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Royal Cornwall Hospitals NHS Trust

Prevention of Deep Vein Thrombosis (DVT) and Pulmonary Emboli (PE) in Stroke Patients Using Intermittent Pneumatic Leg Compression Clinical Guideline

V3.0

November 2022

1. Aim/Purpose of this Guideline

1.1. Safe and effective use of intermittent pneumatic compression to prevent DVT and PE in stroke patients.

1.2. This version supersedes any previous versions of this document.

Data Protection Act 2018 (General Data Protection Regulation – GDPR) Legislation

The Trust has a duty under the Data Protection Act 2018 and General Data Protection Regulations 2016/679 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed, and documented. We cannot rely on opt out, it must be opt in.

Data Protection Act 2018 and General Data Protection Regulations 2016/679 is applicable to all staff; this includes those working as contractors and providers of services.

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2. The Guidance

2.1. DVT and pulmonary embolism are common and potentially avoidable causes of morbidity and mortality in hospital inpatients, including those with stroke. Next paragraph.

2.2. Current RCHT and PCH guidance (1) states that medical patients are at increased risk of VTE if they are expected to have reduced mobility relative to their normal state and have one or more of the risk factors such as age >60 years and co morbidities such as ischaemic heart disease. If they are at low risk of bleeding, then appropriate thromboprophylaxis should be prescribed.

2.3. The CLOTS study (2) demonstrated compression hosiery does not lead to reduction in DVT in stroke patients and can lead to harm.

2.4. The CLOTS3 study (3) used intermittent pneumatic compression in acute stroke patients and systematically screened for DVT using Doppler ultrasound at 1 week and 1 month post stroke. There was a significant reduction in proximal DVT from 12.1% without intermittent pneumatic compression to 8.5% with this treatment. There was a 2% decline in mortality in patients treated at 6 month follow up.

2.5. Therefore, we plan to use intermittent pneumatic compression as VTE prophylaxis at RCHT and PCH for all stroke patients.

2.6. **Inclusion criteria**

- Acute stroke as soon as possible after arrival on ward and within a maximum of 3 days post event.
- Patient unable to mobilise.

2.7. **Exclusion criteria**

- Age <16 years.
- Subarachnoid haemorrhage, subdural or extradural haemorrhage.
- Severe peripheral vascular disease (rest pain and/or tissue loss and/or absent foot pulses).
- Known or suspected acute DVT or phlebitis.
- Severe congestive cardiac failure (or any condition where an increase of fluid to the heart may be detrimental).
- Pulmonary embolism.
- Any local condition in which garments would interfere (a balance of risk and benefit would need to be considered) e.g. gangrene, leg wounds, recent skin graft, dermatitis.
- Diabetic patients with active foot lesions and/or abnormal foot anatomy.

2.8. **Procedure**

2.8.1. At RCH the Intermittent Pneumatic Compression System will be electronically prescribed by the admitting doctor after assessment of venous thromboprophylaxis risk. Using EPMA the doctor can search for **intermittent pneumatic compression boot.** The administration times are twice daily which allows nurses to check they are in place at these times.

2.8.2. Nursing staff should assess the patient's feet and legs before application (checking the warmth of the foot and capillary refill).

2.8.3. Treatment should be initiated as soon as possible after admission. Ideally patients should have thigh and calf compression on both legs, continuously day and night until they regain mobility or until a medical decision is made that mobility is unlikely to improve or until they reach 30 days post stroke.

2.8.4. However if the patient is unable to tolerate this then a variety of pragmatic choices can be made to maximise adherence to therapy: the patient can have calf compression only, can have treatment only during the day, or can have treatment on the paretic limb only. The reasons for any change should be documented in the nursing notes. All patients should have a general check of leg condition documented 3 times daily

in nursing care plan.

2.8.5. If a patient really cannot tolerate this treatment a medical decision would be required to consider alternative VTE prophylaxis. For patients with ischaemic stroke this would be low molecular weight heparin. Unfortunately, those patients with haemorrhagic stroke are at high risk of bleeding with LMWH so every effort should be made to ensure compliance with intermittent compression.

