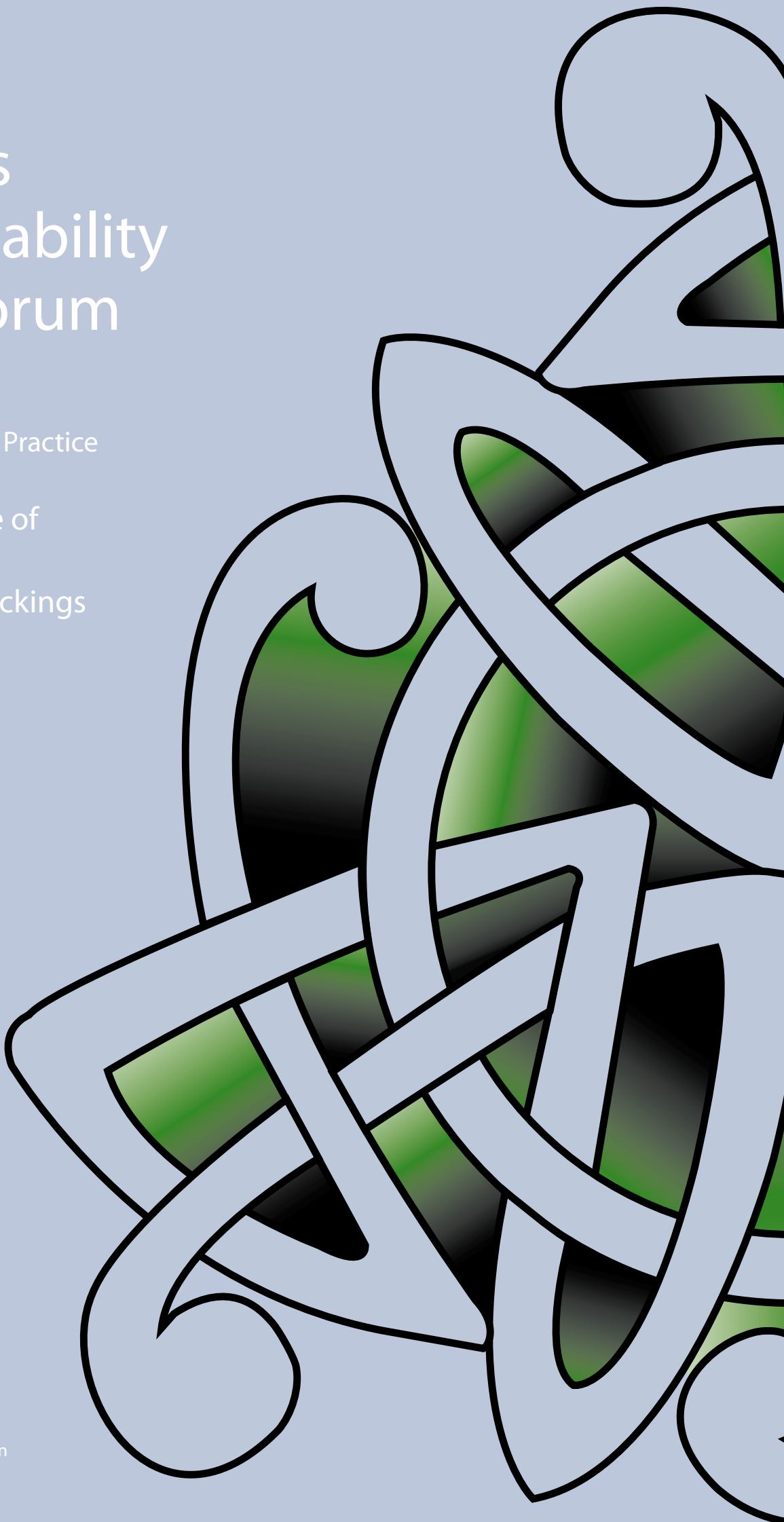
All Wales Tissue Viability Nurse Forum

Guidelines for Best Practice

The Nursing Care of Patients Wearing Anti-Embolic Stockings



IN ASSOCIATION WITH

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graduated compression

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The All Wales Tissue Viability Nurse Forum

This guideline for Best Practice has been written by Clare Morris, Tissue Viability Advisor, North Wales NHS Trust.

The guideline has been reviewed and endorsed by the All Wales Tissue Viability Forum. The All Wales Tissue Viability Forum was formed in September 2003 and following the six key principles from the Institute of Medicine (Safety; Effectiveness; Patient-centred; Timely; Efficient; Equitable) (Welsh Assembly Government, 2005), has the following aims:

1. To raise awareness of tissue viability in order to improve patient outcomes
2. To raise awareness of the impact of tissue viability in health economics
3. To promote evidence-based practice in tissue viability and influence appropriate policy across Wales
4. To be recognised by the Welsh Assembly Government as a knowledgeable and valuable resource
5. To contribute to the body of knowledge by initiating and participating in tissue viability research and audit
6. To improve patient outcomes by maintaining the links with academia and disseminating knowledge relating to tissue viability to all health-care providers
7. To work in partnership with industry in order to improve patient care
8. To provide peer support to all tissue viability nurses working in Wales.

