

Making it Through the Night

Lisa K. Cannada MD



Disclosures

- **Member: OTA & AAOS Committees**
- **AAOS Now Editorial Board & multiple others**
- **Member: MAOA & COS BOD**

Objectives

- **Transfer Criteria**
- **Classify**
 - **Life Threatening**
 - **Limb Threatening**
 - **Function Threatening**



The Golden Hour

- R Adams Cowley - “The Golden Hour”
- Recognized that patients that received definitive care soon after injury had a much higher survival rate than those whose care was delayed.
- Due to maintaining organ function



The Golden Hour

The ACOS COT has used this concept to emphasize the importance of getting a patient to a facility where expert trauma care is available during a period of reversible shock



**Patient's
Whose Needs
Exceed
Available
Resources!**

Pelvis/Abdomen

ACS Committee on Trauma: Resources for Optimal Care of the Injured Patient

- **Unstable pelvic- ring disruption**
- **Pelvic ring disruption with:**
 - Shock
 - Evidence of continuing hemorrhage
- **Open pelvic injury**



Extremity

ACS Committee on Trauma: Resources for Optimal Care of the Injured Patient

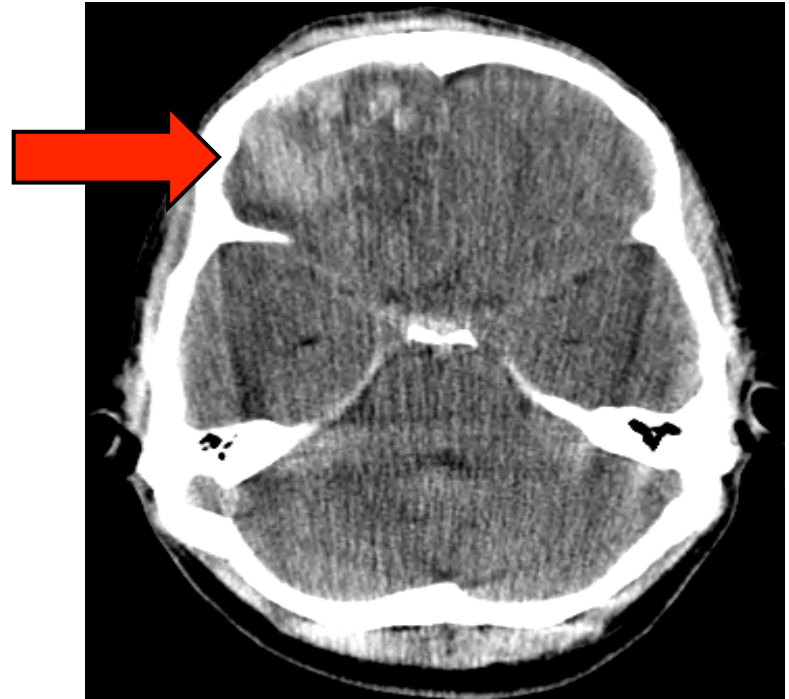
- Severe open fractures
- Traumatic amputation
- Complex articular fractures
- Major crush injury
- Ischemic limb



Multi-system Injury & Co Morbidities

ACS Committee on Trauma: Resources for Optimal Care of the Injured Patient

- Head injury
- Injury to more than two body regions
- Major burns
- Multiple long-bone fractures
- Co Morbidities



As Soon As Possible

- **As soon as it is recognized that patient's needs exceed that of the institution**
- **Efforts to perform additional diagnostic tests:**
 - **Delay definitive care**
 - **Unproductive if one can't act on them**

But It Happens...

- Friday night
- It's only you...
- Blizzard, wildfire
you name it...keeps
helicopter from
flying



What if You are Stuck?

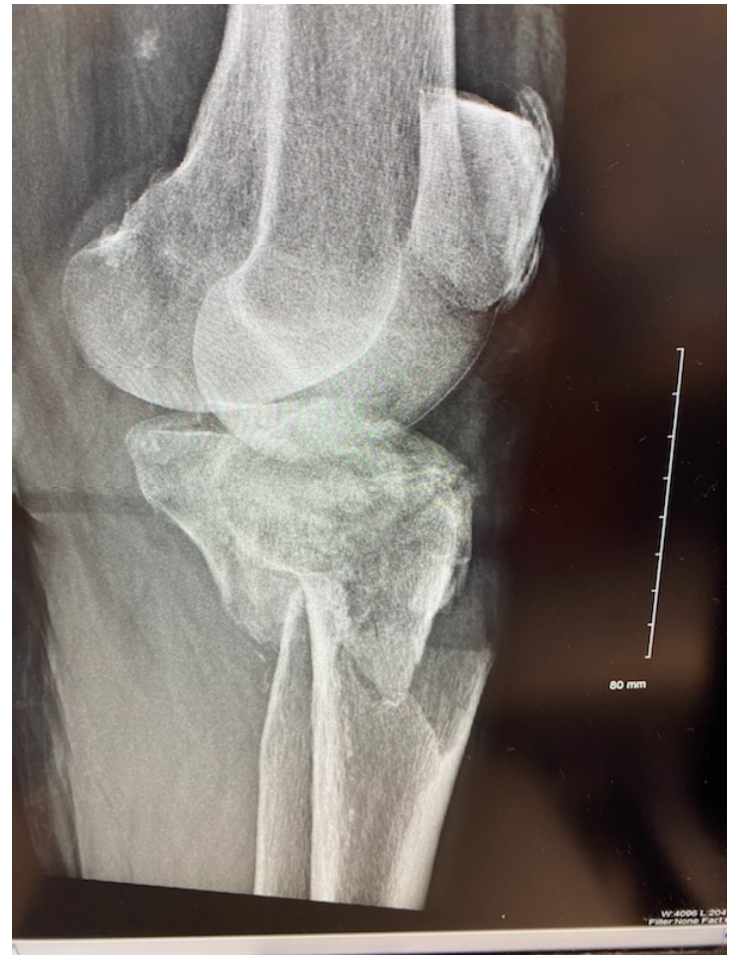
No Matter How Bad It Seems

- *Survey the situation*



No Matter How Bad It Seems

- *Temporize*



No Matter How Bad It Seems

- *Don't miss the "small things...."*



No Matter How Bad It Seems

- *Ask 3 basic questions*



Basic questions

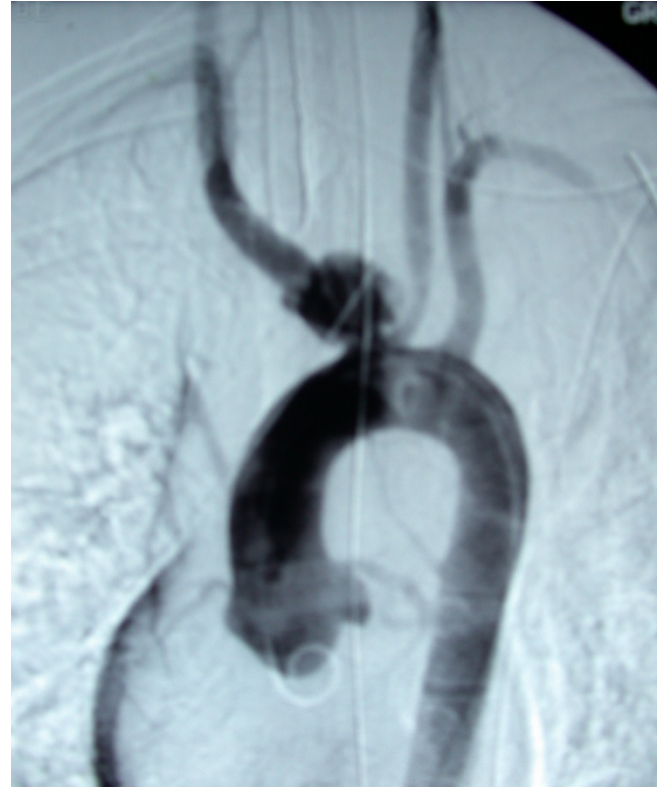
What can the patient tolerate?

