AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

Clinical Care Standards

Venous Thromboembolism Prevention Clinical Care Standard

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The Australian Commission on Safety and Quality in Health Care has produced this clinical care standard to support the delivery of appropriate care for a defined condition. The clinical care standard is based on the best evidence available at the time of development. Healthcare professionals are advised to use clinical discretion and consideration of the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian, when applying information contained within the clinical care standard. Consumers should use the clinical care standard as a guide to inform discussions with their healthcare professionals about the applicability of the clinical care standard to their individual condition.

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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.

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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.

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

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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.

About the clinical care standards

Clinical care standards aim to support the delivery of appropriate evidence-based clinical care, and promote shared decision making between patients, carers and clinicians.

A clinical care standard contains a small number of quality statements that describe the clinical care a patient should be offered for a specific clinical condition. Many of the quality statements are linked to indicators that can be used by health service organisations to monitor how well they are implementing the care recommended in the clinical care standard.

A clinical care standard differs from, and is therefore not intended to be, a clinical practice guideline. Rather than describing all the components of care recommended for managing a clinical condition, a clinical care standard addresses priority areas of the patient pathway where the need for quality improvement is greatest.

Clinicians are advised to use clinical judgement and consider an individual patient's circumstances, in consultation with the patient and/or their carer or guardian, when applying the information in the clinical care standard. Health service organisations are also responsible for ensuring local policies, processes, and protocols to guide clinical practice are in place, so that clinicians can apply the information described in the clinical care standard and to enable clinicians and health service organisations to monitor the delivery of appropriate care.

Clinical care standards intend to support key groups of people in the healthcare system by:

- Educating the public about the care that should be offered by the healthcare system, and helping them to make informed treatment decisions in partnership with their clinicians
- Providing clear information to clinicians to assist making decisions about appropriate care
- Outlining the systems required by health service organisations so that they are better able to examine their performance and make improvements in the care that they provide.

This *Venous Thromboembolism Prevention Clinical Care Standard* was developed by the Australian Commission on Safety and Quality in Health Care (the Commission) in collaboration with consumers, clinicians, researchers and health service organisations. It complements existing efforts, including state and territory-based initiatives, which support the prevention of hospital-acquired venous thromboembolism (HA-VTE) in hospital and follow-up care in the community.

For more information about the development of this clinical care standard visit **www.safetyandquality.gov.au/ccs**.

Introduction

Context

Venous thromboembolism (VTE) is a potentially preventable disease that includes deep vein thrombosis (DVT) and pulmonary embolism (PE). It can result in complications such as post-thrombotic syndrome, pulmonary hypertension, recurrent thrombosis, or death. In DVT a blood clot usually forms in the deep veins of the calf, thigh, or pelvis which may or may not cause symptoms such as swelling, redness or pain. In some people, clots resolve spontaneously, however there is a risk that some or all of the clot may break away and travel to the lungs, resulting in PE. This can cause respiratory symptoms, heart failure or death.

Anyone can develop VTE and many risk factors have been identified.[2–11] Hospitalisation is a major risk factor with bed rest, dehydration, and vascular injury from surgery or trauma contributing to this. About 50%–75% of people admitted to hospital have at least one other risk factor for VTE, while 40% have three or more.[2,12] Hospitalised patients are more likely to develop VTE during or shortly after their hospital stay compared to those in the community.[13] Community studies of incidence and modelling of health care statistics have shown that up to 75% of all VTE in both medical and surgical patients occur as a result of hospitalisation, and up to half are not diagnosed until days, weeks, or in some instances, up to three months following discharge from hospital.[13–15]

While the precise number of people affected each year is unknown, estimates suggest that symptomatic VTE affects about 1 per 1,000 Australians per year.[16,17] It is estimated to be one of the leading preventable causes of death in hospital[18,19], with modelling of healthcare statistics showing that PE accounts for 7% of all deaths in Australian hospitals every year.[20,21] In almost 25% of people affected, sudden death is the first clinical sign of PE.[14,22]

Death resulting from VTE acquired in hospital (also referred to as hospital-acquired VTE) is considered potentially preventable if effective VTE prevention methods during and after hospitalisation are in place.[23] Currently this is the only approach likely to reduce deaths from PE and disease burden from VTE. In fact, appropriate use of VTE prevention methods is ranked as the top intervention hospitals can make to improve patient safety[24,25], and international statistics suggest a national approach can reduce the rate of VTE, VTE-related admissions, and VTE-related mortality of hospitalised patients.[26]

Randomised trials show VTE prevention methods (typically risk assessment followed by appropriate initiation of pharmacological and/or mechanical methods), reduce development of symptomatic VTE by 55% to 70% in a broad range of medical or surgical patients.[4,5,8,27,28] It is well known that these methods differ in their balance of effectiveness and safety, depending on a patient's health and their surgical or medical condition. The method of prevention chosen needs to reflect this balance and respect a patient's wishes.

Nevertheless, despite the availability of international evidence-based best-practice guidelines for the prevention of VTE, data from Australia and internationally suggest that a significant proportion of patients at risk of VTE do not receive care as recommended in current guidelines.[29–31]

In a recent Australian report, only 44% of surveyed clinical units reported assessing patients for VTE risk on admission to hospital using a standardised risk-assessment tool. Furthermore only 74% of those assessed to be at risk were offered VTE prevention based on the results of their risk assessment.[1]

This gap between guideline recommendations and practice has prompted multiple calls to action to increase awareness about hospital-acquired VTE.[23,32–34] There is an urgent need to develop and implement service wide policies to guide clinicians in the systematic identification of patients at risk of VTE and the provision of appropriate VTE prevention, to reduce the burden of this condition.