Introduction

Deep vein thrombosis of the leg and pulmonary embolus are a significant cause of post-operative morbidity and mortality (NICE, 2007).

A Cochrane systematic review (Kolbach et al, 2004) has found that the use of elastic compression stockings is significant in the prevention of deep vein thrombosis.

Cock (2006) states that the use of anti-embolism stockings in the prevention of deep vein thrombosis for surgical patients is widely accepted as a non-invasive treatment.

Anti-embolism stockings are used prophylactically to prevent deep vein thrombosis and pulmonary embolus in vulnerable/ non-ambulatory patients.

In the mid-18th century, Virchow identified three main factors that lead to the development of deep vein thrombosis, known as Virchow's Triad (Cited by Collier, 1999):

- A change in the blood clotting mechanism
- Altered structure of the blood vessel, either from trauma or dilation of the vein
- Stasis of the blood flow.

Correctly applied, they are a safe therapy that works by assisting venous return by increasing venous blood flow velocity and preventing venous dilation.

Anti-embolism stockings can be a therapy on their own or used as an adjunct to Clexane/warfarin therapy in patients who have been clinically assessed as having a thrombotic risk.

Anti-embolism stockings are particularly important in the prevention of deep vein thrombosis in patients where anti-coagulant therapy is contra-indicated, for instance in neurosurgery. Prophylactic treatment should be started pre-operatively or as soon as the patient becomes immobile.

A recognised hazard of anti-embolism stockings, if incorrectly applied to vulnerable patients, is ulceration and skin damage particularly to the heels (Cock, 2006; Collier, 1999).

The purpose of these guidelines is to reduce this risk as Walker and Lamont (2007) recommend following their literature review:

- A local policy should be drawn up which outlines the correct use and application of anti-embolism stockings
- An assessment tool should be developed, which documents the decision made in relation to anti-embolism stocking application
- Nurses need to be aware that the incorrect fitting of anti-embolism stockings can be detrimental to the patient and that observation and continual re-assessment is required
- Patient information leaflets need to be drawn up and given to the patient on application of the stocking.

Prescribing Anti-Embolic Stockings

The application of moderate pressure to patients with impaired arterial blood supply to the legs may exacerbate arterial insufficiency and occlude blood flow.

The following is therefore recommended:

- A medical/independent practitioner must prescribe anti-embolism stockings
- It is at the discretion of the person prescribing whether knee or thigh-length stockings are prescribed. Autar (2009) concludes that clinical opinions are divided but Walker and Lamont (2007) state there is strong evidence for the use of knee-length stockings.
- It is crucial that the prescriber and practitioner responsible for measuring and applying stockings is sure that the arterial status of the patient is sufficient to allow safe compression
- Doppler ultrasound will confirm the Ankle Brachial Pressure Index (ABPI) if in doubt about arterial status.

CAUTION – seek medical advice before application for patients with:

- Known peripheral vascular disease or peripheral neuropathy
- Absent/weak foot pulses
- Slow capillary filling (pinched nail-bed that takes more than 3 seconds to return to normal colour)
- History of intermittent claudication or rest pain
- Diabetes
- Leg/foot ulceration
- Trophic skin changes (cold, pale, shiny, hairless leg)
- Fragile 'tissue paper' skin
- Leg oedema or pulmonary oedema from congestive cardiac failure (CCF)
- Cellulitis
- Heel pressure ulcers
- Known allergies to the components/materials of the stockings
- Patient is on noradrenaline

(Collier, 1999; McConnell, 2002; NICE, 2007; Wallis and Autar, 2001)