Unstable

- Bridge +/- minimal fixation
- Splint

Stable

- Consider patient
- Your comfort level



Basic Questions

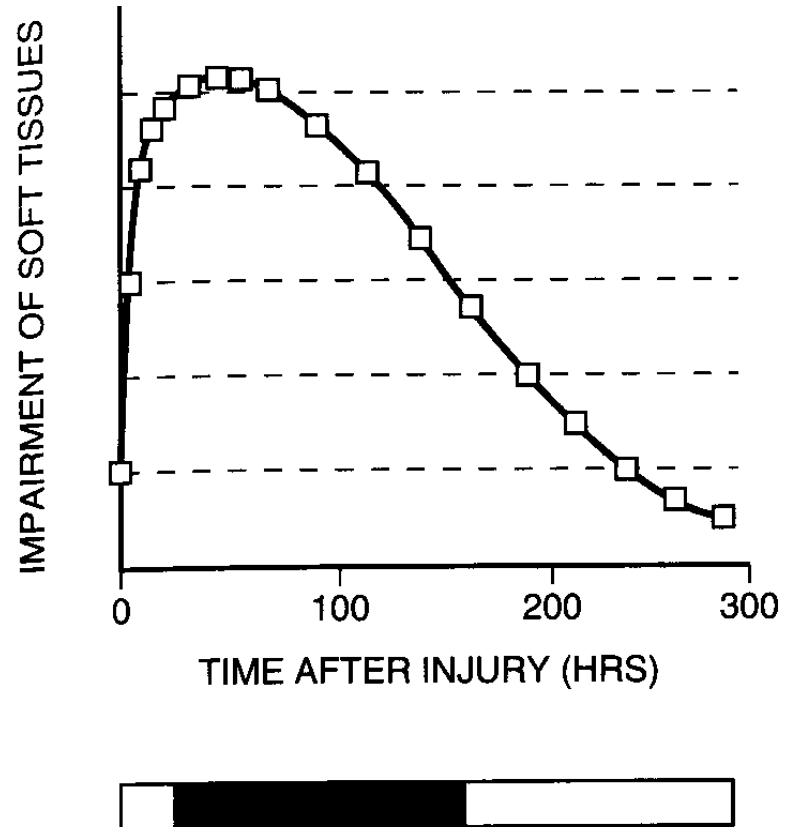
What can the limb tolerate?

- Open wounds
- Fasciotomies
- Vascular repairs
- Consider other injuries
- Existing medical pathology

Basic Questions

What can the skin tolerate?

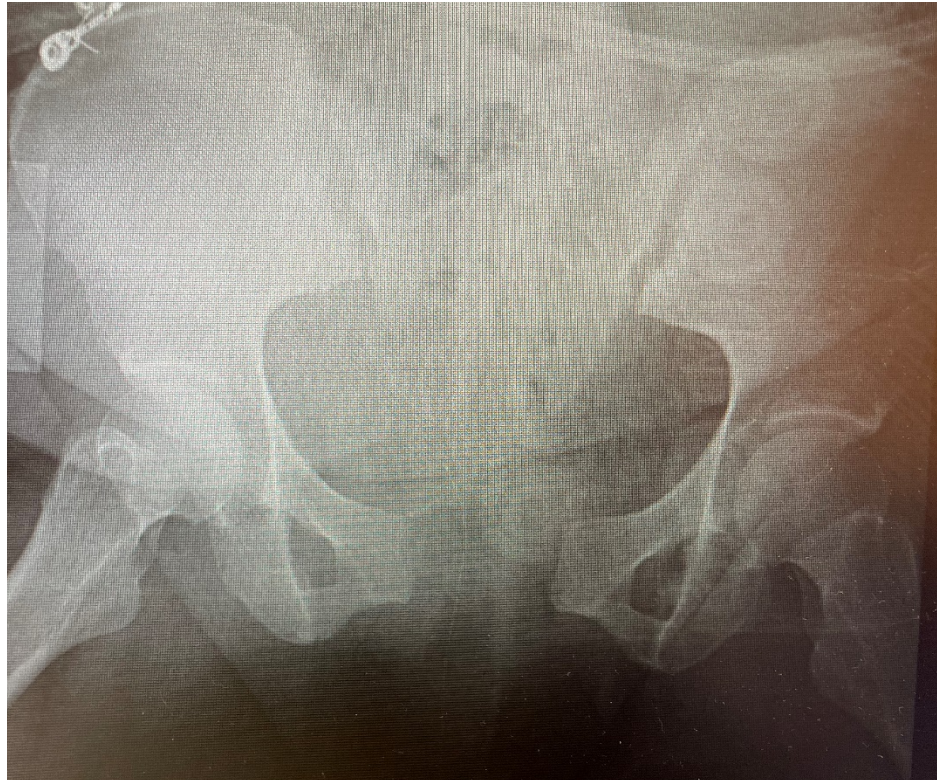
- Timing
- It can be an evolving process



Assess the Injuries

Life Threatening

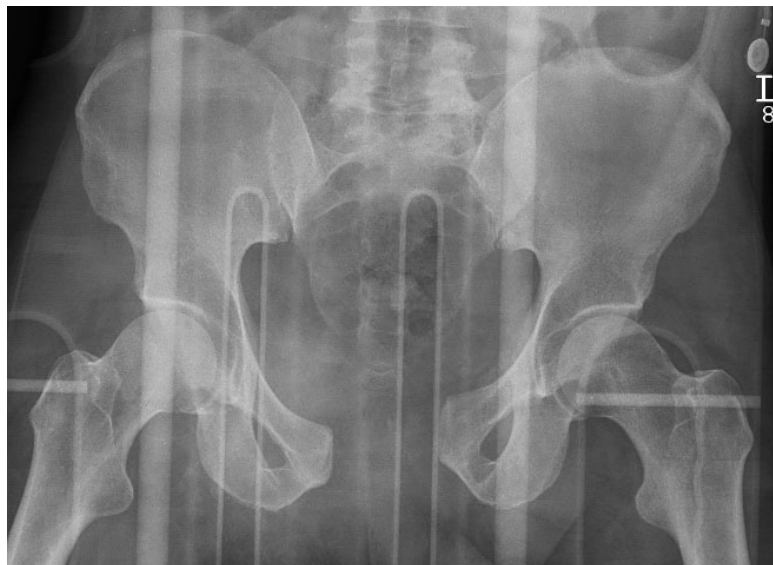
- *Major pelvic fractures*
- Traumatic long bone amputations
- Massive open long bone fractures
- Bilateral femur fractures