Why this clinical care standard is needed

This clinical care standard aims to support clinicians and health services implement the delivery of high-quality care to prevent VTE acquired in hospital and following hospital discharge, by ensuring that patients who present to hospital with risk factors for developing VTE:

- Are identified using a timely VTE risk assessment
- Are assessed for bleeding risk
- Have these risks formally documented as per local hospital/unit policy
- Are informed about VTE and share in decisions about their care and ways to prevent VTE
- Are prescribed appropriate VTE prevention methods
- Have their VTE risk regularly reviewed while in hospital
- Have their VTE risk and VTE prevention plan communicated to their ongoing clinical provider following discharge from hospital.

Evidence sources that underpin this clinical care standard

Note: As there is no current Australian clinical practice guideline for the prevention of VTE acquired in hospital, the *Venous Thromboembolism Prevention Clinical Care Standard* provides information from international guidelines and other high-quality sources to support clinical decision-making and local development of evidence-based policies and procedures. It is not intended to be a clinical practice guideline.

Key evidence sources that underpin the *Venous Thromboembolism Prevention Clinical Care Standard* are current clinical guidelines from the United Kingdom's National Institute for Health and Care Excellence (NICE)[27,35], the Scottish Intercollegiate Guidelines Network (SIGN)[10], the American College of Chest Physicians (ACCP)[4,5,8,36], the American Academy of Orthopaedic Surgeons (AAOS)[37], the American College of Physicians (ACP)[38], and the Royal College of Obstetrics and Gynaecology (RCOG).[39] Other resources include the Agency for Healthcare Research and Quality (AHRQ) Quality Improvement Guide[34], and the VTE prevention framework developed by the NSW Clinical Excellence Commission (CEC).[33]

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 (2017)[40]
- Arthroplasty Society of Australia: VTE guidelines for hip and knee arthroplasty (2018)[41]
- Therapeutic Guidelines: Cardiology (2012)[42]
- European guidelines on perioperative venous thromboembolism prophylaxis (2017)[43]

Goal of this clinical care standard

To reduce avoidable death or disability caused by hospital-acquired VTE through improved identification of patients who are at risk, assessment of VTE and bleeding risk, and appropriate use of VTE prevention methods. Patients should also receive information about VTE and the risks and benefits of prevention so they can share in decisions with their clinicians both in and out of hospital about their care and ways to prevent VTE.

Scope of this clinical care standard

Patients

The *Venous Thromboembolism Prevention Clinical Care Standard* relates to the care that patients aged 18 years and over should receive to reduce their risk of developing hospital-acquired VTE both in hospital and following discharge. It applies to those who are:

- Admitted to a hospital ward or unit within the preceding 24 hours[44]
- Admitted to a day procedure service with significantly reduced mobility compared to their normal state, or require prolonged anaesthesia, or have multiple risk factors for developing VTE[44]
- Discharged home from the emergency department with significantly reduced mobility compared to their normal state (for example, due to a lower-limb injury requiring immobilisation with a plaster cast/brace)[44]
- Pregnant or have given birth within the preceding six weeks, and present to outpatient services for antenatal or perinatal care.

Pathway of care

This clinical care standard covers the initial presentation to hospital and assessment of VTE risk, through to completion of VTE prevention, which may occur following discharge from hospital back in the community depending on the patient's ongoing risk.

Healthcare settings

The following healthcare settings apply:

- All hospital settings where patients are at risk of developing VTE, including public and private hospitals, day procedure services, and sub-acute facilities such as rehabilitation, palliative care, and mental health units
- General practice and other community settings where ongoing monitoring and reassessment of VTE risk are required to prevent VTE following hospitalisation.

Prevention strategies

This clinical care standard covers the use of pharmacological and mechanical methods of VTE prevention.

What is not covered

This clinical care standard does not cover the use of inferior vena cava (IVC) filters to prevent VTE. Patients requiring these devices should be referred to an appropriate specialist for management.

The diagnosis and treatment of VTE are also outside the scope of this clinical care standard.

General principles of care in relation to this clinical care standard

Patient-centred care

Patient-centred care is health care that is respectful of, and responsive to, the preferences, needs and values of patients and consumers.[45]

Clinical care standards support the key principles of patient-centred care, namely:

- Treating patients with dignity and respect
- Encouraging patient participation in decision making
- Communicating with patients about their clinical condition and treatment options
- Providing patients with information in a format that they understand so they can participate in decision-making.[46]

Multidisciplinary care

During a hospital admission and following discharge from hospital, patients are likely to need specific types of care provided by various clinicians. In this document, the term "clinician" refers to all types of health professionals who provide direct clinical care to patients. Multidisciplinary care refers to comprehensive care provided by a range of clinicians (for example, doctors, nurses, pharmacists, physiotherapists and other allied health professionals) from one or more organisations, who work collectively with the aim of addressing as many of a patient's health and other needs as possible.[47]

A coordinated multidisciplinary team approach is essential for delivering the care required to reduce the risk of VTE. Multidisciplinary care of patients can improve health outcomes, and offers more efficient use of health resources. Planning, coordination and regular communication between clinicians are essential components of multidisciplinary care.[47]

Carers and family members

Carers and family members have an important role in the prevention, early recognition, assessment and recovery relating to a patients' health condition. They often know the patient very well and can provide detailed information about the patient's history, routines or symptoms, which may assist in determining treatment and ongoing support.[45]

Although this clinical care standard does not specifically refer to carers and family members, each quality statement should be understood to mean that carers and family members are involved in clinicians' discussions with patients about their care, if the patient prefers carer involvement.

Using this clinical care standard

Integrated approach

Central to the delivery of patient-centred care identified in this clinical care standard is an integrated, systems-based approach supported by health services and networks of services with resources, policies, processes and procedures.

