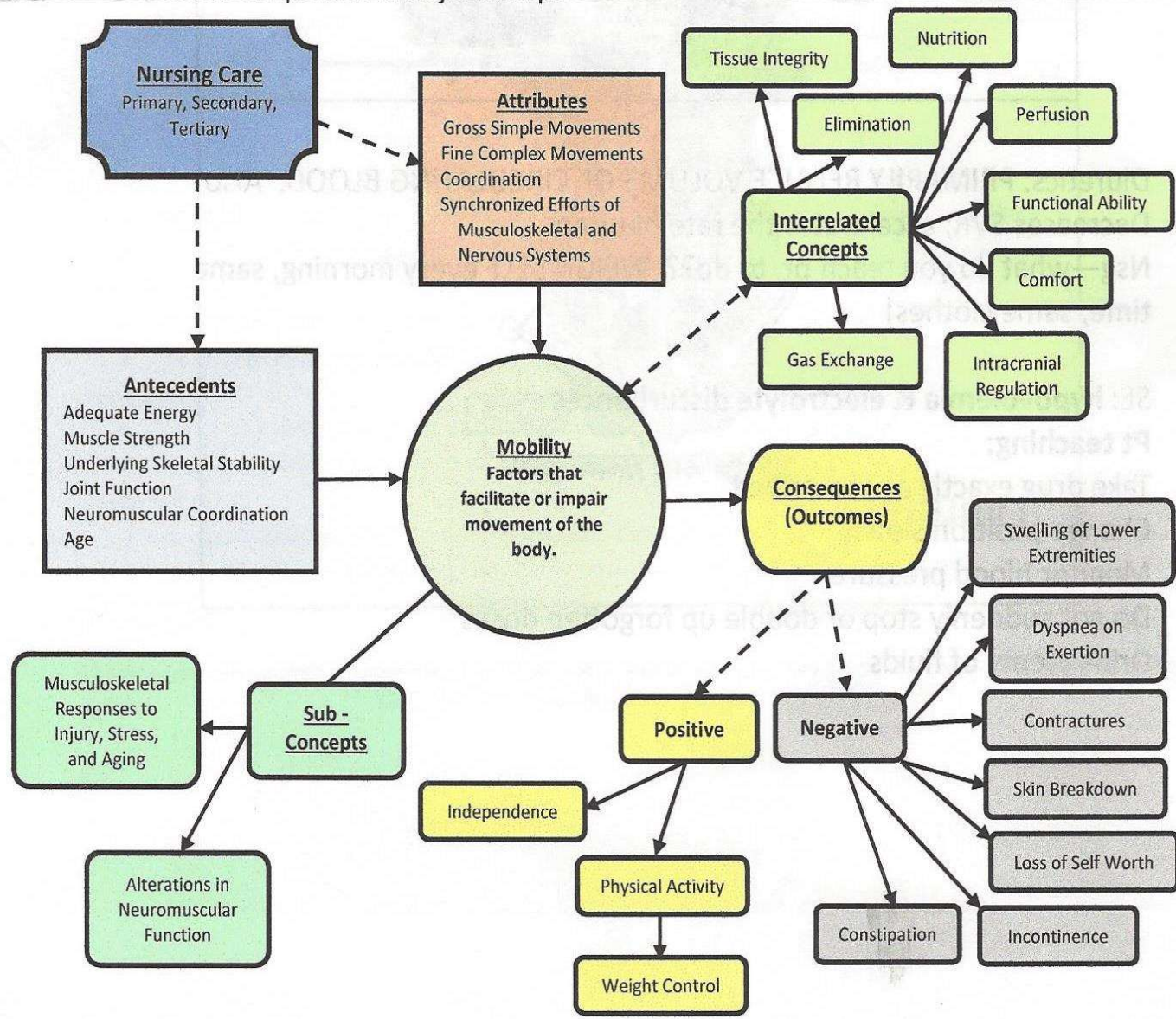




MUSCULOSKELETAL & MOBILITY

PART I OF II





Differentiate



What are the differences in the musculoskeletal systems of the pediatric population?



What are the differences in the musculoskeletal systems of the gerontologic population?



Assessment Data

Subjective Data

What's included?

Objective Data

What's included?



Sprains & Strains

- **Sprain:** tendon/ligament injury
- **Strain:** Overstretching of muscle/fascial sheath
- Diagnostic: x ray to r/o fracture
- Assessment: ↓function, pain, edema, bruising
- Nursing Diagnoses: Impaired physical mobility;
Pain (acute)



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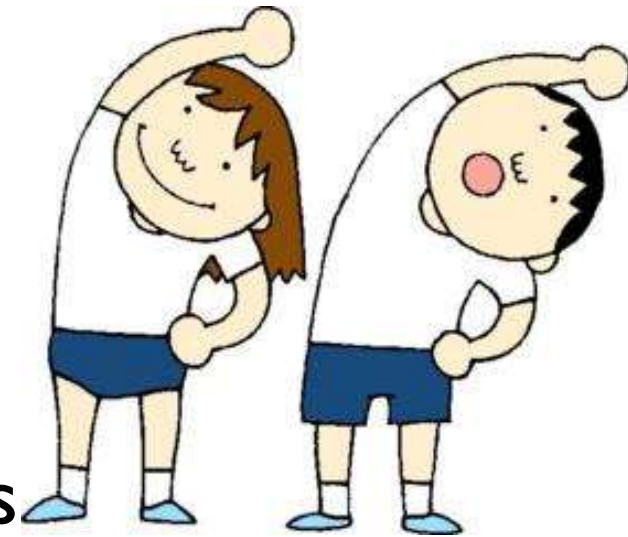
Sprains and Strains

- **Prevention: Teaching**

- Stretching & warm up exercises
- Strengthening, balance, endurance exercise
- Ergonomics* (Repetitive Strain Injury)
- Elastic supportive wrap

- **Acute Intervention**

- **RICE**
- Heat after 24-48 hours



RICE:
rest, ice,
compression
and elevation



Fractures

What is it?

Signs & Symptoms

- Table 62-4

- Emergency Management

- Immobilization

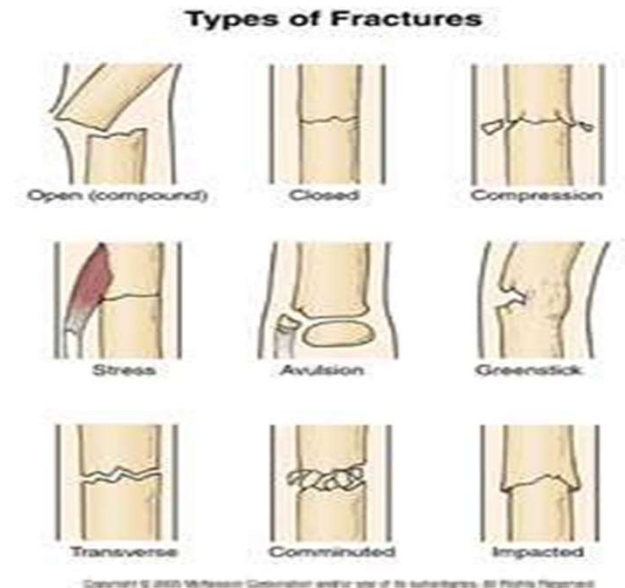
- Interprofessional Management

- Table 62-6

- Neurovascular Assessment

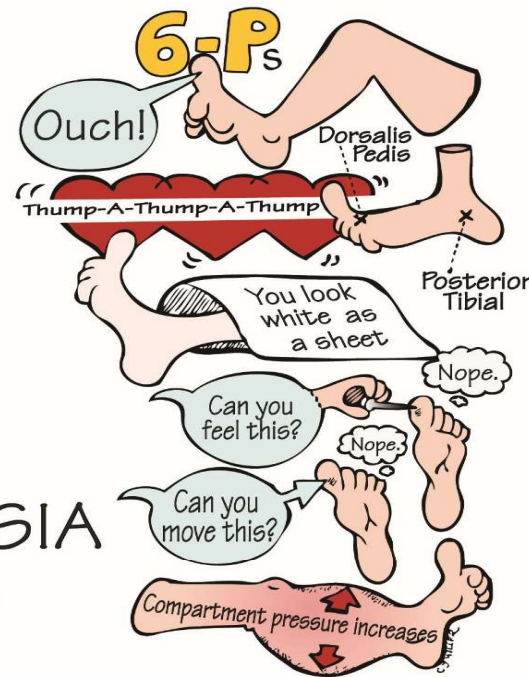
- Peripheral Vascular Assessment

- Peripheral Neurological Assessment



NEUROVASCULAR ASSESSMENT

PPAIN
PPULSE
PPARALYSIS
PPALLOR
PPARESTHESIA
PPRESSURE



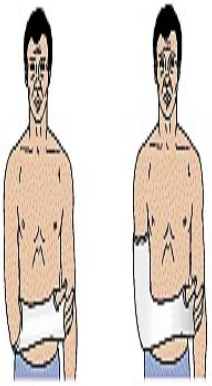
NEC © 2016 Nursing Education Consultants, Inc.