Pathway for the use of AE Stockings

Patient Care	
ACTION	RATIONALE
On Admission	
A venous thrombo-embolic risk assessment should be performed on every patient at either the pre-assessment clinic or on admission.	To identify patients at risk of venous thrombo-embolic disease in order to ascertain appropriate management.
Following medical assessment, ascertain whether the patient should wear stockings and prescribe accordingly.	Unless risk is categorised, prevention can be ineffective. AE stockings must be prescribed by a medical practitioner.
Re-assess the patient as appropriate and as the condition changes.	Patient risk status may alter during their stay and current method of prevention may be ineffective.
Identify if the patient has any cautions or contraindications prior to the application of stockings: ■ Known peripheral vascular disease or peripheral neuropathy ■ Absent/weak foot pulses ■ Slow capillary filling (pinched nail-bed that takes more than 3 seconds to return to normal colour) ■ History of intermittent claudication on rest pain ■ Diabetes ■ Leg/foot ulceration ■ Trophic skin changes (cold, pale, shiny, hairless leg) ■ Fragile 'tissue paper' skin ■ Leg oedema or pulmonary oedema from congestive cardiac failure (CCF) ■ Cellulitis ■ Heel pressure ulcers ■ Known allergies to the components/materials of the stockings ■ Patient is on noradrenaline. Document assessment on appropriate form (Appendix 1).	To reduce the risk of possible hazards associated with inappropriate application of stockings. To provide evidence of assessment.
Inform the patient of the need to wear AE stockings and give them the information leaflet (Appendix 2).	Informing the patient, including written information, can improve patient compliance.
Registered nurse to measure the patient carefully in accordance with manufacturer's instructions.	AE stockings are designed to provide 14–18mmHg at the ankle reducing to 11–14mmHg at the knee. Optimum therapeutic value is dependent upon well-fitting hosiery.
Select the correct size for the patient according to the manufacturer's instructions. Document the ankle circumference and stocking size in the care plan.	To enhance communication for subsequent practitioners.
Registered nurse to apply stockings and check limb 30 minutes after application for any tissue redness/damage and tissue perfusion.	To identify any tissue ischaemia following application of stockings.

Every Shift/8 hours	
At the beginning of each shift the patient's legs should be checked by a registered nurse to ensure that their hosiery is in place correctly (i.e. no wrinkles) and there is no pain or discomfort. All anti-embolism stocking checks should be documented on correct form (Appendix 3)	To ensure they are not acting as a tourniquet anywhere as this will increase the risk of DVT. To provide evidence of care.
Every Day	
Stockings should be worn for 23.5 hours a day. The stockings may remain off for a maximum of 30 minutes in a 24-hour period.	To allow the patient to be washed and check circulation and sensation are adequate and that the skin over pressure points is intact.
Legs should be re-measured by a registered nurse if there is any sign of oedema or swelling. If an increase in size is noted, this should be documented and hosiery re-prescribed. Report any increase in size to medical staff.	An increase in leg diameter of 5cm can double pressure applied by the stocking.
Patients who are infected and undergoing decolonisation, e.g. for MRSA, should have their stockings changed every day, as well as their linen.	To ensure effective decolonisation.
Every Three Days	
Clean stockings should be applied every three days or before if soiled.	To maintain personal hygiene.
On Discharge	
Patients must not be discharged with anti-embolism stockings unless medically indicated (NICE, 2007).	
Adapted from Policy for the prevention of venous thromboembolism, The Pennine Acute Hospitals NHS Trust, 2006	

Key criteria/summary

To ensure effective prophylaxis and safe practice:

- Anti-embolic stockings should be prescribed on the patient's prescription chart following medical assessment of risk (NICE, 2007)
- Prior to stocking application, patients should be assessed as to the suitability for stockings (NICE, 2007)
- Patient's legs should be measured prior to stocking application and the correct length and size of stockings supplied (Byrne, 2001; Maylor, 2001)
- Patients should wear stockings at all times, but they should be removed daily to observe skin condition and integrity (May et al, 2006)
- Patients should receive written information to support verbal advice (Walker and Lamont, 2008; Wallis and Autar, 2001)
- Stockings should be discontinued once normal or improved mobility has returned and the risk of deep vein thrombosis is minimal (NICE, 2007)

References

Welsh Assembly Government (2005) *Designed for Life – Creating World Class Health and Social Care for Wales*. Welsh Assembly Government, Cardiff

NICE (2007) *Venous Thrombosis: reducing the risk of venous thromboembolism (DVT or PE) in patients undergoing surgery*. NICE, London

Kolbach DN, Sandbrink MWC, Hamulyak K, Neumann HAM, Prins MH (2004) Non-pharmaceutical measures for prevention of post thrombotic syndrome. *Cochrane Database of Systematic Reviews* **Issue 1(Art No):** CD004174

Cock KA (2006) Anti-embolism stockings: are they used effectively and correctly? *Br J Nurs* **15(6; Supp):** S4–S12

Collier M (1999) Anti-embolic stockings for prevention and treatment of deep vein thrombosis. *Br J Nurs* **8(1):** 44–49

Walker L and Lamont S (2007) The use of antiembolic stockings. Part 1: a literature review. *Br J Nurs* **16(22):** 1408–12

Autar R (2009) A review of the evidence for the efficacy of anti-embolism stockings in venous thromboembolism prevention. *J Orthopaed Nurs* **13(1):** 41–49

McConnell EA (2002) Applying antiebolism stockings. *Nursing* **32(4):** 17

Wallis M, Autar R (2001) Deep vein thrombosis: clinical nursing management. *Nurs Stand* **15(18):** 47–57

