



**Implementation Guide**  
**Venous Thromboembolism  
Prevention**  
**Clinical Care Standard**

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# Key

Throughout this guide, you will see these boxes which contain tips for implementation, case studies from hospitals and jurisdictions across the country, reflective questions and links to useful resources and tools.



## Tips for implementation

Information and recommendations based on the experience of others who have implemented the Venous Thromboembolism Prevention Clinical Care Standard



## Case study

Examples from hospitals and states and territories across Australia showing how venous thromboembolism prevention strategies have been put into practice



## Reflective questions

Questions to consider to help identify local considerations and strategies



## Helpful resources

Ideas and tools to assist with various stages of implementing the Venous Thromboembolism Prevention Clinical Care Standard

# Introduction

**Venous thromboembolism (VTE) is estimated to be one of the leading preventable causes of death in hospital,<sup>1,2</sup> with modelling estimating that pulmonary embolism (PE) accounts for 7% of all deaths in Australian hospitals every year.<sup>3,4</sup>**

VTE is fatal in 4–11% of affected patients depending on the year, type of patient and time of diagnosis.<sup>5–7</sup> In almost 25% of people affected, sudden death is the first clinical sign of PE.<sup>8,9</sup> Fatalities also occur from inappropriate use and monitoring of anticoagulants.

Despite the availability of international evidence-based best-practice guidelines for the prevention of VTE, Australian and international data suggest that a significant proportion of patients at risk of VTE do not receive care as recommended in current guidelines.

The Australian Commission on Safety and Quality in Health Care (the Commission) has developed the Venous Thromboembolism Prevention Clinical Care Standard to support high-quality care to prevent VTE in hospital and following discharge.

## Purpose of this document

This document has been produced to support the implementation of the Venous Thromboembolism Prevention Clinical Care Standard at a local level. It highlights what is known about the evidence and best practice, as well as gaps in current practice for preventing VTE. It is relevant to all those with a role in achieving high-quality care for people at risk of VTE, including clinicians, policymakers, health system managers, researchers and consumers.

## About this document

This implementation guide brings together a variety of strategies and recommendations as a starting point for implementing the Venous Thromboembolism Prevention Clinical Care Standard. It is based on published evidence where available, and consultation with consumers, clinicians, researchers and health service organisations.

Each section provides tips for implementation and examples of how VTE prevention strategies have been put into practice in hospitals and states and territories across Australia. Links to useful resources and implementation tools are included at the end of each section, with some reflective questions to help identify local considerations and strategies. A full list of useful tools and resources is also provided in Appendix A.

This document is divided into two sections:

### Section 1: Planning

This section covers the core planning activities for developing a VTE prevention implementation strategy, including:

- Establishing a case for change
- Establishing local VTE governance
- Engaging local clinicians
- Determining local VTE prevention policy
- Establishing monitoring and feedback mechanisms.

### Section 2: Implementation

This section covers the implementation activities for VTE prevention at a local level, including:

- Educating and supporting clinicians
- Involving consumers
- Establishing workflow and documentation
- Using standardised tools and resources.



#### Tips for implementation

This document should be read in conjunction with the [Venous Thromboembolism Prevention Clinical Care Standard](#).

Activities to implement the Venous Thromboembolism Prevention Clinical Care Standard should be developed with awareness of the [National Safety and Quality Health Service \(NSQHS\) Standards](#), as well as wider work to reduce hospital-acquired complications and related work such as antimicrobial stewardship, as there may be opportunities to draw inspiration from, or model, these wider activities. During consultation for this document, the Commission identified some gaps in existing arrangements for VTE prevention that form barriers to best-practice care. This guide seeks to address these common gaps. Table 1 lists gaps in existing arrangements and the section of this document that addresses them.

**Table 1: Gaps in existing arrangements for venous thromboembolism (VTE) prevention**

<b>Gaps in existing arrangements for VTE prevention</b>	<b>Find out more</b>	<b>Go to</b>
<ul style="list-style-type: none"> <li>Standardised VTE prevention frameworks within hospitals, networks and jurisdictions</li> </ul>	Establish local VTE governance	<b>Section 1.2</b>
<ul style="list-style-type: none"> <li>Agreement between clinical groups about the evidence for VTE prophylaxis and protocol-driven vs individualised clinical decision-making</li> <li>Clinical engagement in local policy development</li> </ul>	Engage local clinicians	<b>Section 1.3</b>
<ul style="list-style-type: none"> <li>Nationally or locally endorsed evidence-based policies, procedures, guidelines and assessment tools</li> <li>Policies, procedures and guidelines that are simple and easy to use</li> </ul>	Determine local VTE prevention policy	<b>Section 1.4</b>
<ul style="list-style-type: none"> <li>Data about current VTE rates</li> <li>Consistent approaches to auditing and quality improvement</li> </ul>	Establish monitoring and feedback mechanisms	<b>Section 1.5</b>
<ul style="list-style-type: none"> <li>General awareness of the importance of VTE prophylaxis</li> <li>Clinical training and understanding about assessing VTE risk, and balancing clotting and bleeding risk</li> <li>Education and information for clinicians about appropriate use of medicines for VTE prophylaxis, including newer agents</li> <li>Better communication within and between treating teams</li> </ul>	Educate and support clinicians	<b>Section 2.1</b>
<ul style="list-style-type: none"> <li>Patient involvement and education</li> </ul>	Involve consumers	<b>Section 2.2</b>
<ul style="list-style-type: none"> <li>Protocols to ensure enough time is allocated for VTE risk assessment</li> <li>Greater clarity about roles and responsibilities for VTE prevention</li> </ul>	Establish workflow and documentation	<b>Section 2.3</b>
<ul style="list-style-type: none"> <li>Simple and easy-to-access tools and resources to facilitate adherence to VTE prevention policies</li> <li>VTE tools that seamlessly integrate into workflows</li> <li>Simple and accessible decision support information at the point of care</li> </ul>	Use standardised tools and resources	<b>Section 2.4</b>

## About the Venous Thromboembolism Prevention Clinical Care Standard

The Venous Thromboembolism Prevention Clinical Care Standard addresses priority areas of the patient pathway where the need for quality improvement is greatest. The goals of the clinical care standard are to ensure that all adults presenting to hospital who are potentially at risk of hospital-acquired VTE are identified and have an assessment of VTE risk and bleeding risk that is formally documented, and that VTE prevention is appropriately prescribed and used to reduce avoidable death or disability from hospital-acquired VTE. Patients should also receive information about VTE and the risks and benefits of prevention so they can share in decisions about their care and understand how to prevent VTE.

The clinical care standard includes seven evidence-based quality statements:

### 1 Assess and document VTE risk

A patient potentially at risk of venous thromboembolism (VTE) (as determined by local hospital/unit policy) receives a timely assessment of VTE risk using a locally endorsed evidence-based tool to determine their need for VTE prevention. The result is documented at the time of the assessment, in a place that is easily accessible to all clinicians involved in the patient's care.