Also see Document **8Ps** of Neurovascular Assessment

Fractures: Treatment Goals & Type(s)

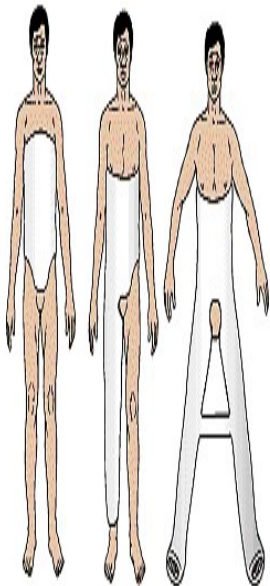
- Anatomic realignment of bone fragments
- Immobilization
- **Restoration of Function**
- Healing without Complications
- Pain Management

- **Closed reduction:**
 - <https://www.youtube.com/watch?v=cy6f7he2e4w>



Short arm cast

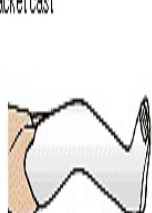
Long arm cast



Body jacket cast

Single hip spica

Double hip spica



Long leg cast



Short leg cast



C A S T S



Short Arm Cast



Long Arm Cast



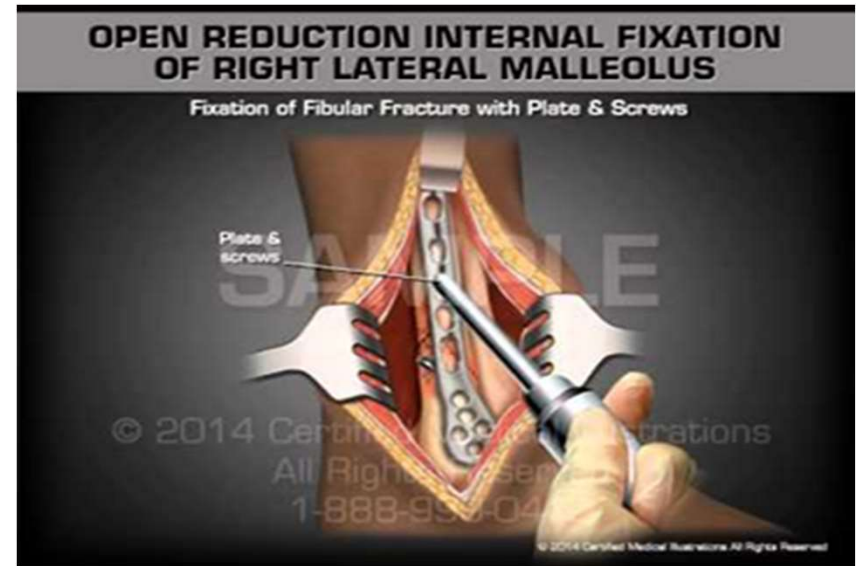
Arm Cylinder Cast

Casts

- **Nursing Interventions**
 - **Skin/Neurovascular assessment**
 - Encourage regional joint movement, unless contraindicated
 - ADL Assistance
 - Additional Assessments
 - Patient/Caregiver Education (Table 62-9,)

Open Reduction

- Definition
- Risks
 - Infection
 - Complications w/ anesthesia
 - Effect of preexisting medical conditions
- Advantages
 - Early ambulation
 - Prevention of complications associated w/ prolonged immobility
- Other:



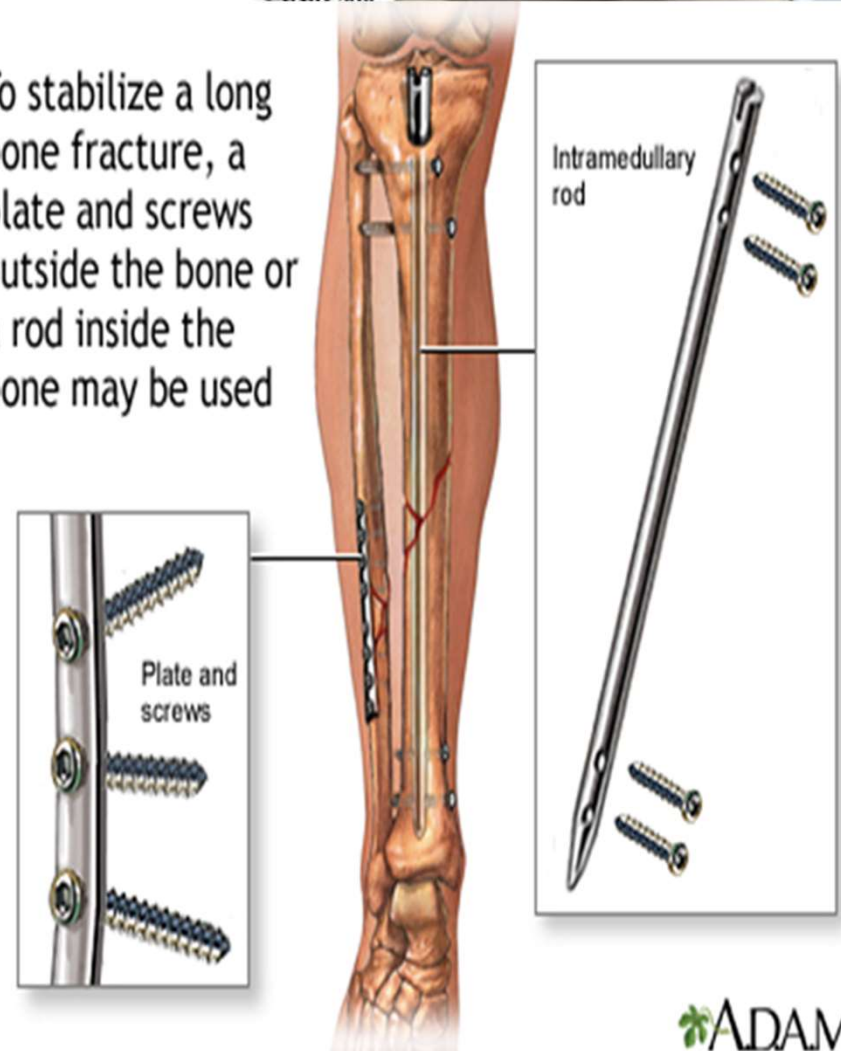
In General.....

- Nutritional Requirements
- Promoting bowel & bladder function

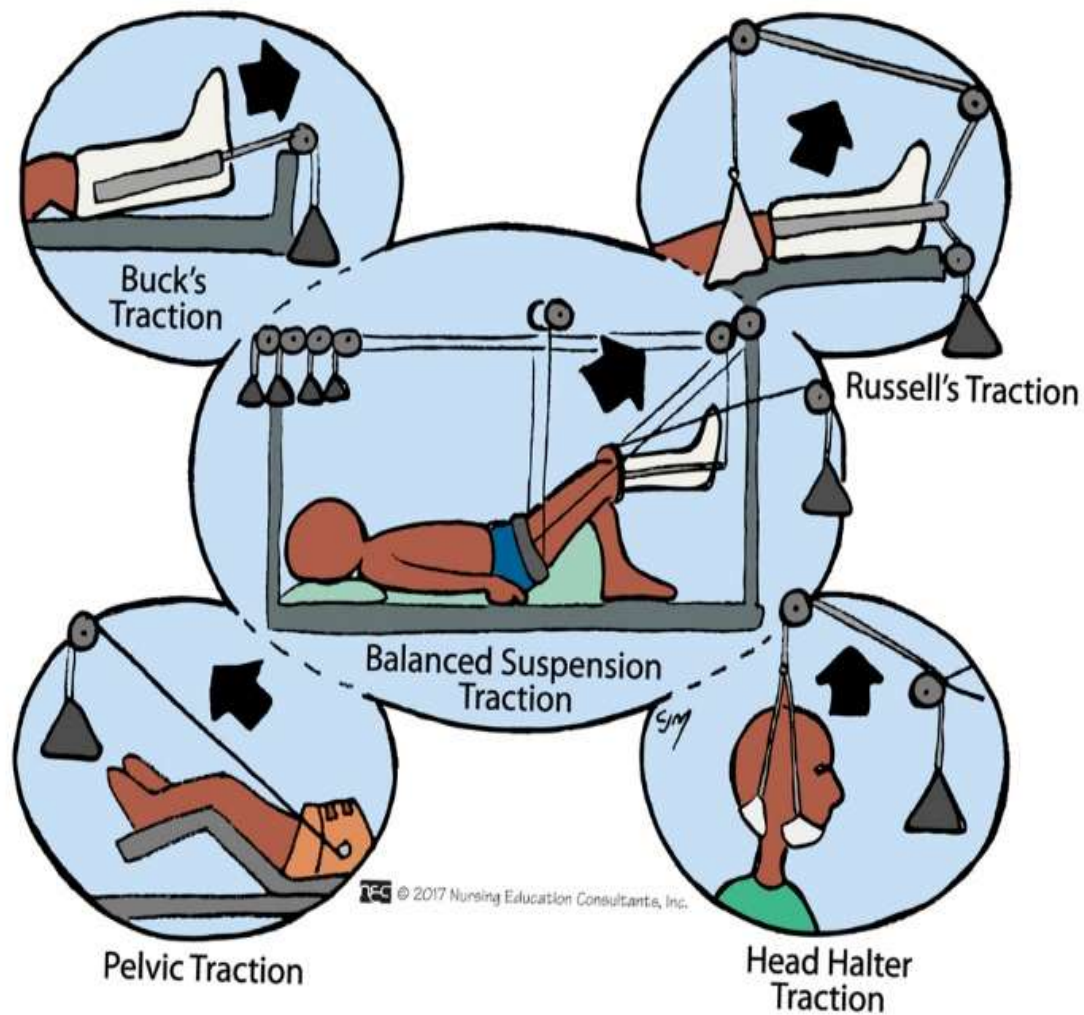
Plate and screw fixation



To stabilize a long bone fracture, a plate and screws outside the bone or a rod inside the bone may be used