2.8.6. Anti-embolic stockings (TEDS) have been shown to be ineffective and potentially hazardous in stroke so should not be used.

2.8.7. The appropriate cuff size will be applied to both legs, as per the manufacturer's recommendation. All staff members who fit cuffs will be required to attend training.

2.8.8. The same system will be introduced to CRCH and Bodmin stroke rehab units so the cuffs will be transferred with the patients when they move.

2.9. Cautions

2.9.1. Garments should be removed immediately if patient experiences tingling or numbness or pain in leg or develops any new skin wounds or pressure damage.

2.9.2. If a patient developed a clinical DVT or PE the equipment should be removed, and the possible event investigated and managed in normal clinical fashion.

2.9.3. The garments can be removed for washing and for therapy sessions but should be re-fitted as soon as possible afterwards.

2.9.4. Thrombolysed patients – this system can be used as long as it is 24h post lysis (i.e. after the 24h CT scan), using it sooner would potentially cause leg injury due to bruising.

2.10. References

- RCHT Clinical Guideline for Thrombosis Prevention, Investigation and Management of Anticoagulation, January 2013.

- Effectiveness of thigh-length graduated compression stockings to reduce the risk of deep vein thrombosis after stroke (CLOTS trial 1): a multicentre, randomised controlled trial. Lancet 2009:373:1958-65.

- Effectiveness of intermittent pneumatic compression in reduction of risk of deep vein thrombosis in patients who have had a stroke (CLOTS 3): a multicentre randomised controlled trial. Lancet 2013.

- Effect of intermittent pneumatic compression on disability, living circumstances, quality of life, and hospital costs after stroke: secondary analyses from CLOTS 3, a randomised trial Lancet Neurology 2014.

3. Monitoring compliance and effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	• Thromboprophylaxis in patients with stroke after implementation will have a retrospective case notes audit. The EPMA system will be used as case identification as all garments will only be fitted if prescribed. • Thereafter there will be annual audit of a subset of patients • Root cause analysis of all patients who develop DVT or PE as inpatients will take place.
Lead	Dr M Maddula and Andrew McSorley
Tool	Retrospective notes audit will include correct thromboprophylaxis assessment, frequency of DVT or PE, tolerability of intervention, length of time intervention used, any complications of intervention
Frequency	Annually
Reporting arrangements	Eldercare monthly governance meeting -documented in meeting minutes.
Acting on recommendations and Lead(s)	Eldercare Governance Lead, Dr Emma Thomas and Eldercare Clinical Lead Dr Tracey Grey
Change in practice and lessons to be shared	Audit results will be fed back to medical team via weekly eldercare educational team meetings.

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Inclusion and Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Information Category	Detailed Information
Document Title:	Prevention of Deep Vein Thrombosis (DVT) and Pulmonary Emboli (PE) in Stroke Patients Using Intermittent Pneumatic Leg Compression Clinical Guideline V3.0
This document replaces (exact title of previous version):	Prevention of Deep Vein Thrombosis (DVT) and Pulmonary Emboli (PE) in Stroke Patients Using Intermittent Pneumatic Leg Compression Clinical Guideline V2.0
Date Issued/Approved:	October 2022
Date Valid From:	November 2022
Date Valid To:	November 2022
Directorate / Department responsible (author/owner):	Dr M Maddula Stroke Specialty Lead
Contact details:	01872 252447
Brief summary of contents:	Guidance re the safe and effective use of intermittent pneumatic compression to prevent DVT and PE in stroke patients.
Suggested Keywords:	• Deep Venous Thrombosis • Pulmonary Emboli • Intermittent Pneumatic Leg Compression
Target Audience:	RCHT: Yes CFT: No CIOS ICB: No
Executive Director responsible for Policy:	Chief Medical Officer
Approval route for consultation and ratification:	Eldercare Governance Group
General Manager confirming approval processes:	Johanna Floyd
Name of Governance Lead confirming approval by specialty and care group management meetings:	Paul Evangelista

Information Category	Detailed Information
Links to key external standards:	None
Related Documents:	RCHT Thrombosis Prevention and Anticoagulation Policy
Training Need Identified?	No
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet
Document Library Folder/Sub Folder:	Clinical / Stroke

