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|  <b>Saskatchewan<br/>Health Authority</b> | Policies and Procedures<br><br><b>Title: CAST REMOVAL and/or SPLITTING:<br/>Adult and Pediatric</b><br><br><b>RN Specialty Practice (RNSP): RN Procedure</b><br><br>I.D. Number: <b>1181</b> |
| Authorization:<br><input checked="" type="checkbox"/> Former SHR Nursing Practice<br>Committee                             | Source: Nursing<br>Cross Index:<br>Date Effective: February 2018<br>Scope: Former SKtnHR Acute Care: Rural<br>Humboldt District Hospital   |

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## **DEFINITIONS**

**Cast** - a rigid device made of plaster, fiberglass, or other synthetic material applied externally to immobilize bone and musculoskeletal tissue. For this policy “cast” will refer to a circumferential cast, encircling entire circumference of the limb. A slab cast is a non-circumferential immobilizer that only supports part of the limb. The removal of slab casts is not included in this policy.

**Compartment Syndrome** – is the compression of muscles, blood vessels and nerves within a confined space that inhibits blood flow to the surrounding tissues and can lead to cellular ischemia. The degree of damage is dependent on the amount of pressure and the length of time perfusion is compromised. Compartment syndrome is an emergency situation that requires immediate surgical measures to prevent permanent tissue destruction. If there is any suspicion of compartment syndrome, notify the MRHP immediately.

### Initial signs:

1. *Pain* – excruciating pain on passive range of motion or active flexion of affected limb that is disproportionate to the extent of the injury
2. *Pressure* – limb will feel tight or tense upon palpation and the skin may appear taut and shiny as the skin stretches

### Late signs:

3. *Pallor* – poor skin colour, cool temperature and delayed capillary refill
4. *Pulselessness* – weak or absent pulses
5. *Parasthesia* – numbness, tingling loss of sensation (relief of pain)
6. *Paralysis* – motor dysfunction

**Splitting** – is to cut along the length of a cast on two opposite sides (bivalve), including the full thickness of the padding and stockinette

## **ROLE - Scope of Practice**

**Registered Nurse (RN)** – RNs, identified by the manager in targeted practice settings, will be certified in this RN Specialty Practice: Cast Removal and/or Splitting

### **1.0 PURPOSE**

- 1.1 To standardize treatment and management of cast removal and/or splitting that is in keeping with best practice guidelines
- 1.2 To guide and ensure cast removal and splitting is carried out in a safe, effective manner by clinicians trained in relevant risk assessment, equipment use and approved techniques.
- 1.3 To minimize the risk of thermal and abrasive injuries or other complications associated with cast removal and/or splitting
- 1.4 To ensure that targeted staff are trained and certified to remove and/or split casts when indicated

### **2.0 POLICY**

- 2.1 RNs, identified by their manager in targeted areas, will require certification in this procedure. Prior to removing and/or splitting a cast independently, the nurse will have:
  - Completed the Cast Removal and/or Splitting Learning Package and quiz
  - Demonstrated skill on a patient (or simulation) to a clinical nurse educator (CNE) or Clinical Leader (CL)
  - Provided documentation to Manger of Nursing (MON), CNE or CL of learning package quiz and skills checklist completion
- 2.2 Cast removal and/or splitting by certified RNs will only be done with a valid order from the Most Responsible Health Practitioner's (MRHP)
- 2.3 Personal protective equipment (PPE) will be worn by staff, patients and others in the room, as per point of care risk assessment by the clinician.
- 2.4 The MRHP will be notified of unexpected outcomes or conditions that occur during the cast removal procedure, such as: a thermal or abrasion injury, unexpected pain, visible pressure points, malformation of limb

### **3.0 PROCEDURE**

#### **3.1 Removing and/or Splitting a Cast in an Emergency Situation**

- 3.1.1 Assess neurovascular status of the casted limb for signs and symptoms of circulatory compromise and/or compartment syndrome (see definition above).
  - If compartment syndrome is suspected
    - elevate the limb only to the level of the heart to promote circulation

- notify the MRHP immediately
- Prepare to immediately remove or split the cast as per MRHP order
- If compartment syndrome is not identified, but circulation is compromised
  - elevate the limb to the level of the heart to reduce pain and swelling
  - Prepare to remove or split the cast as per MRHP order
- 3.1.2 Consider other indications for removal and/or splitting:
  - Circulatory compromise due to swelling
    - pain, impaired sensation and/or motor function
  - Suspicion of pressure injury or infection under the cast
  - Broken or collapsed cast requiring replacement
  - Risk of maceration or skin breakdown due to wet under-cast padding
- 3.1.3 To gain patient cooperation, prepare them for what to expect
  - Describe the physical sensation the patient will experience
    - i.e. the vibration of the cast
  - Demonstrate the loud noise of the cast cutter  
Inform the patient that they may feel warmth, but should not feel heat
    - Agree upon a gesture the patient can use to inform you if they feel heat, or to request you pause momentarily
    - Describe how the cast cutter is designed specifically for cast removal, and how it oscillates or vibrates rather than rotates or spins like a conventional saw.
- 3.1.4 Assess patient's ability to understand and follow instructions, their level of cooperation, degree of anxiety, and response to pain
  - Anticipate the need for assistance with small children, confused or uncooperative patients
- 3.1.5 Assemble tools and equipment (see Appendix B)
  - Oscillating cast cutter
    - Ensure cast cutter is in good working order
    - Note: there is an increased risk of thermal or abrasive injury with a blade that is not secure, dull or has damaged teeth
    - Ensure high/low speed is operational
  - Cast Spreaders
    - Use to separate cast edges and expose padding
  - Blunt tipped bandage scissors
    - use to cut through padding
  - Saw-stop zip stick, tongue depressor or protective device
    - used to protect skin at the distal and proximal edge
  - Plastic sheet/soaker pad
    - place under cast to catch debris
  - Mild soap and towels
    - use for post cast removal skin care
  - Personal Protective Equipment (PPE)
    - hearing protection (nurse, patient and others in the room)