Sheet

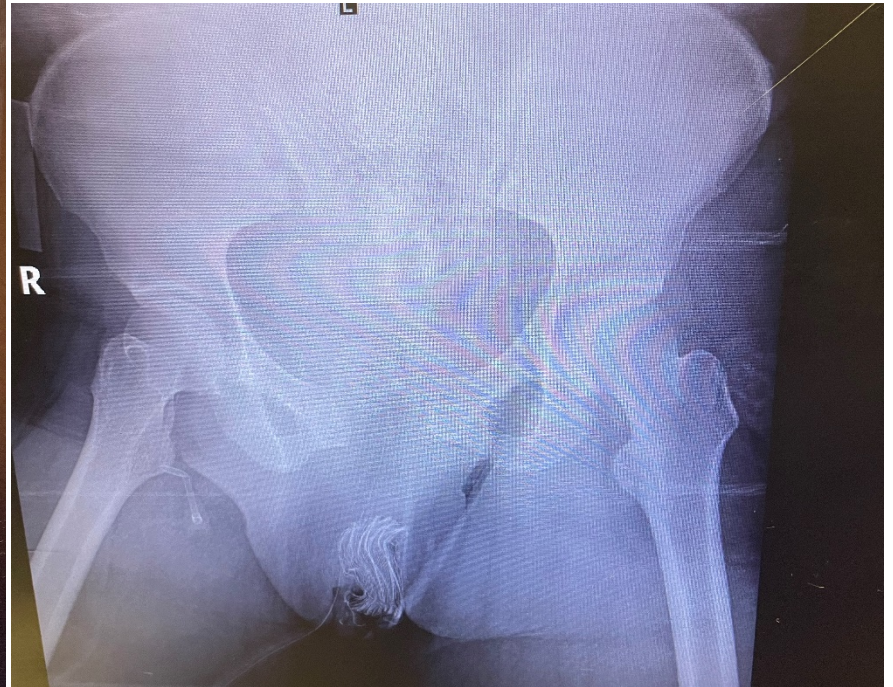
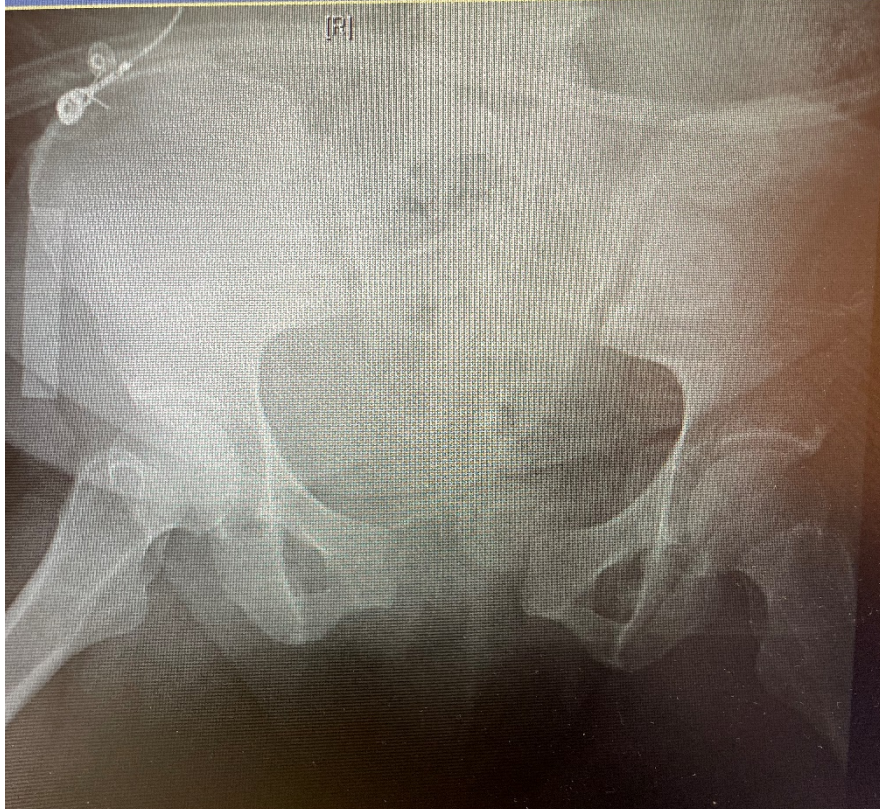


Pelvic Binder



Pelvic Binder Tips



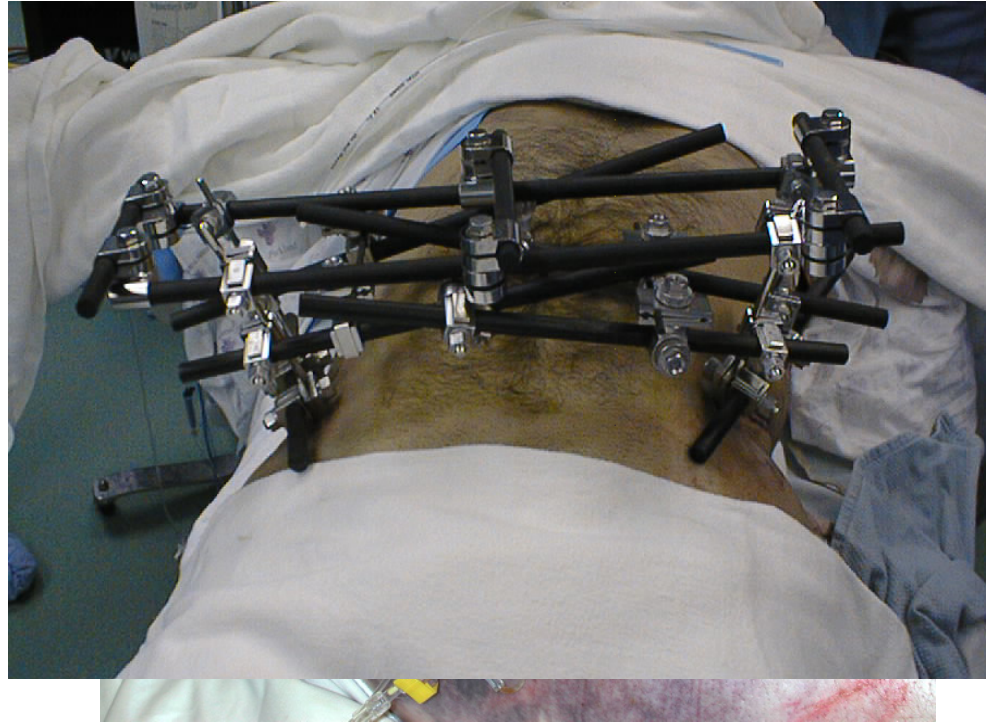






External Fixation

- Only if you are comfortable...
- Make sure in bone...



Bilateral Femur Fractures



Retrograde Intramedullary Nailing in Treatment of Bilateral Femur Fractures

Lisa K. Cannada, MD,† Sascha Taghizadeh, MD,* Jothi Murali, MD,‡
William T. Obremskey, MD, MPH,† Charles DeCook, MD,† and Michael J. Bosse, MD†*

- **Previous: 25 % mortality rate**
- **Largest study in the literature**
- **5.6% Mortality Rate**
 - **Thoracic injury associated**
- **Early OR important**

Traction OK

ORIGINAL ARTICLE

Skeletal Traction Versus External Fixation in the Initial Temporization of Femoral Shaft Fractures in Severely Injured Patients

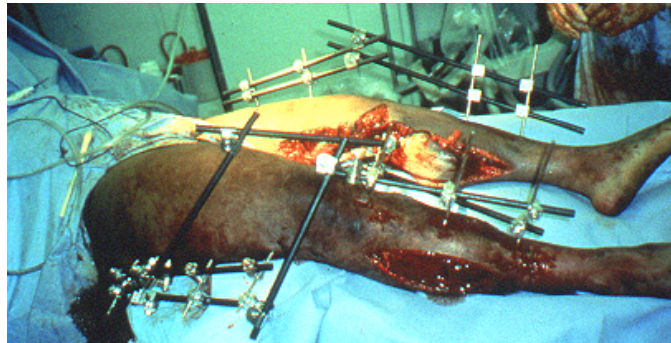
*Brian P. Scannell, MD, Norman E. Waldrop, MD, Howell C. Sasser, PhD, Ronald F. Sing, DO,
and Michael J. Bosse, MD*

