

Casts, Care, and Compartment Syndrome

Nursing Best Practices





Purposes of Casts

- Immobilize and hold bone fragments in alignment
- Apply uniform compression of soft tissue
- Permit early mobility
- Correct and prevent deformities
- Support and stabilize weak joints

Note: This course is not intended to provide the details of assisting in specific cast applications, but rather to underscore critical post-cast assessment.

Types of Casts

- Short-arm cast
 - Below elbow to proximal palmar crease
- Gauntlet cast
 - Below elbow to proximal palmar crease including thumb
- Long-arm cast
 - Axillary fold to proximal palmar crease
- Short-leg cast
 - Below knee to base of toes
- Long-leg cast
 - Upper thigh to base of toes
- Body cast
 - Encircles the trunk stabilizing the spine
- Spica cast
 - Incorporates the trunk and the extremity
- Cast-brace
 - Constructed with hinges to permit early motion of joints
- Cylinder cast
 - Used for fracture or dislocation of knee or elbow



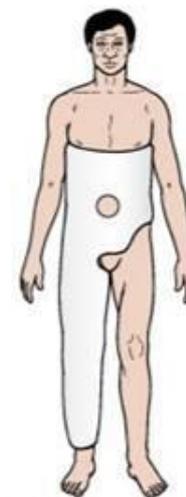
Short arm cast



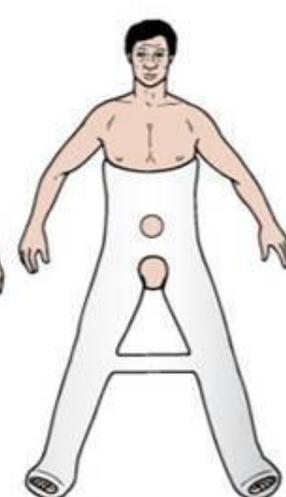
Long arm cast



Body jacket cast



Single hip spica



Double hip spica



Long leg cast



Short leg cast

Best Nursing Practices

- Assisting MD in cast application
- Monitoring for diminished CSMs (neurovascular changes) and reporting to the MD signs of impending compartment syndrome
- Monitoring for increased pain
- Assessing cast edges for irritation
- Educating patient in care of cast

Cast Maintenance

Complications Associated with Casts

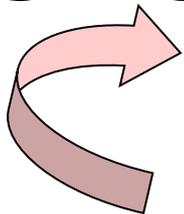


- Neurosis
- Pressure sores
- Nerve palsies
- Compartment syndrome (see following slides)
- Immobility and confinement
- Nausea, vomiting, abdominal distention
- Anxiety and/or depression
- Thrombophlebitis and pulmonary emboli (see following slides)
- Respiratory atelectasis and pneumonia
- Urinary tract infection
- Anorexia and constipation

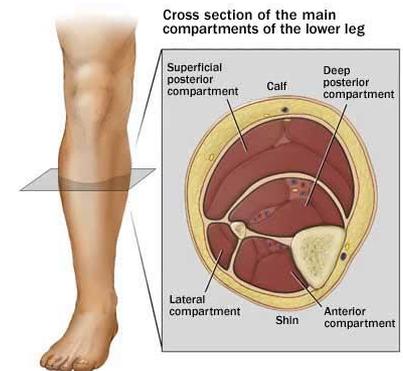
Compartment Syndrome

- Compartment syndrome is a condition resulting from increased progressive pressure within a confined space, thus compromising the circulation and the function of tissues within that space. A tight cast, trauma, fracture, prolonged compression of an extremity, bleeding, and edema put patients at risk for compartment syndrome

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Assess to Avoid Complications

- Assess skin integrity and neurovascular status of extremity with cast hourly during the first 24 hours and less frequently as swelling subsides

Look for:

