

# Musculoskeletal Trauma

R.Thomas

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## INJURIES

Sprain

■ Treatment

- Rest
- Ice
- Compression
- Elevation

Dislocation

- Immobilize
- Anti-inflammatory

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## TENDONS, LIGAMENTS, KNEE LIGAMENTS, AND MENISCI

- Rotator cuff tears
- Epicondylitis
- Lateral and medial collateral ligament injury
- Cruciate ligament injury
- Meniscal injuries
- Rupture of the achilles tendon

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## TYPES OF FRACTURE

- Types
- S/S
  - Pain
  - Loss of function
  - Deformity
  - Shortening
  - Crepitus
  - Edema & ecchymosis
- Management
  - Reduction- closed, open
  - Nursing care
- Complication



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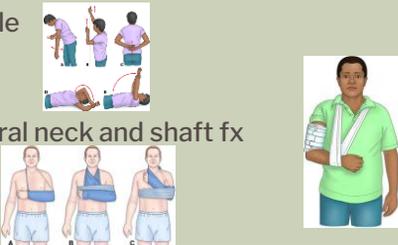
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## SPECIFIC FRACTURES

- Clavicle
- Humeral neck and shaft fx



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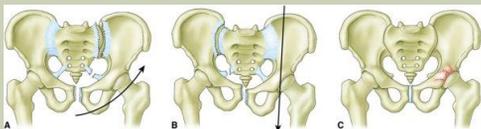
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## SPECIFIC FRACTURES

- Elbow fx
- Radial, ulnar, wrist, hand fx
- Pelvic fx



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## FEMUR FRACTURE

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## FEMORAL SHAFT FRACTURE

- Assessment
- Dx
- Management
  - Immobilization
  - Internal fixation
  - Irrigation & debridement

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## SPECIFIC FRACTURES

- Tibia & Fibula
- Rib
- Thoracolumbar Spine
  - Stable & unstable fx
  - Stable
    - Limited bed rest
    - Pain management
    - Activity restrictions
    - Patient education

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## 6 P'S OF NEUROVASCULAR ASSESSMENTS

- Pain
- Paresthesia
- Pallor
- Polar
- Paralysis
- Pulses

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### Nursing Process: The Care of the Patient With a Brace, Splint, or Cast—Assessment #1

- ❖ Before application
  - General health assessment
  - Emotional status
  - Presenting signs and symptoms and condition of the area
- ❖ Monitoring of neurovascular status and for potential complications
- ❖ Treat lacerations and abrasions before cast, brace, splint
- ❖ Provide information about the purpose of treatment
- ❖ Prepare patient for application by explaining procedure

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## Splints and Braces

- ❖ Contoured splints of plaster or pliable thermoplastic materials may be used for:
  - Conditions that do not require rigid immobilization
  - For those in which swelling may be anticipated
  - And for those who require special skin care
- ❖ Braces (i.e., orthoses) are custom fitted to various parts of the body and are used to:
  - Provide support
  - Control movement
  - And prevent additional injury

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## CASTING

- Types
  - Short and long arm casts
  - Short and long leg casts
  - Walking cast with rubber heels
  - Body casts
  - Spica casts
- Casting material
  - Plaster of paris
  - Synthetic fiberglass casts
- Application
  - Pre and post case care

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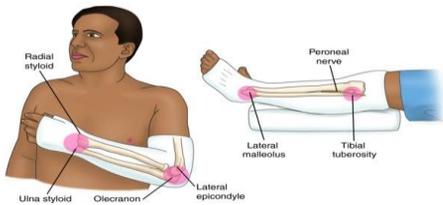
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## Long-Arm and Short-Leg Cast and Common Pressure Areas



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### Education Needs of the Patient With a Cast, Brace, or Splint

- ❖ Impact of injury to physiologic functioning (ADL, IADL)
- ❖ Activity, exercise, rest
- ❖ Medications
- ❖ Techniques for cast drying
- ❖ Controlling of swelling and pain
- ❖ Care of minor skin irritation
  - Pad rough edges with tape or moleskin
  - Blow with hair dryer to relieve itching
  - Do not stick foreign objects into the cast

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### Education Needs of the Patient With a Cast (cont.)

- ❖ Signs and symptoms to report:
  - Persistent pain or swelling,
  - Changes in sensation, movement, skin color or temperature
  - Signs of infection or pressure areas
- ❖ Required follow-up care
- ❖ Cast removal and after care
- ❖ Refer to Chart 40-2

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### External Fixation Devices

- ❖ Used to manage open fractures with soft tissue damage
- ❖ Provide support for complicated or comminuted fractures
- ❖ Patient requires reassurance because of appearance of device
- ❖ Discomfort is usually minimal, and early mobility may be anticipated with these devices
- ❖ Elevate to reduce edema
- ❖ Monitor for signs and symptoms of complications, including infection
- ❖ Pin care
- ❖ Patient education

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### External Fixation Device



