The Royal College of Emergency Medicine

Clinical Audits

EXCELLENCE IN EMERGENCY MEDICINE

VTE Risk in Lower Limb Immobilisation in Plaster Cast

2015/2016

Introduction

A significant number of patients attend emergency departments with lower limb injuries each year. Many of these are discharged with the leg immobilised, either in a plaster cast or other forms of splintage. All these patients, although their limb is immobilised, are deemed to be ambulant and the concept for prescribing thromboprophylaxis to ambulatory patients with temporary immobilisation is not a novel one.

Background

The relationship between temporary limb immobilisation and venous thromboembolism (VTE) has been documented since 1944[1] and the French and German health authorities recommend this as national practice[2]. It is reported that temporary limb immobilisation is implicated as a factor for VTE in 1.5-3% of all VTE events[3,4] but the actual incidence of VTE in patients with lower limb immobilisation is estimated to be anywhere between 5 and 39%[2].

Despite the fact that the Department of Health identified VTE prevention as a clinical priority and produced NICE guidelines on reducing the risk of VTE in patients admitted to hospital[5], these guidelines focused on the indications and use of thromboprophylaxis in inpatients and the advice for outpatient management is minimal. In relation to temporary immobilisation of lower limbs in plaster casts, the guideline states

> *"Consider offering pharmacological VTE prophylaxis to patients with lower limb plaster casts after evaluating the risks (see section 1.1) and benefits based on clinical discussion with the patient. Offer LMWH (or UFH for patients with renal failure) until lower limb plaster cast removal"(paragraph 1.6.3).*

The guideline also states that trauma patients are at increased risk of VTE if they are deemed to have a 'significant reduction in mobility' and one of the following risk factors -active cancer or cancer treatment, age over 60 years, critical care admission, dehydration, known thrombophilias, obesity (body mass index [BMI] over 30 kg/m^2), one or more significant medical comorbidities, personal history or first-degree relative with a history of VTE, use of hormone replacement therapy or

oestrogen-containing contraceptive therapy, varicose veins with phlebitis, and women who are pregnant or have given birth within the previous 6 weeks

Although the guideline focuses on inpatients it defines a 'significant reduction in mobility' as including patients who are *bedbound, unable to walk unaided or likely to spend a substantial proportion of the day in bed or in a chair*". It also includes patients undergoing day surgery stating that

> *"If the patient is expected to have significantly reduced mobility after discharge, continue pharmacological VTE prophylaxis, generally for 5–7 days".*

It could therefore be argued that all patients discharged from ED with lower limb immobilisation meet this criteria as the majority will be unable to walk 'unaided' due to their non-weight bearing status post injury and in most of these patients the reduced mobility is likely to last more than 5-7 days.

In addition to the NICE guideline, the GEMNet published a guideline for the use of thromboprophylaxis in ambulatory trauma patients requiring temporary limb immobilisation in 2012[1]. This guideline states that although there is grade A evidence to suggest a significant risk of VTE in ambulant patients with an isolated injury and temporary limb immobilisation, there is no validated prediction score to risk stratify these patients. However, it does state that ambulatory patients with lower limb injury with rigid immobilisation, non-weight bearing status and an acute severe injury (defined as dislocation, fracture of tendon rupture) are at increased risk if they also have two or more of the risk factors for VTE, outlined above.

Objectives

The object of the audit is to identify current performance in EDs against clinical standards and show the results in comparison with national results from participating sites in order to facilitate quality improvement.

The audit primarily covers domain 3 of the NHS Outcomes Framework: helping people to recover from episodes of ill health and injury.

Participation

All EDs in acute trusts/Health Boards in England, Ireland, Northern Ireland, Scotland, Wales and the Channel Islands are invited to participate. This audit will be listed in the DH (England) Quality Accounts 2015/16 which require providers in England to report on their participation in identified national clinical audits. Reports will be made available by ED and Trust/Health Board to participants.

Inclusion criteria

Patients must meet the following criteria for inclusion:

- Patients 17 years of age and above who present to an ED or an Minor Injuries Unit that is part of the ED with a lower limb injury and are discharged with temporary immobilisation of the limb using a plaster cast

Exclusion criteria

Do **not** include

- Any patient under the age of 17 years
- Patients who are admitted to a ward as an inpatient (excluding observation and short stay wards under the jurisdiction of the ED)
- Patients on warfarin, related New Oral Anticoagulants (NOACs) or heparin
- Patients with lower limbs immobilised by other means e.g. air cast boot, cricket splint etc

Sample size

RCEM recommend auditing a different number of cases depending on the number you expect to see in this period. If this is an area of concern in your ED, you are able to submit data on more cases for an in depth look at your EDs performance.