EXAMPLES OF COMMON TYPES OF TRACTION



Pre/Post Operative Fracture Care

Pre-Operative

- Education: post-op expectations
- Proper skin preparation
- **Neurovascular assessment**

Post-Operative

- **Neurovascular assessment**
- Drainage
- Pain management
- Plan care based on mobility limitations
- Education

Fracture Complications

- Infection
- Compartment Syndrome
 - 6/8 Ps
- Venous thrombosis
- Fat Embolism



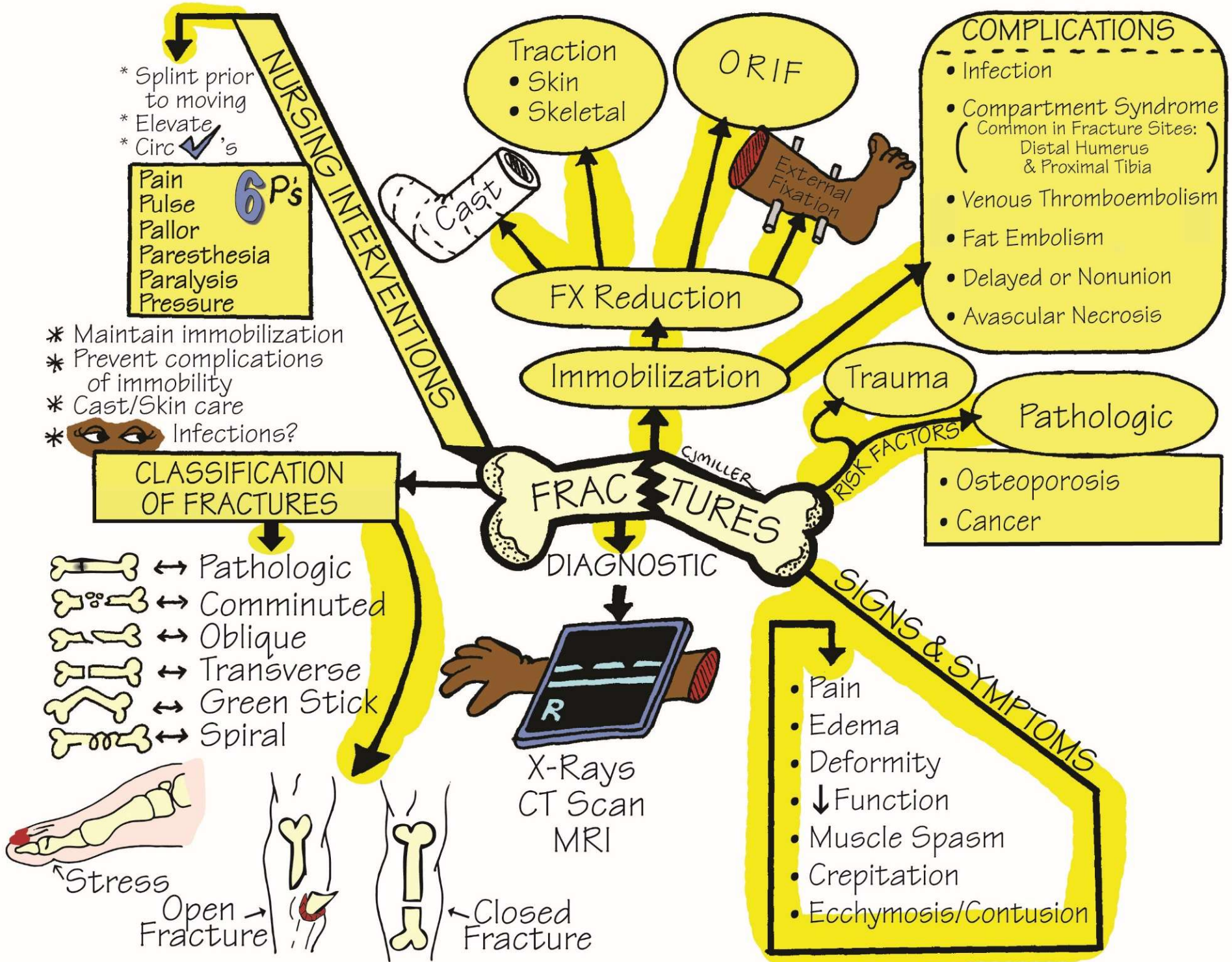
Compartment Syndrome
Faoj.org



Fracture infection
www2.aofoundation.org



Venous Thrombosis
www.womenfitness.net



Case Studies

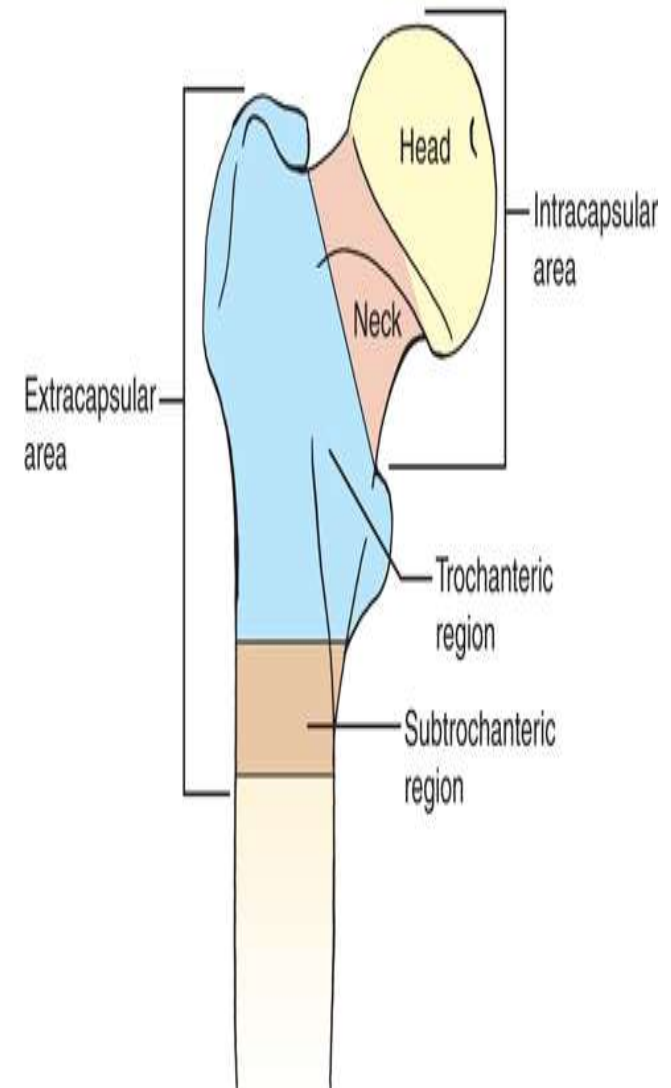
- Chapter 61: GA
 - P. 1434, 1436, 1438 & 1442
- Chapter 62:
 - Periprosthetic Hip Fracture & Revision Arthroplasty
 - P. 1475

Hip Fracture

<https://www.youtube.com/watch?v=xNH6S4bJEho>

Assessment:

- External rotation
- Muscle spasm
- Shortening of affected leg
- Severe pain
- Tenderness at fracture site

