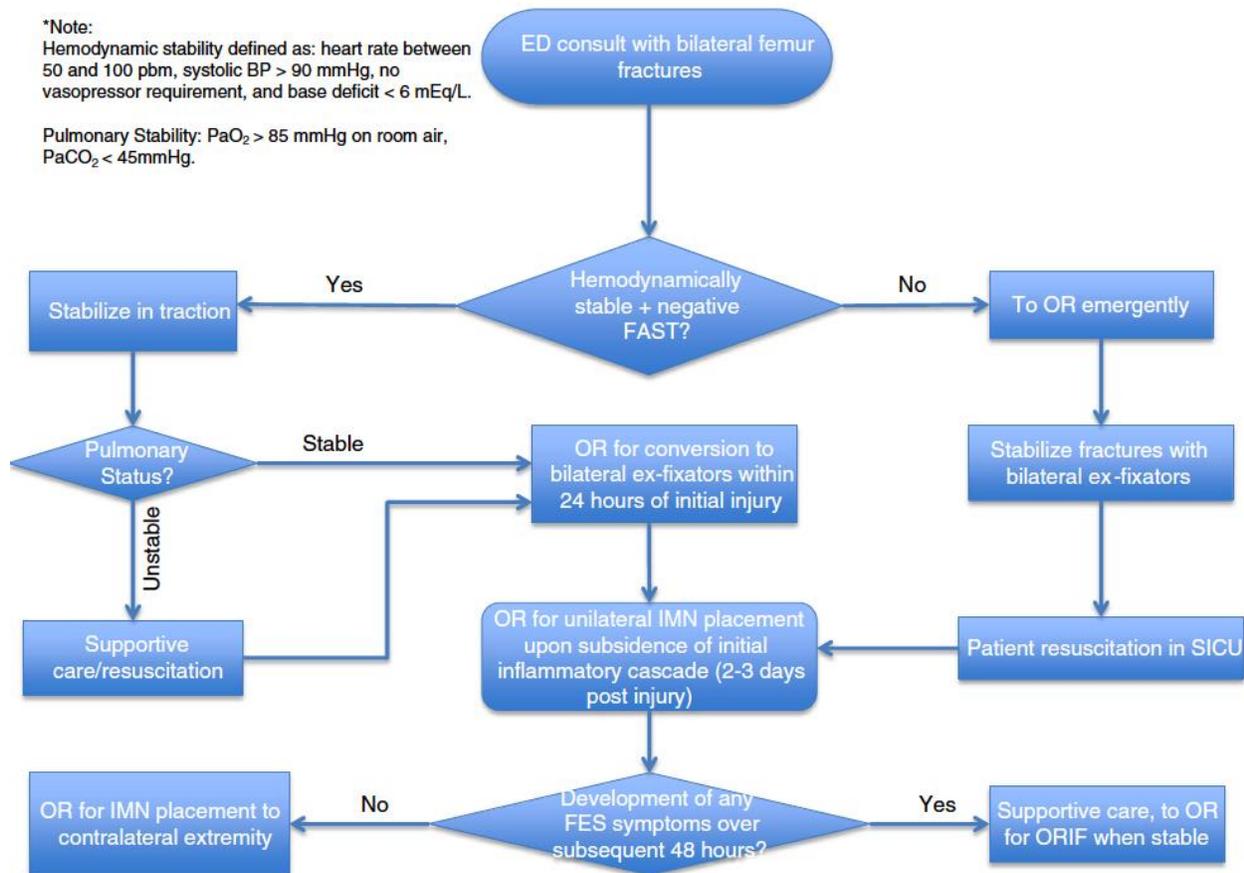
Vallier HA, Moore TA, Como JJ, et al. Complications are reduced with a protocol to standardize timing of fixation based on response to resuscitation. *Journal of Orthopaedic Surgery and Research*. 2015 10:155.

Childs BR, Nahm NJ, Moore TA, Vallier HA. Multiple procedures in the initial surgical setting: when do the benefits outweigh the risks in patients with multiple system trauma? *J Orthop Trauma*. 2016;30:420-425.

Pape HC, Pfeifer R. Safe definitive orthopaedic surgery (SDS): repeated assessment for tapered application of early definitive care and damage control?: an inclusive view of recent advances in polytrauma management. *Injury*. 2015 Jan;46(1):1-3

Bilateral Femoral Fractures

Treatment Algorithm for Bilateral Femoral Fractures:



Reference:

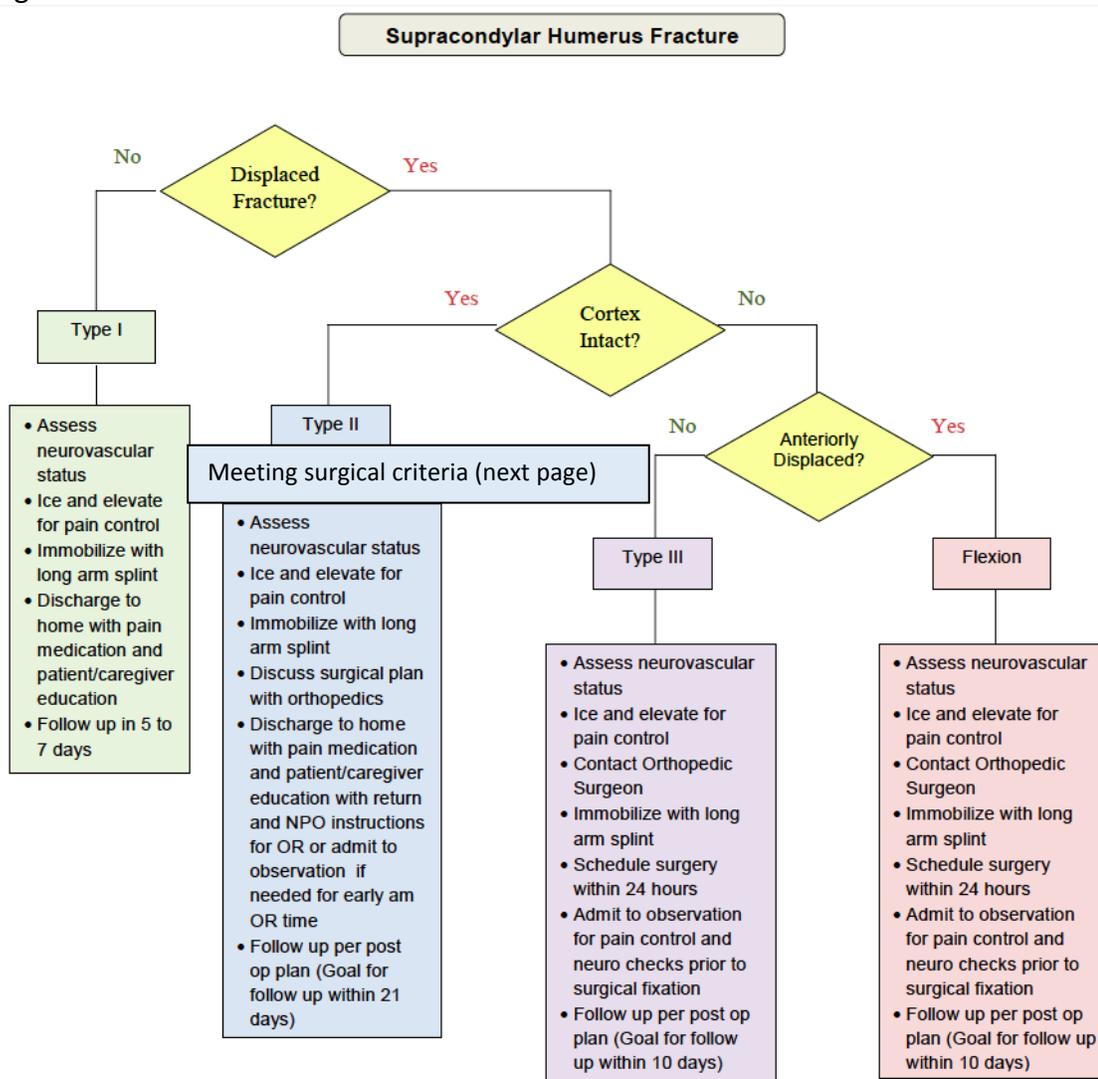
Dunn RH, Jackson T, Burlew CC, et al. Fat emboli syndrome and the orthopaedic trauma surgeon: lessons learned and clinical recommendations. *International Orthopaedics*. 2017 41:1729-1734.

Supracondylar Humerus Fractures (Pediatric)

A. Key Principles:

- Identify fracture type and need for surgical fixation
- Immobilize in long arm posterior splint
- Hold in observation unit if concern for pain or swelling
- Oral or IV pain management
- Schedule all type III fractures and type II fractures meeting criteria for surgery within 24 hrs
- Discuss care plan with family
- Follow up within 10 days

B. Algorithm

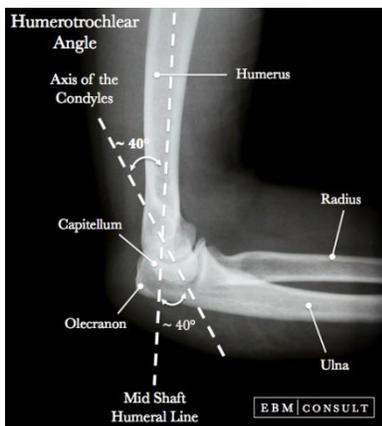
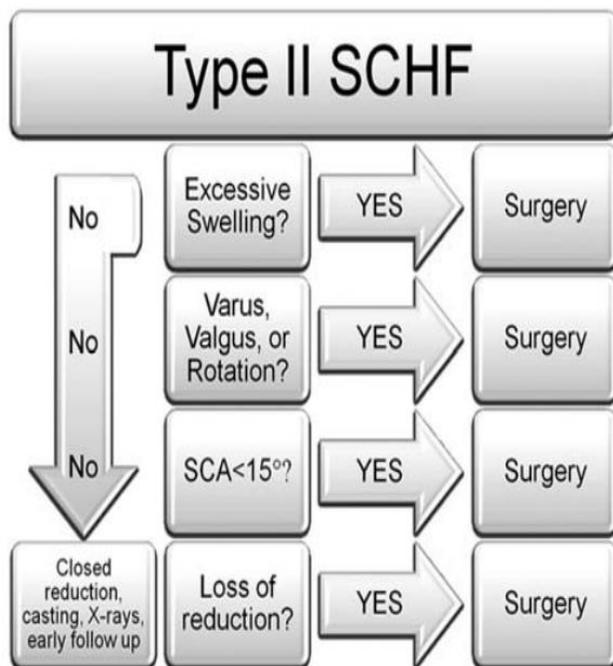


Source:

Children's Hospital of Colorado; Orthopedic Institute. 2011.