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### Traction #1

- ❖ The application of pulling force to a part of the body
- ❖ Purposes
  - Reduce muscle spasms
  - Reduce, align, and immobilize fractures
  - Reduce deformity
  - Increase space between opposing forces
- ❖ Used as a short-term intervention until other modalities are possible

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## TRACTION

- Purpose
- Types
  - Manual
  - Skin
    - Buck extension traction
    - Cervical head halter
    - Pelvic traction
  - Skeletal
  - Halo
- Traction Care

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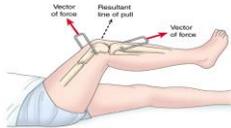
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## Traction #2

- ❖ All traction needs to be applied in two directions. The lines of pull are "vectors of force." The result of the pulling force is between the two lines of the vectors of force



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## Principles of Effective Traction

- ❖ Whenever traction is applied, a counterforce must be applied. Frequently, the patient's body weight and positioning in bed supply the counterforce
- ❖ Traction must be continuous to reduce and immobilize fractures
- ❖ Skeletal traction is never interrupted
- ❖ Weights are not removed unless intermittent traction is prescribed
- ❖ Any factor that reduces pull must be eliminated
- ❖ Ropes must be unobstructed, and weights must hang freely
- ❖ Knots or the footplate must not touch the foot of the bed

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## Buck Extension Traction



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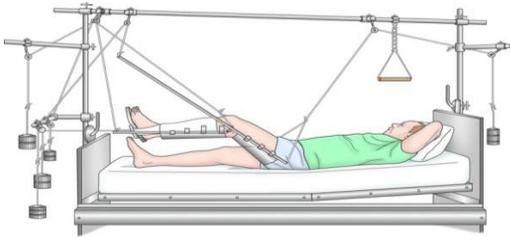
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### Balanced Skeletal Traction with Thomas Leg Splint



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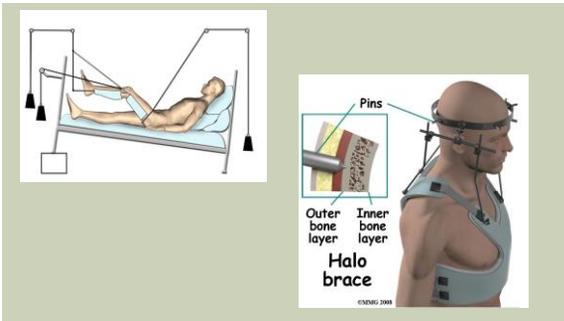
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### Nursing Interventions for the Patient in Skin Traction

- ❖ Proper application and maintenance of traction
- ❖ Monitor for complications of skin breakdown, nerve damage, and circulatory impairment
  - Inspect skin at least three times a day
  - Palpate traction tapes to assess for tenderness
  - Assess sensation and movement
  - Assess pulses, color, capillary refill, and temperature of fingers or toes
  - Assess for indicators of DVT
  - Assess for indicators of infection

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### Nursing Interventions Skeletal Traction #1

- ❖ Evaluate traction apparatus and patient position
- ❖ Maintain alignment of body
- ❖ Report pain promptly
- ❖ Trapeze to help with movement
- ❖ Assess pressure points in skin every 8 hours
- ❖ Regular shifting of position
- ❖ Special mattresses or other pressure reduction devices
- ❖ Perform active foot exercises and leg exercises every hour



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### Nursing Interventions Skeletal Traction #2

- ❖ Elastic hose, pneumatic compression hose, or anticoagulant therapy may be prescribed
- ❖ Pin care
- ❖ Exercises to maintain muscle tone and strength



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### Nursing Management of Patients in Traction

- ❖ Assessing anxiety
- ❖ Assisting with self-care
- ❖ Monitor and manage complications
  - Pressure ulcer
  - Atelectasis and pneumonia
  - Constipation
  - Anorexia
  - Urinary stasis
  - Infection
  - DVT



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## COMPLICATIONS

- Compartment Syndrome
- Shock
- Fat embolism
- Deep Vein Thrombosis
- Osteomyelitis
- Avascular necrosis
- Failure of Fracture to Heal

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### Collaborative Problems and Potential Complications

- ❖ Compartment syndrome:
  - Serious complication
  - Occurs from increased pressure in a confined space
  - Compromises blood flow
  - Ischemia and irreversible damage can occur within hours
- ❖ Dx: Clinical assessment of 6 Ps; pain is the early indicator
- ❖ Treatment: Notify physician, cast may be removed, and emergency fasciotomy may be necessary

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### Collaborative Problems and Potential Complications

- ❖ Pressure ulcer: caused by inappropriately applied cast
  - Lower extremities most susceptible
  - Patient reports painful "hotspot" and tightness
  - Dx: May cut window in the cast for inspection and access
  - Treatment: dressing applied over exposed skin
- ❖ Disuse Syndrome: muscle atrophy and loss of strength
  - Treatment: Isometric exercises, muscle setting exercises
  - Refer to Chart 40-1