Key elements of this approach include:

- An understanding of the capacity and limitations of each component of the healthcare system across metropolitan, regional and remote settings
- Clear lines of communication between components of the healthcare system, including primary care, hospital, sub-acute, and community services
- Appropriate coordination so that people receive timely access to optimal care regardless of how or where they enter the system.

To achieve these aims, health service organisations implementing this standard may need to:

- Deploy an active implementation plan and feedback mechanisms
- Include agreed protocols and guidelines, decision-support tools and other resource material
- Employ a range of incentives and sanctions to influence behaviours and encourage compliance with policy, protocol, regulation and procedures
- Integrate risk management, governance, operational processes and procedures, including education, training and orientation.[48]

To assist health service organisations implement the *Venous Thromboembolism Prevention Clinical Care Standard*, key considerations for clinical decision-making and local policy development have been included under some of the quality statements.

Integration with the National Safety and Quality Health Service (NSQHS) Standards

The National Safety and Quality Health Service (NSQHS) Standards were developed by the Commission in collaboration with the Australian government, states and territories, clinical experts, and consumers. The primary aims of the NSQHS Standards are to protect the public from harm and improve the quality of health service provision. They provide a quality assurance mechanism that tests whether relevant systems are in place to ensure expected standards of safety and quality are met.

The first edition of the NSQHS Standards, which was released in 2011, has been used to assess health service organisations since January 2013. The second edition of the NSQHS Standards was launched in November 2017, and health service organisations will be assessed against the new standards from January 2019.

In the second edition of the NSQHS Standards, the Clinical Governance Standard and Partnering with Consumers Standard combine to form the clinical governance framework for all health service organisations.

The Clinical Governance Standard aims to ensure that there are systems in place within health service organisations to maintain and improve the reliability, safety and quality of health care.

The Partnering with Consumers Standard aims to ensure that consumers are partners in the design, delivery and evaluation of healthcare systems and services, and that patients are given the opportunity to be partners in their own care.

Under the NSQHS Standards (2nd ed.), health service organisations are expected to support clinicians to use the best available evidence, including clinical care standards such as the *Venous Thromboembolism Prevention Clinical Care Standard* where relevant (see Action 1.27b).

Health service organisations are expected to implement the NSQHS Standards in a manner that suits the clinical services provided and their associated risks. Other aspects of the NSQHS Standards (2nd ed.) that are particularly relevant to the prevention of hospital-acquired VTE include, but are not limited to, those listed in the following table:

Clinical Governance Standard:	**Partnering with Consumers Standard:**	**Medication Safety Standard:**	**Communicating for Safety Standard:**	**Recognising and Responding to Acute Deterioration Standard:**
Governance, leadership and culture (1.1 and 1.2)	Informed consent (2.3, 2.4 and 2.5)	Clinical governance and quality improvement to support medication management (4.1 to 4.4)	Communication of critical information (6.9)	Responding to deterioration (8.10)
Safety and quality monitoring, including incident reporting systems (1.8, 1.11)	Sharing decisions and planning care (2.6 and 2.7)	Documentation of patient information (4.5 to 4.9)	Documentation of information (6.11)	
Policies and procedures (1.7)	Information for consumers (2.9) and communication of clinical information (2.10)	Continuity of medication management (4.10 to 4.12)		
Credentialing and scope of clinical practice (1.23 and 1.24)		Management of high risk medicines (4.15)		
Evidence-based care (1.27)				
Variation in clinical practice and health outcomes (1.28)				

Indicators to support local monitoring

The Commission has developed a set of indicators to support healthcare providers and local health service organisations to monitor how well they implement the care described in this clinical care standard. The indicators are a tool to support local quality improvement activities. No benchmarks are set for any indicator.

The process to develop the indicators specified in this document comprised:

- A review of existing local and international indicators
- Prioritisation, review and refinement of the indicators with the Venous Thromboembolism Clinical Care Standard Topic Working Group.

Most of the data underlying these indicators require collection from local sources, mainly through prospective data collection or a retrospective chart review. Where an indicator refers to 'local arrangements', this can include clinical guidelines, policies, protocols, care pathways or any other documentation providing guidance to clinicians on the care of patients to prevent hospital-acquired VTE, both in hospital and following discharge from hospital.

Monitoring the implementation of the clinical care standards will assist in meeting some of the requirements of the National Safety and Quality Health Service (NSQHS) Standards. Information about the NSQHS Standards is available at: www.safetyandquality.gov.au/accreditation

In this document, the indicator titles and hyperlinks to the specifications are included with the relevant quality statement under the heading 'Indicators for local monitoring'. Full specifications of the Venous Thromboembolism Prevention Clinical Care Standard indicators can be found in the Metadata Online Registry (METeOR) at http://meteor.aihw.gov.au/content/index.phtml/itemId/697224

METeOR is Australia's web-based repository for national metadata standards for the health, community services and housing assistance sectors. Hosted by the Australian Institute of Health and Welfare, METeOR provides users with online access to a wide range of nationally endorsed data and indicator definitions.

Indicators to support local monitoring of the overall quality of VTE prevention

As the goal of this clinical care standard is to reduce the burden of hospital-acquired VTE both in hospital and following hospital discharge, three overall outcome measures are also recommended. Data on hospital-acquired DVT and 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. The specifications for these indicators can be found at https://www.safetyandquality.gov.au/our-work/indicators/hospital-acquired-complications/

Outcome indicator 1:
Rate of hospital-acquired deep vein thrombosis

Outcome indicator 2:
Rate of hospital-acquired pulmonary embolism

Outcome indicator 3:
Rate of haemorrhagic disorder due to circulating anticoagulants

The Commission's website has more information about the HACs list and the indicator specifications.