Spencer HT, Dorey FJ, Zionts LE, Dichter DH, Wong MA, Moazzaz P, Silva M. Type II supracondylar humerus fractures: can some be treated nonoperatively? *J Pediatr Orthop*. 2012 Oct-Nov;32(7):675-81.

The nonoperative type II



SCA - Shaft-condyle angle



Varus



Rotation



Valgus

Source:

Children's Hospital of Colorado; Orthopedic Institute. 2011.

Spencer HT, Dorey FJ, Zions LE, Dichter DH, Wong MA, Moazzaz P, Silva M. Type II supracondylar humerus fractures: can some be treated nonoperatively? *J Pediatr Orthop.* 2012 Oct-Nov;32(7):675-81.

Geriatric Fracture Protocol

Inclusion/Exclusion Criteria:

- A. Inclusion Criteria: ≥ 65 years with fragility fractures of the hip
- B. Exclusion Criteria: multiple trauma patients who are generally admitted to the Trauma Surgery service

Emergency Department Care:

- A. Emergency department physicians call the Orthopaedic surgery team on call as well as the Hospital Medicine Consult physician
- B. Baseline labs: CBC, BMP, PTT, PT/INR, Type and screen
- C. CXR
- D. 12 lead EKG
- E. Pain management with low dose opioid analgesics
- F. Patient is admitted to the Orthopedic Surgery service
 - Exceptions: Patient has another medical problem which necessitates ICU level care, or in discussion with the Medicine Consult attending and Orthopedic Surgery attending the patient cannot be safely managed on the Orthopedic Surgery service with Hospital Medicine co-management.

Pre and Postoperative care:

- A. Use admission order set
 - Ortho Geriatric Fracture Admission
- B. General:
 - Admit to surgical tower B when possible
 - Consider room close to nurses' station
 - Consider need for bed alarm, chair alarm, and/or patient safety monitor
 - Consider requesting pharmacist evaluation for patients at high risk for fall and/or delirium to identify potential contributory medications.
- C. Nursing Care:
 - Foley catheter to gravity
 - Complete bed rest
 - Ice to fracture site as needed
 - Incentive spirometry every hour while awake
 - CMS checks every shift
 - Assess for fall risk every shift with appropriate interventions
 - Assess for skin breakdown every shift with appropriate interventions to prevent skin breakdown and pressure ulcers
 - Reposition every two hours while in bed

C. Nursing Care (cont'd):

- Avoiding delirium:
 - Excess opiate medications can precipitate delirium.
 - No benzodiazepines, diphenhydramine (Benadryl), hydroxyzine, sedative/hypnotic medications (Ambien, temazepam, etc), skeletal muscle relaxants and other anticholinergics (i.e. scopolamine).
 - Exception: Patient takes these medications at home and they are ordered by hospitalist.
 - Frequent reorientation as necessary.
 - Ensure use of hearing aids or glasses while patient awake.
 - Adequate pain control with scheduled acetaminophen and low dose opiates.
 - Delirium screen performed every shift (CAM assessment tool). If positive, notify hospitalist.

D. Pain control: The goal is to provide sufficient relief of fracture-related pain using low dose opiate pain medication and scheduled non-opiate pain medication.

- Scheduled acetaminophen and low dose opioid medications
- Adult Bowel Protocol.

E. DVT prophylaxis: all patients with hip fractures are at high risk for venous thromboembolism.

- DVT prophylaxis should begin on admission.
- Pharmacologic prophylaxis
 - Recommend formulary LMWH unless:
 - Patient will be going to surgery within 24 hours then prophylaxis starts immediately post-op.
 - GFR <30 then use subcutaneous unfractionated heparin.
 - Pharmacologic prophylaxis should continue for a minimum of 14 days after surgery.
- Mechanical DVT prophylaxis: sequential compression devices and Ted hose for entire hospital stay.

Preparation for operative care:

- A. Patients who undergo surgery for fragility fractures of the hip within the first 24 hours have lower one-year mortality and fewer short-term complications than those patients whose surgery is delayed. All patients will be seen and optimized for surgery by a hospitalist and have a preoperative evaluation by a provider in the Anesthesia department.
- B. Goal is for operative fixation to take place within 24 hours. If the patient is admitted in the morning the goal is for the patient to have surgery sometime that afternoon. If the patient is admitted in the afternoon, evening or nighttime, the goal is for the patient to go to the OR the next morning.

- C. Patient is seen by hospitalist for perioperative medical assessment the day of admission if admitted during daytime hours or by the next morning if admitted during nighttime hours.
- Medical optimization includes evaluation for active cardiac conditions, reversing anticoagulation to goal $INR \leq 1.5$ (or per surgeon preference), and evaluating for any other conditions which would unduly increase perioperative mortality.
 - If the hospitalist believes it necessary to delay surgery it will be standard for that physician to call orthopedic surgeon scheduled to operate on that patient to discuss the case and the delay. If it is unclear per the OR schedule which surgeon will be operating, the orthopedic surgeon on call should be contacted.

Discharge planning:

- A. Discharge planning will begin at admission.
- B. Social worker to meet with patient and family on hospital day #1 to discuss potential need for subacute rehab placement post-operatively.

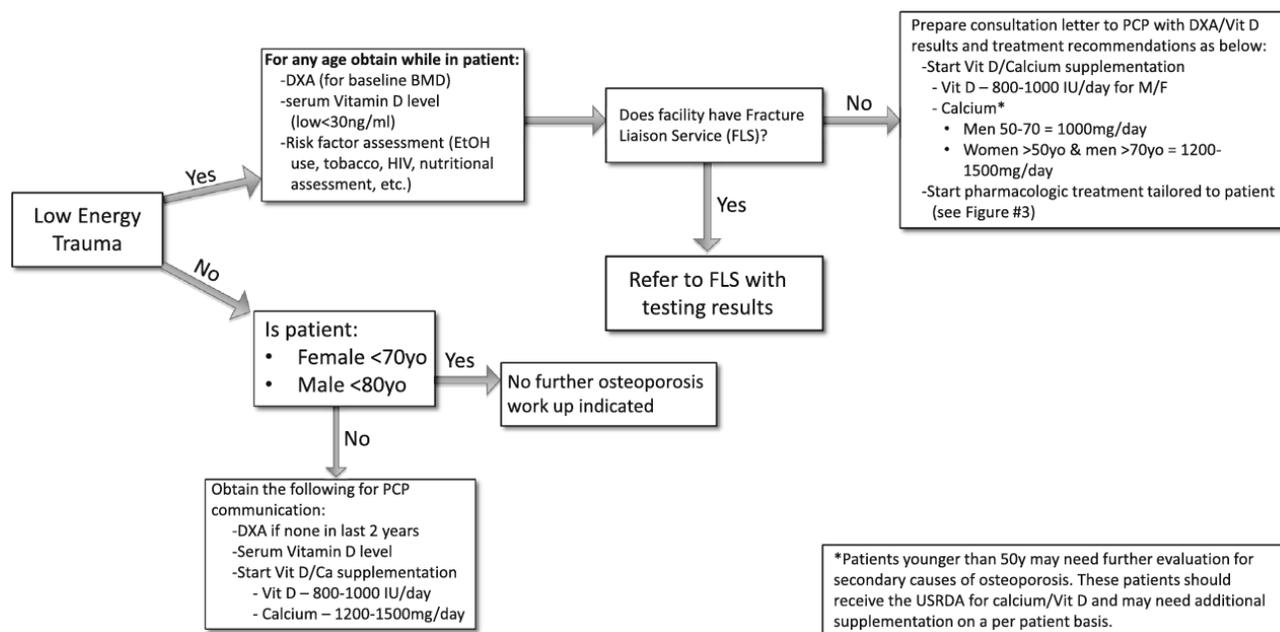
Additional postoperative care:

- A. Use post-op order set
 - Ortho Geriatric Fracture Admission: Post-op
- B. Nursing:
 - Foley catheter discontinued on POD#1.
- C. Activity/Rehab:
 - PT/OT consult for mobilization and recommendation of placement on all patients. Order placed immediately following surgery.
 - Patient is mobilized within 24 hours after surgical repair.
- D. Osteoporosis management: Treatment of osteoporosis after a fragility fracture is imperative to decrease the patient's risk of a subsequent fracture. Every patient will have osteoporosis management started in the hospital and recommendations made to the patient and primary care physician regarding future management of their osteoporosis.
 - Calcium/Vitamin D supplementation
 - Check vitamin D level
 - 25-hydroxy vitamin D blood test (ng/mL):
 - Start high dose vitamin D replacement if indicated
 - ≥ 30 : No supplementation necessary
 - 20-29: Cholecalciferol 2,000 units/day x 6 weeks
 - < 20 : Cholecalciferol 2,000 units/day and Ergocalciferol 50,000 units/day x 6 weeks
 - Counsel on smoking cessation if applicable
 - All patients should be referred to Geriatric Fracture Clinic (AKA "Bone Health Clinic") for follow up
 - This follow-up is arranged by the Fracture Liaison Service.
 - Make sure to place a Fracture Liaison Service consult at the time of

admission (or, if this was not done on admission, during post-op orders)

- This is part of the Geriatric Fracture Order Sets, under “Specialty Consults”
- See Algorithm in Figure 4

Figure 4. Work up of a patient with a primary fragility fracture and treatment algorithm.

