PERIOPERATIVE MEDICAL MANAGEMENT OF HIP FRACTURES

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OBJECTIVES

- RECOGNIZE THE URGENCY IN EXPEDITING SURGERY
- UNDERSTAND WHICH PREOPERATIVE TESTING WILL BENEFIT THE PATIENT VS. UNECESSARY DELAYS
- WHO NEEDS CARDIOLOGY CLEARANCE
- IMPLICATIONS AND TIMING OF DVT PROPHYLAXIS
- DETERMINE WHICH FRACTURE TYPES LEAD TO WHICH POST OP MANAGEMENT ISSUES
- MANAGING POST OP COMPLICATIONS

THESE ARE THE FACTS

- WELL OVER 500 HIP AND FRAGILITY FRACTURES AT BRRH
- NUMBER IS INCREASING
- PROBLEM: NOBODY IS DYING, OSTEOPORSIS WORSE WITH AGE
- BEST RESULTS FOR RETURN TO FUNCTION
    - INSTITUTIONS WITH A PLAN
    - RECOGNITION OF URGENCY
    - COORDINATION OF CARE

LATEST RESEARCH; JAMA NOV 2017

- SURGERY WITHIN 24 HOURS RESULTS IN REDUCED COMPLICATIONS
  - CARDIAC EVENTS
  - VENOUS AND PULMONARY THROMBOSIS
  - PULMONARY COMPLICATIONS
  - 21% REDUCTION IN MORTALITY AFTER ONE MONTH

WHAT IS THE DELAY?

- LACK OF SURGICAL TIME
  - NO AVAILABLE SURGEON
  - OR SCHEDULING LOGISTICS
- NECESSARY (OR UNECESSARY) TESTING
  - MEDICAL EVALUATION AND METABOLIC ABNORMALITIES
  - CARDIAC TESTING
  - NEURO CLEARANCE

SUBCAPITAL (INTRACAPSULAR) FRACTURES

- Less Acute Bleeding (Bleeding limited to capsule volume)
- Acute pain diminishes quicker (important if choosing conservative mgt)
- Cuts off blood supply to the head (determines the treatment)