Measuring and monitoring patient experience

Systematic routine monitoring of patients' experiences of healthcare is an important way to ensure that service improvements and patient-centeredness are driven by patients' perspectives. This is the case with all health services, including the prevention of VTE.

While there are no indicators in this standard specific to patient experience measurement, the Commission strongly encourages health services to adopt the Australian Hospital Patient Experience Question Set (AHPEQS). The AHPEQS is a short 12 question generic patient experience survey which has been tested and found reliable and valid for both day-only and admitted hospital patients across a wide variety of clinical settings. The instrument is available for download free of charge to both private and public sector health services. The Australian Hospital Patient Experience Question Set (AHPEQS) can be found at **https://www.safetyandquality.gov.au/our-work/indicators/hospital-patient-experience/**

Supporting documents

The following supporting information for this clinical care standard is available on the Commission's website at: **https://www.safetyandquality.gov.au/our-work/clinical-care-standards/venous-thromboembolism-prevention-clinical-care-standard/**

- A consumer fact sheet
- A clinician fact sheet
- An evidence sources document, summarising the evidence base for the clinical care standard
- A link to the set of indicators to support local monitoring.

Quality statement 1 – Assess and document VTE risk

A patient potentially at risk of 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.

Purpose

To ensure that patients potentially at risk of VTE receive a timely assessment and documentation of that risk, so that all clinicians involved in the patient's care have access to the results and are aware of the patient's VTE prevention needs.

See *Key considerations* on pages 14–15 to guide development of local policies for assessing and documenting VTE risk.

What the quality statement means

For patients

If you are going to hospital, your doctor or another member of your clinical team (such as a nurse or midwife) will conduct a thorough assessment to see what risk you have of developing blood clots during or following your hospital stay. Your risk depends partly on the reason why you are in hospital and the treatment you need to have, and partly on other risk factors you may have. Therefore, you will be asked about the things that can increase your risk including:

- Your general health and mobility
- Whether you or a family member have had blood clots before
- Other health conditions you might have such as cancer, an infection, heart disease (such as heart failure), or a history of stroke
- Any medicines you are taking (including over-the-counter and complementary medicines), as some medicines, like an oral contraceptive, can make blood clotting more likely.

Once your risk of developing blood clots has been assessed, the findings will be recorded so that all the clinicians involved in your care understand what your risk is and whether you need preventive care.

For clinicians

Assess each patient for VTE risk to determine their need for VTE prophylaxis.[42,44,49] Use a standardised, locally endorsed, evidence-based tool or checklist to aid the assessment,[27,34,35,44,50] for example, the **NSW Clinical Excellence Commission (CEC): Adult VTE Risk Assessment Tool**[51] (see *Key considerations* on page 14). Ensure the tool includes an assessment of patient and admission-related factors that are known to increase VTE risk. Use the best possible medication history (BPMH)[52] obtained as part of the admission process to identify medicines the patient might be taking (including complementary and over-the-counter medicines) that increase the risk of clotting.

At the time of the assessment, document the findings on a **national standard medication chart** (paper or electronic)[53], or where applicable, the patient's medical record, approved risk assessment form, or other place according to local hospital/unit policy.[33,44,54,55] This will assist all clinicians involved in the patient's care to be aware that the patient's risk has been assessed and whether they require VTE prevention.

For health services

Ensure a multidisciplinary VTE prevention program is in place that facilitates the assessment and documentation of a patient's VTE risk according to evidence-based guidelines.[9,34,50,54,56] Ensure a standardised approach to risk assessment is taken by selecting and endorsing an evidence-based tool or checklist for use within the health service organisation, which includes assessment of patient and admission-related factors that are known to increase the risk of VTE (see *Key considerations* on page 14). Ensure a standardised approach to obtaining a BPMH is also in place to identify any medicines the patient is taking that are associated with an increased risk of clotting. For ongoing quality improvement, ensure that monitoring of, and feedback to clinicians takes place to confirm risk assessments are being conducted in accordance with the tool.[44,57,58]

Indicator for local monitoring

Proportion of patients admitted to hospital who were assessed for VTE risk within 24 hours of admission, using a locally endorsed risk assessment tool, and had the outcome of the risk assessment documented in their medical record.

METeOR link: http://meteor.aihw.gov.au/content/index.phtml/itemId/697312

More information about this indicator and the definitions needed to collect and calculate it can be found online in the above METeOR link.

A patient's risk of VTE also needs to be reassessed during their hospital stay. Refer to Quality Statement 6 for information about risk reassessment

Quality statement 1 –

Assess and document VTE risk

Key considerations for determining local policy to assess and document VTE risk

The contribution of risk factors to developing VTE: The risk of developing VTE during or following hospitalisation depends on a combination of risk factors related to the patient and their reason for going to hospital. It is important to note that the contribution of individual patient factors (such as obesity, other comorbidities, and concomitant medicines) to VTE risk varies depending on whether the patient is admitted for a medical condition or surgical procedure.[3,6,7,11] For surgical patients, the risk of VTE also depends on the type of surgery being performed. While all types of surgery increase VTE risk, hip and knee replacement surgery and hip fracture surgery are associated with a much higher risk of VTE.[4]

Risk factors to include in a VTE risk assessment tool: The number of admission and patient-related risk factors for medical, surgical, and obstetric patients to include in a VTE risk assessment tool is too extensive to list in this clinical care standard, and varies depending on whether the patient is admitted for a medical condition or surgical procedure. Useful sources of information about risk factors in various clinical situations are available from published guidelines listed on page 15. As part of the risk assessment, use the best possible medication history (BPMH) obtained during the admission process to identify the patient's current medicines that are associated with an increased risk of clotting. Medicines that increase the risk of clotting include, but are not limited to: oestrogen-containing oral contraceptives, hormone replacement therapy, tamoxifen, and antipsychotics.[42]