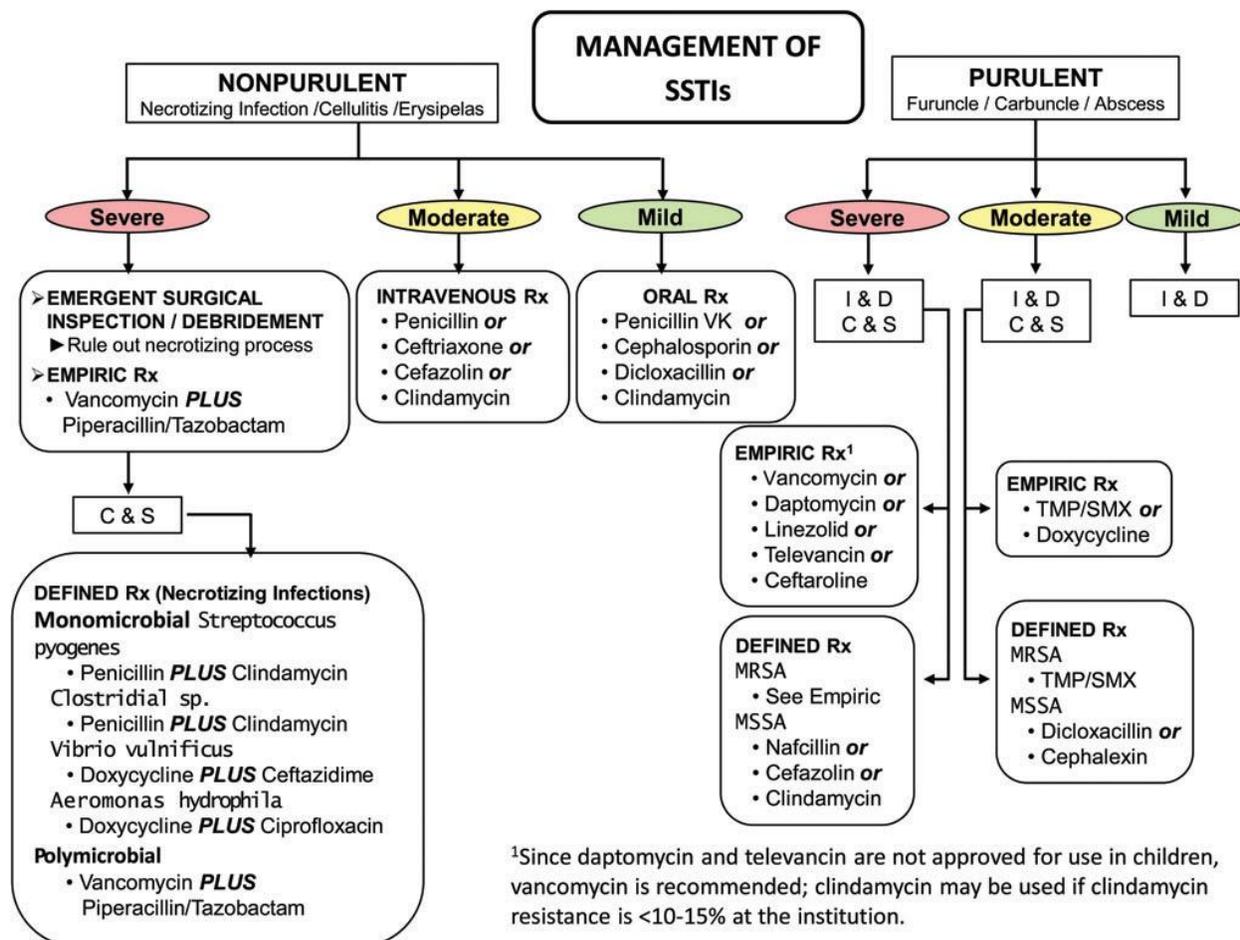


References:

Farmer RP, Herbert B, Cuellar DO, et al. Osteoporosis and the orthopedic surgeon: basic concepts for successful co-management of patients' bone health. *Int Orthop*. 2014 Aug;38(8):1731-8

Soft tissue infections (nec fasc)

- Hand team:
 - All purulent and nonpurulent infections distal to elbow (including AC fossa)
 - Abscesses, necrotizing fasciitis, cellulitis, myositis, osteomyelitis
- Ortho trauma:
 - All purulent and nonpurulent infections proximal to elbow



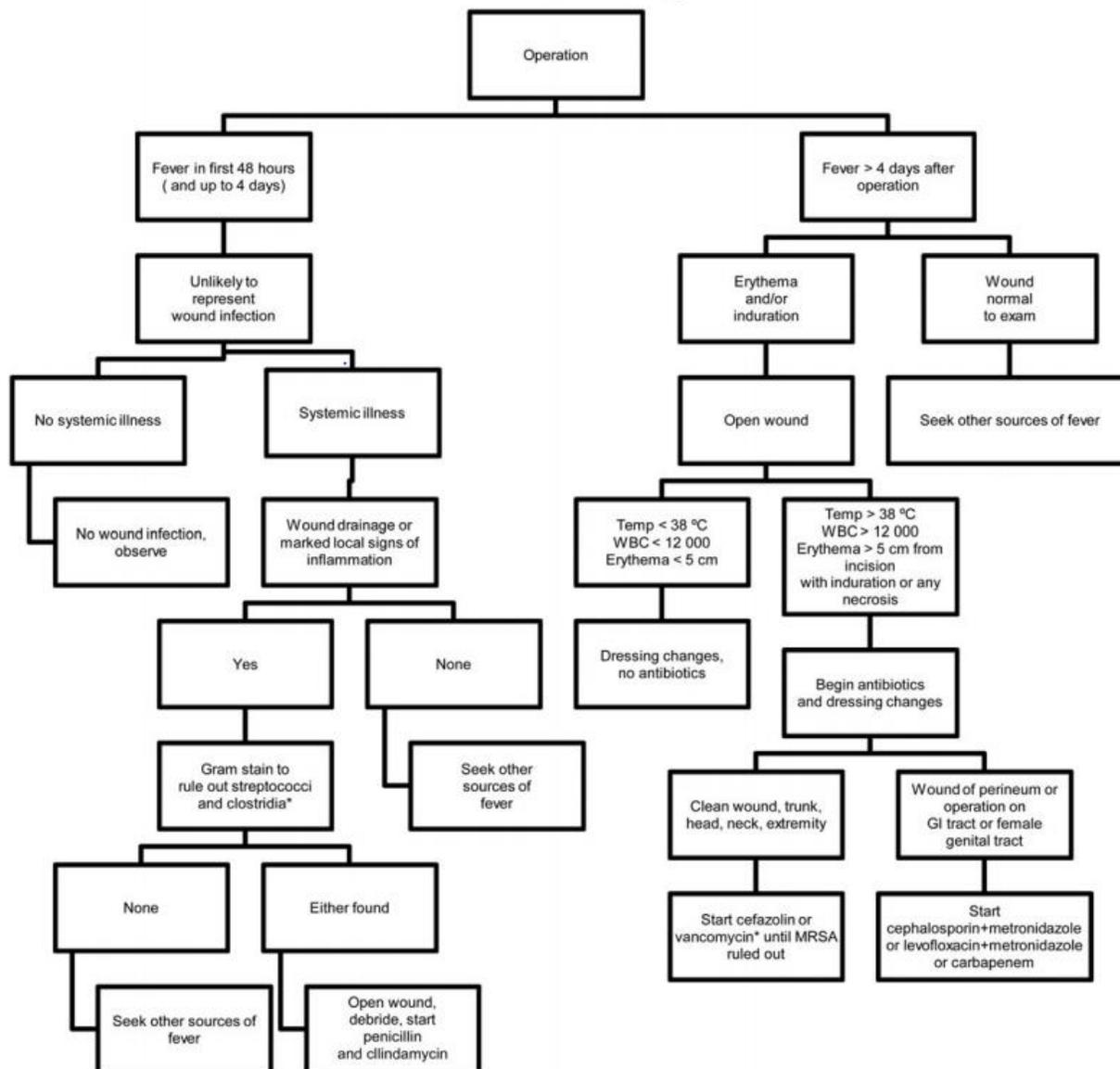
Soft Tissue Abscess Management

Denver Health Abscess Protocol for the Main ED and the AUCC

- A. This will help better streamline the care of patients with simple cutaneous (typically shooter's) abscesses in the ED and AUCC. This includes specific recommendations by our Infectious Disease group based on current available data from the peer-reviewed literature and evidence-based guidelines.
 - Of note, this protocol does not apply to the management of cellulitis, suspected nec. fasciitis, septic patients, etc.!
- B. For outpatients with bedside I&D:
 - No request for labs (ESR, CRP, WBC)!!!
 - Adjunctive Xrays as needed.
 - No i.v. Abx (not even single shot)
 - D/C with wet-to-dry change of dressing and a 5 day course of p.o. Abx, using one of the following 3 options (listed by priorities): Bactrim DS 1 tab p.o. bid
 - In case of Sulfa allergy: Doxycycline 100mg p.o. bid
 - Last option: Clindamycin 450mg p.o. tid
- C. For inpatients admitted for formal I&D in OR:
 - Adjunctive Labs as needed (ESR, CRP, WBC).
 - Initiate i.v. Vancomycin
 - Don't the use Unasyn, Augmentin, etc. due to inadequate antimicrobial spectrum.
- D. ED patients with upper extremity cellulitis:
 - **All cellulitis is to be considered necrotizing fasciitis until proven otherwise**
 - If you have concern for necrotizing fasciitis based on exam or laboratory values, please discuss with chief, and then attending on call
 - Adjunctive Labs as needed (ESR, CRP, WBC).
 - Initiate i.v. antibiotics
 - Can no longer observe in the ED. Must be admitted to the orthopedic service for observation

Surgical Site Infection Protocol

Wound Infection Algorithm



References

Stevens et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis. 2014 Jul 15;59(2):e10-52

Pain, DVT, Host management

DVT Prophylaxis

Denver Health Deep Venous Thrombosis (DVT) Prophylaxis Protocol

- A. Mechanical prophylaxis: for all patients regardless of injury
 - This involves SCD's and daily ambulation
- B. Chemical prophylaxis:
 - Lovenox 30 mg BID
 - Any pelvic or acetabular fracture
 - All femur fractures (excluding isolated greater trochanteric avulsions treated non op)
 - Peri-knee injuries: knee dislocations and high-energy tibial plateau fractures
 - Bilateral non-weight bearing patients or temporarily immobilized patients who are not ambulating
 - Enteric coated Aspirin 81 mg BID
 - Isolated tibial shaft, ankle, or foot fractures with at least one risk factor: >40 y/o, immobilization in splint/cast, smoker, birth control, history of DVT/VTE, etc...
 - Duration of chemical prophylaxis:
 - 14 days for all patients with the above injuries
 - EXCEPTION: chemical prophylaxis should be continued up until bilateral non-weight bearing patient is able to again ambulate
- C. **NEVER withhold morning dose of Lovenox** if patient is going to the OR
 - Unless there is a specific reason that is documented
 - This should be part of the "Time Out" process in the OR, confirming that anticoagulation has been given

References

Sagi HC et al. Venous Thromboembolism Prophylaxis in Orthopaedic Trauma Patients: A Survey of OTA Member Practice Patterns and OTA Expert Panel Recommendations. J Orthop Trauma. 2015 Oct;29(10):e355-62.

