NHS Resolution

Venous thromboembolism

Advise / Resolve / Learn

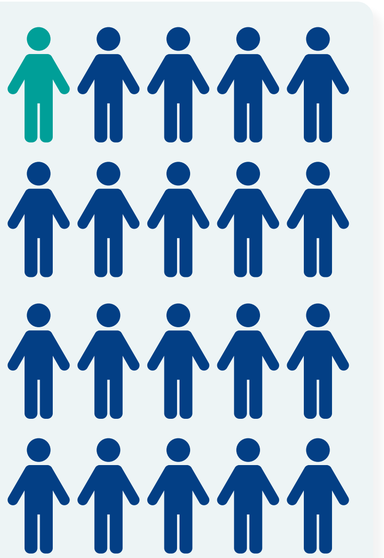
Did you know?

Venous thromboembolism (VTE), is an umbrella term for deep vein thrombosis and pulmonary embolism.

A deep vein thrombosis (DVT) occurs when a blood clot forms in a deep vein, usually in the lower leg, thigh, or pelvis. A pulmonary embolism (PE) occurs when a clot breaks loose and travels through the bloodstream to the lungs[1].

VTE is a significant cause of mortality, long-term disability and long-lasting ill-health problems – many of which are avoidable. **1** in **20** people will have a VTE at some time in their life and the risk increases with age.

It is estimated that as many as half of all cases of VTE are associated with hospitalisation for medical illness or surgery[2]. Pregnancy is alsoa VTE risk factor.[3,4].



1 in 20 people will have a VTE at some time in their life

The risk of developing VTE is highest after major surgery, a major injury or periods of immobility following hospitalisation. Swelling, redness, and pain are some of the symptoms of DVT. A PE can cause sudden chest pain and shortness of breath.

A missed or delayed DVT diagnosis may result in fatal PE. Diagnostic algorithms and risk assessments are in place to help clinicians with the diagnosis[5].

In 2022, NHS Resolution published thematic reviews looking at high value and fatality related claims in emergency departments (ED)[6] and general practice related claims[7]. VTE featured amongst the most common causes of mortality related to a missed diagnosis in ED, and established that VTE is a theme in general practice claims, emphasising the range of clinical settings.

[1] Venous Thromboembolism - What Is Venous Thromboembolism? | NHLBI, NIH

[2] https://www.e-lfh.org.uk/programmes/venous-thromboembolism/

[3] The assessment of venous thromboembolism risks associated with pregnancy and the postnatal period (hsib.org.uk)

[4] House of Commons - Health - Second Report (parliament.uk)

[5] Does This Patient Have Deep Vein Thrombosis? | Venous Thromboembolism | JAMA | JAMA Network

[6] Thematic Review 1: High value and fatality related claims (resolution.nhs.uk)

[7] CNSGP Report (resolution.nhs.uk)

Did you know?

From **1 April 2012** until **31 March 2022** NHS Resolution documented **687 closed claims** relating to VTE injuries across the clinical negligence indemnity schemes covering Clinical Negligence Scheme for Trusts (CNST) and the general practice clinical negligence schemes (Clinical Negligence Scheme for General Practice [CNSGP]/ Existing Liabilities Scheme for General Practice [ELSGP])*.

687
Claims received between 2012-2022

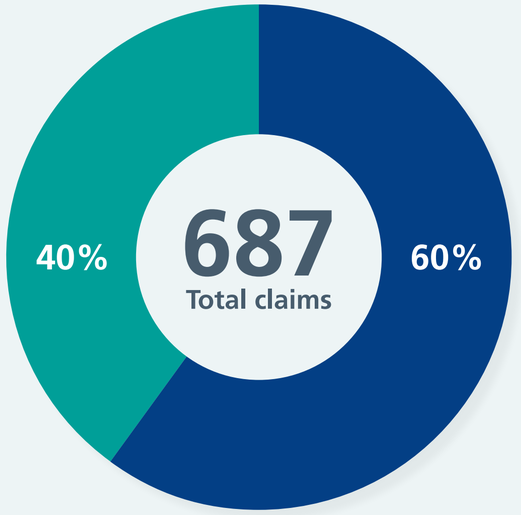
411
Claims were settled with damages paid