VTE risk assessment tools: Current evidence-based guidelines recommend all hospitalised patients are assessed for VTE risk using a standardised tool to identify those at risk so that appropriate VTE prevention can be given. Several tools and approaches to assessing VTE risk in surgical, medical, and obstetric patients, have been published and implemented.[35,56,59] These tools are generally based on the following two methods:

- **Risk assessment scoring**, which stratifies a patient's level of VTE risk (high, medium or low risk)
- **Risk factor recognition**, which identifies whether a patient has risk factors for VTE without assigning a score or level of risk.

There is no consensus among evidence-based guidelines regarding the preferred method of VTE assessment[33,34], and there is no evidence suggesting that one assessment tool is better than another.[34,35] Ideally, the chosen tool should: accurately detect patients at VTE risk; reliably exclude those who are not at risk; and be simple to use.[34,60] Examples of tools that may assist with developing local policy are listed on page 15. Note this list is not exhaustive.

Published guidelines

- AAOS: Preventing VTE in patients undergoing elective hip and knee arthroplasty[37]
- ACCP: Executive summary: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed[36]
- ACCP: Prevention of VTE in nonorthopedic surgical patients[5]
- ACCP: Prevention of VTE in nonsurgical patients[8]
- ACCP: Prevention of VTE in orthopedic surgery patients[4]
- ACP: VTE prophylaxis in hospitalized patients[38]
- AHRQ: Preventing hospital-associated VTE[34]
- ASA: VTE guidelines for hip and knee arthroplasty[41]
- ASCO: Venous thromboembolism prophylaxis and treatment in patients with cancer[61]
- ESA: European guidelines on perioperative venous thromboembolism prophylaxis[43]
- International Angiology: Prevention and treatement of venous thromboembolism international consensus statement[28]
- NICE: Venous thromboembolism in over 16s: reducing the risk of hospital-acquired DVT or PE[35]
- NICE: Venous thromboembolism in adults: reducing the risk in hospital[27]
- NZ: National Policy Framework: VTE prevention in adult hospitalised patients in NZ[9]
- Queensland Health: Venous thromboembolism (VTE) prohpylaxis in pregnancy and the puerperium[55]
- RCOG: Reducing the risk of VTE during pregnancy and puerperium[39]
- SIGN: Prevention and management of venous thromboembolism[10]
- Stroke Foundation: Clinical guidelines for stroke management[40]
- Therapeutic Guidelines: Cardiovascular[42]

Available VTE risk assessment tools

- CEC: Adult VTE risk assessment tool[51]
- CEC: Maternal VTE risk assessment tool[62]
- The UK Department of Health VTE risk assessment tool[63]
- The Royal College of Obstetrics and Gynaecologists VTE risk assessment tool[64]
- Padua Risk Assessment Model for use in medical patients[65]
- The IMPROVE tool for use in medical patients[66]
- The Intermountain score for use in medical patients[67]
- Parvizi: Individualised risk model for VTE after total joint arthroplasty (available via iTunes)[68]
- The Kucher score for use in medical and surgical patients[69]
- Rogers score: The Patient Safety in Surgery Study (page 1219)[70]
- Caprini Risk Assessment Model for use in hospitalised surgical patients[71]

Quality statement 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.

Purpose

To ensure bleeding risk and other possible contraindications to VTE prevention are considered prior to the development of a patient's VTE prevention plan.

See *Key considerations* on pages 18–19 to guide development of local policy for the preparation of VTE prevention plans and the assessment of bleeding risk. Appendix 1 also lists medicines that can affect bleeding risk.

What the quality statement means

For patients

If you are assessed to be at risk of developing blood clots, your clinician will develop a clot-prevention plan with you by weighing up your risk of clotting against your risk of bleeding, and what the consequences could be if you unexpectedly bleed. This is important as the medicines used to prevent clots can increase the risk of bleeding in some people and make it harder to stop bleeding if it starts. Your risk of bleeding depends on the reason why you are in hospital and the treatment you need to have, as well as other risk factors you might have that can make you more likely to bleed. Therefore, you will be asked about:

- Whether you or a family member have a history of a bleeding disorder or a health condition that may increase your risk of bleeding such as kidney or liver disease, high blood pressure, stroke, or peptic ulcer disease
- Whether you have had any recent bleeding (for example, in the last week)
- Any medicines you might be taking (including over-the-counter and complementary medicines) as some medicines may increase your risk of bleeding
- Whether you have any other conditions where clot-prevention might further increase your risk of bleeding.

For clinicians

For patients assessed to be at risk of VTE, develop a plan for VTE prophylaxis by balancing the risk of VTE against the risk of bleeding and its potential adverse clinical consequences.[33,72] Check for other contraindications to VTE prophylaxis before offering it to the patient.[33,44,50] Assess bleeding risk using a standardised, locally endorsed evidence-based tool or checklist (see *Key considerations* on page 18–19). Ensure the tool assesses the admission and patient-related factors that may influence bleeding risk,

including the reason for admission, the patient's comorbidities, bleeding history, and medication history.[10,27] Use the BPMH[52] obtained during the admission process to identify medicines the patient might be taking (including complementary and over-the-counter medicines) that increase the risk of bleeding. See Appendix 1 for a list of medicines that can affect bleeding risk.