Pain Management

Outpatient/Emergency Care

- Except for acute musculoskeletal condition (Fracture, Acute Radiculopathy) opioids **will not** be prescribed at initial consultation
- Prescriptions for acute pain should last no more than 5 days and be no more than 100 OME (Oral morphine equivalents)
- Consider low-potency agent: Tramadol

Postoperative

- Acetaminophen and/or NSAIDs should be the first-line therapy postoperatively
- Opioids **will not** be prescribed beyond 4 weeks postoperatively
- If patients require or anticipated to require greater than 4 weeks of opioid management must establish care with primary care or pain specialist
- No long-acting opioids will be initiated by the orthopedic service (OxyContin, MS Contin)

Opioid Prescription Guidelines

Level	Condition	Max OME*	In order of increasing opioid potency			
			Tramadol (50mg)	Oxycodone (5mg)	Oxycodone + Tramadol	Hydromorphone (2mg)
1	-Acute fracture -Radiculopathy -Carpal Tunnel	100	20	15	8/8	15
2	-Knee Scope -ACL -Hand ORIF -Foot ORIF	200	40	25	15/20	25
3	-Ankle ORIF -Wrist ORIF -Shoulder scope	300	60	40	20/30	40
4	-Pelvis/Tab -Long bone ORIF -Arthroplasty	400	80	50	25/40	50

References

Iolascon G, Di Pietro G, Gimigliano F. Vitamin D supplementation in fractured patient: how, when and why. Clin Cases Miner Bone Metab. 2009 May;6(2):120-4.

Kennel KA, Drake MT, Hurley DL. Vitamin D deficiency in adults: when to test and how to treat. Mayo Clin Proc. 2010 Aug;85(8):752-7

Ryan S, Politzer C, Fletcher A, Bolognesi M, Seyler T. Preoperative Hypoalbuminemia Predicts Poor Short-term Outcomes for Hip Fracture Surgery. Orthopedics. 2018 Sep 17:1-8.

Hwang JS, Kim SJ, Bamne AB, Na YG, Kim TK. Do glycemic markers predict occurrence of complications after total knee arthroplasty in patients with diabetes? Clin Orthop Relat Res. 2015 May;473(5):1726-31.

Host Optimization

- A. Vitamin D/Calcium Supplementation in all fracture patients
 - a. Vitamin D testing is expensive and deficiency is pervasive. All patients should receive 50,000 units of Ergocalciferol postoperatively then weekly for 12 weeks along with daily maintenance dose of Calcium/Vitamin D 500mg/400units BID. Daily maintenance dose should be continued permanently in fragility fracture setting.
- B. Nicotine
 - a. Doubles risk of infection and nonunion. All nicotine users should be counseled on cessation
 - b. Tobacco Cessation order set.
- C. Malnutrition
 - a. In cachectic patients or patients with Albumin < 3.5 counsel on nutrition and order high calorie/high protein diet while hospitalized if kidney function is normal
- D. Diabetes
 - a. Obtain HgbA1c in diabetics, suspected diabetics, or patients presenting with glucose >200. Medical consult for management if presenting glucose > 200 and/or HgA1c is > 7.5.

If patient uses nicotine, is malnourished, or an uncontrolled diabetic this needs to be mentioned as a problem in your assessment with specific interventions done to address to ensure we are doing something about it.

Example:

- #1 Nicotine use – Counseled on tobacco cessation. Offered medical management.
- #2 Malnourished – Counseled on dietary needs. Placed on a high protein/calorie diet.
- #3 Uncontrolled diabetic – Medicine following for medical management

References

Iolascon G, Di Pietro G, Gimigliano F. Vitamin D supplementation in fractured patient: how, when and why. Clin Cases Miner Bone Metab. 2009 May;6(2):120-4.

Kennel KA, Drake MT, Hurley DL. Vitamin D deficiency in adults: when to test and how to treat. Mayo Clin Proc. 2010 Aug;85(8):752-7

Ryan S, Politzer C, Fletcher A, Bolognesi M, Seyler T. Preoperative Hypoalbuminemia Predicts Poor Short-term Outcomes for Hip Fracture Surgery. Orthopedics. 2018 Sep 17:1-8.

Hwang JS, Kim SJ, Bamne AB, Na YG, Kim TK. Do glycemic markers predict occurrence of complications after total knee arthroplasty in patients with diabetes? Clin Orthop Relat Res. 2015 May;473(5):1726-31.

Operating Room

Surgical Site Infection Prevention

- A. Hand-rubbing with an alcohol-based formulation is considered as effective as scrubbing, however the rapid antimicrobial action, wider spectrum of activity, and the absence of the risk of hand contamination by rinsing water might favor alcohol-based formulations
- B. Antibiotics within 30 minutes of incision with a first- or second-generation parenteral cephalosporins. If patient has a positive history or screen positive for MRSA then add Vancomycin.
- C. One dose of perioperative antibiotics is sufficient. Redosing may be justified for operating procedures longer than 4 h or in the case of significant blood loss
- D. Chlorhexidine-based skin preps are superior to povidone-iodine preps
- E. Antibiotic medication should not be administered for more than 24 h after closure of open fractures

For a summary of WHO recommendations for the prevention of surgical site infections (see references):

References:

Edmiston CE Jr, Bruden B, Rucinski MC, Henen C, Graham MB, Lewis BL. Reducing the risk of surgical site infections: does chlorhexidine gluconate provide a riskreduction benefit? *Am J Infect Control*. 2013 May;41(5 Suppl):S49-55.

Allegranzi B, Bischoff, de Jonge Stijn, et al. New WHO recommendations on preoperative measures for surgical site infection prevention: an evidence-based global perspective. *Lancet Infect Dis*. 2016;16:e276-87.

Allegranzi B, Zayed B, Bischoff P, et al. New WHO recommendations on the intraoperative and postoperative measures for surgical site infection prevention: an evidence-based global perspective. *Lancet Infect Dis*. 2016;16e288-303.

Ortho Pre-Op Check-List

Patient label

Procedure:

Date:

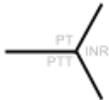
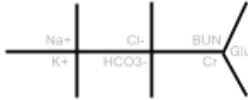
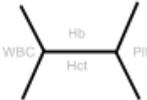
Laterality L R N/A

Imaging

- full length long bone XR or Full series pelvis XR
- Advanced imaging (CT for articular fx, pelvic fx; MRI for infection)

Labs:

- Hgb > 8
 - Type and Screen vs. Type and cross
- PT/INR: Albumin: HAg1c:
- INFECTION WBC: ESR: CRP:
- POLYTRAUMA BE: Lactate:



Medical optimization

- Patient needs further workup for:

- Cleared by hospitalist or TACS

Orders

- NPO
- Added
- Anticoagulation:
- Consent in chart
- Marked
- Rep notified (if necessary)

OR Schedule

OR

MONDAY	TUESDAY	WEDSDAY	THURSDAY	FRIDAY
URGENT (Stacey)	URGENT (MAUFFREY)	URGENT (PARRY)	URGENT (PARRY)	URGENT (MAUFFREY)
	ELECTIVE (MAUFFREY)	ELECTIVE (Stacy AM, Parry PM)	ELECTIVE (Stacey)	ELECTIVE (MAUFFREY)
	ELECTIVE (Parry)			

Clinic

Mauffrey		Stacey (PM)		Stacey/Parry
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Admin

Parry	Stacey		Mauffrey	
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OR Case Request Procedure

For add-on cases, book as Urgent <24 hours, and click the “add-on” box, or it will not pop up in the charge RN’s report.

For all other cases, including outpatient cold trauma, book as urgent >24 hours. Do not book as “Elective.” If you are booking outpatient cases (e.g. ORIF ankle) where patients are coming back for surgery, be sure to send Jason Rankin and Miles Dennis a message about the add-on as well.

When booking OR cases the table below will give appropriate times to use in the case request. When improper times are placed this prevents proper time coordination of cases and hampers our team from efficiently operating on patients. If an outpatient ankle ORIF is booked for 4 hours then the next patient won’t have an OR time until 4 hours after the start of the ankle instead of 60-90 minutes which would be more accurate. Please adhere to the table unless told to do otherwise by your attending.

Procedure	Approx OR Time (min)	Notes
ORIF Ankle (lateral/medial malleolus only)	60	
ORIF bimalleolar ankle fracture	90	
ORIF trimalleolar ankle fracture	90	
Ankle spanning ex-fix	45	
Open repair of Achilles tendon	90	
Intramedullary Nail Tibia	60	
ORIF pilon fracture	120	60 if all percutaneous
ORIF tibial plateau	120	60 if all percutaneous or 180 if complex
ORIF patella fracture	90	
Open patellar tendon repair	60	
ORIF clavicle	75	
Below Knee Amputation	75	
Irrigation and debridement knee	45	
Retrograde Intramedullary Nail Femur	90	
ORIF distal femur	120	
Antegrade Intramedullary Nail Femur	75	
Cephalomedullary Nail Subtroch Fracture	120	
Cephalomedullary Nail Intertroch Fracture	90	
CRPP Femoral Neck Fracture	60	
Hip Hemiarthroplasty	120	
Percutaneous SI screws	60	
Pelvic Column Screws	120	
ORIF Anterior Pelvis	150	
Supra-acetabular Ex-Fix Pelvis	45	

ORIF Acetabulum	180
ORIF distal humerus	180
ORIF distal radius	75
ORIF both bone forearm fracture	90
ORIF olecranon	60
Carpal tunnel release open	10
Cubital tunnel release	30
Ganglion excision	20
Trigger finger release single	10
Trigger finger release multiple	30
Wrist arthroscopy	60

Operative Dictations

Call 22222
User number
Work type: 11 (op note)
Patient CSN

Begin Dictation/Pause: 2
End: 8

MRN
Date of service
Time of service
Attending:
Assistant:

(Diagnosis and procedure from the attending's brief op note)

Preop Diagnosis:
Postop Diagnosis:
Procedure:

(always dictate which side)

Anesthesia: (general, LMA, sedation, popliteal block, etc)

Wound type:

- 1 - Clean
- 2 - Clean/contaminated (Entered GI/GU/Resp)
- 3 - Contaminated (Open wounds, inflamed)
- 4 - Dirty (old wound, necrosis, infx)
- 5-- No incision/cast room

Complications: "None apparent"

Specimens: (cultures or pathology)

Tourniquet Time:

Drains:

Blood loss:

Implants:

Indications:

Brief HPI including pertinent medical issues

Indication for surgery

Risks, benefits, and alternatives of surgery were discussed. (STATE PERTINENT RISKS)

Risks include, but are not limited to, risk of anesthesia, infection, damage to vessels and nerves, nonunion, malunion, failure of hardware, posttraumatic arthritis, and potential need for additional surgeries.

