

## Search question: How to reduce the risk of blood clots for our patients?

Venous thromboembolism (VTE) is a relatively common medical problem with a yearly incidence of approximately 1 in every 1000 adults.<sup>3</sup> It is estimated that over half of hospitalized medical patients are at risk for venous thromboembolism (VTE, ie, deep vein thrombosis [DVT] and/or pulmonary embolus [PE]). In addition, it is widely believed that PE is the most common preventable cause of hospital death.<sup>1</sup>

VTE most frequently occurs in the deep veins of the legs or pelvis (a deep vein thrombosis [DVT]). If it dislodges and travels to the lungs, it is called a pulmonary embolism, which in some cases can be fatal. Hospital-acquired VTE accounts for thousands of deaths annually in the NHS, and fatal pulmonary embolism remains a common cause of in-hospital mortality. Hospital associated thrombosis (HAT) accounts for 50% to 60% of all VTE seen. In 2013 to 2014, there were around 24,700 admissions for pulmonary embolism and 19,400 for DVT in England. In 2013 in England and Wales, there were 2,191 deaths recorded as due to pulmonary embolism and 2,816 due to DVT. Treatment of non-fatal symptomatic VTE and related long-term morbidities is associated with a considerable cost to the health service.<sup>2</sup>

### Signs and symptoms

#### Deep Vein Thrombosis

BMJ Best Practice list the following signs and symptoms of DVT as including:

- Calf swelling (or, more rarely, swelling of the entire leg)
- Localised pain along the deep venous system
- Oedema
- Dilated superficial veins over the foot and leg
- Redness and warmth
- Coolness
- Blue discoloration (cyanosis).<sup>3</sup>

#### Pulmonary Embolism

BMJ Best Practice list the following signs and symptoms of PE as including:

- Dyspnoea
- Chest pain
- Signs of concurrent deep vein thrombosis
- Presence of risk factors (active cancer, Recent surgery, or hospitalisation (last 3 months), previous or current DVT, pregnancy and 6 weeks postpartum, history of immobilisation) are listed as strong risk factors
- Hypoxaemia
- Failure to meet Pulmonary Embolism Rule-out Criteria (the PERC rule)
- Positive Wells (or Geneva) score.<sup>5</sup>

### Risk Assessment

SWB Guideline states that all patients must have risk assessment for VTE on admission and again 24 hours later and on each occasion when there is a change of

clinical situation. For elective patients, VTE risk assessment should be done at the pre assessment clinic. <sup>5</sup>

The NICE Guideline says that we should assess all medical, surgical and trauma patients to identify the risk of VTE and bleeding:

- as soon as possible after admission to hospital or by the time of the first consultant review
- using a tool published by a national UK body, professional network or peer-reviewed journal. The Trust Guideline includes an assessment tool in appendix one. The suggested tool by the NICE Guideline is the Department of Health VTE risk assessment tool. <https://www.nice.org.uk/guidance/ng89/resources/department-of-health-vte-risk-assessment-tool-pdf-4787149213> . <sup>2</sup>

There are several prediction scores (including Padua prediction score, IMPROVE risk score, GENEVA risk score). These prediction scores require further validation from independent, prospective studies before they can be used in routine practice. <sup>1</sup>

### **Bleeding risk**

Balance the person's individual risk of VTE against their risk of bleeding when deciding whether to offer pharmacological thromboprophylaxis to Medical, surgical and trauma patients.

If using pharmacological VTE prophylaxis for Medical, surgical and trauma patients, start it as soon as possible and within 14 hours of admission, unless otherwise stated in the population-specific recommendations.

#### *Reassessment of risk of VTE and bleeding*

Reassess all medical, surgical and trauma patients for risk of VTE and bleeding at the point of consultant review or if their clinical condition changes. <sup>2</sup>

*High risk populations include Intensive Care patients, cancer patients, stroke patients, pregnant patients.*

Other risk factors include heart failure, myocardial infarction, age > 60 years, previous VTE, prolonged immobility ≥3 days, renal failure, obesity, inherited or acquired hypercoagulable states and Covid-19, acute respiratory failure, sepsis, inflammatory bowel disease, known thrombophilia and possibly patients with an elevated D-dimer. <sup>1</sup>

*For pregnant women and women who gave birth or had a miscarriage or termination of pregnancy in the past 6 weeks*

Assess all women on admission to hospital or a midwife-led unit if they are pregnant or gave birth, had a miscarriage or had a termination of pregnancy in the past 6 weeks, to identify their risk of VTE and bleeding. Use a tool published by a national UK body, professional network or peer-reviewed journal. The most commonly used tool is the Royal College of Obstetricians and Gynaecologists risk assessment tool. <https://www.nice.org.uk/guidance/ng89/resources/royal-college-of-obstetricians-and-gynaecologists-risk-assessment-tool-pdf-4787150509> . <sup>2</sup>

### **VTE Prophylaxis**

NICE separates interventions for each of the following groups of patients:

- [all patients](#)
- [Interventions for people with acute coronary syndromes or acute stroke or for acutely ill patients](#)
- [Interventions for people with renal impairment](#)

- [Interventions for people with cancer](#)
- [Interventions for people having palliative care](#)
- [Interventions for people admitted to critical care](#)
- [Interventions for people with psychiatric illness](#)
- [Interventions when using anaesthesia](#)
- [Interventions for people having orthopaedic surgery](#)
- [Interventions for people having elective spinal surgery or cranial surgery or people with spinal injury](#)
- [Interventions for people with major trauma](#)
- [Interventions for people having abdominal, thoracic or head and neck surgery](#)
- [Interventions for people having cardiac or vascular surgery](#)
- [Interventions for pregnant women and women who gave birth or had a miscarriage or termination of pregnancy in the past 6 weeks](#)

**UptoDate** summary separates groups into low, medium, and high-risk patients with the following recommendations.

**Low-risk patients** - For most patients hospitalized with an acute medical illness and who are without obvious risk factors for VTE (e.g., young patients admitted for a 12-hour observation following an episode of syncope from hypoglycaemia), pharmacologic thromboprophylaxis is not warranted. Options for this low-risk group include early ambulation with or without mechanical methods of thromboprophylaxis.