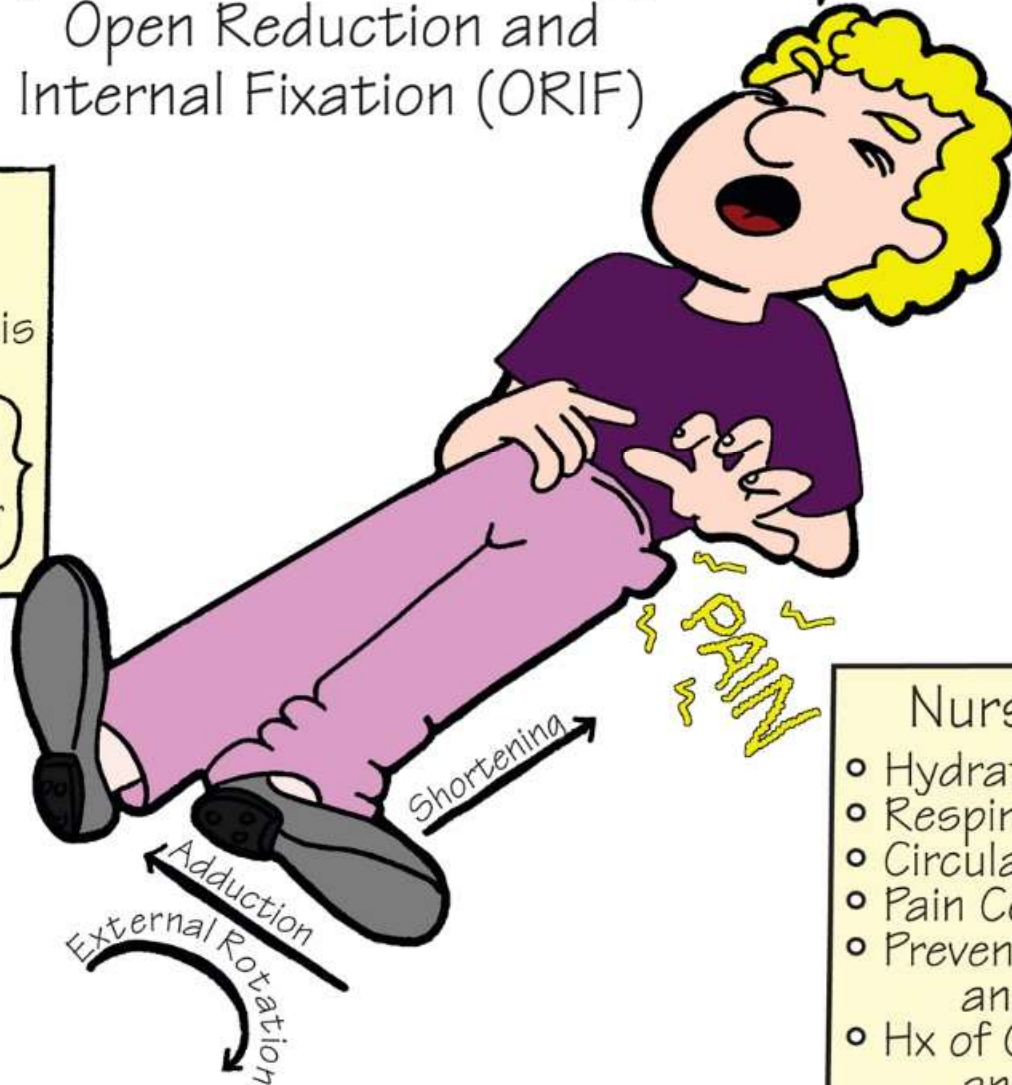


HIP FRACTURE

TX: Bucks Traction, Immobility
(Trochanter Roll or Sand Bags)
Open Reduction and
Internal Fixation (ORIF)

I can't
move my
leg!

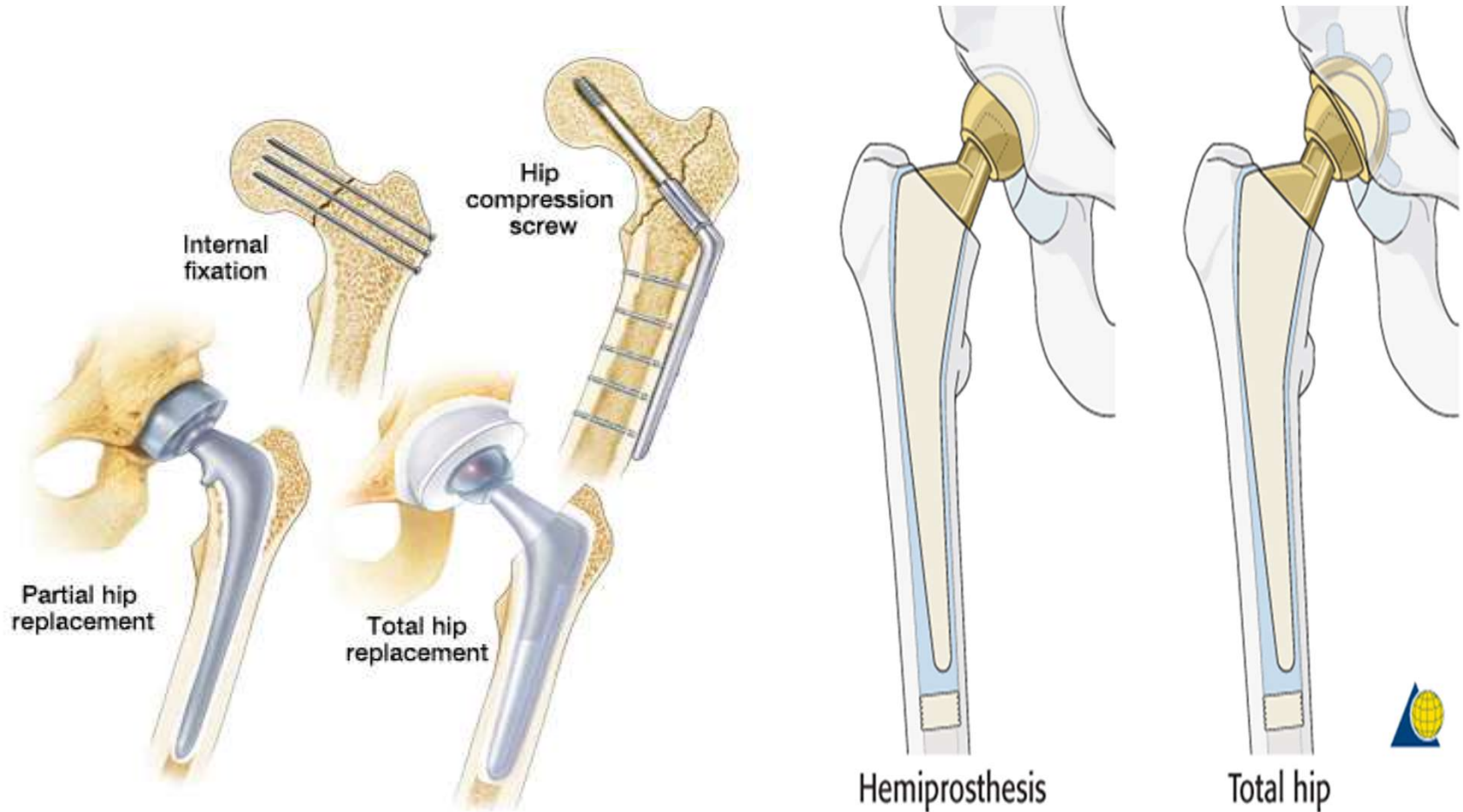
- ↑ Age
- Female
- History of Osteoporosis
- ↓ Estrogen
- ↑ Falls { TIA's, Anemia,
Medications,
Cardiovascular
Disease }



Nursing Priorities

- Hydration
- Respiratory Support
- Circulation Checks
- Pain Control
- Prevention of Immobility and Complications
- Hx of Chronic Conditions and Medications

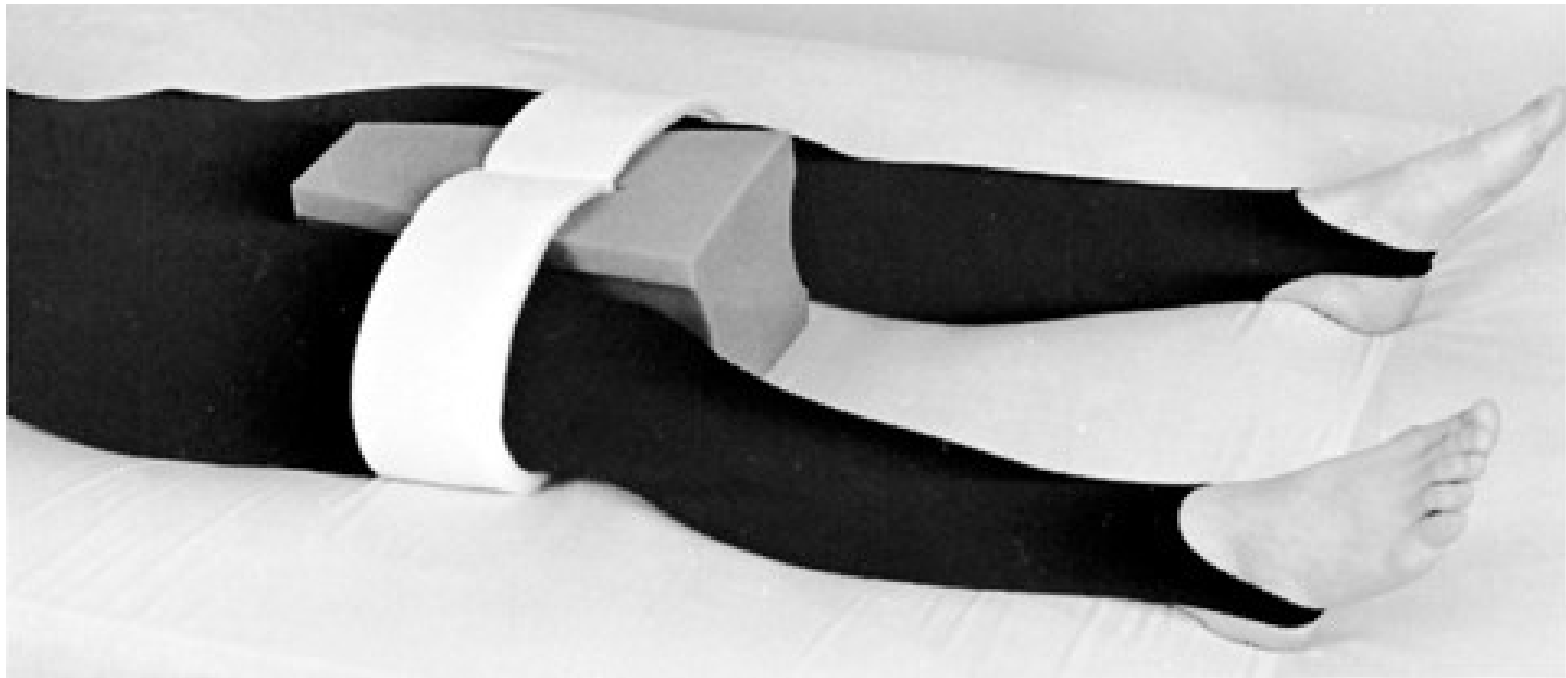
Types of Repair: Hip Fractures/Replacement