### 2 Develop a VTE prevention plan, balancing the risk of VTE against bleeding

A patient assessed to be at risk of VTE has a prevention plan developed that balances the risk of thrombosis against the risk and consequences of bleeding (as an adverse effect of VTE prevention medicines). Other contraindications to VTE prevention methods are also considered before offering any to the patient.

### 3 Inform and partner with patients

A patient at risk of VTE receives information and education about VTE and ways to prevent it tailored to their risk and needs, and shares in decisions regarding their VTE prevention plan.

### 4 Document and communicate the VTE prevention plan

A patient's VTE prevention plan is documented and communicated to all clinicians involved in their care.

### 5 Use appropriate VTE prevention methods

A patient requiring a VTE prevention plan is offered medicines and/or mechanical methods of VTE prevention according to a current, locally endorsed, evidence-based guideline, taking into consideration the patient's clinical condition and their preferences.

### 6 Reassess risk and monitor the patient for VTE-related complications

During hospitalisation, a patient's thrombosis and bleeding risk is reassessed and documented at intervals no longer than every seven days, whenever the patient's clinical condition or goals of care change, and on discharge from hospital. The patient is also monitored for VTE-related complications each time risk is reassessed.

### 7 Transition from hospital and ongoing care

A patient at risk of VTE following hospitalisation receives a written discharge plan or care plan before they leave hospital, which describes their ongoing, individualised care to prevent VTE following discharge. The plan is discussed with the patient before they leave hospital to ensure they understand the recommended care and follow-up that may be required. The plan is also communicated to the patient's general practitioner or ongoing clinical provider within 48 hours of discharge so that ongoing care to prevent VTE can be completed in accordance with the plan.

# Section 1:

## Planning

Appropriate use of VTE prevention methods is ranked as the top intervention hospitals can make to improve patient safety.<sup>10,11</sup> International data suggest that a national approach can reduce the rate of VTE, VTE-related admissions and VTE-related mortality of hospitalised patients.<sup>12</sup>

The scope of activities required for VTE prevention is broad because it is a hospital-wide activity affecting clinicians at every level in most clinical contexts. Each hospital, facility or network is responsible for determining and implementing a local VTE prevention policy that is appropriate for local circumstances and meets local clinical requirements.

For an implementation process to be successful, it is important that time is spent on the preparatory work. This section provides information on how to get started with implementation, including advice on stakeholder engagement, policy development and implementation overseen by a local VTE governance committee. These steps are outlined in Figure 1.

**Figure 1:** Core planning activities for developing a venous thromboembolism (VTE) prevention implementation strategy



## 1.1 Establish a case for change

For a VTE prevention program to be successful, clinicians need to understand the rationale for change. This process involves gathering information about local experience to construct a compelling case for change.

Identifying gaps in current practice will help you to understand how your service is performing in relation to the quality statements in the Venous Thromboembolism Prevention Clinical Care Standard. One way to identify gaps is by undertaking a gap analysis.

Thinking and planning for sustainability at the start of a project is also important if positive results from the initial phase are to be sustained in the long term. Features indicating that an organisation is receptive to change include strong leadership, clear vision, good management relations and effective data capture systems. In some cases, implementation strategies will need to be adapted to reflect the environmental readiness for change.

Often, both cultural and behavioural change are required. For example, for effective implementation of a risk assessment approach, its importance must be recognised by senior and junior medical staff prescribing VTE prophylaxis, as well as by nurses carrying out risk assessments, and be supported by workflow.

A good understanding of the barriers to change is important for developing effective implementation strategies. A simple way to assess the barriers to and facilitators of change in your organisational environment is to do a 'SWOT' analysis, involving the whole clinical team in identifying barriers and facilitators. SWOT stands for Strengths, Weaknesses, Opportunities and Threats, and will help to identify potential risks or issues that will affect implementation, and strategies to mitigate these risks before implementation. This information will help to inform your implementation plan and Plan-Do-Study-Act (PDSA) cycles to formally implement and sustain changes.



### Tips for implementation

Implement changes based on your local environmental assessment. Within some areas of your facility, there may be excellent examples of VTE prevention practice that are already occurring. These should be noted and celebrated. In other cases, some processes may need only slight adaptation to meet the quality statements in the Venous Thromboembolism Prevention Clinical Care Standard.

Developing a clear case for change will help to secure buy-in across the organisation. A strong case for change should incorporate local and international data to illustrate:

- The benefits to patient safety or system performance
- The risks associated with not changing
- That use of a structured risk assessment tool leads to better prescribing decisions.



## Case study

A 34-year-old female professional tore her Achilles tendon during an after-work netball game. The tendon was surgically repaired six days after the injury. She stayed overnight in a private hospital, where she received enoxaparin. Unfortunately, despite asking the surgeon explicitly, she was not prescribed any anticoagulation on discharge.

Six days post-surgery, the patient stretched her leg out straight and noticed sharp pain behind the knee. Doppler studies the next day showed three deep vein thromboses (DVTs). She was managed with oral anticoagulation for 14 weeks until the clots resolved.

As well as the impact on her life, the patient incurred high associated costs, including needing to pay for four Doppler scans, three extra appointments with the surgeon and additional medicines.

This patient was invited to join the hospital's governance committee. She has helped to review consumer fact sheets to ensure language and key messages are suitable for consumers.



## Reflective questions

- Considering the case study above, how many contributing factors can you identify? How could the patient's DVTs have been prevented?
- What is the current situation in your organisation?
- What is the desired state?
- Why are you changing? What are the consequences of not changing?
- What are the likely benefits for those who are required to change?
- Who will be affected by the change, and what impact will it have?
- What are the measures of success and what will success look like?
- What are the key barriers to and facilitators of change for your organisation?



## Helpful resources

- A standard self-assessment tool can assist teams to identify gaps in current service provision.
- Environmental readiness assessment worksheet – **see Appendix B.**
- SWOT analysis template – **see Appendix C.**
- Other quality improvement tools, such as Pareto charts, fishbone diagrams and driver diagrams, can also help to identify barriers and factors that contribute to them; a variety of quality improvement tools are available on the [NSW Clinical Excellence Commission website](#).

## 1.2 Establish local VTE governance

Local action for implementing the quality statements described in the Venous Thromboembolism Prevention Clinical Care Standard depends on a robust VTE governance system.