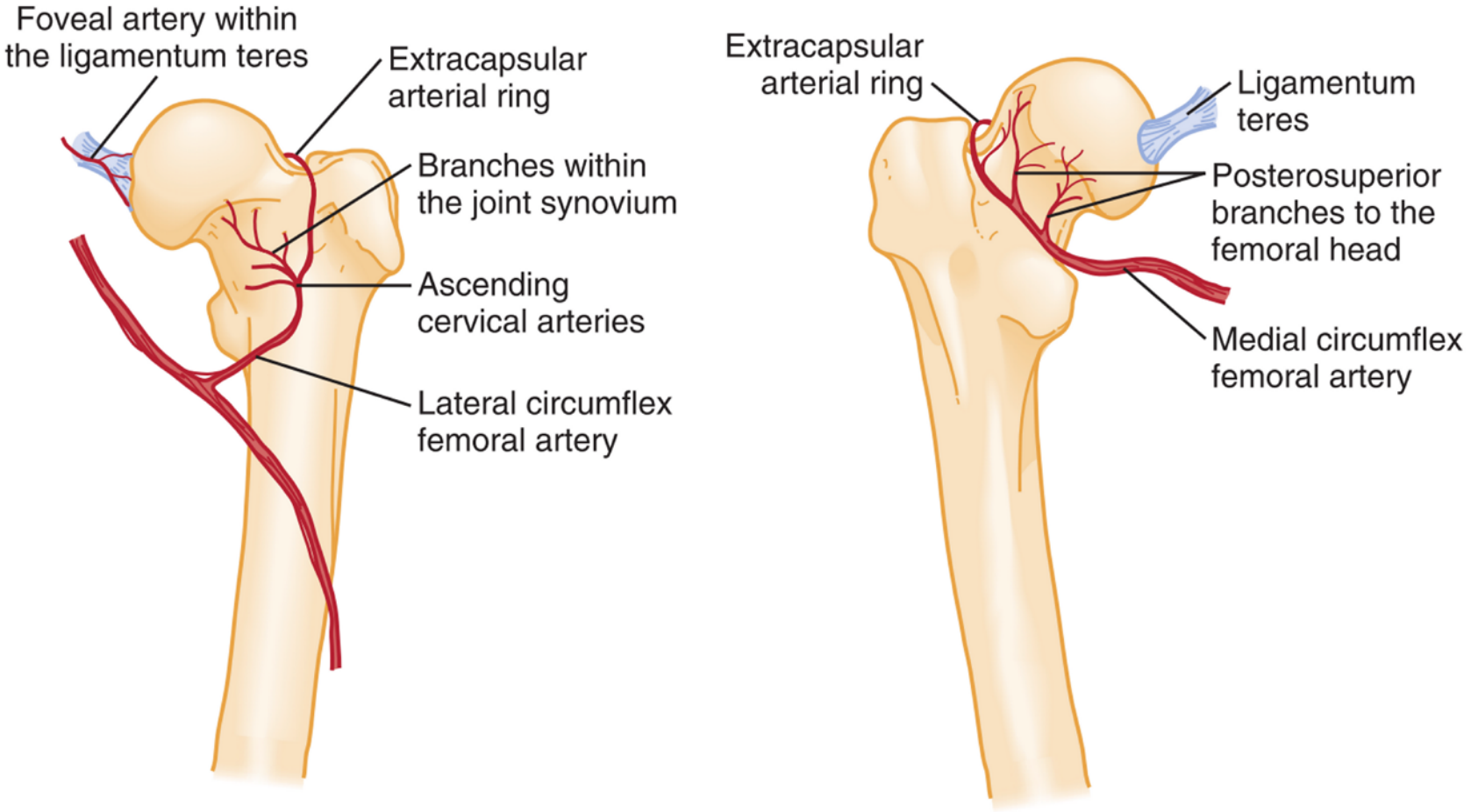
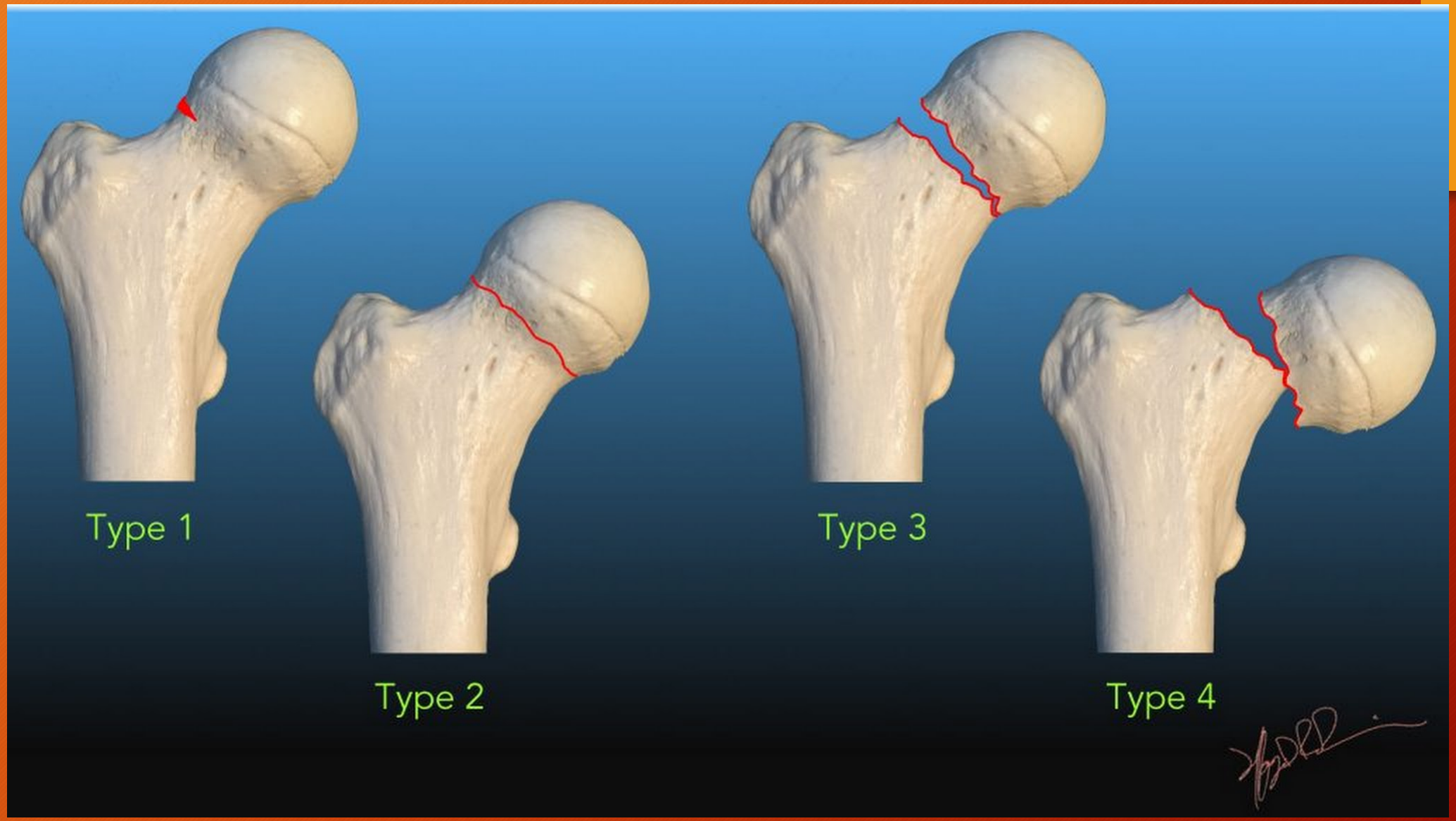