**Moderate-risk patients** - For most patients hospitalized with an acute medical illness, who have at least one risk factor for VTE and do not have an increased risk of bleeding, the use of pharmacologic thromboprophylaxis rather than mechanical methods or no prophylaxis is recommended. Low-molecular-weight (LMW) heparin is generally the preferred anticoagulant based upon randomized trials that suggest it is superior for preventing deep vein thrombosis (DVT). For those with renal failure (creatinine clearance <30 mL/min) or for those in whom cost is an issue, unfractionated heparin (UFH) is a reasonable alternative to LMW heparin.

**High-risk patients** - For most patients hospitalized with an acute medical illness who are at high risk for VTE (e.g., critically ill, cancer, stroke) and at low risk of bleeding, the use of pharmacologic thromboprophylaxis rather than mechanical methods or no prophylaxis is recommended. In general, we prefer LMW heparin rather than other anticoagulants, but UFH is an alternative in those with renal failure or in whom cost is an issue.

VTE prophylaxis should ideally continue until the patient is fully ambulatory or discharged from the hospital. Although extended duration prophylaxis (ie, beyond the acute hospital stay), has been shown to benefit some high-risk surgical patients. similar benefits have not been consistently observed in patients admitted for acute medical illness.

**Special populations** – Special populations of medical patients require an individualized approach to thromboprophylaxis during an acute hospitalization. These include patients with heparin-induced thrombocytopenia, patients undergoing neuraxial anaesthesia or analgesia, patients with stroke or cancer, patients who are traveling for extended periods, and patients who are pregnant. <sup>1</sup>

## Guidelines

The following SWB guidelines are available on Connect

Prevention, Management and Treatment of Venous Thromboembolism (VTE) and Pulmonary Embolism (PE) in Adult Medical and Surgical Patients

<https://connect2.swbh.nhs.uk/wp-content/uploads/2018/11/Venous-thromboembolism-and-Pulmonary-embolism-PTCARE-017.pdf?x30906> . Please note, this guideline expired in 2020.

Thromboembolic disease : deep vein thrombosis and pulmonary embolism in pregnancy and puerperium <https://connect2.swbh.nhs.uk/wp-content/uploads/2016/07/DEEP-VEIN-THROMBOSIS-AND-PULMONARY-EMBOLISM-IN-PREGNANCY-AND-PUERPERIUM-MAT082-Approved-June-20-1.pdf?x30906>

Management of Thrombolysis for Acute Stroke <https://connect2.swbh.nhs.uk/wp-content/uploads/2016/07/Thrombolysis-in-Acute-Stroke-PtCARE-126.pdf?x30906>

Management of Thromboprophylaxis in Trauma & Orthopaedics <https://connect2.swbh.nhs.uk/wp-content/uploads/2021/08/Management-of-Thromboprophylaxis-in-TO-2021.pdf?x30906>

Thromboprophylaxis in Obstetrics <https://connect2.swbh.nhs.uk/wp-content/uploads/2016/07/Thromboprophylaxis-in-Obstetrics-MAT041-SWBH.pdf?x30906>

Prevention of Peri-Operative Venous Thromboembolism (VTE) in Paediatric patient <https://connect2.swbh.nhs.uk/wp-content/uploads/2021/08/Prevention-of-Peri-Operative-Venous-Thrombo-Embolic-VTE-in-Paediatric-Patient.pdf?x30906>

#### References/Further reading:

1. UpToDate (2022) *Prevention of venous thromboembolic disease in acutely ill hospitalized medical adults*. [Online]. Waltham, MA: UpToDate. Available from: <https://bit.ly/3yBL29A> [Accessed 5 July 2022] For the full text of this review, please contact the library.
2. National Institute of Health and Care Excellence (2019). *Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism* [NICE Guideline 89]. [Online]. London: NICE. Available at: <https://www.nice.org.uk/guidance/ng89> . [Accessed 5 July 2022].
3. BMJ Best Practice (2022) *Deep Vein Thrombosis*. [Online]. London: BMJ. Available at: <https://bestpractice.bmj.com/topics/en-gb/3000112> [Accessed 6 July 2022].
4. Sandwell & West Birmingham NHS Trust (2018). *Guidelines for the Prevention and Management and Treatment of Venous Thromboembolism in Adult Medical and Surgical Patients*. [Online]. Birmingham: SWB NHS Trust. Available at: <https://connect2.swbh.nhs.uk/wp-content/uploads/2018/11/Venous-thromboembolism-and-Pulmonary-embolism-PTCARE-017.pdf?x30906> [Accessed 5 July 2022].
5. BMJ Best Practice (2022) *Pulmonary Embolism*. [Online]. London: BMJ. Available at: <https://bestpractice.bmj.com/topics/en-gb/3000115> [Accessed 6 July 2022].

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