Implementing clinical care standards is a requirement of the [Clinical Governance Standard](#) of the [NSQHS Standards \(second edition\)](#), which requires clinicians to 'use the best available evidence, including relevant clinical care standards developed by the Australian Commission on Safety and Quality in Health Care' (Action 1.27b).<sup>13</sup>

Clinical governance for VTE prevention broadly includes development and oversight of the strategic elements of a VTE stewardship program. This includes responsibility for:

- Determining local policies, procedures and protocols that align with national and state or territory recommendations, including the Venous Thromboembolism Prevention Clinical Care Standard
- Determining local policies to ensure best-practice VTE risk assessment and management
- Identifying and engaging with key stakeholders
- Defining local clinical education and support requirements
- Monitoring the delivery of prophylaxis and care
- Undertaking quality improvement activities.

It is important to integrate the change process into existing processes and structures, and ensure it complements other safety and quality initiatives that are already taking place in the organisation. For example, linking your VTE prevention improvement project with the implementation of the NSQHS Standards may help to embed the project in the organisation's broader safety and quality plan and gain buy-in from senior management.



### Tips for implementation

When establishing local governance for VTE prevention, consider how this will fit into the pre-existing broader clinical governance framework. Some potential options include:

- Incorporating VTE prevention governance entirely into the remit of a pre-existing quality committee
- Establishing a subcommittee of a pre-existing quality committee
- Establishing an entirely new committee.

When planning how VTE prevention will be audited, consider:

- Integrating VTE prevention audits into ongoing auditing programs and processes
- Building VTE prevention audits into existing technology, such as electronic medical records.



### Case study

A major tertiary referral hospital performed an institution-wide audit of the 'rate of prescribed thromboprophylaxis and assessment of appropriateness'.

They found an overall 86% rate of appropriate thromboprophylaxis.

Inappropriate prophylaxis was due to reasons such as provision of prophylaxis with no risk factors; and suboptimal thromboprophylaxis, including underdosing of anticoagulant or lack of mechanical prophylaxis.

In response, a collaborative multi-pronged strategy was developed and implemented, including governance, clinical engagement, and ongoing data collection with audit and feedback.



### Reflective questions

- How will VTE prevention fit into the existing clinical governance framework?
- How will VTE prevention be audited?
- Who will be responsible for conducting VTE prevention audits?
- Do you have appropriate administrative and staffing support for ongoing VTE prevention governance and audits?
- What needs to happen to ensure appropriate resources?
- Which stakeholders need to be involved in VTE prevention governance to ensure success?
- Are the terms of reference of VTE prevention governance defined?
- Is there anything that could get in the way of success that needs to be managed?



### Helpful resources

Make sure your local governance committee aligns with the [NSQHS Clinical Governance Standard](#).

The [\*Hospital-Acquired Complication Fact Sheet 7: Venous thromboembolism\*](#) provides further information about clinical governance structures, quality improvement processes to support best practice in relation to VTE prevention, and how this links to the NSQHS Standards (second edition).

## 1.3 Engage local clinicians

Local clinical engagement in development of VTE prevention policy requires a collaborative approach. This means involving clinicians in decision-making about the design, planning and evaluation of activities related to VTE prevention at a local and system level.<sup>14</sup>

Local clinical engagement is required to implement all of the quality statements in the Venous Thromboembolism Prevention Clinical Care Standard, and is critical for successfully developing and implementing a local VTE prevention policy.

Evidence shows that, without local clinical engagement, change is either not sustainable or does not happen.<sup>14</sup> Achieving clinical engagement requires agreement between clinical groups about the evidence for VTE prevention and recognition that protocols are required to achieve consistency, but that there is still a role for individual clinical decision-making. Successful clinical engagement is underpinned by mutual understanding and trust.<sup>14</sup>



### Tips for implementation

Recommendations for successfully engaging clinicians in policy development include<sup>14-16</sup>:

- Involving clinicians (visibly) from the outset of the project
- Developing a common purpose with shared goals and priorities
- Ensuring involvement is rewarding and valued
- Listening to and understanding real-world concerns
- Ensuring the correct stakeholders are included and consulted
- Including multiple viewpoints from experts and people affected by the policy (if possible).

Key strategies for successful clinical engagement in implementing VTE prevention include:

- Getting buy-in from each unit head driven by a 'thrombosis interest party'
- Identifying and recruiting clinical champions, including junior doctors, who may serve as peer influencers
- Communicating and presenting the 'case for change' to drive engagement across the organisation
- Considering the role of baseline local data, with or without benchmarking, to assist with engagement
- Using co-creation methodology to define the scope of work and strategic approach to policy development and implementation.



## Case study

A private hospital convened a clinical project lead meeting with relevant surgeons and anaesthetists to facilitate agreement on a single approach for assessing VTE risk in standard-risk and high-risk patients.

They developed a simplified one-page risk assessment tool for VTE prevention in arthroplasty surgery. The protocol was endorsed by the hospital and is displayed in operating theatres to form part of the established workflow.

As a result of this engagement:

- A single anticoagulant has been agreed on for first-line use, and a standard order set has been developed in conjunction with the pharmacy department
- The protocol contains an escalation plan for complex patients
- The protocol is on display in all orthopaedic theatres and forms part of the timeout process in theatres.



## Reflective questions

- Who are the important clinical stakeholders (at all levels) who can help provide information, give endorsement, contribute to creative solutions and assist with implementation?
- How can clinical engagement in VTE prevention be meaningful and rewarding?
- How can trust and understanding be built?
- What needs to happen to ensure goals are aligned between all stakeholders?



## Helpful resources

Resources to support clinical engagement and collaboration include:

- [National Health Service \(NHS\): \*Stakeholder analysis\*](#)
- [NHS: \*Enabling collaboration by working with resistance\*](#)
- [NHS: \*Active listening\*](#)
- [The King's Fund: \*Leadership and engagement for improvement in the NHS: together we can\*](#)
- [Victorian Department of Health and Human Services: \*Clinician engagement: scoping paper\*](#).

## 1.4 Determine local VTE prevention policy

In the absence of an Australian clinical practice guideline for the prevention of VTE, each state or territory, network and facility needs to determine what evidence-based policies, procedures, guidelines and assessment tools they will use locally. In some cases, state- or territory-level policies will apply.

A local VTE prevention policy should include:

- Guidance to ensure a standardised level of care is provided that aligns with the seven quality statements from the Venous Thromboembolism Prevention Clinical Care Standard
- Information about anticoagulants as high-risk medicines, with reference to the **Medication Safety Standard** of the NSQHS Standards (2nd ed.)
- Clear escalation procedures or algorithms for complex patients
- The need for tailored VTE prevention plans according to the patient's VTE risk
- The need for ongoing monitoring and reassessment of VTE risk
- When to seek specialist advice
- Where to find further support and information
- Key roles, responsibilities and accountabilities of healthcare workers.



### Tips for implementation

- When determining local policies, it is important to take into account peak body position statements and guidelines, state- or territory-wide policies, coroners' recommendations, and local expertise.
- Ensure the policy is reviewed regularly, and is simple to use and easily accessible at the point of care.