Informed consent obtained. The patient or medical decision-maker voiced an understanding of these risks and agrees to them. All questions were answered

Procedure:

The patient was identified in the holding area.

The correct procedural side and site were identified and marked.

The patient was brought to the operating room.

He/She underwent -- - anesthesia

He/She was positioned/padding . . .

The (side, upper/lower extremity) was prepped and draped in the usual sterile fashion.

IV antibiotics (type, amount) were administered prior to incision

Tranexamic?

A timeout was performed to confirm patient identity, side, site, and procedure

Narrate the procedure

Use "We", not "I", for legal reasons

Orientation/location of incision

Approach (mention pertinent structures)

Implants used:

Sequence of procedure

For I&Ds/Open fxs describe exactly what you excised and with what

Path/Culture (site, location, appearance)

Closure (drains?)

Counts correct at end of procedure

Dressing/Immobilization

*** If length of surgery prolonged by >25% (DASH 22 modifier) due to operative difficulty must state the *objective* reasons for such difficulty like morbid obesity, scarring, or multiple approaches***

Post-op Plan:

Weightbearing/ROM

24 hours Periop Antibiotics

Chemical DVT prophylaxis is/is not indicated. He/She will be initiated on (ie Lovenox 40 mg SQ once daily for 2 weeks and then Aspirin 325 mg PO bid for 4 weeks thereafter.)

Follow-up at two weeks for wound check

Attending Attestation:

Cut and paste from the attending's brief op note

Conferences

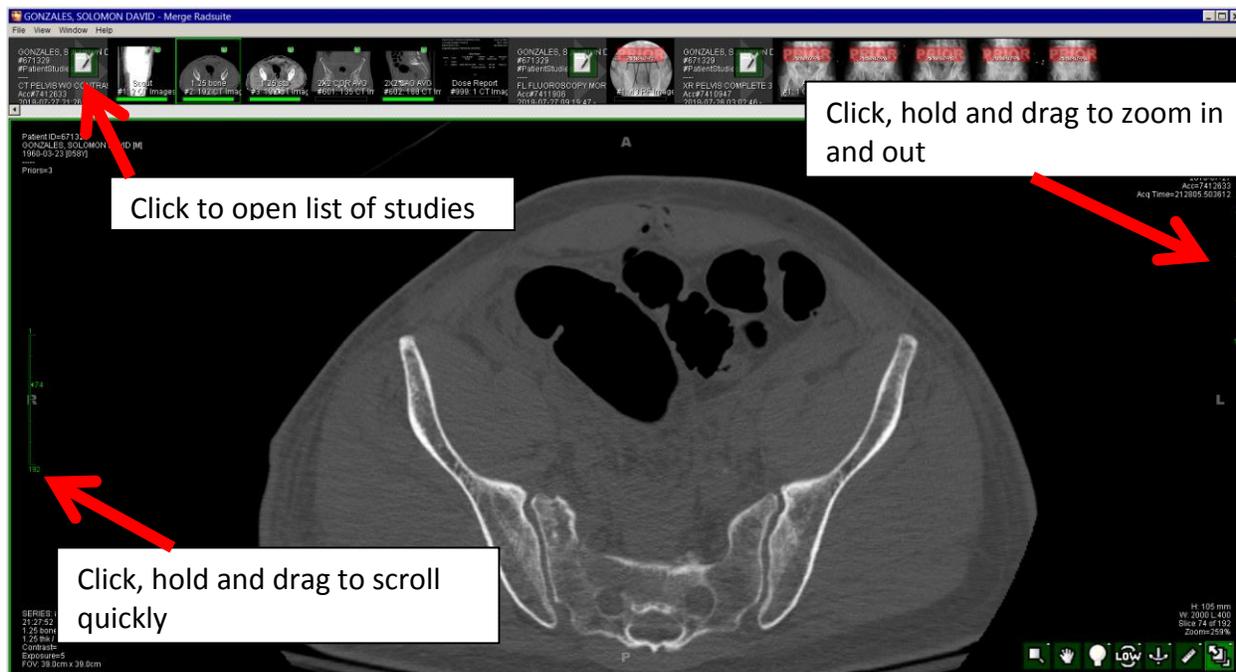
Surviving Fracture Conference

Format

2 PGY2s will run PACS. Preferably, the person with the most consults should not be running the board. Consults will be presented first, followed by post-ops, followed by M&M on Mondays. Imaging studies should be presented on alternating screens. All imaging studies should be pulled up and ready to go **prior to 7 AM**. You should have a pre-determined order figured out, so that presenters know what consults are coming up next. There should be no hesitation whatsoever when patients are pulled up.

Practice running the board if you have not done so – it is harder than it looks

- Always present x-rays first, followed by advanced imaging studies
- It is helpful when dragging x-rays into the consult or post-op folder, to drag all relevant images – sometimes this requires going back through and removing the non-relevant imaging studies (e.g. 30 chest x-rays). This will make life easier for the person running PACS.
- For pelvic fractures, the most useful CT sequence is the axial cut, bone window



After fracture conference, the 2nd year who saw the consult is responsible for updating the patient on any change of plan (e.g. operative vs. non-operative treatment or clinic follow-up)

How to present a simple consult

- Shorter = better, but include relevant information
 - E.g. Name is a (age) (sex) with (relevant comorbidities) s/p (mechanism) with (injury). (Pertinent exam findings / imaging); Plan is for (Plan)
 - Come up with a plan, and be ready to defend it! If you don't know, read about it. It's ok to run your plan by the chief the morning before conference if you're still not sure after reading
- Plan should NEVER be
 - to discuss treatment at fracture conference
 - to discuss treatment at follow-up
- Only include relevant labs
 - It is not always necessary to present a laundry list of labs (especially when presenting infections), but have them available in case they are asked
 - If you're trying to paint a picture of necrotizing fasciitis or the severity of an infection, DO include those labs
- Cut out all meaningless commentary, no matter how funny you think you are.

Presenting Polytraumas/Complex patients

Have a formula to follow to ensure a concise but comprehensive picture of the patient. This should include everything encompassing resuscitation status, non-orthopedic injuries and plans, and orthopedic injuries and plans. ***Practice reciting these a few times to come up with the most succinct and meaningful presentation. NO WASTED WORDS!!!***

Example:

John Doe is a (age) (sex) s/p (mechanism). GCS ___ on arrival, hemodynamically (stable/unstable) with (+/- FAST). ___ units of PRBCs given in ED with/without response. Initial labs (lactate, base def). Non-orthopedic injuries include ____. Orthopedic injuries include: Start with one extremity at a time and go through in a systematic fashion. This morning, hemodynamic status is improved/unchanged/worse with lactate/base deficit of ____. State plan for each individual orthopedic injury.

All polytrauma patients presented over the weekend must be presented again at Monday morning conference.

Helpful Resources beyond Orthobullets

- Most recent JAAOS review on the topic
- Handbook of Fractures
- OTA Resident Lecture Series Powerpoints (<https://ota.org/education/resident-core-curriculum-lectures>)
- It is helpful to jot down basic information (tolerances, indications, etc.) that are obvious questions for fracture conference

Fracture Conference Teaching Lecture Series

Background:

The Department of Orthopaedics at Denver Health Medical Center runs a daily fracture conference that serves several well-defined purposes:

1. Quality control component
2. Patient safety component
3. Educational component
4. Research component (enrollment of patients in our ongoing prospective studies)

Our fracture conference takes place Mondays, Tuesdays, Thursdays and Fridays from 7am to 8 am.

Structure of the Conference:

> 7:00 am to 7:15 am: Review of all consults that came in through referrals from an outside facility or through our ED (Quality control, educational component and research). Each consult is reviewed and discussed for appropriateness, surgical indication, pearls and pitfalls of such fracture, indications for non surgical treatment and techniques of non surgical treatment

> 7:15 am to 7:30 am: Review of all previous 24 hours fractures postoperative X-rays (Quality control, educational component and research). Each postoperative case is reviewed and reduction and fixation strategies are discussed, alternative treatment options and postoperative protocols.

> 7:30 am to 8:00am: On Mondays we focus on the patient safety component reviewing complications from the previous week (M&M conference). On other days we run the AO foundation educational lecture series on fracture/trauma care covering a 2 months period.

Aim and Objectives of the Lecture Series on Fracture Care:

This lecture series is designed to provide the participant with a fundamental knowledge of operative treatment of fractures according to the AO principles. The four guiding AO principles of fracture fixation are:

1. Anatomic reduction of the fracture fragments, particularly in joint fractures
2. Stable fixation to ensure proper healing of the fracture allowing surrounding tissue to move and strengthen;
3. Atraumatic surgical technique to preserve the blood supply to the bone fragments and soft tissue;
4. Early, pain-free mobilization returning the patient to function as soon as possible. The course covers the concepts of absolute and relative stability, as applied in context, of the soft tissue injury for each limb segment's major fracture types. This course is the foundation for the AONA curriculum, which teaches the surgeon how to manage trauma and trauma reconstruction. The goal of this course is not to advocate the treatment of all fractures by surgical fixation, but rather to help ensure that when surgery is carried out, that it is done properly based upon

principles, appropriate preoperative planning, and decision-making. Faculty members deliver the lecture series.