Limb Threatening

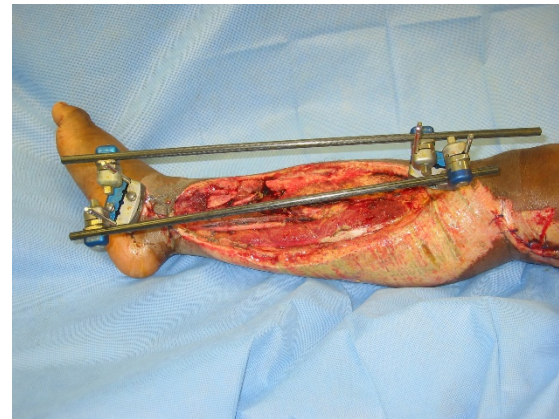
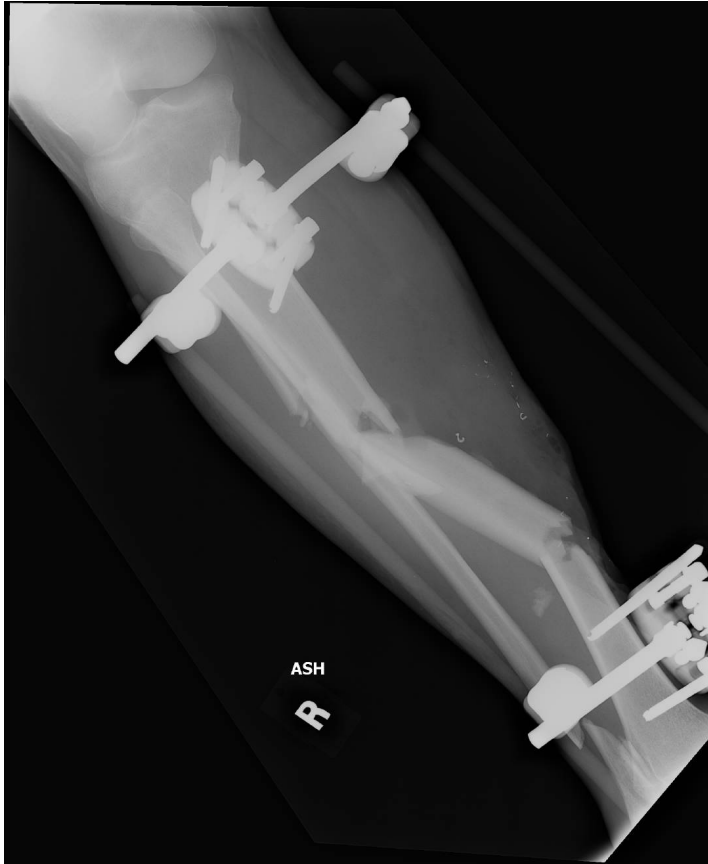
- Open fractures
- Fractures with vascular injury
- Crush injuries
- Compartment syndrome
- Dislocation (knee)



External Fixation is The Answer



External Fixation: DON'T

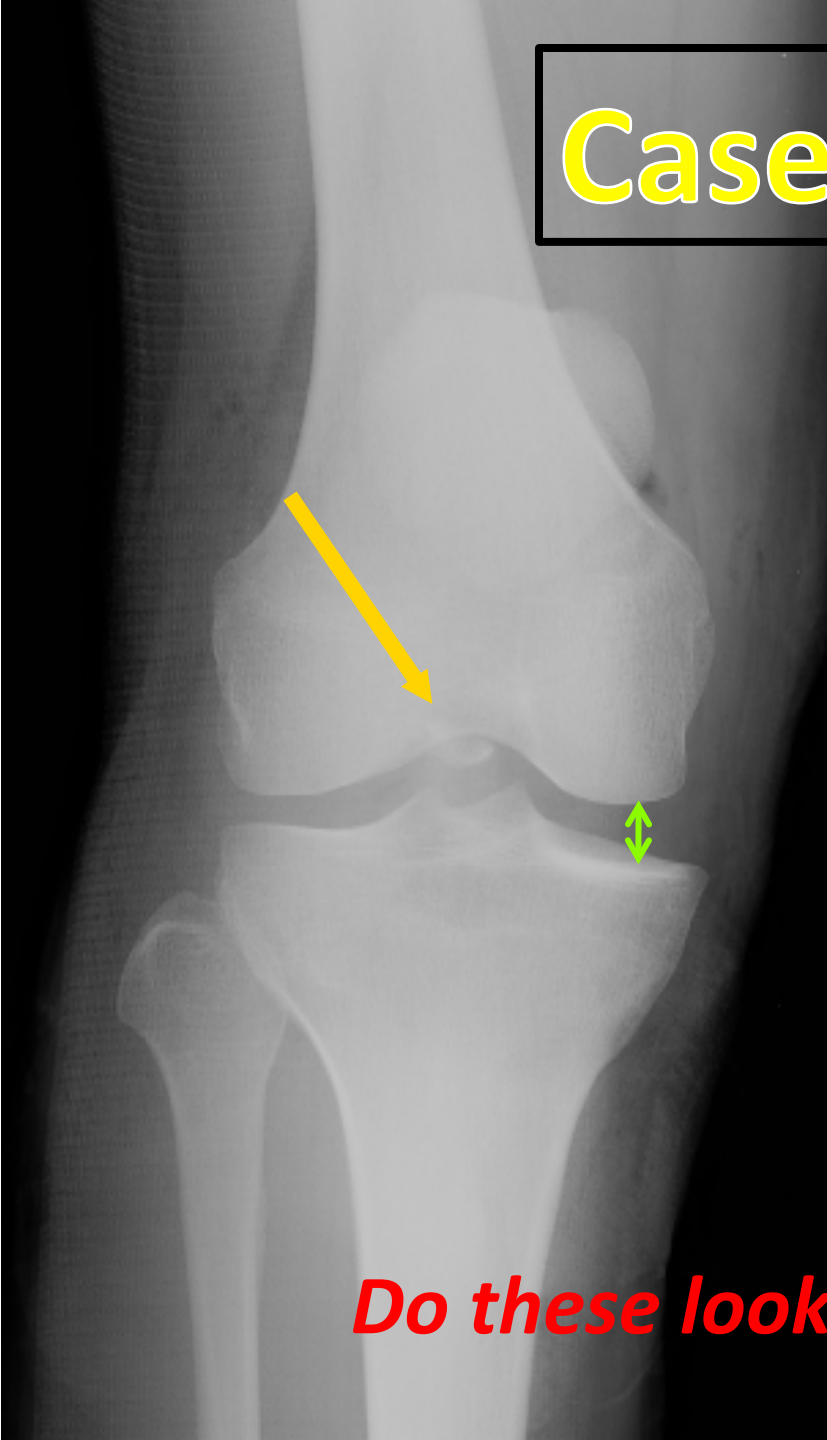


Knee Dislocation

- **Do not send home!**
- **ABI's SOC**
- **Ex fix**
 - **FX/DX**
 - **Unstable**
- **Monitor**



Case Example



Do these look like an unstable knee?

Open Fractures: Yes/No



Night: Yes/No



Night: Yes/No



Night: Yes/No



Night: Yes/No



Compartment Syndrome

Compartment Syndrome

Diagnosis

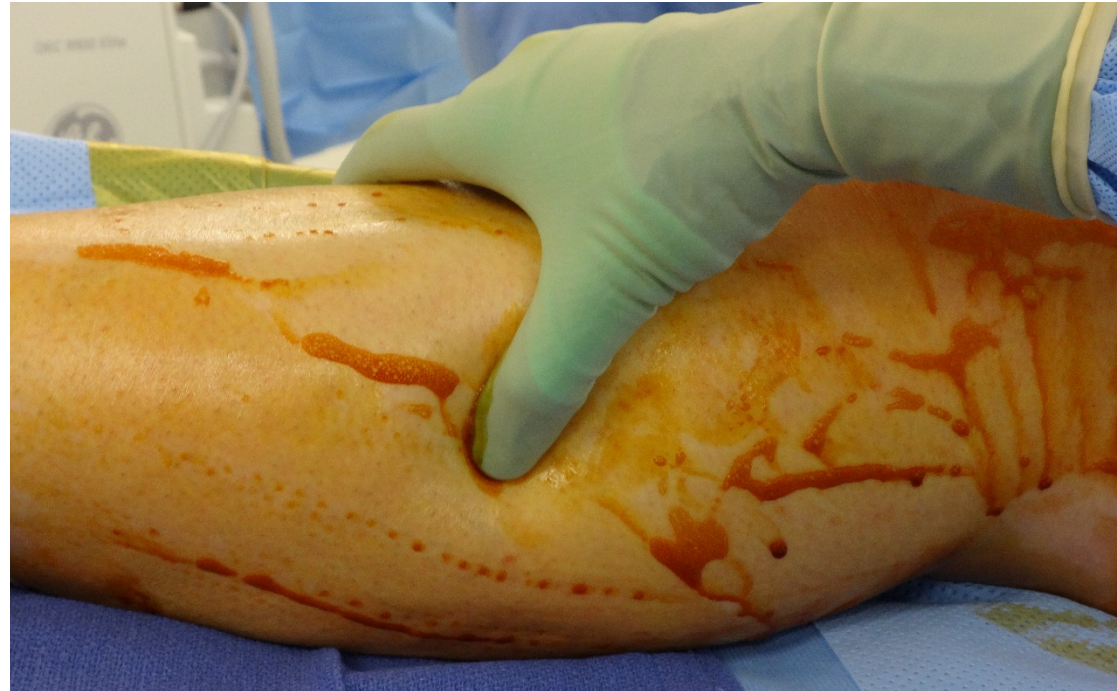
- **Pain out of proportion**
- **Pain with passive stretch**
- **Paresthesia**
- **Paralysis**
- **Pulselessness/pallor**