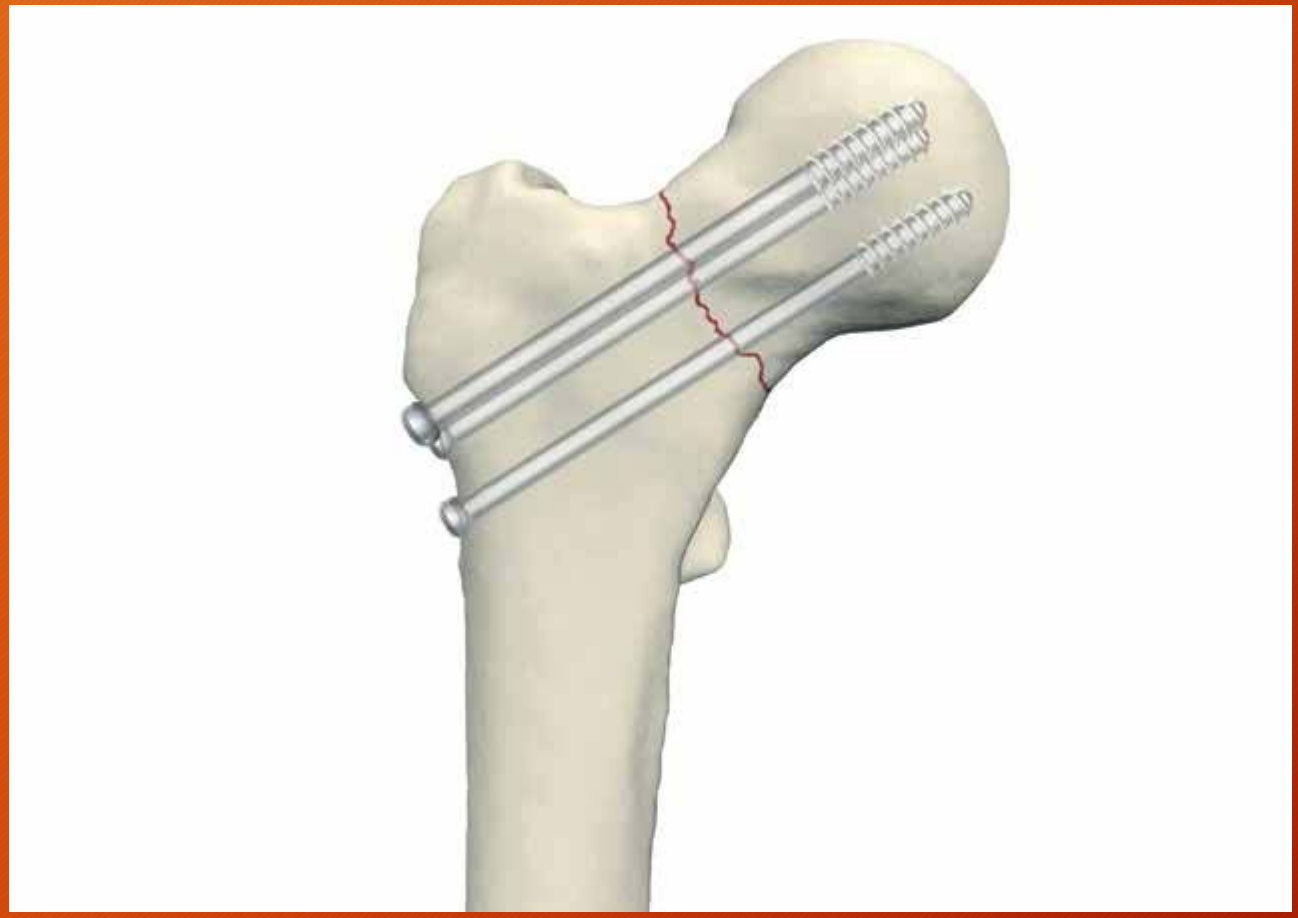