276
Claims were settled with no damages paid

The sum of total damages was £23,780,179

Figure 1: VTE claims outcomes

- 60% of claims were settled with damages paid
- 40% of claims were settled with no damages paid



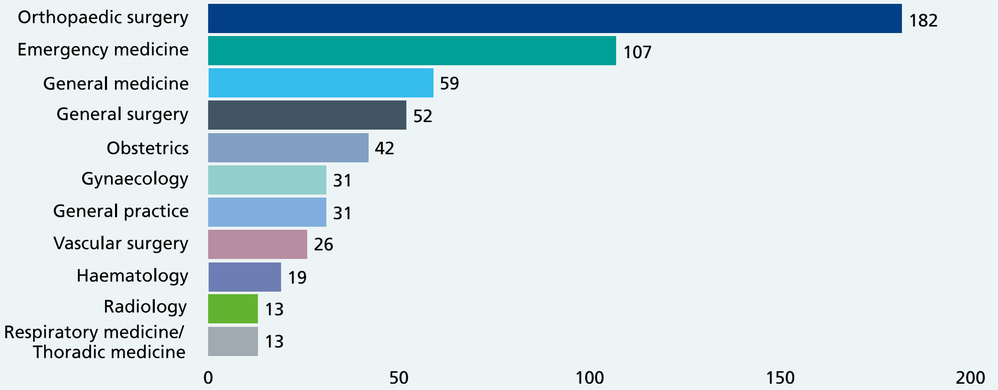
* Likely underestimation of claim volume due to delay between incident and decision to pursue a negligence claim.

Common signs and symptoms

From our analysis of VTE claims, we have not identified a specific trend in relation to specialised services generating more claims.

However, evidence suggests that surgical specialties, especially major orthopaedic surgery, are associated with a significantly higher risk of DVT and PE. Prolonged surgical times and post-surgical immobilisation times are further associated with increased risk of VTE[8]. Admission with acute medical illness can also raise VTE risk particularly when combined with immobility. Additional risk factors such as advanced age or previous VTE might add to the risk.

Figure 2: Number of VTE claims by top 10 specialties



The National Centre for Care Excellence (NICE) has developed a range of guidance[9,10,11] which covers reducing the risk of VTE and describes high-quality care in priority areas for improvement. Health Education England have produced e-learning resources to improve training and awareness of VTE[12].

In line with the NICE guidance, patient's should be risk assessed on admission to hospital and reassessed whenever the clinical situation changes.

[8] Deep Venous Thrombosis Risk Factors - StatPearls - NCBI Bookshelf (nih.gov)

[9] Overview | Venous thromboembolic diseases: diagnosis, management and thrombophilia testing | Guidance | NICE

[10] Venous thromboembolism in adults: diagnosis and management | Quality standards | NICE

[11] Overview | Venous thromboembolism in adults | Quality standards | NICE

[12] https://www.e-lfh.org.uk/programmes/venous-thromboembolism/

Common signs and symptoms

Symptom of DVT in the leg include:

- Throbbing or cramping pain in one leg (rarely both legs), usually in the calf or thigh
- Swelling in one leg (rarely both legs)
- Warm skin around the painful area
- Red or darkened skin
- Leg pain alone may be a factor to consider

Symptoms of PE include:

- Pain in the chest or upper back
- Shortness of breath
- Dry cough
- Haemoptysis (coughing up blood)

Common signs and symptoms

DVT may sometimes present with only mild symptoms and PE may present without preceding symptoms of DVT. Hence, considering the clinical probability and differential diagnosis is important in clinical practice.