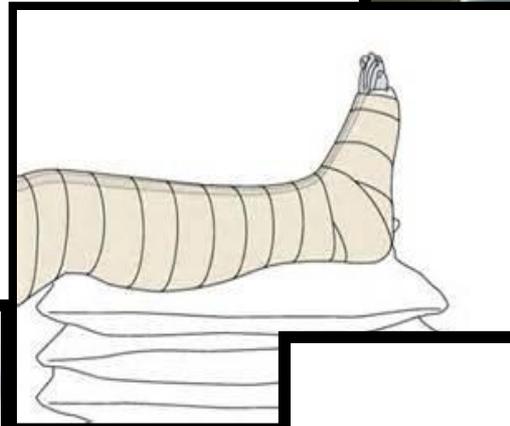
- Pain out of proportion to injury
- Swelling
- Discoloration (pale or blue)
- Cool skin distal to injury
- Tingling or numbness (paresthesia)
- Pain on passive extension (muscle stretch)
- Slow capillary refill
- Diminished or absent pulse
- Paralysis
- Severe initial pain over bony prominences
- Odor
- Drainage on cast

Patient Positioning

- Elevate the extremity on cloth-covered pillow above the level of the heart
- Avoid resting cast on hard or sharp surfaces; don't place objects on casts
- Handle moist casts with palm of hands
- Turn patient every two hours while cast dries

- Be aware of potential pressure sites
 - Lower extremity
 - Heel, malleoli, dorsum of foot, head of fibula, anterior surface of patella
 - Upper extremity
 - Medial epicondyle of humerus, ulnar styloid
 - Plaster jackets or body spica casts
 - Sacrum, anterior and superior iliac spines, vertebral borders or scapula

Elevation Alternatives





Minimize Effects of Immobility

- Reposition and turn patient frequently
- Encourage “normal” movement
- Avoid pressure behind the knees
- Use anti-embolism stockings and/or SCDs as indicated
- Encourage deep breathing
- Encourage liberal fluid consumption and balanced food intake with attention to protein, calcium and phosphorus containing foods
- Observe for symptoms of bowel syndrome or other forms of abdominal malfunction



Nursing Alert: Embolism

- People at high risk of pulmonary emboli include older adults and persons with previous thromboembolism, obesity, heart failure, smokers, women on BCPs, or patients with multiple trauma. These patients require prophylaxis against thromboembolism (eg SCDs, anticoagulant medications).

Note on SCDs and Buck's Traction

- When skin traction is applied to a patient SCDs must **not** be placed on the leg in traction...
 1. Removing weights to apply SCDs reduces the effectiveness of the traction
 2. Placing a SCD cuff beneath a traction sleeve may cause pressure sores

Nursing Alert: Compartment Syndrome

- Signs and symptoms of compartment syndrome include **pain, paresthesia, pallor, pulselessness, poikilothermia, and paralysis.**
- Pain is the first sign and is usually described as deep, constant, poorly localized, and out of proportion to the injury.
- The pain is not relieved by analgesia and worsens with stretching of the muscle group.
- The other signs occur late in the course of compartment syndrome.

Unrelenting pain and other signs of compartment syndrome should be reported immediately!!! The cast may have to be split and removed or fascia surgically opened to avoid loss of limb.

If symptoms are present:

- Notify health care provider immediately!!!
- Cast may be “windowed” so the skin at the pain point can be examined and treated
- Bivalve the cast for Compartment Syndrome
 - Split the cast on each side over its full length into two halves
- Cut the underlying padding
 - Blood-soaked padding may shrink and cause constriction of circulation
- Spread the cast sufficiently to relieve constriction



Patient Education

- Explain to the patient what neurovascular symptoms they should be checking for
- Apply ice bags as needed
- Alternate periods of ambulation (with weight-bearing restrictions) and periods elevation of injured extremity
- Cast care
- Exercises

Role of RN/ Nurse	Role of Physical Therapist
Assisting with casting process (often occurs in the ED or MD office) . Reinforce RICE instruction.	Education of the patient Cast type, safety precautions, allowed mobility, assistive devices, follow-up.
Initial assessment for post casting complications especially compartment syndrome	Assessment of cast device precaution practices.
Positioning/moving/tilting patient to prevent skin breakdown. Elevation of part.	Initial training for movement /gait with assistive devices.
Providing cast edge care and education for self care post discharge.	Education of the patient : safety precautions, mobility, exercises.



The End

Orthopedic Nursing Part 3:

Casting and Compartment Syndrome

Nursing Best Practice