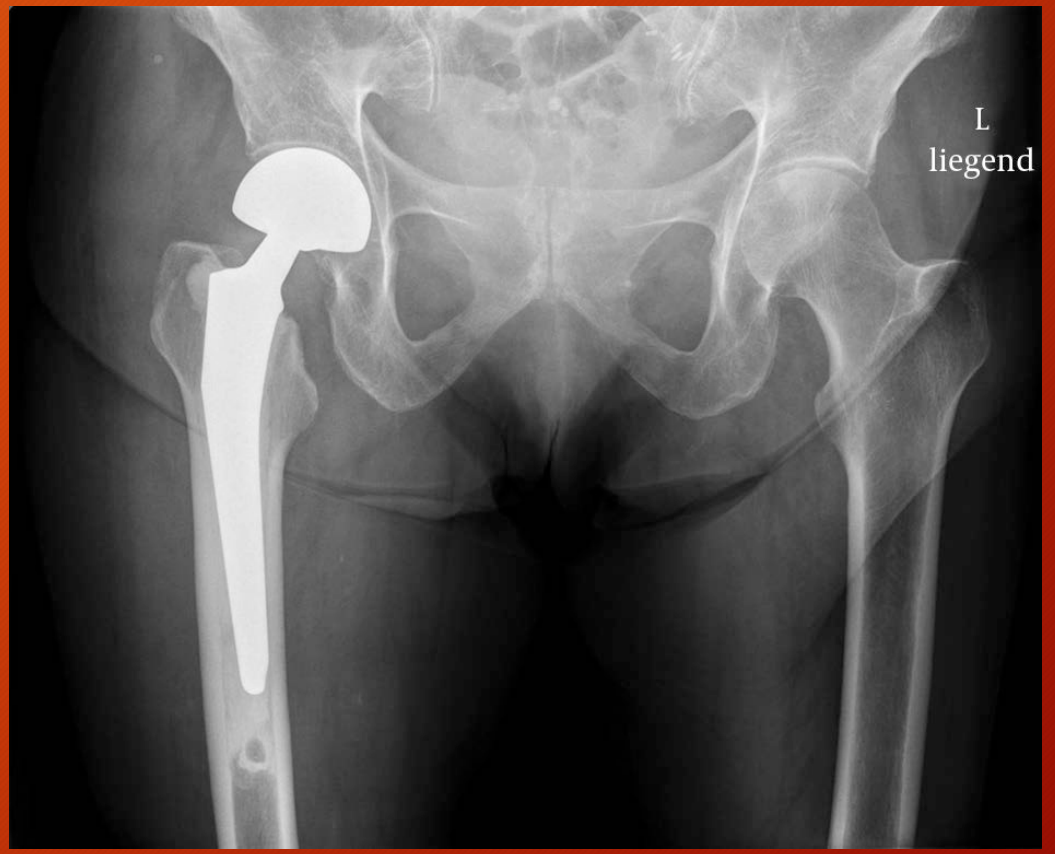
Figure 56-4. The arterial blood supply of the femoral neck and head is provided to varying degrees by three sources: the ascending cervical arteries, the arterial branches within the marrow *(not illustrated),* and the foveal artery within the ligamentum teres.