It is imperative that relevant questions are asked, such as whether there is a past or family history of VTE or if there has been a recent episode of immobility due to surgery or a fracture or even medical illness. It is critical that the patients' primary concerns are fully considered prior to and during an examination.

Diagnostic tools such as the Wells score[14] or a D-dimer,[15] test should be applied after a comprehensive history, which includes consideration to family history and recent immobility and a clinical examination for signs of VTE.

When DVT is suspected, risk stratification tools such as the Wells score are used to assess clinical probability. It is important to note different criteria are listed for PE versus DVT.

DVT is considered excluded, if clinical pre-test probability is low and the D-dimer test is negative. If clinical pre-test probability is moderate or high, ultrasound imaging is performed without the need for D-dimer to be measured[15].

[14] Wells' Criteria for DVT - MDCalc
$ A D-dimer is not a reliable diagnostic test for pregnant women and therefore not used. Pregnant women with a suspected VTE are normally referred for a USS doppler of the leg or CTPA.

[15] Diagnosis of deep vein thrombosis with D-dimer adjusted to clinical probability: prospective diagnostic management study | The BMJ

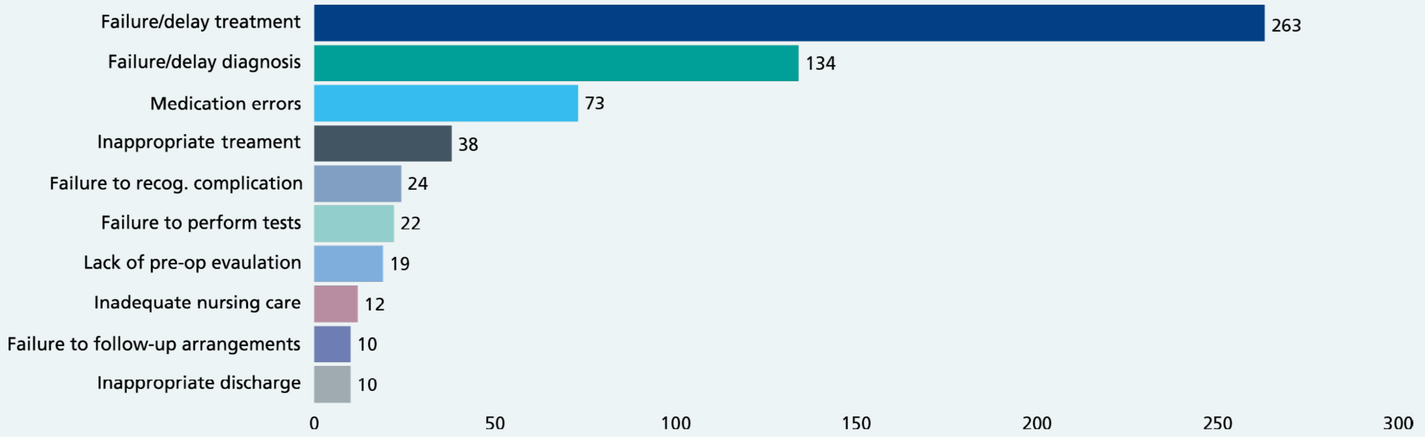
Common signs and symptoms

Of the claims received, **10.6%** were related to a medication error. This statistic correlates with the findings in NHS Resolution medication errors series, which highlighted anticoagulant medication errors[16].

Across specialities there were common medication error themes leading to VTE;

- Failure to prescribe or administer anticoagulant
- Failure to carry out a VTE risk assessment
- Incorrect dose of anticoagulant administered

Figure 3: Number of VTE claims by top 10 causes



[16] Heparin and anticoagulants - NHS Resolution

Case study

These case stories are illustrative and are based on combined examples of real events. NHS Resolution is sharing the illustrative experiences of those involved to help prevent similar events happening to patients, families and staff in the future.