Attendance at Fracture Conference and Feedback/Evaluation:

All residents, fellows (Trauma, hand and joint reconstruction) as well as faculty from our department are encouraged to attend the lecture series. A sign-in sheet is distributed at every lecture and feedback forms are provided to each faculty delivering lectures at the end of each 2 months lecture series for evaluation of quality of delivery and content purposes.

An example of our rolling schedule is attached (September 2017 to February 2018 with date, topic and faculty).

Topics of lectures and questions pertinent to the topics are:

Humeral Shaft Fractures
Biology of Bone Health/Plate Design and Function
Spectrum of Stability
Surgical Reduction Techniques
Proximal Humeral Fractures
Tibial Plateau Fractures
Treatment Algorithms
Soft Tissue Injury and ACS
Tension Band Principles
Ex-Fix/Locked Plating Relative Stability
Ankle Fractures
Fractures of the Tibial Diaphysis
Bridge Plating/IMN Fixation
Open Fractures
Biology of Bone Healing
Principles of Diaphyseal Fractures
Radiation Safety
Distal Radius Fractures
Both Bone Forearm Fractures
Principles of Articular Fractures
Reduction Techniques of Articular Fractures
Pertroch and Intertrochanteric Femur Fractures
Acetabulum Fractures: Radiology Landmarks
Femoral Neck Fractures
How Not To Do AO
Pelvis Fractures: The A, B and C's
Basic Science Principles
QUIZ: All Topics

Denver Health Orthopedics Morbidity and Mortality Conference

- A. Occurs every week on Mondays (except the first Monday of the month)
- Every complication, defined below on the form, is reviewed
- B. All cases should be reported in real time to M&M coordinator via email with “safemail” as the subject of email
- Info should include attending name, patient MRN and complication
- C. Residents should prepare each patients on the M&M list including the grading and possible suggestions for root cause and loop closure which will need to be documented on the form or via an email and subsequently sent back to the M&M coordinator.

Name:	Admitted:	
Ortho M&M:	Ortho Team:	/
MRN:	FIN:	Trauma #:
Reported Event:		
<p>I. Status</p> <input type="checkbox"/> A. Complication <input type="checkbox"/> B. "Near miss" event <input type="checkbox"/> C. "No harm" event <input type="checkbox"/> D. Death <input type="checkbox"/> E. Not a complication <input type="checkbox"/> F. Not an Ortho complication		
<p>II. Specific Complication</p> <input type="checkbox"/> A. Postoperative infection <input type="checkbox"/> B. Failure of reduction/fixation <input type="checkbox"/> C. Misplaced implant <input type="checkbox"/> D. Fracture-Nonunion <input type="checkbox"/> E. Wound healing issue <input type="checkbox"/> F. Failure of flap or replantation <input type="checkbox"/> G. Postop bleeding/hematoma <input type="checkbox"/> H. Vascular injury <input type="checkbox"/> I. Neurologic injury <input type="checkbox"/> J. Medical complication <input type="checkbox"/> K. DVT/PE <input type="checkbox"/> L. Death <input type="checkbox"/> M. Other: _____ <input type="checkbox"/> N. Missed Injury		
<p>III. Patient Harm</p> <p>1. DHMCQSS</p> <input type="checkbox"/> QSS 1: "No harm" to patient <input type="checkbox"/> QSS 2: "No harm", but increased risk of harm <input type="checkbox"/> QSS 3: Harm requiring escalation of care <input type="checkbox"/> QSS 4: Harm resulting in prolonged disability <input type="checkbox"/> QSS 5: Life threatening or resulting in death		
<p>IV. Contributing Root Cause</p> <input type="checkbox"/> A. Communication <input type="checkbox"/> B. Supervision <input type="checkbox"/> C. Indication <input type="checkbox"/> D. Technique <input type="checkbox"/> E. Treatment concept <input type="checkbox"/> F. Judgment error <input type="checkbox"/> G. Aftercare <input type="checkbox"/> H. System issue <input type="checkbox"/> I. Patient compliance <input type="checkbox"/> J. Patient selection <input type="checkbox"/> K. Co-morbidities <input type="checkbox"/> L. Injury severity <input type="checkbox"/> M. No root cause evident <input type="checkbox"/> N. Other: _____		
<p>V. Corrective Action</p> <input type="checkbox"/> A. Education at QA Conference <input type="checkbox"/> B. Guideline/protocol <input type="checkbox"/> C. To PI Committee/Peer Review		
<p>VI. Preventability</p> <input type="checkbox"/> 1. Preventable <input type="checkbox"/> 2. Potentially Preventable <input type="checkbox"/> 3. Non-Preventable <input type="checkbox"/> 4. Equivocal		
<p>VII. Disclosure</p> <input type="checkbox"/> A. Occurred <input type="checkbox"/> B. Did not occur - Reason: _____		
<p>Procedure Start:</p>		<p>Heparin Start:</p>
<p>Procedure End:</p>		<p>Last Heparin:</p>
<p>Antibiotics Start:</p>		
<p>Total Tourniquet Time:</p>		
<p>Loop Closure Comments:</p> <input type="checkbox"/> No deviation from standard of care <input type="checkbox"/> See separate dictation <input type="checkbox"/> Deferred loop closure to PI Committee		
<p>2. Revision Surgery</p> <input type="checkbox"/> None <input type="checkbox"/> Yes - Planned Return to OR <input type="checkbox"/> Yes - Unplanned return to OR		
<p>Definitions:</p> <p>Complication: Any event that deviates from an anticipated uneventful recovery from illness or surgery</p> <p>"Near Miss" Event: An unplanned event with the potential of resulting in a preventable injury, which was recognized and aborted in time before inducing patient harm.</p> <p>"No Harm" Event: An unplanned event which was not recognized or aborted in time, but did not result in patient harm, and did not meet the criteria for the definition of a "true" complication.</p> <p>Unplanned Return to OR: Any return to the OR for an unanticipated event or complication</p> <p>Preventable: Expected or unexpected sequela of procedure, disease or injury that is likely to have been prevented or substantially ameliorated by taking appropriate steps.</p> <p>Non-Preventable: Expected or unexpected sequela for which reasonable and appropriate preventive steps had been taken</p> <p>Potentially Preventable: Expected or unexpected sequela which had the potential to be prevented or substantially ameliorated.</p>		
<p>Preventable VI. - 1</p>		
<p>Non-Preventable VI. - 3</p>		
<p>Equivocal VI. - 4</p>		
<p><i>Confidential Privileged Quality Management Document per C.R.S. § 25-3-109</i></p>		

Dictating Instructions

1. Dial **303-602-2222** or toll free **1-866-249-1553** Internal Extension: **2-2222**
2. Enter your **Denver Health User ID** followed by the # key.
3. Enter the **Work Type** followed by the # key.

2	H&P	14	Consultation
3	Progress Note	15	Outpatient Clinic Note
4	Interim Summary	16	Misc. Report
6	Procedure Note	18	HCG Book Report
10	ED Report	28	EEG
11	Operative Report	30	Ortho Outpatient Encounter
12	Discharge Summary	47	Short Stay Discharge Summary

4. Enter the **Medical Record Number** followed by the # key. Press 2 to dictate.
5. Please remember to dictate Date of Service, Attending Physician, Encounter number.

WHEN FINISHED:

- Press 5 to disconnect, or
- Press 8 to dictate another report

NOTE: Dictation Job ID number will be announced upon pressing 5 or 8.

Please make note of the Job ID# on discharge paperwork for retrieval if necessary.

FOR INFORMATION PLEASE CALL 303-602-8031

LISTEN INSTRUCTIONS

Dial Dictation Line

When prompted, enter your Denver Health User ID followed by the # key
Press * to enter "LISTEN" mode.

When prompted, enter the patient Medical Record Number.

Press 2 to begin listening, press 2 to pause.

Press 8 to skip to next dictation on same patient.

Press 5 to disconnect, or enter next patient MRN.

NOTE: The 2 key is the "PLAY" key in LISTEN mode.

DICTATION/LISTEN KEYPAD

KEY #	FUNCTION
2	DICTATE/PAUSE toggle (beeping tone will indicate pause mode – press 2 to resume dictation). In LISTEN mode, this will activate the playback and stop.
3	Short rewind/playback
4	Fast forward
5	Disconnect (Job Confirmation # playback)
6	STAT/Priority Press after dictation begins
7	Rewind to beginning
8	End current report/begin new (Job Confirmation # playback)
*7	Go to end of dictation
*2	Enter LISTEN mode after entering User ID

Sign-out

Denver Health Gold Sign-out:

1. **Monthly schedule:** You get 1 golden weekend per month. The R3 on research rotation will cover Saturday and the Silver R2 will take your Friday night shift.
2. **General structure:**
 - a. **Gold:** Mauffrey & Fellow
 - b. **Silver:** Stacey, Parry, & Iams
 - c. If you are on call with King or Beardmore add patients to your list.
3. **Daily Schedule:**
 - a. **Sunday:** Round on Gold. Touch base with the Silver person to see who is rounding on Hand. If the Hand senior is on call with you, they will round. Conference with attending at 7am and then to OR. On call during the day.
 - i. ***** Order XR's for clinic. You will split the clinic list with your chief and order XR's*****
 - ii. Prepare to present the Gold M&M on Monday. (Staff meetings is on the 1st Monday of the month so typically no M&M). Email complications to: Carri.Cherney@dhha.org
 - iii. Add the poly traumas and consults that need surgeries w/o a plan to the consult folder to be re-presented on Monday.
 - b. **Monday:** Round on Gold. Then, clinic starts at 8:20. See the separate Residents Clinic Cheat Sheet for the particulars. Clinic notes are expected to be completed in 24 hours.
 - i. **Close the loop:** If there is a PCP linked to the chart, clinic "Communication" on the right hand side and send the notes to the PCP.
 - ii. **PT, suture/staple removal orders:** PT order is "P50" if you want PT to see patient in clinic. Place suture/staple removal orders in so the MA get paid!
 - iii. **Close encounter:** When you are finished with your note, go to the level of service box and click "Needs LOS" button and then close the encounter. Put Mauffrey as the co-signer.
 - iv. **Kelly Schmadeke kick ass:** She takes care of an insane amount of stuff behind the curtains. 317-753-7293.
 - c. **Tuesday:** Round on Gold. Conference at 7am, arrive early to setup the board. OR all day. This is your day to pick which room you would like to be in therefore the best opportunity to prep for cases.
 - i. Don't forget to pre-op elective cases. They theoretically should be in pre-op around 6:30.
 - d. **Wednesday:** Round on Gold. No conference. Make sure everyone is tee'd for the OR before you leave for conference. You are expected to be back at 1PM. If cases are still going, jump in the OR.