Cannot Palpate!



IMG_0210.MOV

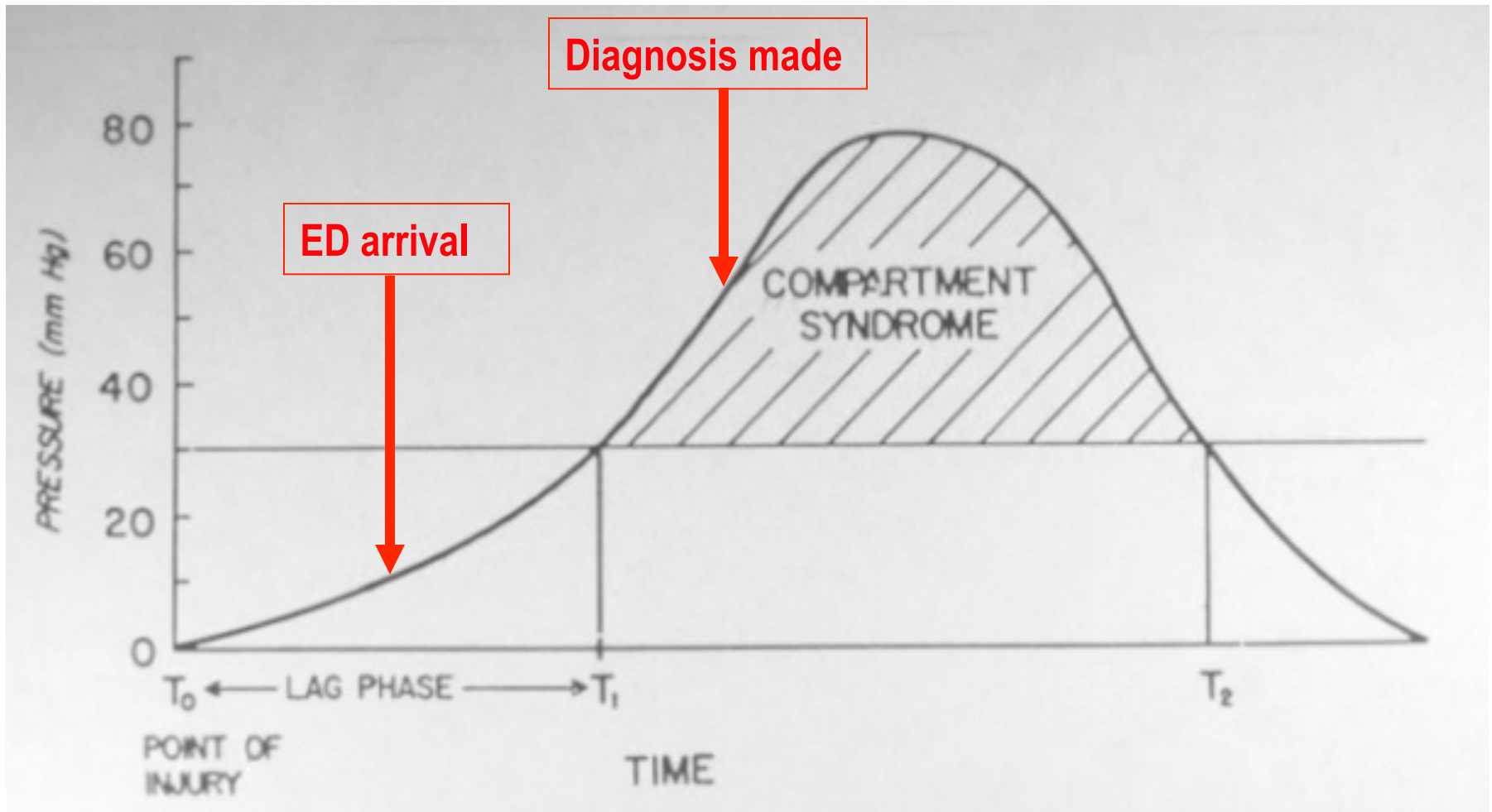
- Serial exams
- But...many obtunded
- True Positive palpation sensitivity 54%



Shuler FD et al, JBJS-A, 2010 Feb;92(2):361-7

Do Patients Need Serial Exams?

- Compartment syndromes develop over time

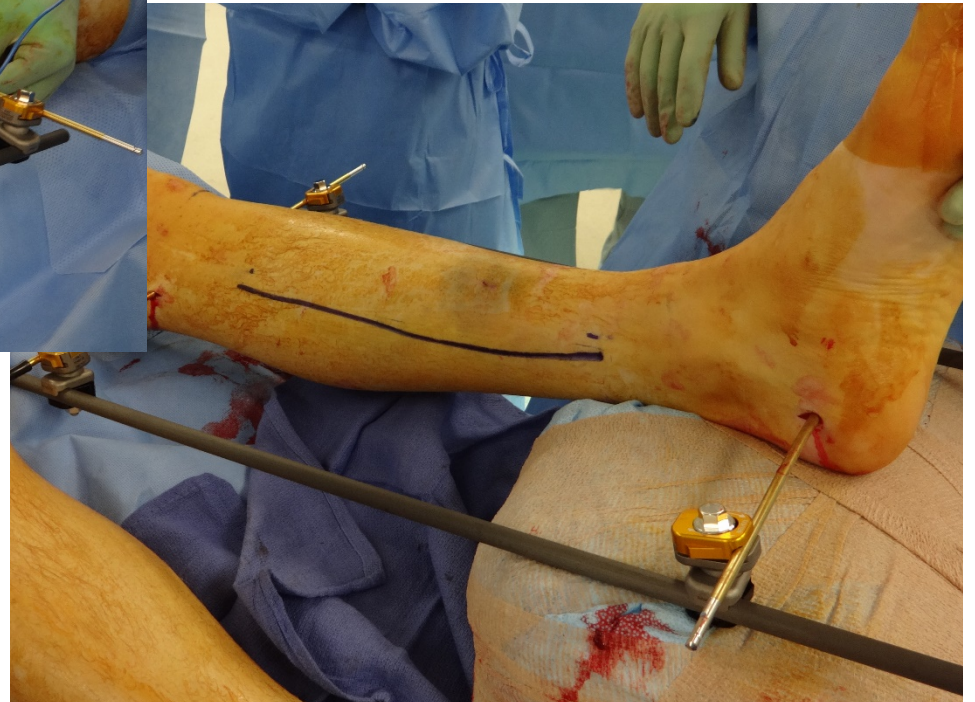


If It Is Obvious...