Nursing Management: Hip Fracture

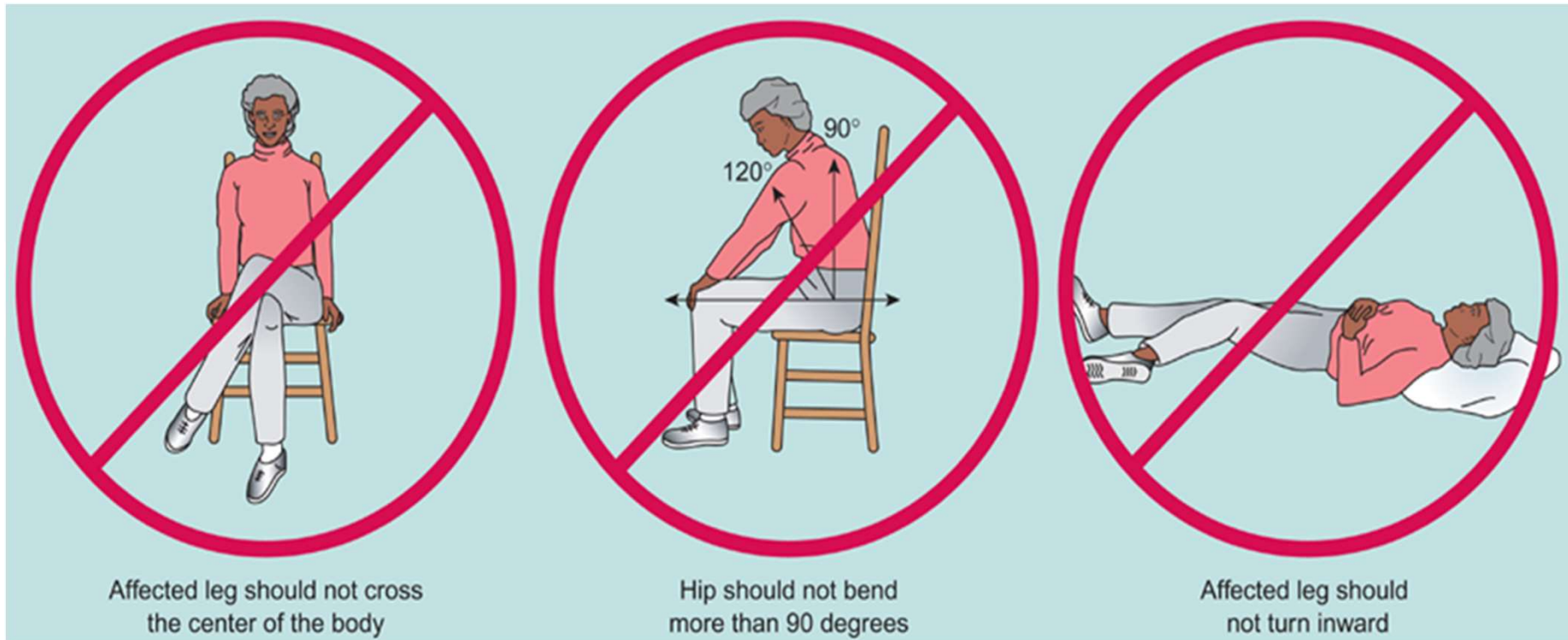
- VS's, I & O, TCDB, VTE Prophylaxis
- Pain Control
- Neurovascular Assessment
- Check drainage (expect some)
- Proper Alignment
 - Posterior-surgical approach surgery
 - Maintain abduction
 - Abduction pillow or regular pillow between legs
- Early Mobilization/Ambulation
 - Walker/Gradual weight bearing

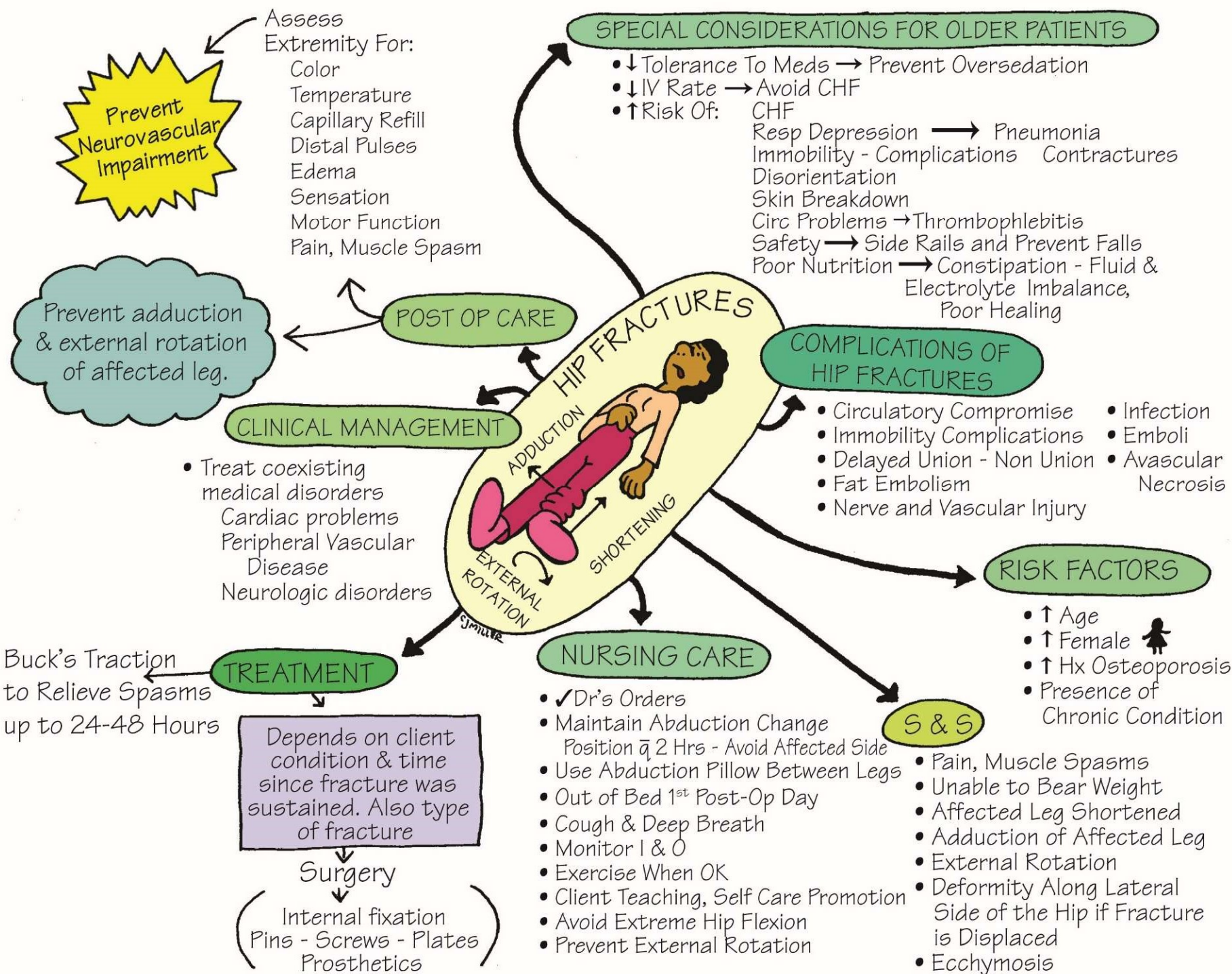
*Use of an Abduction Pillow to Prevent Hip
Dislocation After
Posterior Surgical Approach
Total Hip Replacement*



Nursing Management: Hip Arthroplasty

- Do NOT flex hip more than 90 degrees
- Avoid internal rotation
- Provide protective positioning





Joint Surgical Procedures

- What is the OVERALL GOAL? _____
 - Others:
 - Relieving Chronic pain
 - Improving joint motion
 - Correcting deformity & misalignment
 - Removing diseased cartilage
- If not corrected
 - Contraction w/ permanent limitation of motion
 - Demonstrated on physical Exam
 - Seen on x-rays

Types of Joint Surgeries

- Synovectomy
- Osteotomy
 - Nursing care: same as ORIF
- Debridement
- Arthroplasty
 - Total hip
 - Nursing care same as Hip Fracture
 - Knee Arthroplasty

Arthroplasty

- Total vs Partial
- Post Op Emphasis
 - Pain Management
 - Physical therapy



Continuous Passive Motion device-(CPM)

Total Knee Replacement



Partial Knee Replacement



Anterior



Posterior



Hip Arthroplasty Incision Sites

CAEMG 2003

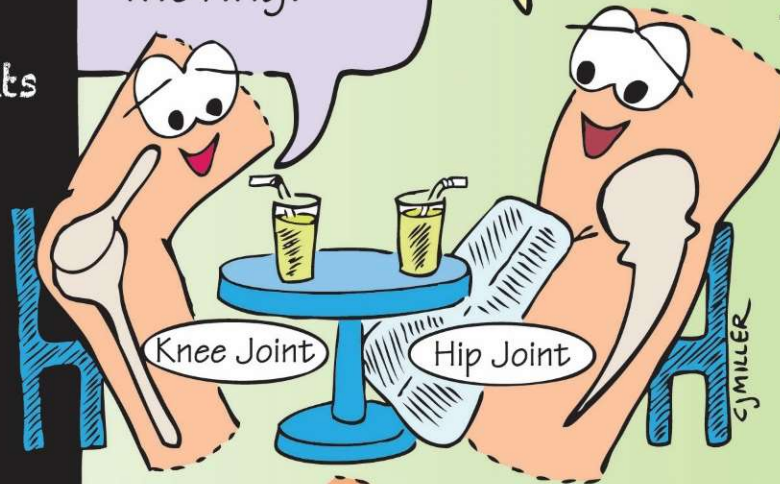
The Joint Café

Doing pretty good – can't cross my legs or stand too long – got to keep moving.