Type 1
Type 2
Type 3
Type 4

SCREW FIXATION FOR UNDISPLACED FEMORAL NECK FRACTURE

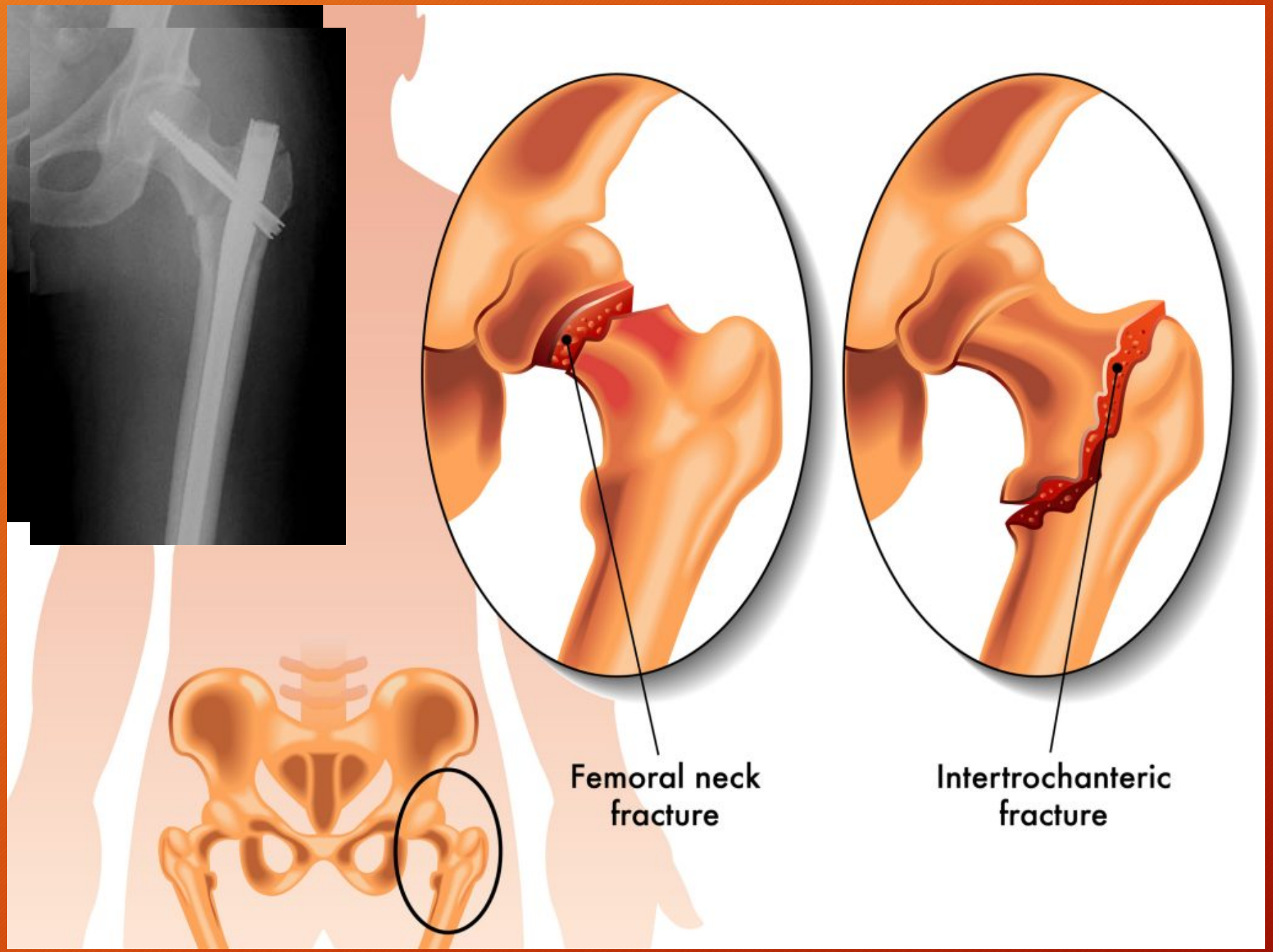


REPLACEMENT FOR DISPLACED FEMORAL NECK FRACTURES



INTERTROCHANTERIC (EXTRACAPSULAR) FRACTURES

- Bleeds into thigh
- Very painful
- Very difficult to treat conservatively


Femoral neck fracture
Intertrochanteric fracture

REVIEW OF MAJOR POINTS

SURGERY URGENT WITHIN 24 HOURS. ANY DELAY FOR TESTING MUST BE FOR GOOD REASON AND EXPEDITED

- **INTRACAPSULAR FRACTURES**
  - (AKA FEMORAL NECK or SUBCAPITAL)
  - LESS INITIAL BLOOD LOSS
- PINNED IF UNDISPLACED
  - SMALL PROCEDURE
- REPLACEMENT IF DISPLACED
  - BIG SURGERY

- **EXTRACAPSULAR FRACTURES**
  - AKA INTERTROCH FRACTURES
  - MORE INITIAL BLOOD LOSS
  - PROLONGED PAIN IF NOT FIXED
- SURGERY (USUALLY IM NAIL)

Peri-operativeDVT Prophylaxis for Hip Fractures

JONATHON B. COURTNEY MD

DVT Rate Following Hip Fracture

- First 3 months: 3.5%
  - 2.9% on injured leg
  - 0.6% on contralateral leg

Protty, Majd B., et al. "Mechanical prophylaxis after hip fracture: what is the risk of deep vein thrombosis? A retrospective observational study." BMJ open 5.2 (2015): e006956.