### Case study

A 55-year-old morbidly obese man with heart failure presented to the emergency department, reporting increased breathlessness, fluid retention and difficulty walking. On admission, he was assessed as being at risk of VTE and received a low molecular weight heparin (enoxaparin, 40 mg injection) once daily for VTE prophylaxis. The resident medical officer prescribed the standard dose of enoxaparin, noting that the patient's creatinine clearance was above 30 mL/min.

The patient's symptoms and mobility improved gradually, following adjustment of his heart failure medicines. After five days, he was keen to return home and, following a review from the general medicine consultant, was discharged. Within 24 hours, the patient collapsed at home. An ambulance transported him back to the emergency department, where pulmonary embolism was diagnosed.

As part of the incident review, a haematology consultant questioned whether dose adjustment had been considered in view of the patient's obesity.

The hospital reviewed their VTE prevention policies in relation to current recommendations for obese patients. They determined that while current clinical guidelines do not recommend specific doses for obese patients, the *Therapeutic Guidelines: Cardiovascular*<sup>17</sup> provides 'Considerations for anticoagulation in obese patients', including, in some circumstances, potential dose adjustment for low molecular weight heparins according to actual body weight.

The hospital revised their local policy to state that specialist advice should be sought regarding appropriate anticoagulants and doses for VTE prophylaxis in obese people, and issued an alert to advise clinicians of the change.



## Reflective questions

- What current protocols are used in VTE risk management and prevention?
- What guidelines do clinicians use and have access to?
- What features need to be included in a VTE prevention policy to enhance good practice in your workplace?
- How will you plan for timely review of your VTE prevention policy?
- How will you ensure that your VTE prevention policy documents are current, comprehensive and effective?
- How will you ensure that your VTE prevention policy documents comply with legislation, regulation, and state or territory requirements?



## Helpful resources

The [Venous Thromboembolism Prevention Clinical Care Standard](#) provides examples of policies, guidelines and assessment tools that health service organisations can consider when developing their policies.

Local VTE prevention policies can be crosschecked with requirements for implementation of the clinical care standard and the [Medication Safety Standard](#) in the NSQHS Standards (2nd ed.).

Other guidelines to assist clinical decision-making and development of local hospital/unit policy include, but are not limited to:

- Stroke Foundation: *Clinical guidelines for stroke management*<sup>18</sup>
- Arthroplasty Society of Australia: *Guidelines for VTE prophylaxis for hip and knee arthroplasty*<sup>19</sup>
- *Therapeutic Guidelines: Cardiovascular*<sup>17</sup>
- European Society of Anaesthesiology: *European guidelines on perioperative venous thromboembolism prophylaxis*.<sup>20</sup>

## 1.5 Establish monitoring and feedback mechanisms

Monitoring and feedback are essential for identifying practice variation and improving processes and outcomes as part of a PDSA cycle. Elements of monitoring include:

- Identifying issues that need further investigation
- Determining measures and indicators
- Establishing monitoring and reporting mechanisms
- Evaluating quality improvement interventions.

Reporting of VTE-related incidents should be encouraged. Analysis of VTE-related incidents can inform future VTE risk management, and help to assess and improve policy implementation. Consider a standardised approach to investigating VTE-related incidents and reporting back to clinicians.

Data on hospital-acquired DVT, PE and haemorrhagic disorder due to circulating anticoagulants are now collected routinely as part of the hospital-acquired complications (HACs) list and can assist hospitals in tracking the success of their efforts to prevent VTE.



### Tips for implementation

- An evaluation plan should be an integral part of planning and implementation, and should be managed from the beginning of the project.
- Hospitals, networks, and states and territories are recommended to identify or develop a relevant register at local or system level that will inform system-wide improvement strategies. A system-wide requirement to report VTE-related incidents is vital.
- Assign someone the ongoing role of monitoring and reviewing the VTE prevention process.



### Case study

One hospital in a regional centre used an electronic medication management (EMM) system to audit and increase rates of prescribing of VTE prophylaxis. This was part of a broader activity to improve use of medicines across the hospital.

They found VTE risk was documented in 75% of cases of admission, and 66% were documented within 24 hours of admission.

However, they also found that VTE risk was rarely updated during hospitalisation. Further, when a 'high risk' was documented, prescribed anticoagulants were not consistent with the hospital recommendations in 19% of cases.

In response, the hospital worked to embed VTE prompts into the EMM system, and an ongoing audit system was put in place. Five years after implementation, guideline adherence had increased from 47.5% to 85.8%.



## Reflective questions

- How well established is a monitoring and feedback system in your workplace?
- What elements of VTE prevention will be most useful to measure?
- Who needs to be involved in monitoring and feedback of VTE prevention activities?



## Helpful resources

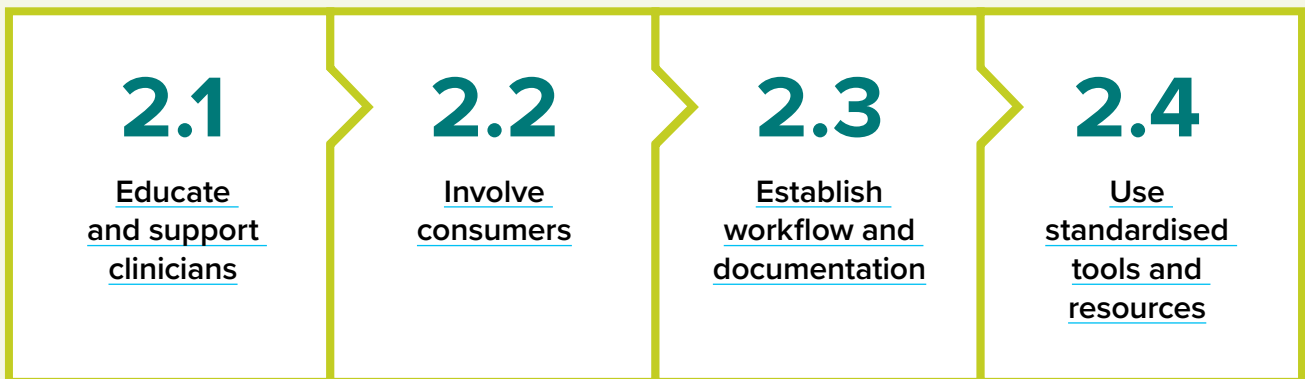
- Indicators to support monitoring and feedback have been included with some of the quality statements in the [Venous Thromboembolism Prevention Clinical Care Standard](#).
- [National Quality Use of Medicines Indicators for Australian Hospitals](#) provides extensive general advice on using indicators in health care (not just related to quality use of medicines), and is a useful source of information on principles for data collection and sampling requirements, data analysis and presenting indicator results.
- The Commission has developed guidance for hospitals on [EMM incident classification](#), including a fact sheet and a set of three tools or classification schema.
- The Commission has developed a [hospital-acquired complication fact sheet](#) on VTE to support clinicians and others to reduce the occurrence and impact of HACs.
- The specifications for [VTE HACs indicators](#) are available on the Commission's website.
- The Agency for Healthcare Research and Quality has developed [Preventing Hospital-Associated Venous Thromboembolism: A guide for effective quality improvement](#). This guide provides detailed information on new and improved metrics for tracking the adequacy of VTE prophylaxis, including 'measure-vention'.