I can't sit up straight and I got this pillow between my legs!

MAIN COURSE

- Low dose anticoagulants
- Pain meds
- Knee – CPM, neutral position
- Hip – Abduction of leg, do not bend hip > 90°
- OOB 1st post op day
- Incision care



JOINT REPLACEMENTS



BLEEDING

VENOUS
THROMBOSIS

INFECTION

↓ Hgb

ANEMIA

COMPLICATIONS

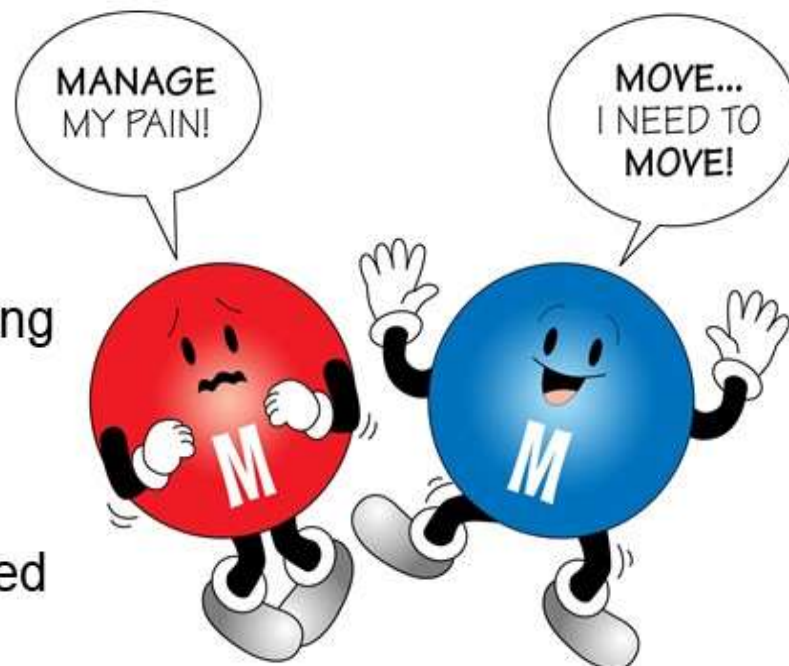
Insanely Easy Tip for Immobile Clients, is they need “**M and M**”!!! Manage Pain & “**MO₂VE**” the Client!

Move the clients within their ability:
assist to ambulate, sit, turn,
ROM, etc.

O₂xygenate: assess need by checking
SaO₂ sat, RR; cough, deep
breathe & incentive spirometry

Vital signs, evaluate trends for altered
oxygenation & intervene

Eliminate pain, if clients are in pain, they won't deep breathe or
move!



(Refer to Concept Oxygenation for specifics)

Osteomyelitis

Severe infection of the bone

Direct or indirect bacterial entry

- Direct: Open wounds / foreign body
- Indirect: via the blood stream

Causative organisms (See Table 63-1)

- *Staphylococcus aureus* (70% to 80%)
- Others: Proteus, Pseudomonas, and E. coli

Osteomyelitis

- **Acute vs chronic**
- **Local Symptoms:**
Persistent bone pain, swelling, tenderness warmth at the site, restricted movement, drainage (later sign)
- **Systemic Symptoms:** fever, night sweats, chills, restlessness, nausea, malaise

Chronic Osteomyelitis

- Possibly diminished systemic symptoms, local signs often ↑ common

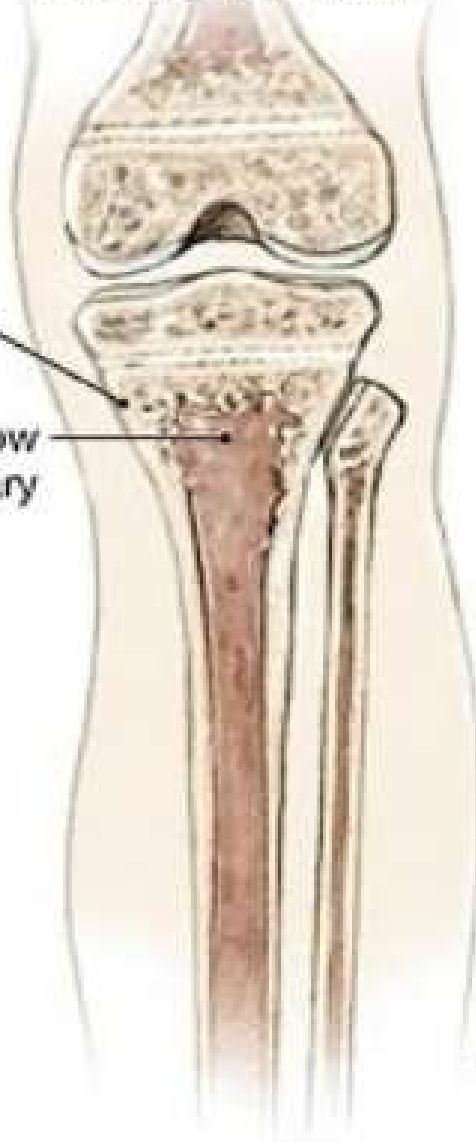
Diagnosis:

- Biopsy
- Blood/Wound Cultures
- WBC, ESR, CRP
- X-ray (late)

Healthy Bone

CROSS SECTION

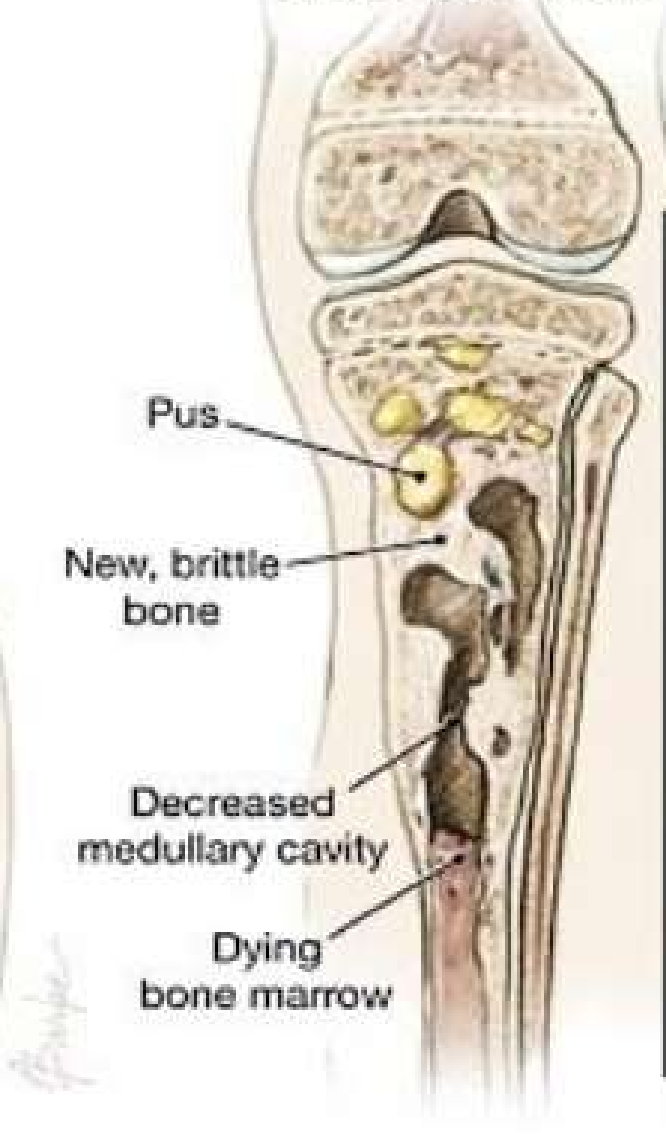
Cortical bone
Bone marrow
(in medullary cavity)



Osteomyelitis

CROSS SECTION

Pus
New, brittle bone
Decreased medullary cavity
Dying bone marrow



X-ray



Radiograph: John L. Zeller, MD, PhD

Osteomyelitis Interprofessional Care

- Culture &/or bone biopsy
- Antibiotic therapy (PICC & po)
 - If delayed: Surgical debrid & decompression
- Acrylic bead chains w/ antibiotics
- Wound vac (post operatively)
- Immobilize limb or support affected site
 - ↓ pain & prevent pathological fractures
- Hyperbaric O₂-new blood growth & healing
- Removal of infected prosthesis
- Muscle flaps & skin grafts (wound coverage)
- Amputation if severe (may save life)

Complications from Treatment

- Flexion Contracture
 - Lower leg & foot (footdrop)
- Prolonged Use of antibiotics
 - Toxic Reactions
 - Hearing deficit
 - Impaired Renal function
 - Neurotoxicity
 - Other Problems with Prolonged Antibiotics
 - especially in immunosuppressed or elderly
 - Overgrowth of candida albicans
 - clostridium difficile