Basing the audit sample size on the number of cases in this way increases the robustness and reliability of you ED's audit results.

Expected number of cases	**Recommended audit sample**
< 50	All eligible cases
50-250	50 consecutive cases
>250	100 consecutive cases

Audited cases should be consecutive during the data collection period (1 January 2015 to 31 December 2015).

Data collection period

From 1 January 2015 to 31 December 2015.

NB: You can start the audit at any point during the data collection period, as long as you submit data for 50 consecutive cases by 31 January 2016

Data submission period

Data can be submitted online at the link below between 1 August 2015 to 31 January 2016.

https://rcem.l2s2.com

Data Sources

ED patient records (paper, electronic or both).

Standards

STANDARD	GRADE
1. If a need for thromboprophylaxis is indicated, there should be written evidence of the patient receiving or being referred for treatment.	**F**
2. Evidence that a patient information leaflet outlining the risk and need to seek medical attention if they develop symptoms for VTE has been given to all patients with temporary lower limb immobilisation.	**D**

Grade:

F = fundamental standard - mandatory requirements which providers are expected to be achieve at all times

D = developmental standard - ED should be working towards achieving these requirements in the future if not already met.

A = aspiration standard – recommended for best practice and setting longer term goals

Standard definitions

Standard 1

- The thromboprophylaxis treatment can occur at any time – it does not have to be administered before patient leaves ED.

Questions

Casemix

Q1	Date of arrival *(dd/mm/yyyy)*	dd/mm/yyyy	
Q2	Age of patient on attendance	17-40	
		41-59	
		60 and over	

Diagnosis

Q3	What was the documented diagnosis for the lower limb injury? *(tick all that apply)*	Fracture	
		Dislocation	
		Soft tissue injury	
		Sprain	
		Rupture	
		Other	
		Not recorded	

Assessment

Q4	Was a VTE risk assessment carried out in the ED prior to discharge?	Yes	
		No	
		No - reason provided	
		No – assessed at review within 24 hrs of ED attendance	
Q5	(Only answer if YES to Q4) was there any indication in the notes to show the patient's risk level of VTE?	Yes	
		No	
Q6	Are there any notes on whether or not thromboprophylaxis is indicated?	Yes – indicated	
		No – not required	
		Not recorded	

Treatment

Q7	Is there written evidence of the patient receiving or being referred for the following type(s) of thromboprophylaxis? *(tick all that apply)*	Anti-embolism stocking	
		Venous ligation	
		Intermittent pneumatic compression	
		Venous foot pump	
		Heparin	
		Thrombin inhibitors	
		Factor Xa inhibitors	

		Other – please state	
		Not recorded	
Q7a	(If OTHER to Q7) Please state		

Patient information

Q8	Was an information leaflet on the risk of VTE, symptoms and where to seek medical help provided to the patient?	Yes	
		No - reason given	
		No	
		Not recorded	

Question and answer definitions

Q3 answer definitions

IVC: inferior vena cava

LUDH: Low dose unfractionated heparin

LWMH: Low molecular weight heparin

Thrombin inhibitors: eg dabigatran, desirudin, bivilarudin, argatroban
Factor Xa inhibitors: eg (generic names) fondaparinux, rivaroxiban, apixaban, edoxaban

References

[1] Guidelines for the use of thromboprophylaxis in ambulatory trauma patients requiring temporary limb immobilisation, CEM GEMNet 2012
http://secure.collemergencymed.ac.uk/code/document.asp?ID=6656

[2] Struijk-Mulder MC, Ettema HB, Verheyen CC, Buller HR. Comparing consensus guidelines on thromboprophylaxis in orthopedic surgery. J Thromb Haemost. 2010 Apr;8(4):678-83.
http://onlinelibrary.wiley.com/doi/10.1111/j.1538-7836.2009.03728.x/abstract

[3] Bertoletti L, Righini M, Bounameaux H, Lopez-Jimenez L, Tiraferri E, Visona A, et al. Acute venous thromboembolism after non-major orthopaedic surgery or posttraumatic limb immobilisation. Findings from the RIETE registry. Thromb Haemost. 2011 Apr;105(4):739-41.

[4] Clarke AM, Winson IG. Does plaster immobilization predispose to pulmonary embolism? Injury. 1992;23(8):533-4.

[5] NICE. Venous thromboembolism: reducing the risk. NICE clinical guideline 92. London; 2010.
www.nice.org.uk/guidance/cg92