- i. **Round on the to-follow list.** I usually get back a little early to do this.
 - ii. Print an extra list for your chief and bring to conference.
 - e. **Thursday:** Round on gold. Conference at 7am, arrive early to setup the board. There will be lots of consults and post-ops so keep your presentations short and move fast. You are on consults starting at 7am. The intern holds the pager and runs consults by you. This is the Silver resident's day to pick cases. You end up bouncing from OR to OR and it's difficult to predict which cases you will do.
 - i. Don't forget to pre-op elective cases.
 - f. **Friday:** Round on gold. Conference at 7am, arrive early to setup the board. You are on call for 24 hours, during the day with the Ortho intern and night with the ED intern. This is the Silver clinic day so you have your pick of cases.
 - i. Don't forget to pre-op elective cases.
 - ii. **Gold weekend signout:** send to Mauffrey, Attending on call, Chief, Silver resident, and intern.
 - iii. Send a text to the Silver resident, attending, and chief in the evening and let them know which cases are added for Saturday.
 - iv. If it's King, Iams, or Beardmore on call, ask them if they are comfortable doing a case before adding it for Saturday. e.g. I had a distal intraarticular femur fracture that had to wait until Monday b/c the attending on call was not comfortable doing it.
 - v. **Dr. Wong** (972-322-2078) is a plastics only attending that is taking Hand call. She will staff and take to the OR any hand soft tissue injury e.g. lacerations, NV injury, tendon lac, infection ect, but will not do any bony work, even if there a fellow on call with her. She is typically on overnight and not the next day. If you have urgent operative cases, you can obs or admit them and talk to the hand attending the next day. If it's emergent e.g. replant I'M NOT SURE???
 - g. **Saturday:** Round on Gold. Conference at 7am to go over overnight consults. Go home!!
 - i. Send 4:30 am text to Silver resident and intern with new add-ons and admits
 - ii. Send 6am text to Chief and attending with the cases added on overnight.
 - iii. Figure out which case is going to be first and ask attending for component/bed preference. Communicate this to the OR charge nurse. Don't forget to contact the rep.
4. **Expectations in the OR:**
- a. **Prepare for cases:** This is very difficult because you will often get shuffled into different rooms and patients will get moved around.
 - i. You are required to pre-op plan all cases you expect to be involved in.
 - ii. Write out steps, draw pictures, print x-rays. Come up with a list of implants and equipment you need. It's ok to be wrong. The attendings just want to know that you are thinking about the case in advance.

- iii. If you get thrown into the case at the last second, people will understand if you don't have something written down and it's ok.
 - b. Help out and do all that is needed. This means holding hook to doing your own cases. Typically, the senior's will walk you through the simple cases and they will do the more complex ones.
 - c. **Expect perfect reductions and fixation.** You are expected to call the attending if you are unable to achieve this.
 - d. **Getting patients off the ProFx table:** Disconnect the feet and slide patient proximally before taking the center post out. This prevents falls. Don't remove the post and move patient directly to their bed.
 - e. **All pelvic and acetabulum fx need pre-op 3D recons and post op CT & flat plates**
 - f. All long bone fractures get flat plates in PACU
 - g. You or the chief will determine who will talk to patients and family after the surgery. Explain post op course and plan.
5. **House Keeping:**
- a. **Adding cases:** Try and get as much detail from the attending as possible.
 - i. Book surgeries for the estimated times that are listed in the resident manual
 - ii. Include in the case request. Table, position, components, XR, and trays
 - iii. Contact the rep.
 - iv. Email Jason and be sure to mark "Contact patient"
 - v. If it's a clinic add-on, let Kelly know and include her on the e-mail as well.
 - b. **Follow-up's:**
 - i. OR: Send a follow up email after each case
 - ii. Consults: The R2 is generally responsible for arranging follow-ups. **Follow up should be with the provider who performed the most major definitive surgery.** Send the standard e-mail (DH PAV B ORTHO FRONT DESK and CC Beth Hjelle). Dr. Wong's follow up's should go to the gen surg scheduler (Kipenda Ritcherson).
 - c. **Operative consults for King, Iams, and Beardmore:** Send these guys a separate email, along with the follow up request. Patient can slip through the cracks or be scheduled too far out.
 - d. **Ensure that the chief resident or someone from your service speaks to the ICU family members DAILY during the day, as family members are typically not present during AM rounds**
6. **Specific advice from Dr. Mauffrey:**
- a. Read the resident book
 - b. Do not over prescribe narcotics. Mauffrey is generally okay with NSAIDs
 - c. Round with Mauffrey 3x/week in his office.
 - d. Please finish all patient conversations with "Is there something else we can do for you today"

- e. PTO notification must be submitted 3 months in advanced to Dr. Mauffrey, as well as Kelly & Beth in clinic so they can cancel your patients.

Orthopedic Trauma Clinic Tips:

Please involve RN Kelly Schmadeke :

- Return to Work /FMLA / Disability paperwork (RN will **make copy** before returning originals).
- Perioperative Wound Vac (NPWT) needed for planned **outpatient** surgery
- Home Health plan of care updates / changes (advancing WB or ROM status, wound care, etc)
- Complex wound assessment / documentation (wound vac application or measurements, etc)
- **Surgery plans, ie. "SCOR" [Surgery Clearance for OR]**
 - o **Lack of Ride / 24 hr Support is typical. Review this need for same-day OR**, along with 12 a.m. NPO, etc. **especially with ED to OR patients**. They can self-pay transport (Uber/cab) IF they also have a responsible party accompanying them. Their support must check-in to surgery with them, or be directly available by phone to prevent OR cancellation.
 - o Relay date of surgery, procedure order/location, and provide RN with a patient sticker. Enter case request in Epic, check box for pre-op Anesthesia visit PRN.
 - o Please also relay to RN if you anticipate need for non-standard post-op visit (1 or 3 week); anticipated post-op obs- or inpatient stay; pre-anesthesia testing visit; NWB status; etc.
 - o RN will review standard pre-operative instructions and schedule their 2-week post-operative clinic visit before they leave clinic.

Please involve SW Daniele Araujo :

- Anticipate 6 months or more disability / time off work
- Respite bed request
- Assistance with Home Care
- Urgent SW needs include APS/CPS, Domestic Violence, Crisis management, respite requests, etc.

Please involve Patient Navigator, Ramiro Godina :

- Medicaid Ride Assistance
- Primary Care Provider connection

Please involve Jan Minifie, PT:

- Assess need for formal therapy
- Assistive device or brace use, etc.
- ROM or WB exercises / Home exercise plan

Please involve Medical Assistant (or RN as back up / complex need):

- cast/splint
- suture/staple removal
- dressing
- follow up visit/print visit summary
- scheduling

White Board

Please communicate the patient's plan of care on the white board (exam room door) upon exiting the room. Adjust flags as needed (see below). Then please enter applicable orders and updates in Epic (Plan > Meds & Orders; Wrap Up > Patient Instructions).

FLAG SYSTEM

Gray- Clean/Empty room

Yellow- **Physical Therapy** Eval in clinic (order "PT50", and ask MA /RN to page Jan PRN.)

Green- Needs **Interpreter**

Orange – Treatment / Check-Out **MA** task

Blue- awaiting **Physician**

Red – **RN / Surgery Pre-Op** "SCOR" – Surgery Clearance for OR

EPIC SCHEDULE VIEW

R-click, "Change Provider to Me" or select "Change Prov" button above Schedule if you are seeing a patient listed under another MD's template.

Review Schedule view for Room #; Ortho Status (in X-Ray, etc); Appointment notes.

Bottom of schedule view you can click arrow to show patient snapshot summary report with good info

After Visit Summary (AVS) / Wrap-Up before Patient Check-Out:

We can add education topics such as: Walking Boot, Crutches, RICE Therapy; ORIF or Immobilization Treatment and Care After for variety of different fractures. You can also free-hand any instructions in Patient Instructions box when in Wrap Up tab, and it will print on Visit Summary (so long as you Refresh or back out of tab and return to Wrap Up before RN or HCP prints off AVS)

If you have patients who seem to have trouble learning or retaining info, this is a great option to ensure the message is relayed re their plan of care, restrictions, etc. Instead of repeating yourself verbally in exam room, simply tell RN to please add any specific instructions to the AVS if you do not have time to yourself.

CLOSING THE LOOP

Eventually this will be done automatically... in the mean time, please review REFERRAL column on Schedule view for any (new) patients needing your visit note sent back to referring provider.

This is a metric every Attending/clinic specialty is scored on in an attempt to become a Medical Specialty Home (increasing our reimbursement).

Ask RN or see cheat sheet card on some of the computers for assist on how to complete this loop closure.

DEETS DUDE DEETS! (Clinic Notes)

- Treatment / Plan
- WB status (**.weightbearing smartphrase** please! HAK pushed this initiation)
- X-Ray_Bone_on arrival *specify in or out of plaster in Comments (please enter order as well)
- Work Status *please refer patient to Social Work (Daniele Araujo) if out of work 6 mo. or more.

Updates or New Referrals to PT/OT :

- Enter new Ambulatory Referral to PT/OT”, switch **Internal** default to **Outgoing**, as needed, and Enter **“Unknown”** as location if patient is willing to locate PT agency of their choice.
- If Outgoing referral, please include info on referral to prevent delays in patient care:
 - o Date of Injury/Surgery, Diagnos(es), Restrictions, WB precautions, Reason(s) or goals for therapy, Start date / Urgency of therapy initiation, any special needs.
- If Internal referral: always let Jan, PT know (for triaging/scheduling purposes).
- Internally we receive more referrals than we can accommodate, so if patient wants to start PT ASAP, they may get in sooner at another agency.

INSTRUMENTS

Please do NOT place any instruments that came out of sterile bubble packaging in exam room Sharps containers. We will sterilize and re-use them. There are small red Biohazard boxes to place supplies in and transfer to Soiled Utility room (when in doubt; MA or RN can assist)

XRAY ORDERS

Please scrub the schedule 1-2 days ahead and enter appropriate XR orders ahead of trauma clinic. Please prep your personal template AND the Attending template(s). Coordinate w/ other Resident PRN.