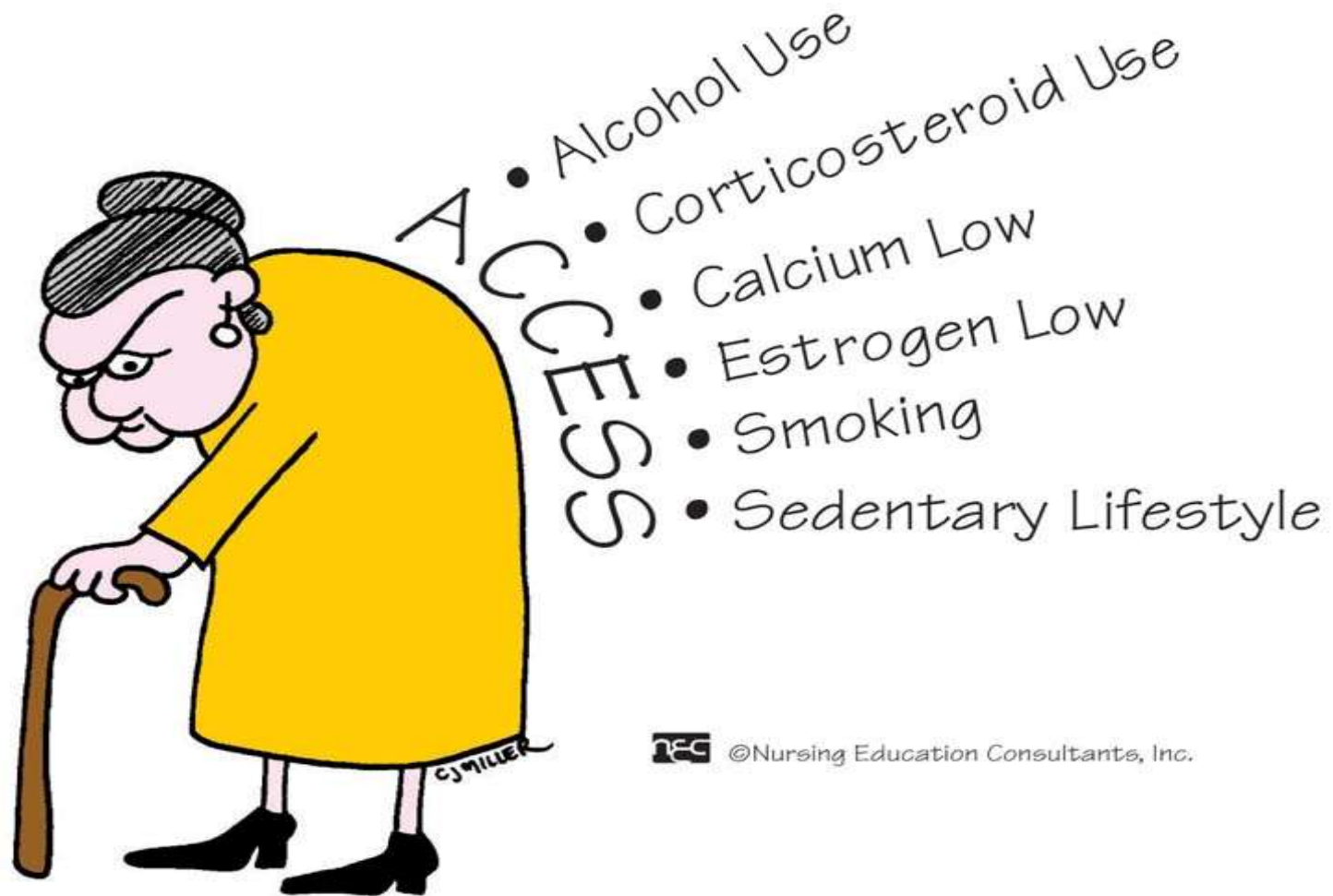
*Peak & trough

Osteoporosis (Porous Bone)

- Chronic progressive disease
- Loss of bone mass
- Structural deterioration
- Fragile bones
 - Common sites: spine/hips/wrists
- 1:2 women 1:8 men over 50
- Risk factors....



OSTEOPOROSIS RISK FACTORS

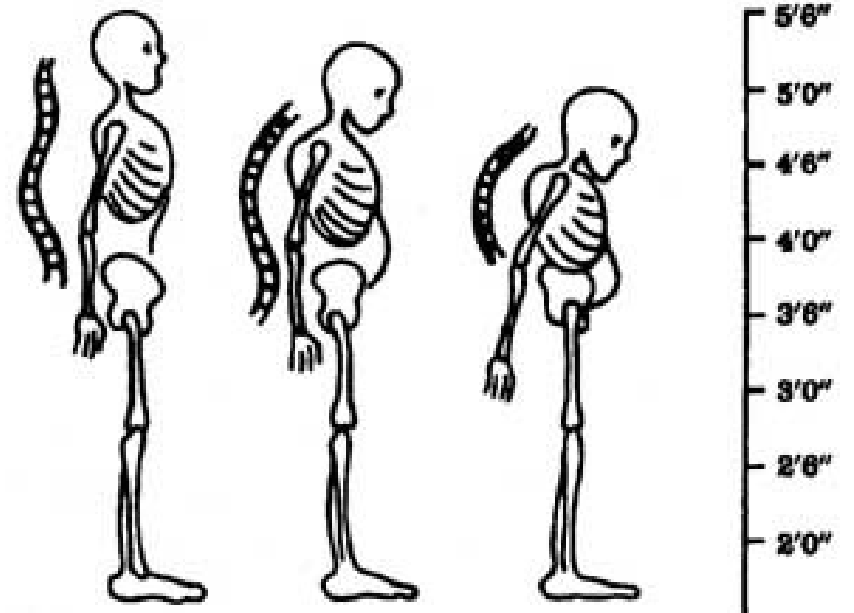
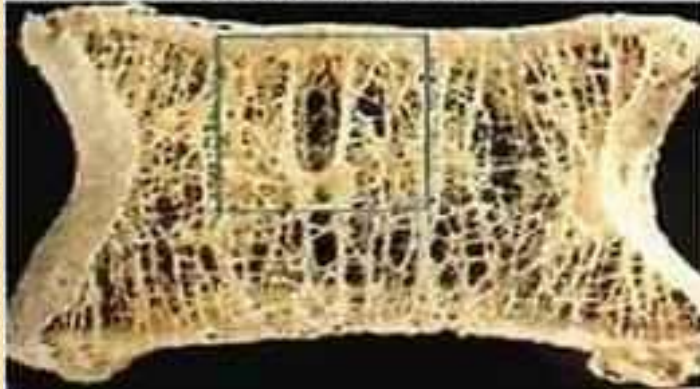


“Access” (leads to) Osteoporosis

HUESO SANO



HUESO CON OSTEOPOROSIS



OSTEOPOROSIS

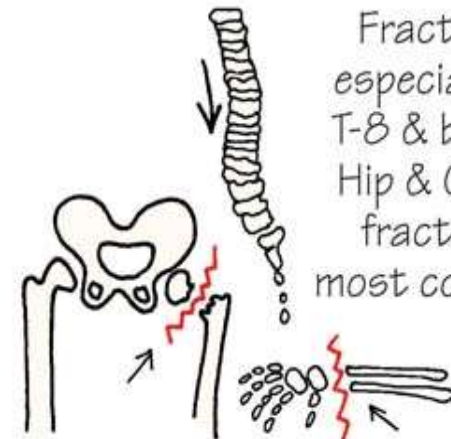
(After Menopause - ↓Estrogen)



C.J. MILLER

Generalized progressive reduction of bone density, causing weakness of skeletal strength.

Slender, Female, Caucasian, Alcohol Users, Smokers, Steroid Users, Inactive Lifestyles, and Diets Low in Calcium or Vitamin D Deficiency... have the highest risk.



Fractures especially at T-8 & below... Hip & Colles' fractures most common.

Osteoporosis Diagnosis

- Bone mineral density
 - Quantitative Ultrasound (QUS)
 - Dual energy absorptiometry (DXA)
 - T-Scores from BMD tests
 - $+1 - (-)1 = \text{Normal}$
 - $-1 - (-)2.5 = \text{Osteopenia}$
 - $-2.5 \text{ \& lower} = \text{Osteoporosis}$

Osteoporosis Consequences

- Fractures
- Secondary risks to elderly

Osteoporosis: Treatment

- Nutrition
- Calcium supplementation
- Exercise
- Fracture prevention
- ↓ ETOH use
- Drug therapy