For health services

Ensure systems are in place so that a patient at risk of VTE has a VTE prevention plan based on an assessment of bleeding risk, which is carefully balanced against the risk of thrombosis, the adverse consequences of bleeding, and contraindications to VTE prevention methods. Ensure a standardised approach to bleeding risk assessment is taken by selecting and endorsing an evidence-based risk assessment tool or checklist for use within the health service organisation. Ensure a standardised approach to obtaining a BPMH is in place to identify any medicines the patient might be taking that are associated with increased bleeding risk. Ensure that monitoring also takes place to identify that VTE prevention plans are developed in accordance with local hospital/unit policy.[54]

Refer to Quality Statement 5 for information about medicines to prevent VTE and mechanical methods that may form part of a patient's VTE prevention plan

Quality statement 2 –

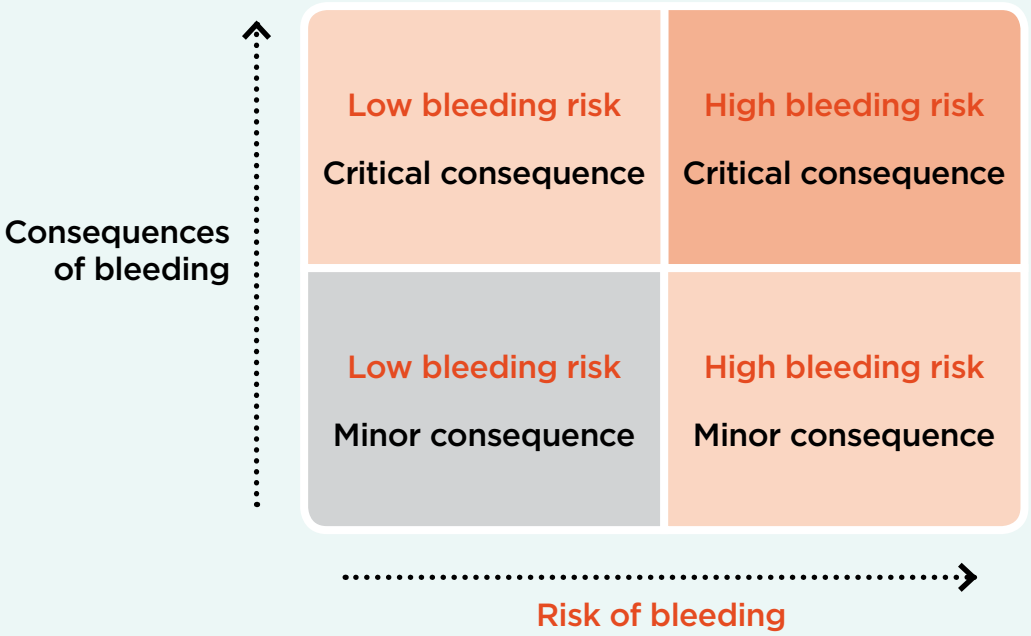
Develop a VTE prevention plan, balancing the risk of VTE against bleeding

Key considerations for determining local policy to guide the assessment of bleeding risk for the development of VTE prevention plans

Medicines used to prevent VTE are associated with an increased risk of bleeding.[72] When prescribing medicines to prevent VTE, it is important to assess bleeding risk taking into consideration:

- The patient's likelihood of bleeding (for example, the likelihood of an intracranial bleed, a gastrointestinal bleed, or a surgical site bleed)
- The consequences of bleeding if it occurs (for example, whether it would be a moderate or critical consequence).

A simple way to consider the risks and consequences of bleeding is provided in the figure below:



For example, if bleeding risk is high but the consequences of bleeding are minor, clinicians will use their clinical judgement to consider whether the benefit of prescribing medicine to prevent VTE really outweighs the risk of bleeding. An example clinical scenario might be a patient requiring a coronary angiogram, where this risk of bleeding at the site of the catheter insertion would be high but the consequences are minor because pressure can be applied at the site to minimise bleeding.

Examples of factors that influence bleeding risk are outlined, but not limited to those below:

Examples of individual patient-related factors that increase a patient's risk of bleeding:

- Procedures with potentially critical consequences of bleeding (such as a lumbar puncture, epidural or spinal anaesthesia)
- Abnormal renal function or liver disease
- Uncontrolled hypertension
- Active peptic ulcer or ulcerative gastrointestinal disease
- Thrombocytopenia (platelet count less than 50 000 µ/L)
- Acute haemorrhagic stroke
- Bleeding history
  - family history of bleeding or personal history of bleeding disorders
  - recent bleeding (within the week) or active bleeding
- Medication history
  - use of other medicines known to increase bleeding risk or alter the metabolism of medicines used to prevent VTE (See Appendix 1)
  - other medicine that may interact with medicines used to prevent VTE

Examples of procedures where bleeding could have major or critical consequences:

- Neurosurgery, spinal surgery or eye surgery
- A surgical procedure with high bleeding risk, such as intracranial surgery, head and neck surgery, or orthopaedic surgery.