Please always enter XR order for next follow-up visit while writing current note / diagnosis. It is much quicker and easier to enter necessary XR details and Associate Diagnosis when patient is fresh in your mind.

Other Orders to enter during clinic:

- Any future Imaging or Procedure (O.R. case request; XR/MRI/C T; IR Consult)
- STAT Ultrasound - DVT v (then let HCP or RN know so we can coordinate)
- Cast Application and/or Removal
- Suture (Staple) Removal (if surgery was done OUTSIDE of Denver Health)
- DME / PT / OT Needs

- Enter “PT50” for any patient you want to see our in-clinic Physical Therapist, Jan Minifie.
- DME: Review with patient - check with insurance for coverage regarding scripts given.
- Medication (Refills)
- Consult or Referral to Non-Ortho Specialty Team/MD (Medical Rehab [PM+R]; General Surgery; etc)
- ED to OR Patients (s/p Fracture Conference)
- Please document a “Telephone Call”, or “Documentation” encounter in Epic when you speak to patients via phone, especially regarding updates in their plan of care. Please also review the *Encounter tab* for any future scheduled Ortho clinic visits, as patients may need their clinic visit re-scheduled to another date upon change in Surgery plans.
- ED or Inpatient Consults / Discharges
- Before signing off & sending a message to schedule Ortho follow-up, please review the patient’s banner in Epic and confirm a valid phone number is documented. Without this, we cannot contact patient to schedule appointment or surgery. If the patient does not have a phone, or anticipates phone issues, check Demographics tab for valid emergency contact and ph# listing.

THE “FAVER” APPROACH: RESPONDING TO INAPPROPRIATE PATIENT REQUESTS

F	Name your <i>feelings</i> about the patient’s request — anger, fear, sadness, annoyance, etc.
A	Analyze your thoughts about the request and what is fueling your feelings. Would fulfilling this request be: <ul style="list-style-type: none"> ▪ Poor medical care? ▪ Illegal, dishonest, or against policy?
V	View the patient in the best possible light. Don’t assume the patient knows that what he or she is requesting is “wrong.”
E	Explicitly state that the requested action would be: <ul style="list-style-type: none"> ▪ Poor medical care, ▪ Illegal, dishonest, or against policy.
R	Reestablish rapport. Use empathy and “I wish ...” statements.

What to say when the request is:

Poor care	"It would be poor care for me to prescribe that medicine. You do not come to see me for poor care. You come to see me for my best medical judgment."
	"It would be poor care for me to do X. Good care would be Y."
	"I understand that Dr. X has given that to you in the past. Doctors do not always agree. You come to see me for my best medical opinion, and I believe it would not be good care for you to take X."
Illegal, dishonest, or against policy	"I understand why you want to avoid jury duty. I wish I could help you, but it would be illegal for me to state things that are not true."
	"We could both end up in jail if we do X."
	"I am sorry you were not aware of those rules. We still have to follow them."

What to do or say when a patient threatens to:

Harm you or your staff	Consult your practice policy. Assess the immediacy of the threat. When safe, dismiss the patient from the practice.
Report you	"Even if you report me, I will not do what I believe is bad for you."
Leave your practice	"I will be sorry to lose you as a patient; however, I won't deliver poor care to keep you here."



FPM Toolbox To find more practice resources, visit <http://www.aafp.org/fpm/toolbox>.

Developed by Michelle Kane, PsyD, and Lee Chambliss, MD. Copyright © 2018 American Academy of Family Physicians. Physicians may duplicate or adapt for use in their own practices; all other rights reserved. Related article: <http://www.aafp.org/fpm/2018/010Q/p25.html>. Last updated: 1/8/18.

Chief Year Expectations

- Present all post-op cases you were involved in
- Be available to staff all consults
- Have a low threshold for necrotizing fasciitis
- Know all the patients on the list
- Someone should leave conference at 7:25 to make sure the 7:30 case(s) are running on time and a first time-out is performed
- Talk to all patients and families post-op
 - Ensure that the chief resident or someone from your service speaks to the ICU family members DAILY during the day, as family members are typically not present during AM rounds
- Attendings will take care of the Brief Op-Note because there is billing information; Chiefs are to dictate the operative report. Do NOT dictate attending attestation statement, as this will be in the brief op note.
- Set the case order in the morning, and notify the attendings about the order. Make sure there is something starting at 7:30 in OR7. Also make sure the OR bridge has actually called for the patient. Sometimes when last minute changes are made, nobody actually calls for the patient, which results in a delay.

Rounding/Documentation

Progress notes

Your assessment and plan should include all ongoing medical issues to prevent poor handoffs and discharge summaries.

Significant Events

Attendings must be notified regarding any major patient events (DVTs, PEs, MIs, CVI)

Specific Postoperative Protocols

Microvascular Revascularization/Replantation Protocol

Guidelines for adults and children who underwent a microvascular replantation or revascularization procedure:

- A. After a successful replantation or revascularization is finished, the patient will be transferred to recovery room.
- B. The patient will be admitted to the ICU or the ward at the discretion of the Hand/Microvascular attending based upon the patient's physiology and extremity reconstruction.
- C. Use order sets:
 - Replant/Revascularization (Adult) - or - PED Replant/Revascularization

- D. For patients admitted to the ICU, temperature and clinical checks of the replanted part are initiated hourly at admission for the first 24 hours, continued every 2 hours for the second postoperative day, every 4 hours for the third post-operative day, and every 8 hours after the fourth post-operative day. This is considered the minimum practice and should be followed unless otherwise ordered. It is very important during the first 72 hours of neurovascular checks to recognize any decrease in temperature of the replanted part. The decreasing temperature is an indication of a vascular failure either at the level of the arteries or veins.
- Assess the temperature of the non-affected digit for a baseline normal temperature reading and then assess the temperature of the replanted (affected) digit according to the schedule listed above.
 - The temperature of a successful replantation is usually 31-36 degrees C. Any decrease in temperature below 30 degrees C or a drop of 2 degrees C or more in the replanted digit must be immediately reported to the hand surgery team.
 - Temperature measurements are to be taken with an infrared thermometer at the affected finger, as well as any uninjured neighboring finger. The latter is to have a base line temperature recorded to be compared with the replanted finger. In case of a hand replantation, the base line comparative temperature measurements are to be taken from the contralateral hand.
- E. During the patient's hospitalization, anti-thrombosis prophylaxis will be administered per the Hand/Microvascular attending order in adults. In pediatrics, replantation orders will be placed only by pediatricians or the hand surgeon. Pediatric aspirin dosing is weight based.
- Patients weighing less than 16 kg will be discharged home with 40.5 mg aspirin once a day for one month.
 - Patients weighing between 16 and 50 kg will be discharged home with 81 mg aspirin once a day for one month.
 - Patients weighing greater than 50kg will be discharged home with 325 mg aspirin once a day for one month.
- F. The patient will be seen in the Hand/Microvascular specialty clinic 7 to 10 days after discharge

Achilles Tendon Rehabilitation Protocol

This protocol can be used for non-operative Achilles tendon repairs, as well as post-operative Achilles tendon repairs.

Time Frame	Activity
0-2 weeks	<ul style="list-style-type: none"> • Posterior slab/splint non-weight bearing with crutches
2-4 weeks	<ul style="list-style-type: none"> • Aircast walking boot with 2 cm heel lift • Protected weightbearing with crutches • Active plantar flexion and dorsiflexion to neutral, inversion/eversion below neutral • Modalities to control swelling

	<ul style="list-style-type: none"> • Incision mobilization modalities (if operative) • Knee/hip exercises with no ankle movement; e.g., leg lifts from sitting, prone or side-lying position • Non-weight-bearing fitness/cardiovascular exercises; e.g., bicycling with one leg, deep-water running • Hydrotherapy (within motion and weight-bearing limitations)
4-6 weeks	<ul style="list-style-type: none"> • Weight bearing as tolerated • Continue 2-4 week protocol
6-8 weeks	<ul style="list-style-type: none"> • Remove heel lift • Weight-bearing as tolerated • Dorsiflexion stretching, slowly • Graduated resistance exercises (open and closed kinetic chain as well as functional activities) • Proprioceptive and gait retraining • Modalities including ice, heat, and ultrasound as indicated • Incision mobilization • Fitness/cardiovascular exercises to include weight-bearing as tolerated; e.g. bicycling, elliptical machine, walking and/or running on treadmill, stairmaster • Hydrotherapy
8-12 weeks	<ul style="list-style-type: none"> • Wean off boot • Return to crutches and/or cane as necessary and gradually wean off • Continue to progress range of motion, strength, proprioception
>12 weeks	<ul style="list-style-type: none"> • Continue to progress range of motion, strength, proprioception • Retrain strength, power, endurance • Increase dynamic weight-bearing exercises, include plyometric training • Sport-specific training

Patellar Tendon Repair Protocol: Post-Operative

Weeks	Weight Bearing	ROM	Exercises
0-2	As tolerated with brace locked in full extension at all times	0° Brace off only for hygiene	<ul style="list-style-type: none"> • Rest, elevate
2-4	As tolerated with brace locked in full extension at all times	0°-45° prone or passive in brace No active knee extension	<ul style="list-style-type: none"> • Heel slides • Quad sets • Straight leg raises • Weight bearing calf raises
4-5	As tolerated with brace locked in full extension at all times	0°-60° prone or passive. No active knee extension	<ul style="list-style-type: none"> • Same as weeks 2-4
5-6	As tolerated with brace locked in full extension at all times	0°-90° prone or passive. No active knee extension	<ul style="list-style-type: none"> • Same as weeks 2-5
6-8	As tolerated with brace 0°-45°	AROM, PROM as tolerated in brace unlocked	<ul style="list-style-type: none"> • Same as weeks 2-5
8-12	Full weight bearing No brace	Full No brace	<ul style="list-style-type: none"> • Progress closed chain activities • Hamstring strengthening • Stationary bike • Proprioception exercises
12-20	Full weight bearing No brace	Full No brace	<ul style="list-style-type: none"> • Single leg balance • Glutes, eccentric hamstring strengthening • Gradual quad strengthening • Core strengthening • Elliptical, bike, swimming
>20	Full weight bearing No brace	Full No brace	<ul style="list-style-type: none"> • OK to return to sport-specific exercises if cleared by MD