Version Control Table

Date	Version Number	Summary of Changes	Changes Made by
July 2015	V1.0	Initial Issue	Dr F. Harrington Eldercare
December 2018	V2.0	No changes	Reviewed by Dr F. Harrington, Eldercare
October 2022	V3.0	No changes	Reviewed by Dr Mohana Maddula, Eldercare

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This document is to be retained for 10 years from the date of expiry.
This document is only valid on the day of printing

Controlled Document

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Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment (EIA) Form

The EIA process allows the Trust to identify where a policy or service may have a negative impact on an individual or particular group of people.

For guidance please refer to the Equality Impact Assessment Policy (available from the document library) or contact the Equality, Diversity and Inclusion Team rcht.inclusion@nhs.net

Information Category	Detailed Information
Name of the strategy / policy / proposal / service function to be assessed:	Prevention of Deep Vein Thrombosis (DVT) and Pulmonary Emboli (PE) in Stroke Patients Using Intermittent Pneumatic Leg Compression Clinical Guideline V3.0
Directorate and service area:	Elder Care and Stroke
Is this a new or existing Policy?	Existing
Name of individual completing EIA (Should be completed by an individual with a good understanding of the Service/Policy):	Dr M Maddula Stroke Lead
Contact details:	01872 252447

Information Category	Detailed Information
1. Policy Aim - Who is the Policy aimed at? (The Policy is the Strategy, Policy, Proposal or Service Change to be assessed)	Safe and effective use of intermittent pneumatic compression to prevent DVT and PE in stroke patients.
2. Policy Objectives	Safe and effective use of intermittent pneumatic compression to prevent DVT and PE in stroke patients.
3. Policy Intended Outcomes	Safe and effective use of intermittent pneumatic compression to prevent DVT and PE in stroke patients.
4. How will you measure each outcome?	Audit and root cause analysis of VTE cases.
5. Who is intended to benefit from the policy?	Stroke patients

Information Category	Detailed Information
6a. Who did you consult with? (Please select Yes or No for each category)	• Workforce: Yes • Patients/ visitors: No • Local groups/ system partners: No • External organisations: No • Other: No
6b. Please list the individuals/groups who have been consulted about this policy.	**Please record specific names of individuals/ groups:** Elder Care Governance Group Phoenix ward manager Kate Schroder and team Eldercare consultants Stroke nurse practitioner Allyson James Ward managers Stroke Rehabilitation wards and teams Denise Williams and Matt Collins CPFT Stroke Lead Lorna Geach Thrombosis Nurse Practitioner Andrew McSorley Consultant Haematologist Dr Creagh Consultant Vascular Surgeon Harvey Chant Tissue Viability Nurse Consultant Heather Newton
6c. What was the outcome of the consultation?	Ratified by Elder Care Governance Group
6d. Have you used any of the following to assist your assessment?	**National or local statistics, audits, activity reports, process maps, complaints, staff or patient surveys:** No

7. The Impact

Following consultation with key groups, has a negative impact been identified for any protected characteristic? Please note that a rationale is required for each one.

Where a negative impact is identified without rationale, the key groups will need to be consulted again.

Protected Characteristic	(Yes or No)	Rationale
Age	No	
Sex (male or female)	No	
Gender reassignment (Transgender, non-binary, gender fluid etc.)	No	

Protected Characteristic	(Yes or No)	Rationale
Race	No	
Disability (e.g. physical or cognitive impairment, mental health, long term conditions etc.)	No	
Religion or belief	No	
Marriage and civil partnership	No	
Pregnancy and maternity	No	
Sexual orientation (e.g. gay, straight, bisexual, lesbian etc.)	No	

A robust rationale must be in place for all protected characteristics. If a negative impact has been identified, please complete section 2. If no negative impact has been identified and if this is not a major service change, you can end the assessment here.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment: Dr M Maddula-Human Stroke Speciality Lead

If a negative impact has been identified above OR this is a major service change, you will need to complete section 2 of the EIA form available here:
Section 2. Full Equality Analysis