## Section 2: Implementation

Implementing the Venous Thromboembolism Prevention Clinical Care Standard at a local level involves several key steps. Implementation activities should be undertaken with relevant partners to improve related health and medical education, and continuing professional development. Partners could include clinical colleges, professional societies, education providers and consumer organisations.

This section provides information on clinician education, consumer involvement, workflow and procedures, and standardised tools and resources. These activities are outlined in Figure 2.

**Figure 2:** Implementation activities for venous thromboembolism prevention at a local level



## 2.1 Educate and support clinicians

Clinician education is required to successfully implement all of the quality statements in the Venous Thromboembolism Prevention Clinical Care Standard. The extent of information provided should be tailored to local needs. It can be useful to survey clinicians to help identify their educational needs. In particular, the needs of junior medical officers and other junior staff should be considered and addressed.

Educational topics might include areas such as:

- Understanding the importance of VTE prophylaxis
  - Understanding the importance of taking a comprehensive medication history
  - How to conduct and document a VTE risk assessment
  - How to develop a VTE prevention plan
  - Awareness of the available anticoagulants for VTE prevention and avoiding concomitant prescribing
  - Prescribing and monitoring requirements for anticoagulants in the context of VTE risk assessment
  - Procedures for identifying, escalating and managing complex patients (for example, obese patients)
- Recognising and managing clinical deterioration related to complications such as PE or bleeding
  - How to include patients as active partners in decisions regarding VTE prevention
  - Best practice for communication within and between healthcare providers and teams to maintain safety.

Include in education materials a set of approved and endorsed VTE prevention messages that are tailored and targeted at hospital executives, managers and clinical leaders, clinicians, and consumers.

Strategies for doing this include:

- Developing compelling educational videos that bring the issue to life and incorporate the voice of the consumer, explaining the implications of VTE in their life
- Developing educational posters
- Using appropriate language and key messages in educational materials
- Developing or sourcing appropriate online training
- Providing point-of-care, real-time advice and support
- Including examples or case reports describing sentinel events in educational materials
- Conducting audit and feedback.



### Tips for implementation

Stakeholders have identified a need to increase the skills of both junior and senior hospital-based doctors and general practitioners in the following:

- Developing VTE prevention plans that balance the risks of clotting and bleeding
- VTE risk assessment when prescribing VTE prophylaxis
- Appropriate length of VTE prophylaxis on discharge from hospital
- Shared decision making with patients about use of VTE prophylaxis.



### Case study

A major tertiary referral hospital surveyed interns, junior medical officers and trainees about their knowledge of VTE prevention.

Some key results include:

- One in three were aware of current guidelines and tools for VTE prophylaxis
- Just over half felt confident doing a VTE risk assessment
- Nine in 10 felt confident prescribing anticoagulant prophylaxis, and eight in 10 felt comfortable prescribing mechanical prophylaxis
- One in three felt confident managing patients who had contraindications to VTE prophylaxis
- Two in three said they had seen incorrect use or prescription of VTE prophylaxis in the past 12 months.

The survey helped to identify educational topics for doctors in training.



### Reflective questions

- What educational gaps exist in your hospital?
- What educational resources are required?



### Helpful resources

- The NSQHS **Medication Safety Standard** provides strategies for improving medication reconciliation (Actions 4.5 and 4.6) and medication review (Action 4.10).
- A variety of resources are available on the **Commission website** to help health service organisations and clinicians identify and implement strategies to improve medication safety.
- The NSW Clinical Excellence Commission **Guide to medication reviews for NSW health services** is a resource for health service organisations and clinicians to develop processes to perform medication reviews for patients.
- Some examples of educational material are available from **the NSW Clinical Excellence Commission**.
- Decision aids that have been assessed against international standards are available at [decisionaid.ohri.ca](http://decisionaid.ohri.ca).

## 2.2 Involve consumers

Involvement of patients, families, carers and other support people is important in VTE governance and in direct patient care. It will be important to include appropriate consumers in the VTE prevention governance committee.

For direct patient care, it is important to include individual patients in decision-making about VTE prevention. This means ensuring that patients understand:

- VTE risks involved with hospitalisation and/or any procedures they may need
- Their personal risks of VTE
- Benefits and risks of VTE prevention
- How VTE prevention will be given
- How long VTE prevention needs to continue after discharge from hospital.

Patient involvement in decision-making can be facilitated using shared decision making. Shared decision making enables a clinician and patient to participate jointly in making a health decision, having discussed the options and their benefits and harms, and having considered the patient's values, preferences and circumstances. It is not a single step to be added into a consultation, but a process that can be used to guide decisions about screening, investigations and treatments.<sup>15</sup>

Patients who continue to have an elevated risk of VTE after discharge from hospital should be adequately informed about their VTE prophylaxis before discharge and provided with a written plan. It is also essential to transfer the inpatient summary and post-discharge management plan to the patient's primary care provider in a timely way (refer to quality statement 7).



### Tips for implementation

You can support consumers to take an active role in VTE prevention by:

- Involving patients in the development of their clot-prevention plan
- Providing information about VTE, how to tell if blood clots are developing and what can be done to reduce risk
- Informing at-risk patients and their families or carers before discharge about ongoing risk, their need for post-discharge prophylaxis, the clinical indicators of post-discharge VTE and where to seek urgent help if they suspect its onset
- Providing simply worded handouts to help reinforce the information discussed face to face. This is particularly important when patients are being discharged.



### Case study

A 67-year-old woman who is frail, overweight and a smoker had bowel surgery for colon cancer. According to local practice, she was discharged with a 10-day supply of self-injected enoxaparin (40 mg per day). A pre-discharge nurse education session was recorded in her hospital notes, but its content was not.

At home, the patient moved between the bed, chair and toilet but was otherwise immobile. She found the enoxaparin injections painful and stopped them after three days. A week after discharge from hospital, her left leg began to swell and she experienced left calf and thigh discomfort, which she and her family attributed to bed rest and 'sciatica'.

Four days later she was short of breath. She collapsed when she attended her general practitioner the next day, and was found to have left leg proximal DVT and extensive PE. Neither she nor her family remembers being told to look out for possible signs or symptoms of DVT and PE after she went home, or the need for urgent medical review if these occurred.