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### Osteomyelitis

- ❖ Infection of the bone
- ❖ Occurs because of
  - Extension of soft tissue infection
  - Direct bone contamination
  - Bloodborne spread from another site of infection
    - This typically occurs in an area of bone that has been traumatized or has lowered resistance
- ❖ Causative organisms
  - Methicillin-resistant Staphylococcus aureus
  - Other: Proteus and Pseudomonas spp., Escherichia coli



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### Joint Replacements

- ❖ Used to treat severe joint pain and disability and for repair and management of joint fractures or joint necrosis
- ❖ Frequently replaced joints include the hip, knee, and fingers
- ❖ Joints including the shoulder, elbow, wrist, and ankle may also be replaced



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### Needs of Patients With Hip Replacement Surgery #1

- ❖ Preventing Dislocation of Hip Prosthesis
  - Correct positioning using splint, wedge, pillows
  - Keep hip in abduction when turning, adduction when transferring
  - Limited flexing of the hip; <90 degrees
- ❖ Mobility and ambulation
  - Patients usually begin ambulation within 1 day after surgery using walker or crutches
  - Weight bearing as prescribed by the physician
- ❖ Drain use postoperatively
  - Assess for bleeding and fluid accumulation



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## Use of an Abduction Pillow to Prevent Hip Dislocation After Total Hip Replacement



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## Needs of Patients With Knee Replacement Surgery #1

- ❖ Postoperatively
  - Compression bandage on knee
  - Assess neurovascular status every 2 to 4 hours
  - Monitor for complications; VTE, infection, bleeding
- ❖ Wound suction drain
  - Removed in 24 to 48 hours
  - Antibiotics prophylactically
  - Autotransfusion of extensive bleeding

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## Needs of Patients With Knee Replacement Surgery #2

- ❖ Continuous passive motion (CPM)
  - Promote range of motion, circulation, and healing
  - Prevent scar tissue in knee
  - Placed in device immediately after surgery
- ❖ Physical therapy
  - Strength and ROM
  - Assistive devices
  - Ambulate first post op day
- ❖ Acute rehab
  - 1 to 2 weeks

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Total recovery 6 weeks  
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### CPM Device



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### Nursing Process: The Care of the Patient Undergoing Orthopedic Surgery—Assessment, Preoperative

- ❖ Routine preoperative assessment
- ❖ Hydration status
- ❖ Medication history
- ❖ Possible infection
  - Ask specifically about colds, dental problems, urinary tract infections, infections within 1 to 2 weeks
- ❖ Knowledge
- ❖ Support and coping

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### Nursing Process: The Care of the Patient Undergoing Orthopedic Surgery—Assessment, Postoperative

- ❖ Pain
- ❖ Vital signs, including respirations and breath sounds
- ❖ LOC
- ❖ Neurovascular status and tissue perfusion
- ❖ Signs and symptoms of bleeding: wound drainage
- ❖ Mobility and understanding of mobility restrictions
- ❖ Bowel sounds and bowel elimination
- ❖ Urinary output
- ❖ Signs and symptoms of complications: DVT or infection

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### Nursing Process: The Care of the Patient Undergoing Orthopedic Surgery—Diagnoses

- ❖ Acute pain
- ❖ Risk for peripheral neurovascular dysfunction
- ❖ Risk for ineffective therapeutic regimen management
- ❖ Impaired physical mobility
- ❖ Risk for situational low self-esteem and disturbed body image

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### Collaborative Problems and Potential Complications—Postoperative

- ❖ Hypovolemic shock
- ❖ Atelectasis
- ❖ Pneumonia
- ❖ Urinary retention
- ❖ Infection
- ❖ Thromboembolism: DVT or PE
- ❖ Constipation or fecal impaction

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### Nursing Process: The Care of the Patient Undergoing Orthopedic Surgery—Interventions #1

- ❖ Administration of medications
  - Patient-controlled analgesia (PCA)
  - Medicate before planned activity and ambulation
- ❖ Use alternative methods of pain relief
  - Repositioning, distraction, guided imagery
- ❖ Specific individualized strategies to control pain
  - Use of ice or cold packs
  - Elevation
  - Immobilization

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### Nursing Process: The Care of the Patient Undergoing Orthopedic Surgery—Interventions #2

- ❖ Muscle setting; ankle and calf-pumping exercises
- ❖ Measures to ensure adequate nutrition and hydration  
    Note: Large amounts of milk should not be given to orthopedic patients on bed rest
- ❖ Skin care measures, including frequent turning and positioning
- ❖ Follow physical therapy and rehabilitation programs
- ❖ Encourage the patient to set realistic goals and perform self-care care within limits of the therapeutic regimen

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## AMPUTATION

- Etiology
- Levels of amputation
- Complications
  - Hemorrhage
  - Infection
  - Skin breakdown
  - Phantom limb pain
  - Joint contracture
- Management
  - Dressings
  - Rehabilitation



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