- non-sterile gloves
  - eye protection
  - surgical mask (if no vacuum on cast cutter)
  - gown (optional)
  - Pen or marker
    - to mark cut line
  - Elastic tensor bandage (used after splitting the cast)
    - to secure cast pieces
- 3.1.6 Perform hand hygiene and don appropriate PPE
- 3.1.7 Examine the cast and take into consideration the:
- type of cast material (plaster or fiberglass or both)
  - nature and amount of cast padding
    - Increased risk of thermal injury with thin padding
  - thickness of the cast
    - Use faster speed to reduce amount of warmth generated
  - the condition of the cast (damaged, wet, and/or contaminated)
    - Soft, wet or damaged areas will be more difficult to cut
    - May need to use scissors
- 3.1.8 Mark the intended cut-lines along the length of the cast
- usually on the medial and lateral aspects for a below the knee cast and anterior/posterior for a short arm cast
  - Avoid cutting over bony prominences to decrease risk of abrasive injury
  - Avoid blood-stained areas
  - Search for the areas requiring fewer passes with the blade
- 3.1.9 Position patient in a secure and comfortable position allowing access to desired aspects of the limb
- Adjust height of the stretcher for clinician comfort
- 3.1.10 Gently insert a protective device (zip stick or tongue depressor) under the cast edge at the start of the blade pass
- If cast edges are very tight to the patient skin, or if there is little padding on the edges, insertion can cause discomfort or abrade the skin under the cast.
    - Consider allowing the patient to insert the stick
- 3.1.11 Turn cast cutter on
- Some models have two speeds
    - Low – for second-attempt blade passes
    - Fast – for quick removal
- 3.1.12 Split the cast along predetermined cut-lines using the cast cutter
- 3.1.13 Cut padding and stockinet to the skin to ensure there is no further constriction of the limb by padding
- Refer to Cutting/Splitting Technique (Appendix A)

- 3.1.14 Re-assess color, sensation and movement of the extremity
- 3.1.15 Wrap cast with an elastic tensor bandage if the cast has been split, but not removed.
  - be careful to avoid causing a return of neurovascular compression symptoms
  - readjust tension of the bandage if symptoms return
- 3.1.16 Ensure that the patient/family are aware that extra precautions are necessary now that the cast integrity has been compromised
- 3.1.17 Report assessment to MRHP
- 3.1.18 Review MRHP post cast splitting instructions with patient
- 3.1.19 Document (refer to 4.0)

### **3.2 Removing a Cast in a Scheduled Situation**

- 3.2.1 Review MRHP orders. They *may* include:
  - Pre and/or post X- rays
  - Physiotherapy referral
  - Post removal instructions (splints, mobility etc)
  - Follow-up appointments
- 3.2.2 Consider the following:
  - Indications for the cast removal
  - Radiology reports (if relevant)
  - Consultation reports (if relevant)
- 3.2.3 Prepare to remove the cast as per MRHP order
- 3.2.4 Refer to 3.1.3 – 3.1.12 for preparation and splitting technique
- 3.2.5 Gradually pull cast apart
- 3.2.6 Assist the patient in gently freeing themselves from the cast
- 3.2.7 Warn patient that they may experience some tenderness, muscle weakness, and atrophy
- 3.2.8 Perform a post cast removal limb assessment and report any concerns to MRHP:
  - Areas of tenderness, weakness, swelling and discomfort
  - Areas of pressure or discoloration related to the cast
  - Skin may have an oily, scaly, yellow appearance, with a foul odour
  - Areas of thermal or abrasive injury related to cast removal
- 3.2.9 Assist patient with skin care following cast removal

- Wash limb with a mild soap and warm water (do not scrub the skin) Pat dry with soft cloth

3.2.10 Review post cast removal discharge instructions with patient and/or family

- Level of activity allowed
- Splints, tensors or braces, if ordered
- Physiotherapy referral, if ordered
- Passive and/or active range of motion exercise
- Muscle strengthening regime
- Prescribed analgesia
- Reportable signs and symptoms
- Follow-up appointments