### Reflective questions

- What type of patient involvement could have helped prevent the consumer in the case study above developing a PE?
- How can patients be better involved in decisions regarding VTE prevention in your workplace?
- Are there any training requirements needed in your workplace to enhance patient involvement in decision-making?
- How are clinicians and patients supported to participate in shared decision making?
- How are patient experience and outcomes measured?



### Helpful resources

- Read more about shared decision making from the [Commission website](#).
- The Commission has developed a [VTE prevention fact sheet for consumers](#) that outlines what they can do to take an active role in their health care.
- The NSW Clinical Excellence Commission has developed an information sheet for patients and carers on [preventing blood clots](#).

## 2.3 Establish workflow and documentation

VTE prevention policy should be reflected in workflow and procedures. Incorporate VTE risk assessment and documentation into everyday practice and admission workflow. Clearly define roles and responsibilities and clinician accountability, including documentation and communication requirements.

Workflows and documentation management are both important to consider when implementing new paper or electronic tools, to reduce disruption and enhance policy adherence.<sup>16</sup> VTE tools should fit within the clinician's workflow and be built into the admission process, trigger at the right time, and link to the VTE prophylaxis prescribing process.



### Tips for implementation

Involving clinicians in developing and implementing new documentation requirements promotes empowerment and engagement, can help resolve redundancies in the system, and is an opportunity for improving workflows.<sup>16</sup>

Consider linking VTE risk assessment to the prescribing process to enable:

- Integration with medical practice and workflows
- Availability of VTE risk assessment, in addition to nursing assessments, to support decision-making by prescribers.



### Case study

One clinical unit in a tertiary hospital worked with the governance unit to map the admission process for patients presenting to the emergency department.

This has helped the unit define:

- Clinical responsibilities for VTE risk assessment and prescription for VTE prevention
- Appropriate time points in the patient journey when VTE risk assessment should occur
- Appropriate documentation in the medical record and appropriate communication between relevant staff.

As a result, the unit has been able to ensure clinical support is available at the correct points in the clinical workflow and increase adherence to the VTE prevention policy.



### Reflective questions

- How can you get clarity about the key points in the clinical workflow and patient journey where VTE risk assessment needs to occur?
- What needs to happen to ensure clinical responsibilities are clearly defined?
- Are decision support for VTE risk assessment and prescription for VTE prevention, and instructions for documentation easily accessible at the point of care?
- Who is responsible for reviewing the documentation to make improvements in VTE prevention?



### Helpful resources

The Commission maintains a suite of [national standard medication charts](#), both paper and electronic.

The Commission's *Electronic Medication Management Systems: A guide to safe implementation* provides guidance on the activities required for safe and effective EMM system implementation and use.

## 2.4 Use standardised tools and resources

Tools and resources can support standardised practice, promote adherence to policy and reduce the number of patients who develop hospital-acquired VTE. These tools and resources may be paper based or electronic, depending on the current state of implementation of the electronic medical record (EMR) in your facility. When developing tools and resources, it is important to consider:

- What tools and resources are already available in your workplace that could be optimised
- How the tools and resources will be made available at the point of care
- Whether the tool or resource should or could be paper based, electronic or both
- Ways to ensure the tools are as simple to use as possible – pilot testing may be required before rolling out any given solution.



### Tips for implementation

Specific strategies for developing electronic VTE risk assessment and prescribing tools include:

- Keeping the tool as simple and usable as possible
- Ensuring that EMR-based tools are tested and optimised by clinical users
- Making sure the VTE risk assessment and prescribing tools are visible and can be easily accessed when needed
- Considering auto-population of relevant fields if the information has been documented elsewhere in the EMR, to minimise re-entering information
- Embedding VTE risk assessment tools into the admission process
- Using standardised prescribing or medication orders (such as PowerPlans or order sets) that include recommended options for VTE prophylaxis.



### Case study

One tertiary hospital found that the rate of VTE risk assessment dropped substantially after implementation of EMR. They identified that the hospital medical officers were used to the paper system, and the risk assessment tool was not easily visible on the electronic system.

The 'thrombosis interest party' at the hospital incorporated IT changes with the software provider to fire an alert on the patient's EMR about the need for assessment and prophylaxis within 24 hours of admission, and again at least once per week because the risk is dynamic.

Following the EMR optimisation, an audit showed that the rate of prophylaxis went back up to 80–85% across the board.



### Reflective questions

- What tools and resources are currently available?
- How are tools and resources used to improve quality of care in your workplace?
- What tools and resources require further development to support VTE prevention?
- Who needs to be involved in the development of tools and resources?



### Helpful resources

The Commission has developed the following [VTE prophylaxis tools and resources](#):

- Instructions on how to use the National Inpatient Medication Chart (NIMC) VTE prophylaxis section
- Auditing and reporting tools.

Other VTE risk assessment tools are:

- [Caprini DVT risk assessment model for use in hospitalised surgical patients](#)
- [NSW Clinical Excellence Commission: Adult VTE Risk Assessment Tool](#)
- [NSW Clinical Excellence Commission: Maternal VTE Risk Assessment tool](#)
- [The IMPROVE tool](#)
- [The Intermountain score](#)
- [The Kucher score](#)
- [Padua risk assessment model for use in medical patients](#)
- [Parvizi individualised risk model for VTE after total joint arthroplasty \(available on the App Store for iPhone and iPad only\)](#)
- [Queensland Health: Adult venous thromboembolism \(VTE\) risk assessment tool](#)
- [Rogers score: The Patient Safety in Surgery Study.](#)

A summary of the types of tools and resources used in Australian hospitals is available in [Appendix D](#).

# Beyond implementation

**Implementation of the Venous Thromboembolism Prevention Clinical Care Standard can help clinicians and health service organisations to deliver high-quality care to prevent VTE acquired in hospital and following hospital discharge. The implementation tips and case studies gleaned from local efforts can inform improvement in this vital area.**

Several key elements are required to achieve meaningful improvement in VTE prevention. These include effective governance, buy-in from key stakeholders across the organisation, ongoing monitoring and feedback processes, education for clinicians and consumers, and a standardised approach to risk assessment and documentation.

To ensure that improvement in VTE prevention is sustained, the changes made through this implementation process need to be continuously monitored, improved and adapted to address both internal and external pressures.

While this implementation guide is targeted at health service organisations implementing the clinical care standard, a consistent national approach to VTE prevention requires coordination of action at many levels of the healthcare system. As well as the important role of state and territory departments of health, there is a need for clinical colleges and societies, medical and nursing educators, and peak organisations to ensure competence and skills in VTE prevention.

The development of resources related to VTE prevention is critical and could include:

- An endorsed national clinical practice guideline and VTE risk assessment tools covering the full scope of VTE prevention in patients admitted to hospital
- Patient education tools, posters and multimedia resources
- Online learning for different clinician groups relevant to their needs.