Byrne B (2001) Deep vein thrombosis prophylaxis: the effectiveness and implications of using below-knee or thigh-length graduated compression stockings. *Heart Lung* **30(4):** 277–84

Maylor M E (2001) Accurate selection of compression and antiembolic hosiery. *Br J Nurs* **10(18):** 1172–84

May V, Clarke T, Coulling S et al (2006) What information patients require on graduated compression stockings. *Br J Nurs* **15(5):** 263–70

Walker L, Lamont S (2008) The use of antiembolic stockings. Part 1: a clinical audit. *Br J Nurs* **17(1):** 32–6

Bibliography

Salford Royal NHS Foundation Trust (2007) *Policy for the Prevention of Venous Thromboembolism.* Salford Royal NHS Foundation Trust

Leicestershire County and Rutland PCT (2006) *Good Practice Guidelines for the use of Antiembolic Stockings*. Leicestershire County and Rutland PCT

Birmingham East and North PCT (2006) *Policy for the Care of Patients Wearing Anti-embolic Stockings*. Birmingham East and North PCT

Kings Healthcare (2001) The use of anti-embolic stockings. Graduated compression stockings for the prevention of post-operative venous thromboembolism. *Best Pract* **5(2):** 1–5

Patient Information Leaflet – Anti-embolism Stockings. Northern Devon Healthcare NHS Trust

Protocol for the use of Anti Thrombo-embolic Stockings. Salisbury Health Care NHS Trust

Kay TWH, Martin FI (1986) Heel ulcers in patients with long-standing diabetes who wear anti-embolism stockings. *Med J Austr* **145:** 290–91

Appendix 1: Contraindications to Graduated Compression Stockings

Insert patient sticker

To be completed for all patients prior to application of anti-embolic stockings on medical direction.

Patient condition	Yes
Peripheral vascular disease	
Peripheral neuropathy	
Cellulitis	
Any local leg conditions with which the stockings would interfere, e.g. dermatitis, gangrene, skin grafts, skin lesions, gout	
Leg oedema, pulmonary oedema from congestive cardiac failure	
Extreme leg deformity	
Leg/foot ulceration	
Pressure ulcer to heel	
Known allergy to contents of stockings	
If patient refuses to wear stockings, this refusal must be documented in notes	
If ankle circumference exceeds manufacturer's recommendation	
If patient on noradrenaline, remove stockings	
Patient given stockings? Yes	No

Signature of assessor ..... Date .....

Designation .....

Appendix 2: Patient Information

When wearing stockings be aware of the following:

- How long to wear them for.
- When and how often to remove stockings.
- Washing instructions and maximum number of washes per stockings depending on manufacturer's instructions.

- Ensure correct fitting and application – do not turn the tops of stockings down as this may constrict your circulation. Ensure there is no bunching up of the stocking. If you are sitting out of bed, ensure stockings are not restricting your circulation at the knee.
- Keep stockings free from oily substances, which can damage the material.
- Stockings can be worn for up to 23½ hours, but should be removed at least once daily for inspection of legs and skin care.
- Stop wearing stockings if you have any pain, discomfort or trauma, or changes to the skin such as redness, rash or itching, and report these to a nurse immediately.
- Check your toes and foot for sensation, circulation and movement and report immediately if there are any problems, such as:
  - Discoloured toes – blue or white
  - Cold toes
  - Tingling – pins and needles in your toes
  - Swelling to your toes
- Should you have any of the above symptoms, stop wearing the stockings and report immediately to a nurse.

How to Apply

1. Insert your hand into the stocking until the seamed area is reached.
2. Grasp centre of heel pocket and turn stocking inside out to heel area.
3. Carefully position stocking over your foot and heel. Be sure your heel is located in the heel pocket.
4. Begin pulling body of stocking up and around ankle and calf.
5. Smooth out any excess material. Pull toe section forward to smooth ankle and instep area and allow toe comfort.

You may require a slip sock to help apply your stockings.

Appendix 3: Anti-Emboli Stockings Check list

Insert patient sticker

Anti-Emboli Stockings Check list					
Stockings checked each shift Sign when completed				Stockings removed for 30 mins daily	Clean stockings every third day
DATE	AM	PM	NIGHT		

This supplement has been produced with the support of an educational grant from Carolon, manufacturers of graduated compression hosiery. Carolon provide a broad range of sizes from short through to bariatric sizes and incorporate two-way stretch. Carolon's stockings are tested and certified for graduated compression from ankle through to thigh band. All Carolon stockings conform to the NICE guidelines and SIGEL profile. If you would like more information on the Carolon range of anti-embolic hosiery, email carolon@hrhealthcare.co.uk or call us on 01482 638491.