As you read about this incident, please ask yourself;

- Could this happen in my organisation?
- Who could I share this with?
- What can we learn from this?

Illustrative case study 1

1. Situation

A 55 year old man presented as an ambulatory patient at ED suffering with three-week persistent lower leg swelling.

2. Background

The patient had been seen three months previously for a fractured tibia prior to this attendance at ED.

The documentation stated that the patient reported a history of minor left lower-limb swelling following the fractured tibia in a telephone call to their GP a week previously and had been told this was likely gravitational oedema following the recent fracture.

3. Assessment

In the ED, a full history was taken. The patient displayed localised tenderness along the left lower limb with around a 2cm difference in calf size from the non-affected limb. Wells score was 2.

Due to the persistent unilateral lower limb swelling and discomfort, the patient was referred for a D-dimer blood test and a Duplex ultrasound scan to rule in/out a DVT.

4. Outcome

The D-dimer was elevated and the duplex scan confirmed a left deep vein thrombosis. The patient was commenced on anticoagulants.

It was subsequently established that the previous telephone triage call documentation was sparse, with no documented detailed findings, no use of the Wells Score and no evidence of safety netting.

This was deemed to fall below an acceptable standard of care; however, causation was not proven.

Case study

Illustrative case study 2

1. Situation

A 72 year old woman was seen as a home visit after reportedly suffering a sudden onset of shortness of breath. She was unable to visit her GP practice as had under gone recent surgery to her leg.

Past medical history involved hypertension for which she took a calcium channel inhibitor, and a previous uncomplicated vaginal hysterectomy. The patient had a BMI of 30 and smoked 10/day.

2. Background

The patient had recently had a short inpatient stay and undergone leg surgery. Low molecular weight heparin prophylaxis had been administered whilst an inpatient. She and had been discharged from secondary care to home a week earlier.

During the hospital stay there had been no discussion of the risks of post-operative VTE and there was no evidence of the WHO surgical checklist[18] being documented.

The duty GP in organising the visit expressed concern about a possible pulmonary embolism.

3. Assessment

The visiting clinician assessed the patient at home and diagnosed muscular pain, related to the recent surgical incision.

They failed to consider the recent surgery and address the concerns about a possible pulmonary embolism. Instead the breathlessness was attributed to smoking and potentially undiagnosed COPD.

The patient remained at home and was told to contact the surgery if symptoms worsened.

4. Outcome

A week later the patient died at home. The autopsy report listed cause of death as a pulmonary embolism.

The subsequent claim resulted in a settlement as it was considered that assessment at home fell below a reasonable standard in failing to consider a possible VTE.

The secondary care clinician's lack of evidence documenting use of the WHO surgical checklist and lack of discussion of the possible risk of post-operative VTE fell below a reasonable standard.

[18] https://www.researchgate.net/publication/51759010_Does_using_the_WHO_surgical_checklist_improve_compliance_to_venous_thromboembolism_prophylaxis_guidelines

Recommendations

What actions can you as a clinician take?

1. Detailed clinical history, insightful questioning to draw out patient information, using key questions rather than relying upon the patient to provide and deliver that information.[17]
2. Pre-test probability of VTE to be recorded in detailed consultation notes.
3. Use of VTE risk assessment tools and reassessment to be recorded in hospital and where appropriate, post operatively in detailed consultation notes.
4. Consider use of digital text or app facility providing patients with advice and safety netting, and clinicians with assurance that patients and their families have access to recall safety netting information if they require clarification.
5. Encourage the patient to vocalise their concerns, creating a more collaborative clinician–patient relationship, leading to a patient co-creation approach to treatment options.
6. Clinicians to attend multidisciplinary training programmes supported by Royal Colleges and Health Education England programmes, with a focus on reducing diagnostic error and implementing existing national guidelines and recommendations.

[17] https://www.nice.org.uk/guidance/NG158

Acknowledgements

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