Pre-Op

- Rate of DVT in affected leg 11[1]-30[2]%
  - Associated with increased duration from admission to time of surgery
  - Patients who waited >24 hours to surgery had higher rates of DVTs

1. Shin, Won Chul, et al. "Preoperative prevalence of and risk factors for venous thromboembolism in patients with a hip fracture: an indirect multidetector CT venography study." JBJS 98.24 (2016): 2089-2095.

2. Song, Kai, et al. "The preoperative incidence of deep vein thrombosis (DVT) and its correlation with postoperative DVT in patients undergoing elective surgery for femoral neck fractures." Archives of orthopaedic and trauma surgery 136.10 (2016): 1459-1464.

AAOS Study Group on Pre-Op Prophylaxis

- One High Strength, three moderate strength, and eight low strength studies comparing pharmacologic prophylaxis vs placebo
  - Risk of DVT is significantly less with prophylaxis than without
  - Hematoma complications higher in treatment group
  - No difference in hospital LOS

Pre-Op Prophylaxis

- No DVT prophylaxis necessary unless surgery to be delayed >24 hours

Beaupre, Lauren A., et al. "Best practices for elderly hip fracture patients." Journal of general internal medicine 20.11 (2005): 1019-1025.

Pre-op Prophylaxis

- If surgery is to be delayed, consider SCDs
  - 7.4% vs 2.2% DVT rate (control vs SCD)

Nam, Ji-Hoon, et al. "Does preoperative mechanical prophylaxis have additional effectiveness in preventing postoperative venous thromboembolism in elderly patients with hip fracture?—Retrospective case-control study." *PloS one* 12.11 (2017): e0187337.

Pre-Op Prophylaxis

- Short-Acting Agents
- Heparin-Based Meds
  - Lovenox
  - Fragmin

Post-Op

- Aspirin
  - No significant difference from anticoagulants in DVT rates
  - Statistically significant decrease in bleeding complications

Drescher, Frank S., et al. "Aspirin versus anticoagulation for prevention of venous thromboembolism major lower extremity orthopedic surgery: A systematic review and meta-analysis." *Journal of hospital medicine* 9.9 (2014): 579-585.

Chu, Janet N., et al. "The risk of venous thromboembolism with aspirin compared to anticoagulants after hip and knee arthroplasty." Thrombosis Research 155 (2017): 65-71.

Surgical Delay

- Associated with increases in:
  - Death
  - Pressure Ulcers
  - Pneumonia
  - Poor functional status after recovery

Patients on Aspirin or Plavix

- Evidence supports not delaying surgery (AAOS)

Patients on Coumadin needing Arthroplasty or ORIF for hip fractures

- INR should be reversed to <1.7
- With low dose Vit K administration, can be done in 18 hours
- Surgery within 36 hours of admission reduces morbidity and mortality

Moores, Thomas Steven, et al. "Preoperative warfarin reversal for early hip fracture surgery." Journal of Orthopaedic Surgery 23.1 (2015): 33-36.

Summary

- Every effort should be made to perform surgery within 24 hours
- If surgery is to be delayed, consider mechanical-only prophylaxis with SCDs
  - Higher risk patients with short-acting LMWH
- Patients on Aspirin or Plavix should still have surgery expediently
- Patients on Coumadin should have their INR reversed to 1.7
- Consider ASA 81mg for post-op prophylaxis in reducing DVT and bleeding complications

PREOPERATIVE CARDIAC EVALUATION

MITCHELL KARL, MD

PREOPERATIVE CARDIAC EVALUATION

- 2014 ACC /AHA Perioperative Cardiac Evaluation and Management of Patients Undergoing Non-Cardiac Surgery by Fleicher et al
  And Presentation Dr. Ryan Hampton 2005

PREOPERATIVE CARDIAC EVALUATION

- Evaluate and Recommend…DON'T "CLEAR"
- Goal is to uncover undiagnosed problems or treat prior conditions suboptimally treated to reduce risk .