The decision to prescribe VTE prophylaxis needs to be tailored to the individual patient, after carefully balancing the benefits of prophylaxis against the patient's risk of thrombosis.[44,50]

Further information about bleeding risk is available from the following guidelines:

- AAOS: Preventing VTE in patients undergoing elective hip and knee arthroplasty[37]
- ACCP: Executive summary: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed[36]
- ACCP: Prevention of VTE in nonorthopedic surgical patients[5]
- ACCP: Prevention of VTE in nonsurgical patients[8]
- ACCP: Prevention of VTE in orthopedic surgery patients[4]
- ACP: VTE prophylaxis in hospitalized patients[38]
- AHRQ: Preventing hospital-associated VTE[34]
- ASA: VTE guidelines for hip and knee arthroplasty[41]
- ASCO: Venous thromboembolism prophylaxis and treatment in patients with cancer[61]
- ESA: European guidelines on perioperative venous thromboembolism prophylaxis[43]
- International Angiology: Prevention and treatement of venous thromboembolism international consensus statement[28]
- NICE: Venous thromboembolism in over 16s: reducing the risk of hospital-acquired DVT or PE[35]
- NICE: Venous thromboembolism in adults: reducing the risk in hospital[27]
- NZ: National Policy Framework: VTE prevention in adult hospitalised patients in NZ[9]
- Queensland Health: Venous thromboembolism (VTE) prohpylaxis in pregnancy and the puerperium[55]
- RCOG: Reducing the risk of VTE during pregnancy and puerperium[39]
- SIGN: Prevention and management of venous thromboembolism[10]
- Stroke Foundation: Clinical guidelines for stroke management[40]
- Therapeutic Guidelines: Cardiovascular[42]

Quality statement 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 risks and needs, and shares in decisions regarding their VTE prevention plan.

Purpose

To increase a patient's knowledge about VTE so they can share in decisions about their care and have an active role in preventing VTE.[9,55]

What the quality statement means

For patients

Your doctor or another member of your clinical team will provide you with information and education about blood clots and explain why you may be at risk. Information about the possible ways to prevent blood clots will be tailored to your risk factors and presented in a format that you understand so that you can share in decisions about your care, and participate in activities to help prevent blood clots forming.

You will have the opportunity to ask questions and be involved in the development of your clot-prevention plan, which will be based on the results of your risk assessment. Your clinician will also consider the methods you prefer to use to reduce your clotting risk if there are different options available.

Methods commonly used to prevent VTE include anti-clotting medicines and/or mechanical methods (such as compression stockings). Information about the different types of prevention methods suitable for you will therefore include:

- The risks and benefits
- Correct use
- Any monitoring that may be needed
- Precautions you should take while using clot-prevention
- The symptoms of blood clots in the leg (such as pain, swelling, or tenderness of the leg or ankle) or lung (such as unexpected shortness of breath or chest pain), or bleeding, and what to do if these occur.

Unless told otherwise, you will also be encouraged to get out of bed as soon as possible during your hospital stay and to remain hydrated regardless of whether you need anti-clotting medicines or mechanical methods to prevent blood clots.[42,44] This is because not moving for long periods of time and dehydration can increase your risk of developing blood clots.[10] See *Key facts about VTE prevention for patients* on page 22 for more information about blood clots and ways to prevent them, including the actions you can take while in hospital.

For clinicians

Support the patient to have an active role in preventing VTE by providing information and education about:

- VTE and ways to potentially prevent it tailored to the patient's risk and in a format they can understand[10,27,33,35,44]
- The importance of mobilising as soon as possible and remaining hydrated, unless mobility or fluid restrictions are in place[10,35,42,44]
- The findings of their VTE risk assessment and their individual risk factors for developing VTE[10,39]
- The risks and benefits of VTE prophylaxis[10,27,42,52], including how it works, correct use, monitoring requirements, available options to manage potential adverse events such as bleeding, precautions to be taken while using prophylaxis, and the potential outcomes if prophylaxis is not used correctly[10,42,55,73,74]
- The symptoms of VTE and bleeding, how to minimise the risk of these occurring, and what to do if these occur[10,42,74]
- Any changes to the VTE prevention plan that may be required if their risk factors or clinical condition changes
- Other clinicians or resources for further information about VTE and ways to prevent it (see *Key facts about VTE for patients* on page 22).

This information is important so that patients can have informed discussions about their VTE prevention plan[33], especially where there are factors such as bleeding risk, needle-phobia, or other personal beliefs raised by the patient (for example religious beliefs) that may influence the choice of prophylaxis.

Ensure the plan for prophylaxis is then discussed with the patient, particularly if there are multiple options available, or specific clinical issues to raise, and document the outcome of the discussion as part of the informed consent process.

For health services

Ensure systems are in place for clinicians to provide patients with information and education about VTE and possible prevention methods, and to support shared decision-making. Ensure information provided to patients covers the risks and benefits of VTE prevention, its correct use, risks associated with its use or misuse, precautionary measures to be taken while using VTE prevention, the symptoms of VTE and bleeding, and what to do if the patient believes these symptoms are occurring. This will support the patient to be engaged in their care and to participate more effectively in decision-making about their VTE prevention plan, which is consistent with the Partnering with Consumers Standard in the NSQHS Standards (2nd ed.).[75]

Quality statement 3 –

Inform and partner with patients

Key facts about VTE for patients

What is VTE? Venous thromboembolism (VTE) is a disease that includes deep vein thrombosis (DVT) and pulmonary embolism (PE). In DVT, a blood clot (thrombus) usually forms in the deep veins of the legs or pelvis. Not all clots cause symptoms and some can resolve on their own. However, some can progress causing symptoms such as pain, tenderness, redness, or swelling of the leg (symptomatic DVT). Sometimes a clot can break off and move up through the veins to lodge in the lung's blood vessels (pulmonary arteries). This is pulmonary embolism (PE) and can result in shortness of breath, coughing up blood, chest pain, faintness, and loss of consciousness. PE may lead to sudden death if the clot blocks enough blood vessels in the lungs.

Who is at risk of VTE? Anyone can develop VTE, but nearly three quarters of all VTE occurs because of hospitalisation.[13] This is called hospital-acquired VTE. The risk of developing VTE during or following a hospital stay depends on a combination of risk factors related to:

- The individual patient and what other health conditions they have
- The reason for their hospital stay and the type of treatment needed (including surgery).