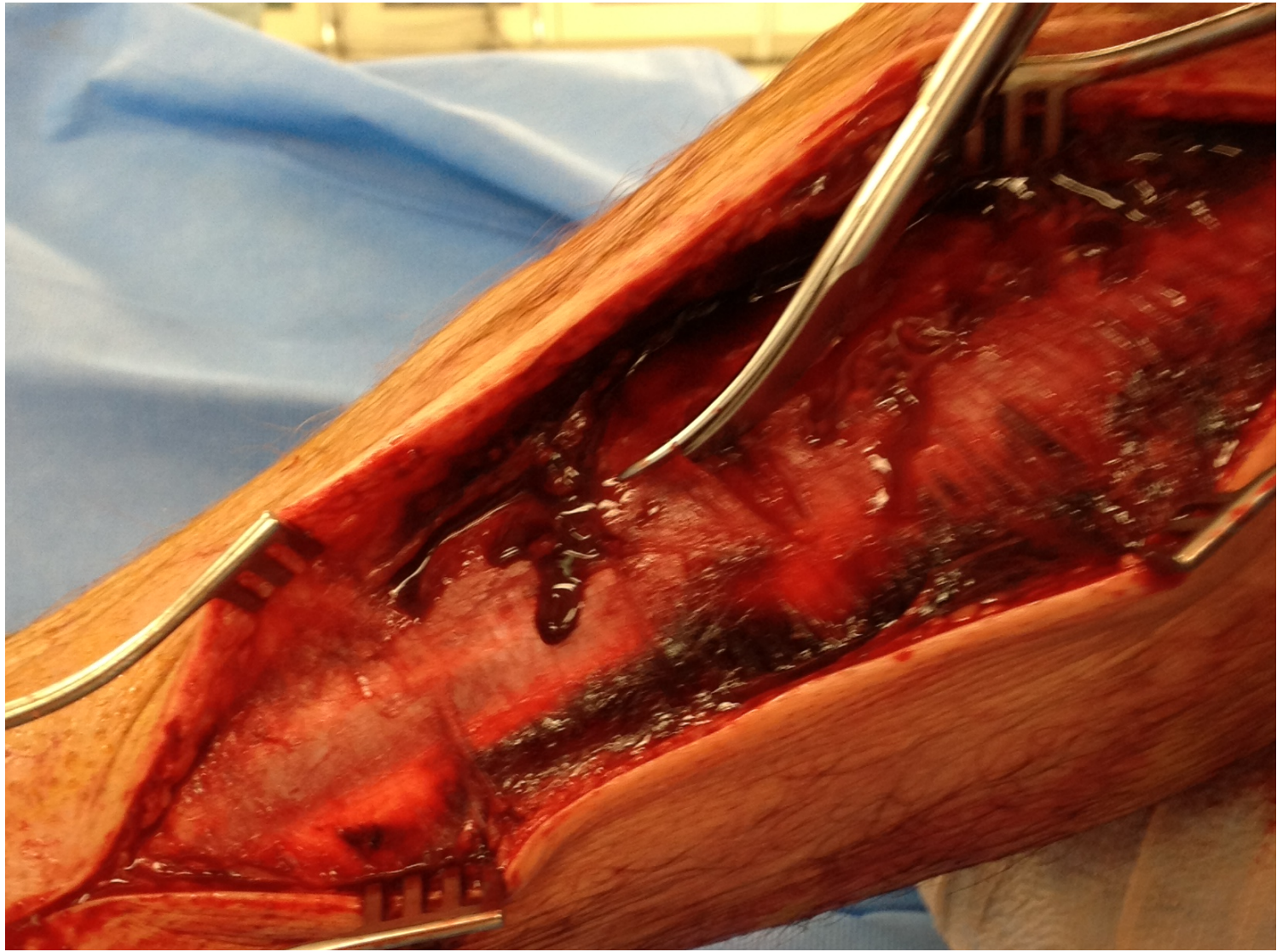
Two Incision Fasciotomy

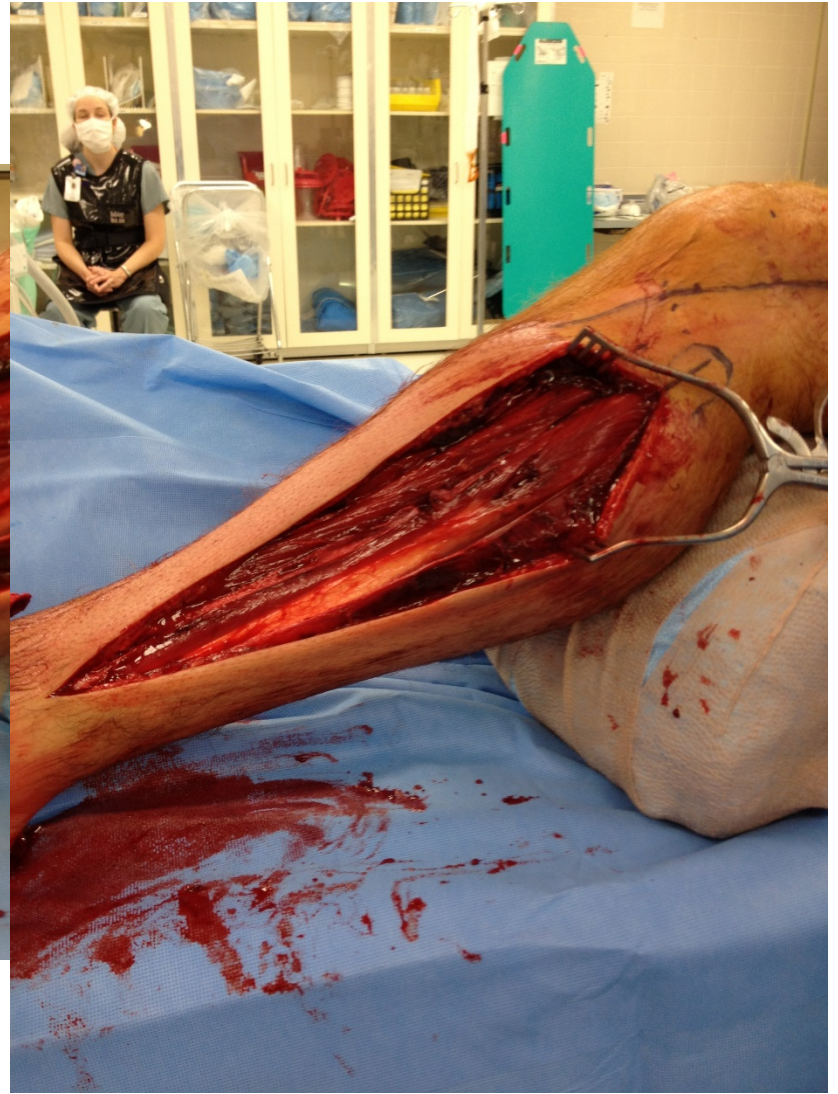
Getting Started



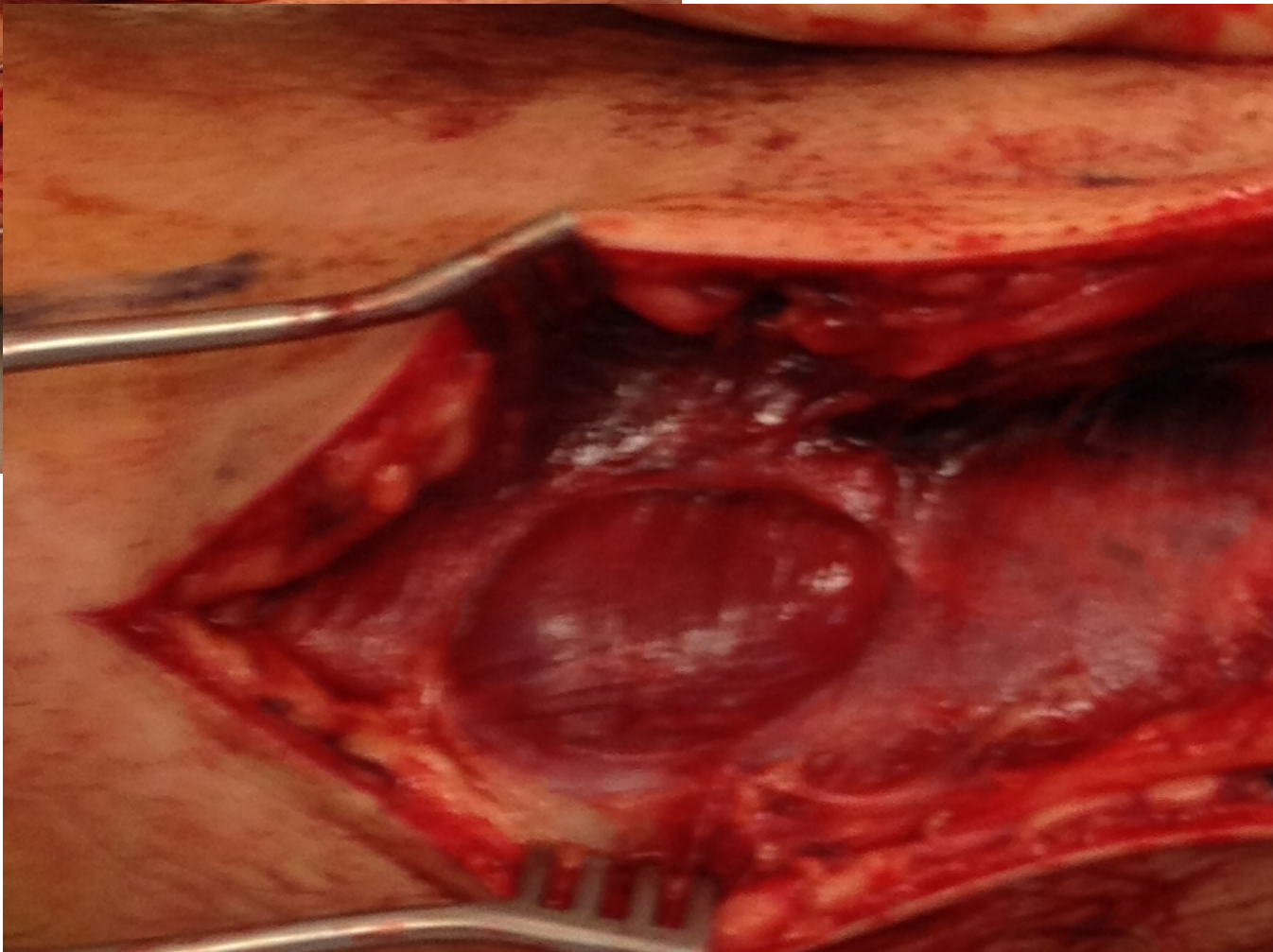
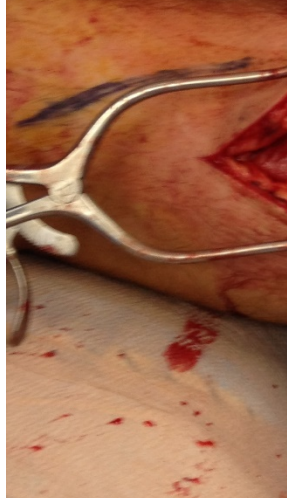
Case Example

