

SUBJECT: ANTI-EMBOLISM STOCKINGS

1. **PURPOSE:** To assist health care providers in the appropriate assessment and use of anti-embolism stockings (AES) as well as to delineate patient care requirements to minimize/eliminate risks associated with their use.

2. **POLICY:** The use of anti-embolism stockings (AES) may be indicated in the immobile/bedridden patient as a mechanical means of deep vein thrombosis (DVT)/pulmonary embolus (PE) Prophylaxis in at risk patients.

3. **PROCEDURE:** Adherence to the following assessment, use and maintenance requirements is required. By definition, anti-embolism stockings (AES) are elastic stockings, which provide between 18-25mmHg gradient pressure. Medical center use is limited to the knee-high stocking.

a. **Indications for Use:**

1. An order by a licensed independent practitioner
2. For DVT/PE Prophylaxis in the immobile/bedridden patient

3. **CONTRAINDICATIONS** for use (listed below)

- a. ___ Arterial insufficiency (including symptoms of claudication, lower extremity pain with elevation)
- b. ___ Absent peripheral pulses
- c. ___ Anatomical abnormality
- d. ___ Dermatitis
- e. ___ Loss of skin integrity
- f. ___ Massive edema of legs or pulmonary edema from CHF
- g. ___ Suspected or actual acute deep vein thrombosis
- h. ___ Lower extremity ischemia or gangrene
- i. ___ Recent vein ligation
- j. ___ Recent skin graft
- k. ___ Ambulatory patient

b. **Assessment, Care, and Maintenance:**

1. Initial assessment as noted above in "A", #1 through #3.
2. Provide patient education, emphasizing the stocking is only to be used while the patient is immobile or bedridden, and once ambulatory should be discarded.
3. Measure the patient for knee high AES only after they have been supine for at least 30 minutes.
4. Measure the extremity(ies) for the appropriate size according to the manufacturer's directions and brand being used. (The ankle is the most important measurement).

5. Assure the patient's leg is clean and completely dry prior to initial application of the stocking
 6. **SAFETY CHECK:** Apply the stockings according to nursing procedure and complete a safety check including:
 - a. ___ Heel is located in the center of the heel pocket
 - b. ___ Toes are freely mobile and the patient reports no cramping
 - c. ___ Smooth fit over sensitive areas (toes, heel, anterior foot, ankle)
 - d. ___ Knit change at the knee should be just below the popliteal fossa
 7. Reassess lower extremity circulation within 1 to 2 hours following initial application. If circulation is diminished (i.e.: toes discolored, patient reports numbness, burning sensation, etc.), remove the stockings and notify the ordering practitioner.
 8. Remove the stockings for 30-60 minutes every shift and conduct a reassessment. Particular at risk areas include the patient's toes, heels, malleolus, anterior ankle and top of the stocking (possible tourniquet effect) Once daily, wash the lower extremities and lubricate the skin. Allow the lubricant to absorb before reapplying the stockings. Powder may be used if the extremity is thoroughly dried prior to application.
 9. Discontinue and discard the stockings when the patient is ambulatory.
- c. Documentation:
1. Stocking Note: Document as a progress note the initial assessment (including peripheral pulse assessment), measurements, size applied, and education provided.
 2. Ongoing q.s. removal, assessment and hygiene is recorded on the treatment record. Discontinuation of AES is also recorded on the treatment record.
 3. Additional progress notes are required only when stockings require discontinuation due to impaired circulation, potential loss of skin integrity, or patient intolerance. Such progress notes will include provider notification.
 4. Skin breakdown associated with use of the stockings requires an incident report to be initiated.
- d. Special Notes:
1. Alternative mechanical devices effective in the prevention of DVT/PE:
 - a. Dorsal and plantar flexion of the foot at least ten times every hour while awake. Such interventions should be documented on the treatment sheet.
 - b. Progressing patients to an ambulatory status as soon as clinically and physically indicated, is one of the most effective measures for DVT/PE prevention.
 - c. Sequential compression devices (SCDs). AES are not recommended for use with SCDs. Rather, absorbent cotton stockings, or stockinette is recommended for use.
 - d. Mechanical foot pumps or compression therapy increase lower extremity peripheral blood flow
 2. Pharmacological agents effective in the prevention of DVT/PE:
 - a. Low molecular weight heparin
 - b. Warfarin
 - c. Subcutaneous heparin

3. Little Known Facts

- a. AES are not effective in treating lower extremity edema in the upright patient. Ambulatory compression stockings (Jobst) may be ordered for this purpose. A variety of gradient pressure models are available from Prosthetics and range from 20 mmHg up to 50mmHg.
- b. Treatment of orthostatic hypotension may include ambulatory compression stockings (Jobst).
- c. Ankle Brachial Index is a non-invasive test which measures the patency of lower extremity arteries. Results < 0.8 indicate arterial occlusion. Normal is from 1.0-1.2. Although there are no data to suggest a critical level for not using AES stockings, vascular advises they should not be used if the patient's ABI is < 0.8. This is the level when critical limb ischemia becomes a serious concern.

e. Patient/Family Education: Describe the purpose of the stockings before application and instruct the patient to notify the nurse immediately of any burning, tingling, numbness or pain following application. In rare situations when patients may be discharged with AES, provide a written handout and review application, maintenance, laundering, and problem reporting with the patient.

4. RESPONSIBILITY: Quality Management Officer, Network 13.

5. REFERENCES: VISN 13 Taskforce, June, 1999.

6. RESCISSIONS:

- Black Hills HCS Springhouse Nursing Procedures, Second Edition, pages 182-185 ;
- Fargo- None ;
- Minneapolis- Nursing Procedure, Hygiene-4B: "ANTI-EMBOLISM STOCKINGS", dated January, 1998;
- Sioux Falls- "Preparing the Client for Surgery", Nursing Interventions and Clinical Skills, Chapter 18, page 349; and,
- St. Cloud- "COMPRESSION THERAPY PROCEDURES", page 3, IV. TED OR ANTIEMBOLISM STOCKINGS, A-F, dated 3/19/97.

7. RESCISSION DATE: August 2001

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