PREOPERATIVE CARDIAC EVALUATION

- **GENERAL CONSIDERATIONS**:
  - Risks
  - Timing
  - Necessity
  - Medication
  - Monitoring

PREOPERATIVE CARDIAC EVALUATION

- Beware of cookbook type risk stratification guidelines…
  (Spit out a number , not validated , based on older treatment considerations)

  Example : *Revised Goldman Cardiac Risk Index (RCRI)-*

- Active Ischemia
- History of CHF
- Insulin requiring DM
- Creatinine greater than or equal to 2
- Cerebrovascular disease
- .4. ,1 ,2.4, 5

PREOPERATIVE CARDIAC EVALUATION

- EKG abnormalities not part of above guideline.
- Other guidelines include:
  - Age
  - Functional status
  - Afib
  - Obesity
- No weight for magnitude only presence and not validated (Poise)

PREOPERATIVE CARDIAC EVALUATION

- Newer guidelines not as cook book or quantitative but more qualitative .

PREOPERATIVE CARDIAC EVALUATION

- Stress testing reasonable if function capacity low 4 mets
- Echocardiography only if CHF, Murmur, or H/O Valvular Heart Disease
- Catheterization usually unnecessary (most data against unless ACS)

PREOPERATIVE CARDIAC EVALUATION

- **New Qualitative Approach in 2014 considers many individual factors:**
  - CHF
  - Valvular heart disease
  - Coronary artery disease
  - Atrial fibrilation
  - Conduction system disease ,SSS ,HB
  - Pacemakers and defiibrators
  - Various Cardiomyopathies
  - Medication perioperatively
  - Presence of stents

ANESTHESIA MANAGEMENT FOR HIP FRACTURE SURGERY

JUAN C RESTREPO, MD

ASSISTANT PROFESSOR FAU

ANESTHESIA FOR HIP FRACTURE REGIONAL

- ANTICOAGULATION. Guidelines with INR
- Risk of paralysis/Epidural hematoma (Diagnosis time)
- Risk of DVT/PE
- Risk and pain of delaying surgery until normal coagulation

PRACTICALITY
COMMON SENSE
REGIONAL ANESTHESIA

- Pain involved in positioning patient for regional anesthesia
- Sedation/required for positioning
- Massive sympathectomy
- Hydration required e.g. CHF
- Aortic stenosis is moderate to absolute contraindication to Spinal anesthesia

PRACTICALITY
COMMON SENSE
GENERAL ANESTHESIA

- Need for intubation Vs LMA e.g. COPD
- Surgery in supine Vs Lateral decubitus
- Cannulated screw vs Gamma nail Vs Bipolar
- Airway viability

CLEARANCE

- Can the patient be optimized. E.g.Breating treatment, diuresis, sepsis (foreign object)
- Preoperative intervention that will impact outcome e.g. cardiac stent
- High risk: “As good as it gets”. Get an educated consent from patient and family

Post op Medical Management Delirium/Pain

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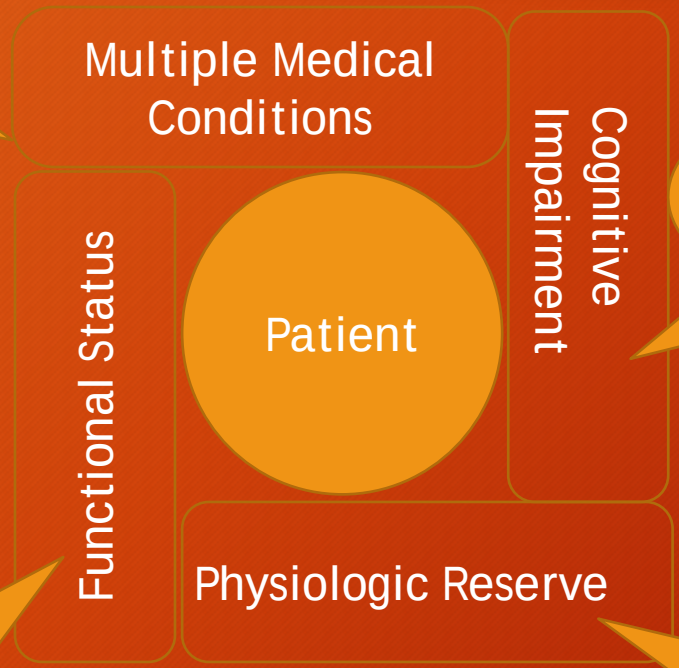
Geriatrics=Complexity≠Contraindication

