## Procedure: Duke Boot Compression Therapy (with self-adherent wrap)

### Practice level

- A Physician/NP order or clinical direction from a Wound Clinician is required to apply a Duke Boot wrap. The compression wrap method (fan-fold or spiral) is to be stated in the order/clinical direction.
- Only those nurses who have successfully completed additional education for compression therapy may apply compression wraps.
- Follow agency/Health Authority compression therapy policies/practice standard.
- Refer to the [Guideline: Application of Compression Therapy for Venous Insufficiency & Mixed Venous/Arterial Insufficiency](#) for further information related to indications, precautions and contraindications.

### Background

- The compression ‘boot’ was developed by USA’s Duke University and there are several variations of this procedure; this document outlines the procedure used within British Columbia.
- The combination of 10% zinc oxide impregnated gauze wrap (Viscopaste) and a self-adherent wrap (Coban Self-Adherent) is known as a ‘Duke Boot’; note that for this procedure:
  - Coban Self-Adherent wrap is used (not the Coban2 or Coban2 Lite compression wraps) and cast padding may be used over the Viscopaste layer to pad of bony prominences and/or to absorb of small amounts of exudates.
- The boot is classified as an inelastic-rigid compression therapy; the Viscopaste wrap forms a mold around the leg; with ambulation, the calf muscle must work against the mold and this work increases the venous return.
- The boot provides moderate compression therapy (20-30 mmHg) when the client is ambulating.

### Indications / Precautions / Contraindications

**Indications:**

- For clients with chronic eczema and dermatitis requiring moderate compression for the treatment of venous insufficiency and/or venous leg ulcers.

**Precautions:**

- Compression wraps may be used:
  - With caution for clients whose ABI is between 0.5 to 0.89 as this value indicates severe to mild arterial insufficiency
  - With caution for clients whose ABI is 1.31 or greater as this value indicates calcified arteries (often seen in persons with diabetes with advanced small vessel disease)
  - With extreme caution and in consultation with vascular surgeon for clients whose ABI is 0.49 or less as this value indicates very severe arterial compromise.
- Protect very thin legs/bony prominences from pressure by adding additional padding.
- Promptly remove the wrap and notify the Physician/NP/Wound Clinician if the client develop pain or a pale, cool or numb toes or foot, or signs and symptoms of Heart Failure.
- Discontinue use if redness, itching or deterioration of the wound occurs; notify Physician/NP/Wound Clinician.
- If using a silver wound product, e.g., Acticoat Flex3 or Acticoat Flex7, then use an interface, e.g. gauze dressing, to prevent the paste’s emulsifier from coming in contact with the silver dressing.

**Contraindications:**

- Do not use for clients with known sensitivity or allergy to zinc or other ingredients in bandage.
- Do not apply in the presence of uncontrolled heart failure.
- Do not apply in the presence of untreated lower limb skin or wound infection.

### Definitions

**Inelastic compression wrap** – A wrap made of non-stretch material such as a zinc paste impregnated gauze wrap or a short stretch wrap.

### Related Documents

- Guideline: [Application of Compression Therapy](#)
- Learning Module: [Application of Compression Therapy](#)
- Procedure: [Ankle Brachial Index for Adults using Hand Held Doppler](#)
- Procedure: [Ankle Brachial Index for Adults using Automatic ABI System](#)
**Equipment and Supplies**
- Viscopaste Bandage 7.5 cm x 6m
- Cast padding, if using
- Coban Self-Adherent wrap 10cm x 4.5m
- 2 pairs of clean gloves
- All necessary dressing supplies if needed
- Measuring tape

**Procedure**  [Link to Procedure Video]

<table>
<thead>
<tr>
<th>Steps</th>
<th>Key Points</th>
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<tbody>
<tr>
<td>Apply/rewrap in the early morning or as soon as possible after the client is out of bed for the day.</td>
<td>Edema should be minimal in the morning if the client has had their legs elevated for the night</td>
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<tr>
<td>Wash or shower leg(s) with warm water using a pH-balanced skin cleanser and dry well before wrapping.</td>
<td>To remove dead skin.</td>
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<td>Measure the ankle circumference 10 cm from the bottom of the heel; measure the calf circumference 30 cm from the bottom of the heel.</td>
<td>With the first wrap, this gives a base-line measurement of the client’s edema; with subsequent wrappings, this provides an assessment of the resolution of the edema.</td>
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<tr>
<td>If wound is present, provide wound care as per care plan and apply the appropriate cover dressing.</td>
<td>Viscopaste can be the primary dressing if the wound has a small amount of exudate.</td>
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**To Apply**

- Apply clean gloves. Support the foot off the floor and position the foot in dorsiflexion. Dorsi-flexion ensures a good walking position once the wrap is on.