A coordinated and consistent approach to improving awareness, skills, policies, and information available to consumers, clinicians, health service organisations and systems has significant potential benefits for improving patient care and reducing rates of this significant, often avoidable, adverse event.

# Appendices

## Appendix A: Resources

### Published venous thromboembolism (VTE) prophylaxis guidelines

- [Agency for Healthcare Research and Quality: Preventing hospital-associated venous thromboembolism](#)
- [American Academy of Orthopaedic Surgeons: Preventing venous thromboembolic disease in patients undergoing elective hip and knee arthroplasty](#)
- [American College of Chest Physicians \(ACCP\): Prevention of VTE in nonorthopedic surgical patients](#)
- [ACCP: Prevention of VTE in nonsurgical patients](#)
- [ACCP: Prevention of VTE in orthopedic surgery patients](#)
- [American College of Physicians: Venous thromboembolism prophylaxis in hospitalized patients](#)
- [American Society of Hematology \(ASH\): American Society of Hematology 2019 guidelines for management of venous thromboembolism: prevention of venous thromboembolism in surgical hospitalized patients](#)
- [Arthroplasty Society of Australia: Guidelines for VTE prophylaxis for hip and knee arthroplasty](#)
- [ASH: American Society of Hematology 2018 guidelines for management of venous thromboembolism: prophylaxis for hospitalized and nonhospitalized medical patients](#)
- [European Society of Anaesthesiology: European guidelines on perioperative venous thromboembolism prophylaxis](#)
- [National Institute for Health and Care Excellence \(NICE\): Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism](#)
- [NICE: Venous thromboembolism in adults: reducing the risk in hospital](#)
- [Queensland Health: Guideline for the prevention of venous thromboembolism \(VTE\) in adult hospitalised patients](#)
- [Royal College of Obstetricians and Gynaecologists: Reducing the risk of venous thromboembolism during pregnancy and the puerperium](#)
- [Scottish Intercollegiate Guidelines Network: Prevention and management of venous thromboembolism](#)
- [Stroke Foundation: Clinical guidelines for stroke management](#)

### VTE risk assessment tools

- [Caprini DVT risk assessment model for use in hospitalised surgical patients](#)
- [NSW Clinical Excellence Commission: Adult venous thromboembolism \(VTE\) risk assessment tool](#)
- [NSW Clinical Excellence Commission: Maternal venous thromboembolism \(VTE\) risk assessment tool](#)
- [The IMPROVE tool](#)
- [The Intermountain score](#)
- [The Kucher score](#)
- [Padua risk assessment model for use in medical patients](#)
- [Parvizi individualised risk model for VTE after total joint arthroplasty \(available on the App Store for iPhone and iPad only\)](#)
- [Queensland Health: Adult venous thromboembolism \(VTE\) risk assessment tool](#)
- [Rogers score: The Patient Safety in Surgery Study \(page 1219\)](#)

## Other resources

- [Australian Commission on Safety and Quality in Health Care \(ACSQHC\): Venous thromboembolism \(VTE\) prophylaxis resources and tools](#)
- [ACSQHC: Venous thromboembolism \(VTE\) prophylaxis section of hospital medication charts](#)
- [ACSQHC: Medication safety self-assessment tools, including for antithrombotic therapy](#)

## Clinical engagement

- [National Health Service \(NHS\): Stakeholder analysis](#)
- [NHS: Enabling collaboration by working with resistance](#)
- [NHS: Active listening](#)
- [The King's Fund: Leadership and engagement for improvement in the NHS: together we can](#)
- [Victorian Department of Health and Human Services: Clinician engagement: scoping paper](#)

## Appendix B: Environmental readiness assessment worksheet

Element	Question	Facilitators	Barriers	Actions
Structure	To what extent does decision-making occur in a decentralised manner?			
	Are there enough staff to support the change process?			
Workplace culture	To what extent are the seven quality statements in the Venous Thromboembolism Prevention Clinical Care Standard consistent with the values, attitudes and beliefs of the workplace?			
	To what degree does the culture support change and value evidence?			
Leadership	To what extent do the leaders within the organisation support implementation (both visibly and behind the scenes)?			
Knowledge, skills and attitudes of target group	Do the staff have the necessary knowledge and skills?			
	Which group is most open to change and new ideas?			
	To what extent are staff motivated to implement the Venous Thromboembolism Prevention Clinical Care Standard?			
Commitment to quality	Do quality improvement processes and systems exist to support measurement of progress and results of implementation?			
Availability of resources	Are the necessary human, physical and financial resources available to support implementation?			
Interdisciplinary relations	Are there positive relationships and trust between the disciplines that will be involved or affected by implementation?			

## Appendix C: SWOT analysis template

### Strengths

### Opportunities

### Weaknesses

### Threats

### Appendix D: Summary of the types of tools and resources that may be required for venous thromboembolism (VTE) prevention in Australian hospitals

Tools and resources	Quality statement	No activity to implement	Considered, but not implemented	Partially implemented in some or all areas	Fully implemented in some areas	Fully implemented throughout	Next steps
Protocol for risk assessment and documentation	1, 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
VTE risk assessment tool	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Protocol to guide decision-making, including need for escalation in complex patients	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Education tools for clinicians	All	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Education tools for patients	3, 7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Policy for use of anticoagulation (high-risk medicines)	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Clinical pathways that prompt reassessment	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Protocols for communication on discharge	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Audit tools	All	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

# Glossary

**anticoagulants:** Medicines that reduce the blood's tendency to clot on the venous side of the circulation, and therefore are used to manage or prevent venous thrombosis (clots made of fibrin).

**assessment:** A clinician's evaluation of the disease or condition based on the patient's report of symptoms and course of the illness or condition, on information reported by family members, carers and other healthcare team members, and on the clinician's objective findings.<sup>21</sup>

**best available evidence:** The best systematic research evidence available, which is used to support decisions about the care of individual patients.

**clinician:** A trained health professional who provides direct clinical care to patients. Clinicians include doctors, nurses, midwives, allied health professionals, nurses' assistants, Aboriginal health workers and all other people who provide healthcare services.<sup>13,22</sup>

**co-creation methodology:** Co-creation extends beyond consultation with or participation of consumers. It is the process of integrating consumers and stakeholders into the processes of policy and service design so that their unique perspectives drive value for both the health service organisation and the consumer.

**deep vein thrombosis (DVT):** Blockage in the deep veins of the legs, thighs or pelvis, caused by the clotting of blood.