Elderly patients undergoing surgery have an average of 6 conditions



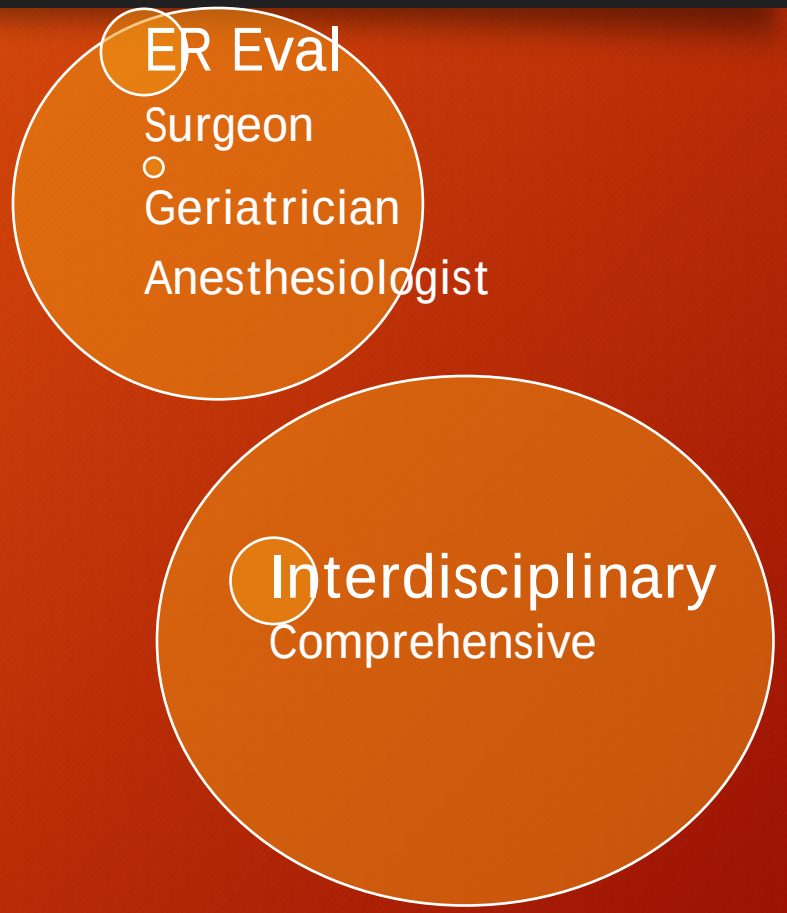
MCI has been associated with worse outcomes

Needing assistance or being dependent for ADL and IADL

Reserve:
Cognitive
GFR
Cardiac

Common Objective

- Offer the most effective surgical treatment
- As fast as possible
- The safest way.



Case

- 83 y/o woman with hx of DM, HTN, Hyperlipidemia.
- Admitted after suffering fall resulting in left IT fracture
- She underwent ORIF

- On POD # 2 the patient appears “disconnected”, she is not agitated, but is not able to follow instructions from the Physical Therapist.

- Patient is discharged to SNF.

- Patient returns in 24 hours after suffering another fall, resulting in a peri-prosthetic fracture

Delirium

- Two major types (hyper- and hypoactive), can co-exist
- Hypoactive delirium continues to be frequently unrecognized:
  - Associated with poor outcomes and longer LOS
  - Main feature is inattention (patient is not agitated but is unable to focus or follow complex instructions)
- Patient sometimes able to answer questions with simple sentences or with “Yes” or ‘No”
- Multiple etiologies (see section on delirium for further information on causes, prevention and treatment)

Delirium

- Avoid treating agitation without seeing the patient
- Two major types (hyper- and hypoactive), can co-exist
- Associated with poor outcomes and longer LOS
- Multiple etiologies:
  - Pain (use standard regime)
  - Withdrawals
  - IV's Urinary Catheters
  - Hypoxemia
  - Infection

Pain Management

Represents a challenge due to

- coexisting diseases,
- concurrent medications,
- and age-related pharmacodynamic and pharmacokinetic changes

- **Basic Principles**
  - Include pharmacologic and nonpharmacologic treatments
  - Poor controlled pain is worse than the side of effect of its treatment
  - Acetaminophen remains first-line pharmacologic treatment for older adults with mild-to-moderate pain **(scheduled)**
  - Avoid long-term use of oral nonsteroidal anti-inflammatory drugs
  - Use opiods low dose / short intervals **PRN**