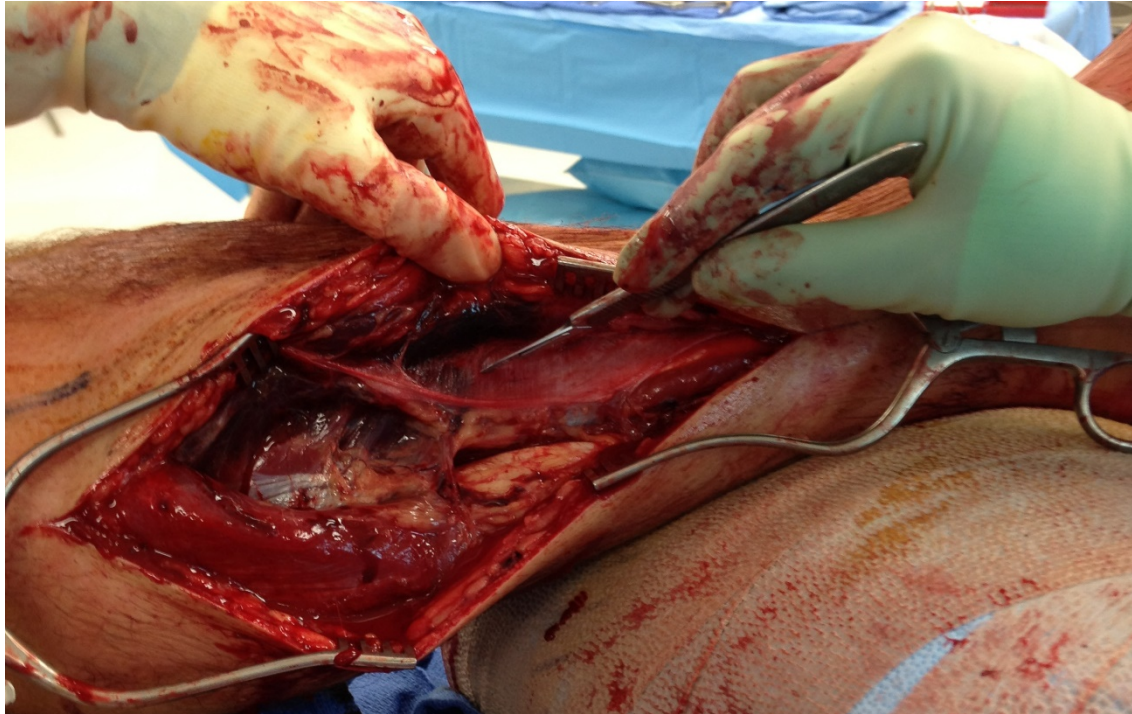










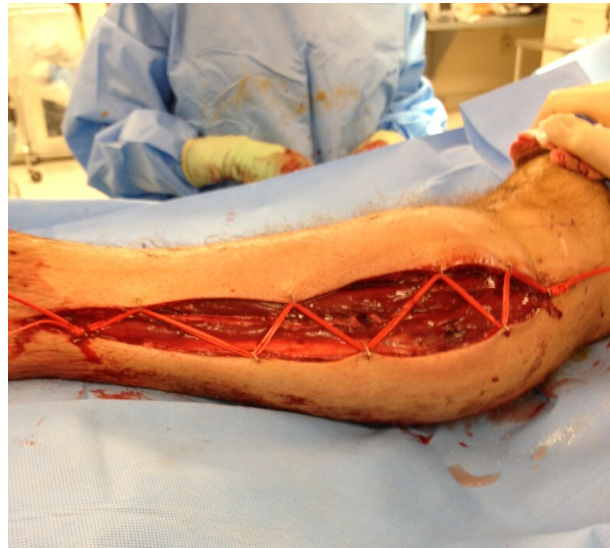


Complete Release...OR



Aftercare

- **Vessel Loops**
- **Elevation of limb**
- **Second Look**



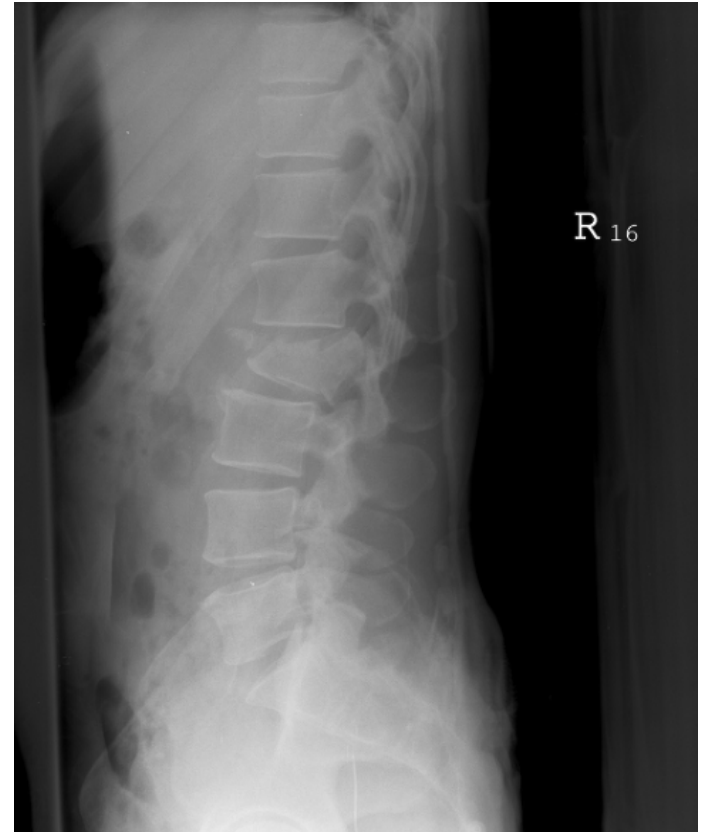
Should I?

- If you are thinking about it...
- Big cause of malpractice claims
- Not benign..but saves the limb



Function Threatening

- Hip dislocation
- Spine fractures
- Intra-articular fractures



Hip Dislocations

- **Dislocation requires substantial force**
- **Concomitant injuries are common**