**evidence-based (or best-practice) guideline:** A set of recommended actions that are developed using the best available evidence, which are used to achieve the best outcomes for a patient.<sup>23</sup>

**health service organisation:** A service responsible for the clinical governance, administration and financial management of unit(s) providing health care.<sup>13</sup>

**high-risk medicine:** A medicine that has a high risk of causing significant patient harm or death if used incorrectly.<sup>22</sup>

**hospital:** A licensed facility providing healthcare services to patients for short periods of acute illness, injury or recovery.<sup>24</sup>

**hospital-acquired VTE:** All VTE that occurs in hospital and for 90 days after a hospital admission.<sup>25</sup>

**measure-vention:** A method of active surveillance to identify measures that can drive concurrent intervention to address deficits in prophylaxis in real time.<sup>26</sup>

**mechanical prophylaxis:** A physical agent that is used to prevent thrombosis. Mechanical methods of VTE prophylaxis include: graduated compression stockings (GCS), intermittent pneumatic compression (IPC) and foot impulse technology (FIT).<sup>25</sup>

**medical record:** Paper or electronic and includes the My Health Record.

**medicine:** A chemical substance given with the intention of preventing, diagnosing, curing, controlling or alleviating disease, or otherwise improving the physical or mental wellbeing of people.<sup>13</sup>

**PDSA:** The Plan-Do-Study-Act (PDSA) method is a way to test a change that is implemented. Going through the prescribed four steps guides the thinking process into breaking down the task into steps and then evaluating the outcome, improving on it and testing again.<sup>27</sup>

**prevention:** Care that is provided to reduce the risk of developing VTE.

**prophylaxis:** A measure taken for the prevention of a disease.<sup>25</sup>

**pulmonary embolism (PE):** A blood clot that breaks off from the deep veins and travels round the circulation to block the arteries in the lung (pulmonary arteries).<sup>25</sup>

**quality improvement:** The combined efforts of the workforce and others – including consumers, patients and their families, researchers, planners and educators – to make changes that will lead to better patient outcomes (health), better system performance (care) and better professional development.

**risk assessment:** Assessment, analysis and management of risks. It involves recognising which events may lead to harm in the future, and minimising their likelihood and consequence.<sup>13</sup>

**risk factor:** A characteristic, condition or behaviour that increases the possibility of disease, injury or loss of wellbeing.<sup>28</sup>

**shared decision making:** A consultation process in which a clinician and a patient jointly participate in making a health decision, having discussed the options and their benefits and harms, and having considered the patient's values, preferences and circumstances.<sup>13</sup>

**SWOT analysis:** A study undertaken by an organisation to identify its internal strengths and weaknesses, as well as its external opportunities and threats.

**system:** The resources, policies, processes and procedures that are organised, integrated, regulated and administered to provide health care.<sup>13</sup>

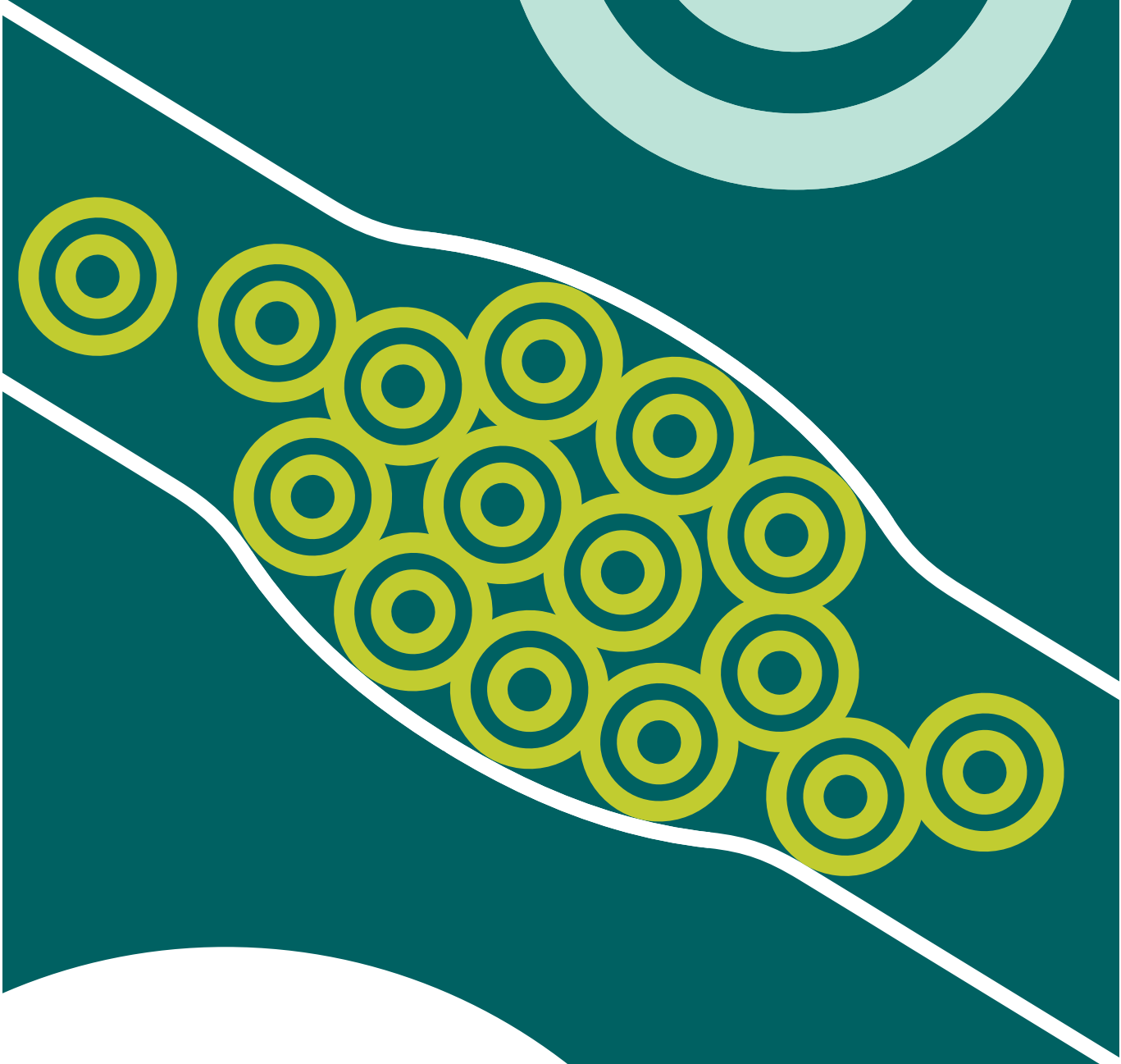
**thrombosis:** The formation of a blood clot in a blood vessel.

**venous thromboembolism (VTE):** The blocking of a blood vessel by a clot that has broken away from its site of origin. It includes both DVT and PE.<sup>25</sup>

**VTE-related complications:** Bleeding, thrombosis and adverse events related to the use or misuse of VTE prophylaxis.

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