**First Layer**

- **If using the Fanfold method:**
  - Start at the base of the toes, using no tension and an overlap of 50%, loosely wrap the paste bandage around the foot, heel and ankle; ensure that all areas are covered.
  - Starting above the ankle, using no tension and overlapping by 50%, with each turn up the leg, fold the bandage back upon itself just off centre of the anterior (front) aspect of the leg.
  - Repeat this process up the leg; when complete there will be a row of pleats running up the anterior aspect of the leg.
  - Stop two finger widths below the knee; cut off any excess wrap and smooth the wrap to conform to the leg.
  - Viscopaste has no elasticity so the fan-folded pleats allow the wrap to expand slightly in the presence of increasing edema.

- **If using the Spiral method:**
  - Start at the base of the toes, using no tension and an overlap of 50%, loosely wrap the paste bandage around the foot, heel and ankle; ensure that all areas are covered.
  - Starting above the ankle, using no tension and overlapping each turn up the leg by 50%, wrap the paste bandage up the leg using a spiral technique.
  - Stop two finger widths below the knee; cut off excess wrap and smooth the wrap to conform to the leg.

**Second Layer (if needed)**

- Wrap the foot/leg with cast padding in a loose spiral; secure with tape. To prevent undue pressure over bony prominence or for absorption of small amount of exudate.
**Third Layer:**
- Change gloves.
- Apply Coban Self-Adherent layer at half stretch and with a 50% overlap.
- Begin with a circular wrap at the base of the toes, starting 5th metatarsal head.
- Complete two to three figures-of-eight around the ankle to ensure the entire foot and heel are covered with at least two layers.
- Proceed up the leg using a 50% overlap and a 50% stretch of the compression wrap and stop two fingers widths below the knee.
- Cut off excess material and press lightly on the entire surface of the compression wrap to secure.

**Viscopaste residue on the gloves can interfere with adherence of the Coban Self-Adherent wrap.**

**Note:** use only Coban Self-Adherent wrap, not Coban2 or Coban2 Lite compression wraps.

**To Remove**

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<th>Effect</th>
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<td>Unwrap the wrap or cut it off with scissors (away from the ulcer location, if applicable).</td>
<td>Lift bandage away from the skin while cutting to avoid cutting the skin.</td>
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**Frequency of Wrap Change**

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<td>If ulcer present, then change wrap with each wound dressing change; if no ulcer present, then change wrap once a week unless there is slippage. Encourage client to shower legs prior to re-application of wrap.</td>
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**Client Teaching**

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<tr>
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<td>Teach client to:</td>
<td>Heart failure may develop due to the shifting of fluid back up to the heart.</td>
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<td>- Assess for shortness of breath indicating heart failure.</td>
<td>If skin shows signs of sensitivity consult with Physician/NP for patch testing.</td>
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<tr>
<td>- Monitor for wrap slippage.</td>
<td>Wrap slippage can result in a tourniquet effect leading to increased pressure and possible tissue necrosis.</td>
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<tr>
<td>- Assess for pain, numbness, tingling, discolouration or swelling of the toes indicating circulatory problems.</td>
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<tr>
<td>- Assess for itchiness due to sensitivity to zinc or other product ingredients.</td>
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<td>- Remove the wrap if any of the above occur and contact a health care provider immediately.</td>
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**Expected Outcome**

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<td>Resolved eczema or dermatitis within 2 weeks; and/or Measurable improvement in the ankle and calf measurement within 1 week.</td>
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**Documentation**

1. Document as per agency/Health Authority policy that the procedure was done.
2. Document as per agency/Health Authority policy that client teaching was done.

**References**

2. Smith & Nephew Viscopaste Product Information.
Procedure: Duke Boot for Compression Therapy

Document Creation/Review
This guideline is based on the best information available at the time it was published and relies on evidence and avoids opinion-based statements where possible. It was developed by the Provincial Nursing Skin and Wound Committee and has undergone provincial stakeholder review.

<table>
<thead>
<tr>
<th>Created By</th>
<th>British Columbia Provincial Nursing Skin and Wound Committee in collaboration with the Wound Care Clinicians from across all Health Authorities</th>
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