- **Early diagnosis and treatment are necessary**



Other Dislocations

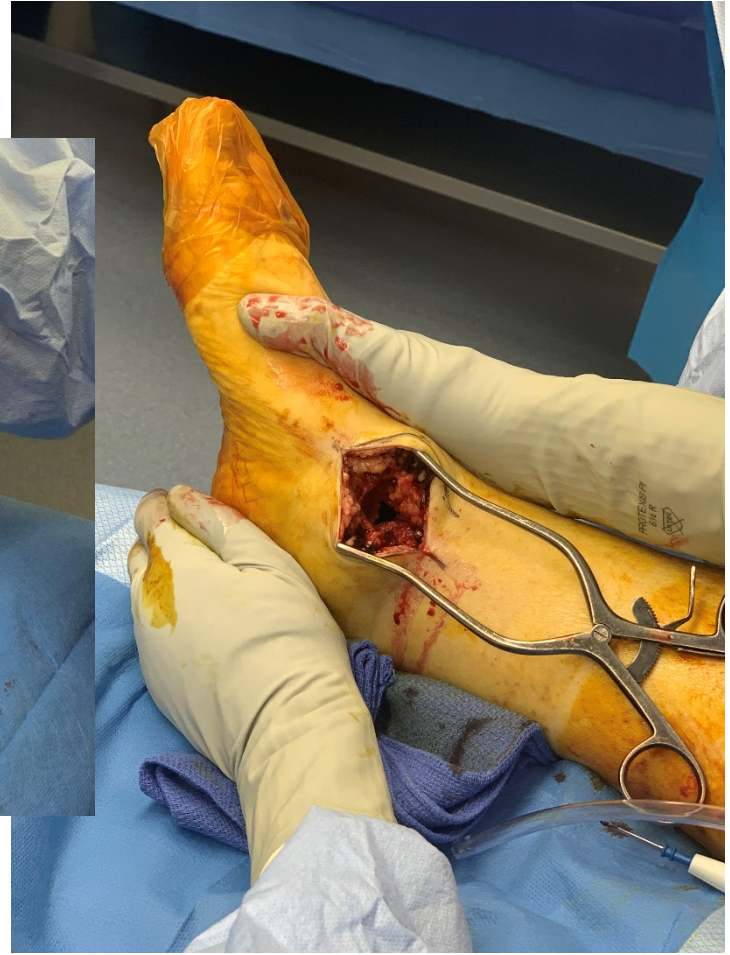
- **Shoulder**
- **Elbow**
- **Ankle**
- **Wrist**



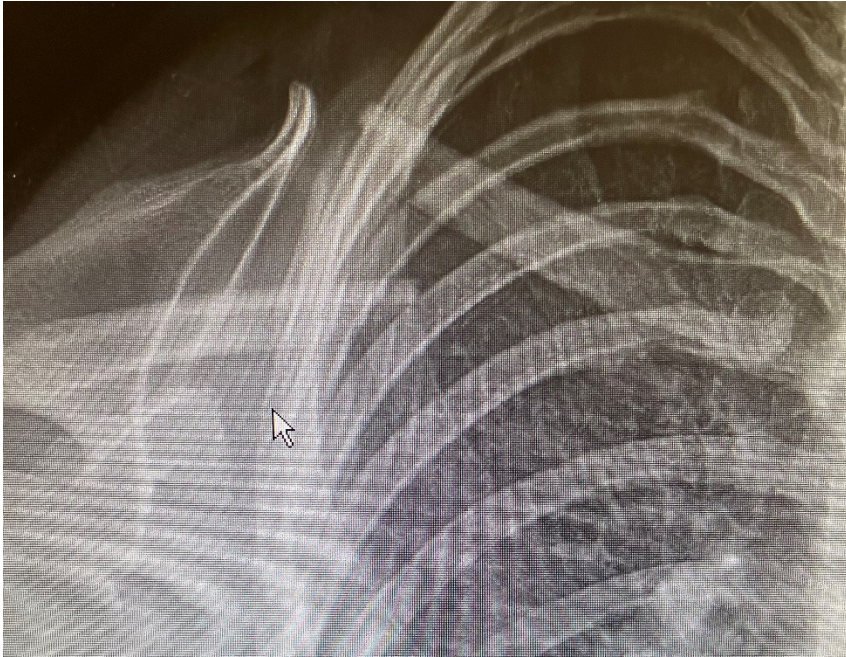
Skin Tenting

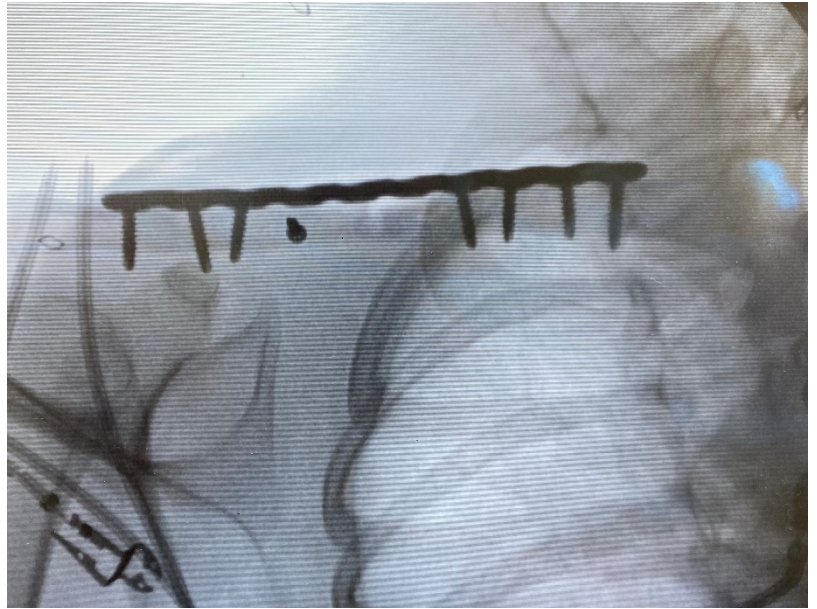
Injury





Injury





Conclusion

Making It Through The Night

• *Chocolate....*



Caffeine...



Reasonable Approach

- Timing (when?)
- Titration (how much?)
- Temporization (when necessary)
- Temptations (avoid)



Remember: The Sun Always Rises!





Thank You!

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