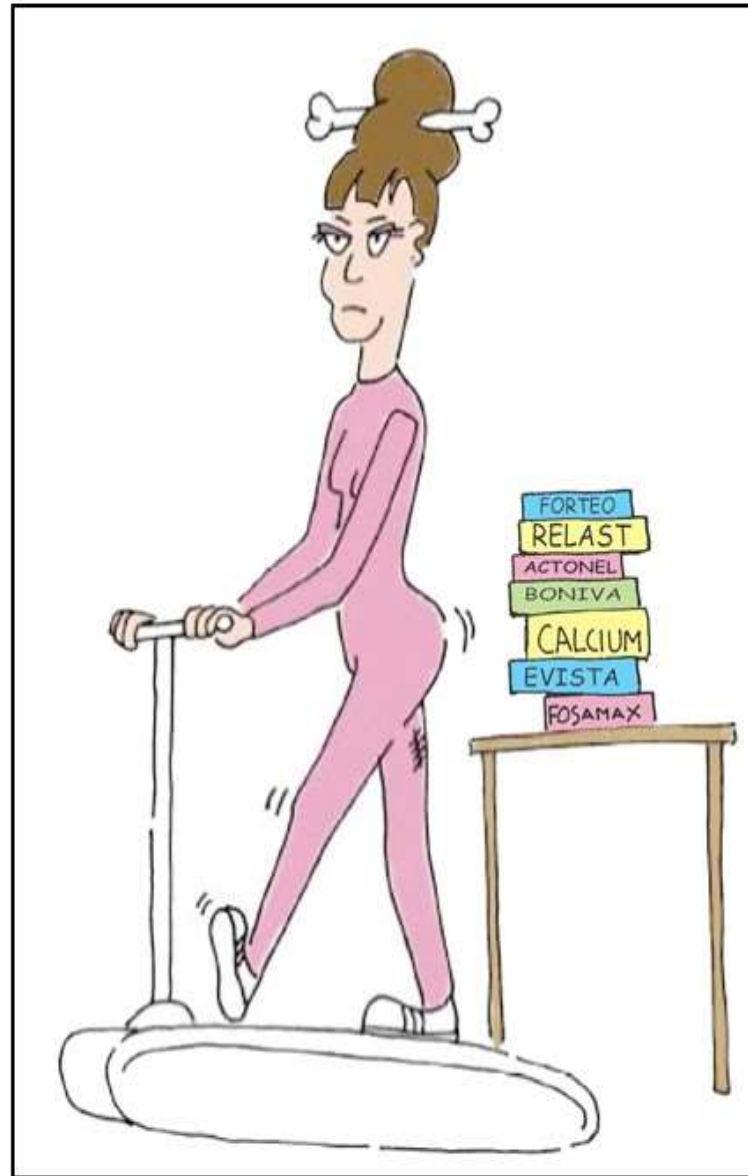


Osteoporosis Drug Therapy

- Bisphosphonates – inhibit osteoclast activity
- Calcitonin (IM, SC, Intra-nasal spray)
- Selective Estrogen Receptor Modulators (SERMs) (Raloxifene)
- Teriparatide (Forteo): daily SQ injections
- Calcium/Vitamin D & Vitamin C

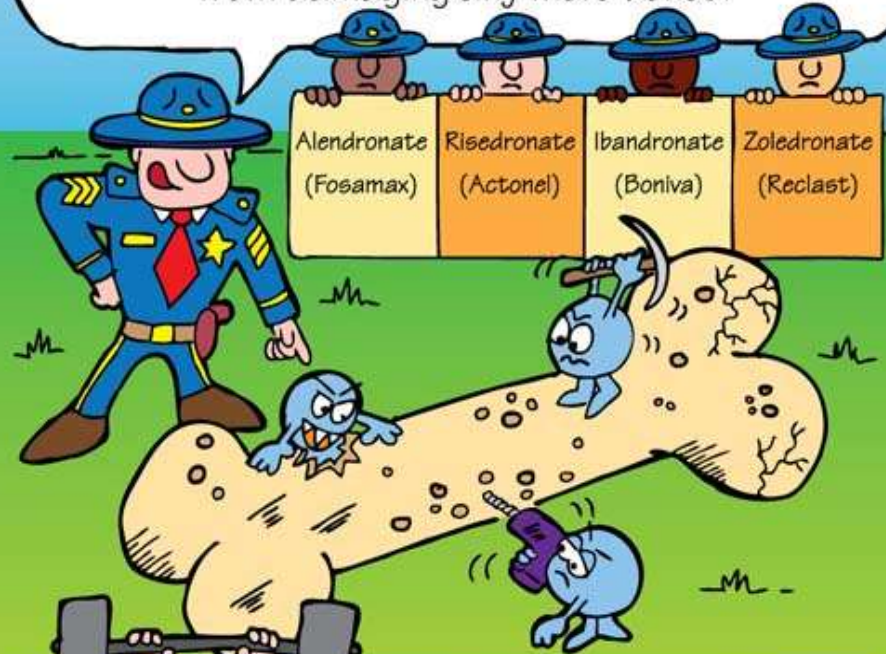


JOSEPHINE BONE-A-PART



BISPHOSPHONATES

Your days of breaking down bones are over!
My squad is here to prevent you osteocasts
from damaging any more bones!



SMILLER

CALCITONIN-SALMON (CALCIMAR)

“When diet alone just isn’t enough...
Calcimar, a bone resorption inhibitor.”

Sometimes dietary calcium isn’t enough. Calcitonin acts on bone to decrease osteoclast activity.

Decreases tubular absorption of Ca, which increases Ca excretion.

Watch for nausea after injections (SubQ or IM) and inflammation at the injection site. Nasal sprays can cause rhinitis, nasal irritation, dryness and soreness.

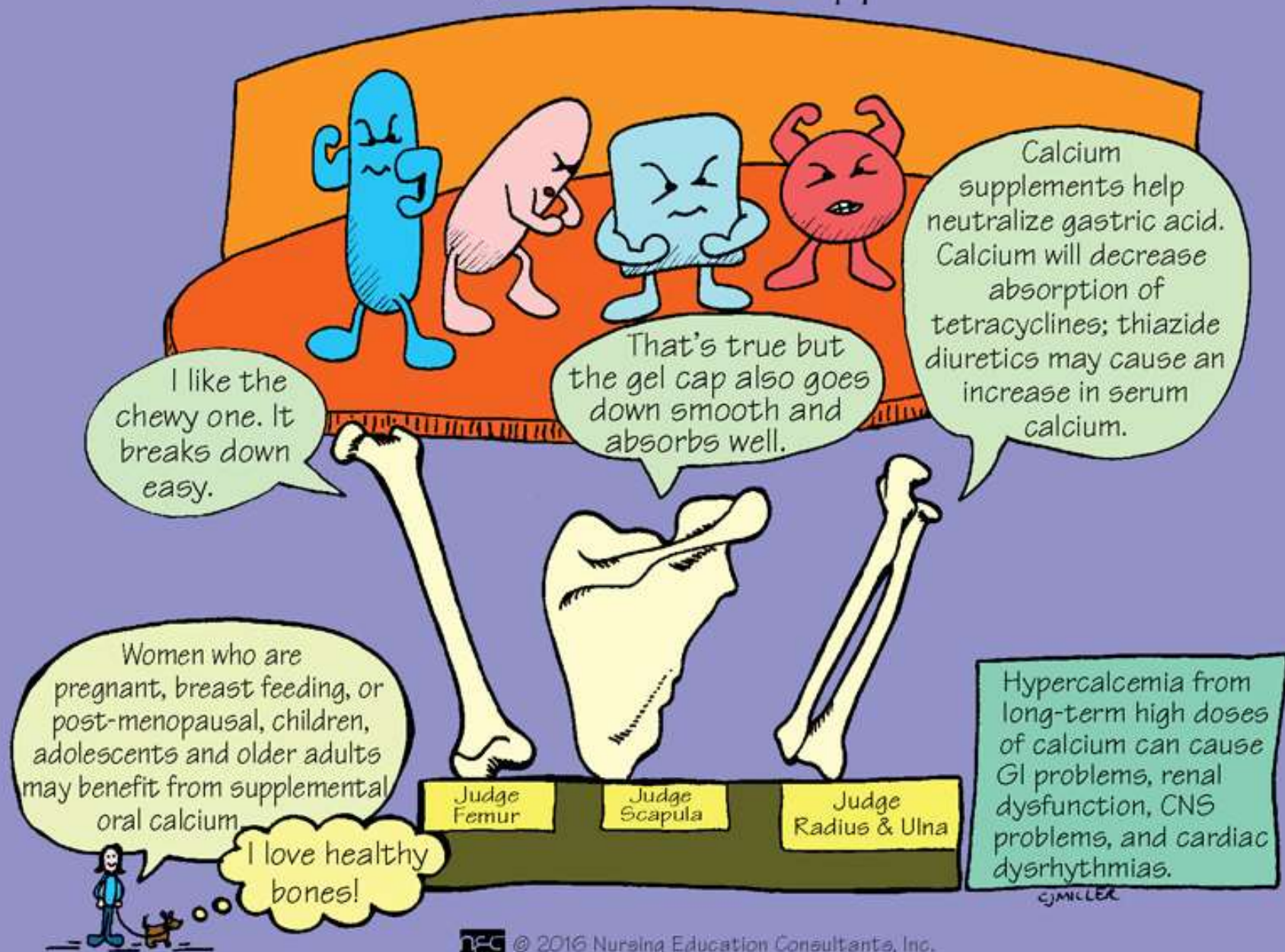
Alternate nostrils to avoid nasal irritation.



CJMILLER

CALCIUM SUPPLEMENTS (ORAL)

The Beauty of Calcium Supplements



Plan of Care “BONES”

- B**one density scan result reported to HCP.
- O**ut of calcium: assess Ca⁺⁺ & Vitamin D levels, supplements as needed; may need referral to dietician (*Refer to Concept on Nutrition for specifics*).
- N**eed drugs to prevent further deterioration: administer Selective Estrogen Receptor Modulators (SERM), Bisphosphonates (i.e., Alendronate), etc. as prescribed; (if taking medications, advise dentist prior to dental procedures (*Refer to the medication list in this chapter*)).
- E**strogen may help decrease incidence of osteoporosis.
- E**xercise (weight bearing) program with weight bearing exercises implement.
- E**xercise fall precautions.
- S**tress fractures assess for: low back pain, fractures of forearm, spine, and hip. Select assistive devices as needed.