3.2.11 Dispose of cast in regular garbage and perform hand hygiene

**4.0 Documentation**

4.1 Document in the patient's medical record, the following information:

- 4.1.1 Date and time of removal or splitting (bivalve)
- 4.1.2 Indication for the cast removal or splitting (scheduled or emergency)
- 4.1.3 Location and type of cast removed or split (ie. Left wrist short arm, full length right leg)
- 4.1.4 Type of casting material (plaster, fiberglass, or both)
- 4.1.5 Limb assessment before and after procedure
- 4.1.6 Patient's response/tolerance of procedure
- 4.1.7 Patient and/or family teaching and instructions given

4.2 Update the patient's plan of care, if applicable

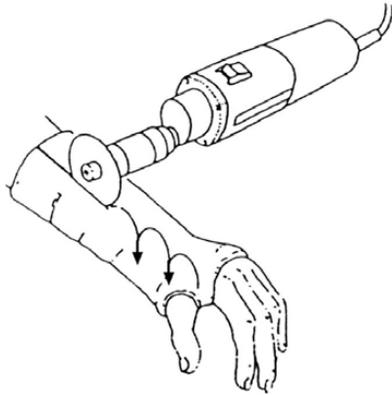
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## Cutting/Splitting Technique

## Appendix A

**1.** The saw should be securely held with two hands to maintain stable control. The dominant hand should grasp the barrel of the saw. The non-dominant hand should have a finger placed between the barrel and the blade to steady and guide the saw head and to act as a depth gauge. The fingers of the non-dominant hand may also rest along the cast to provide stability.



**2.** The blade should be positioned over the cutting line, perpendicular to the cast surface. An even 'down and up' vertical motion should be used. Do not exert excessive working pressure – allow the blade to cut at its own rate. Excessive pressure will potentially contribute to overheating of the blade.

**3.** When the blade breaks through the cast wall there is a loss of resistance referred to as 'end-feel'. At this moment the blade should be withdrawn from the cast and re-positioned progressively along the cutting line in a series of downward cuts. The saw may be rotated slightly before proceeding to the next cut to avoid overheating or blunting of the blade. Cutting proceeds as described in a series of cuts until a full length split is completed.

**4.** The saw blade must not be dragged horizontally along the cast because the cutting action will be ineffective. In addition, the clinician will be unable to judge end-feel which may increase the risk of soft tissue trauma and produce rough edges along the split.

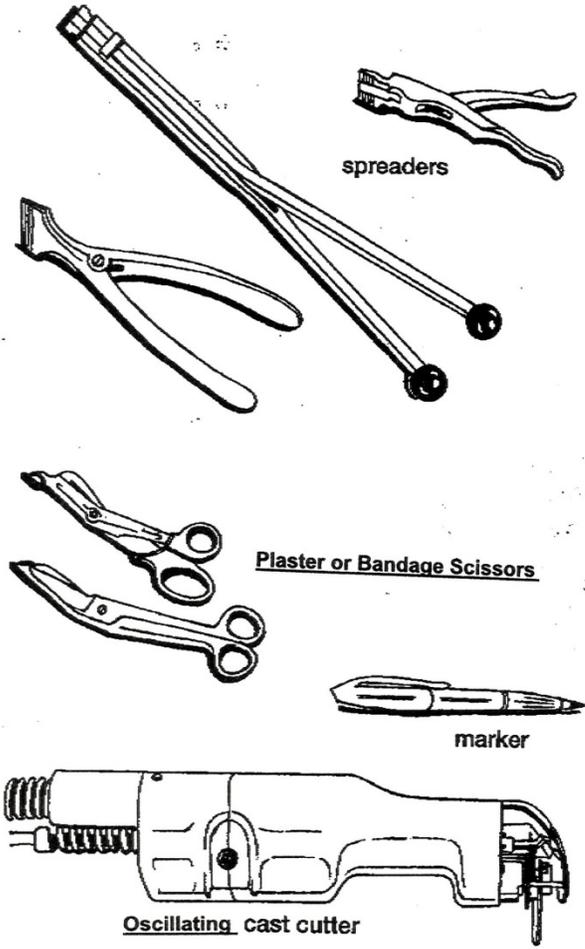
**5.** Extra care should be taken when padding is minimal or when the cast is tight fitting.

**6.** Once the cast has been cut along the full length, the split/s may be opened with spreaders and the padding or liner cut with plaster scissors. The cast may then be removed or bandaged as necessary.

**7.** The blades of shears and scissors should be kept parallel to the limb where possible to prevent the points of the tools digging into the skin.

Appendix B

**Tools and Equipment**

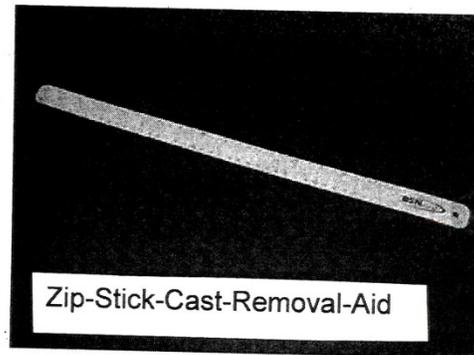


spreaders

Plaster or Bandage Scissors

marker

Oscillating cast cutter



Zip-Stick-Cast-Removal-Aid