People in hospital are at particular risk of VTE because they are in bed most of the time and this lack of mobility causes blood to pool in the veins of the legs. Dehydration can also lead to VTE. However, it is important to know that the risk of VTE continues beyond discharge when patients have left the hospital. Most cases of hospital-acquired VTE are not identified until the patient is back in the community.[13]

How can the risk of hospital-acquired VTE be addressed? It is very important that patients receive an assessment of VTE risk, are informed about VTE prevention methods, and are provided with a plan for VTE prevention during their hospital stay so that they can take an active role in their own care. Prevention methods most commonly include anti-clotting medicines and/or mechanical methods such as stockings. Patients should receive information about the risks and benefits of the prevention methods available to them, correct use, any precautions, and any monitoring needed.

Regardless of whether the patient needs medicines or mechanical methods to prevent blood clots, they should be encouraged to get out of bed as soon as possible during their hospital stay and to have plenty of fluids unless there is a reason for them not to. This is because moving the lower limbs and having plenty of fluids can decrease the risk of developing blood clots.[10]

What is the role of the general practitioner in partnering with patients? General practitioners (GPs) and other primary healthcare workers have a critical role in preventing hospital-acquired VTE. Before a patient's hospitalisation (for example, when organising a planned admission to hospital), they can highlight the patient's VTE risk factors, including those that can be addressed before going to hospital. They can also provide a best possible medication history (BPMH) and highlight the patient's medicines that may increase the risk of blood clots or bleeding, and potentially suggest a plan for prevention. After discharge from hospital, GPs can monitor the patient and perform ongoing assessments of VTE risk if the patient's condition changes.[76]

Where can I find out further information about VTE? Useful sources of information about VTE and ways to prevent it are available from:

- NSW Clinical Excellence Commission[33]
- NPS MedicineWise[77]
- Stop the Clot: Reducing the risk of blood clots in your legs and lungs[78]
- The Joint Commission[74]

Quality statement 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.

Purpose

To ensure that all clinicians involved in the patient's care are aware that a plan for VTE prevention has been documented and is in place so that they can understand a patient's particular VTE prevention needs.

What the quality statement means

For patients

When your clot-prevention plan has been discussed with you and decided upon, your clinician will document your plan so that all the clinicians involved in your care know what methods of clot-prevention you need.

For clinicians

Once you have discussed the plan for VTE prophylaxis with the patient, document the prevention plan with the results of the risk assessment on a national standard medication chart (paper or electronic)[53], or where applicable, the patient's medical record, approved risk assessment form, or other place according to local hospital/unit policy.[9,33,44,54,55,73] Ensure other clinicians involved in the patients care are aware that a prevention plan has been documented so it can be actioned.

For health services

Ensure that systems are in place that specify where to document decisions about VTE prevention, and how clinicians will be advised that documentation has occurred. This might include the patient's medical record, a national standard medication chart (paper or electronic)[53], approved risk assessment form, or other place according to local policy.[33] Monitor documentation procedures to ensure they occur according to local hospital/unit policy.

Quality statement 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.

Purpose

To ensure the safe and effective use of VTE prevention and to minimise the risk of adverse events.

See *Key considerations* on pages 26–27 to guide the development of local policies for the safe and effective use of VTE prevention methods.

What the quality statement means

For patients

Your clot-prevention plan will be based on current guidelines for VTE prevention. The clot-prevention method that is best for you depends on several factors, including your other health conditions, other medicines you are taking (including all prescribed, over-the-counter and complementary medicines), and the methods of prevention you prefer to use.

Your clinician will provide you with information and education about the specific clot-prevention methods you are using, including their risks and benefits, how they should be used, how long they should be used for, possible side effects and how to manage these, and any precautions you should take while using clot-prevention. You will have the opportunity to discuss your clot-prevention plan with your clinicians, and to ask questions to make sure you understand how to use the prevention methods correctly. Your clinician may also ask you questions to confirm that you understand the information you have been given.

For clinicians

If medicines and/or mechanical methods are required as part of a patient's VTE prevention plan, make sure they are used according to a current, locally endorsed, evidence-based guideline, taking into consideration the patient's clinical condition and the methods of prevention they prefer to use.[9,10,27,28,33–39,42,44,49,55,61,79]

Provide information and education about the recommended prophylaxis at the time it is initiated to reduce the likelihood of harm associated with its use. This should include the risks and benefits of prophylaxis, how to use it, how long to use it for, possible side effects and how they should be managed, and any associated precautions.[10,33,34,42,44,50,55,73,74] Invite the patient to ask questions, and use methods such as teach-back to confirm the patient understands how to use their clot prevention correctly.[80]

If medicine is prescribed, document the fact that information and education about the medicine has been provided[52] on a **national standard medication chart** (paper or electronic)[53], or, if applicable, the patient's medical record, or other place according to local policy.

For health services

Ensure that systems are in place to provide clinicians with access to a current evidence-based guideline about the quality use of medicines for VTE prevention and appropriate use of mechanical prophylaxis, and that usage patterns can be monitored against the guideline for feedback to clinicians and ongoing quality improvement.[73] Ensure that systems support clinicians to provide individualised information and education to patients about their clot-prevention, and that patients have access to ongoing advice when needed. Ensure medicines used to prevent VTE, particularly anticoagulants, are identified within the organisation as high-risk medicines.[53,73,81] Oversee their storage, prescribing, dispensing and use according to local high-risk medicines policies, and consider the implementation of stewardship activities, such as audit and feedback, to optimise their safe prescribing and use.[82]

Indicator for local monitoring

Proportion of patients prescribed VTE prophylaxis appropriate to their VTE and bleeding risks in accordance with the locally approved guideline/policy

METeOR link: http://meteor.aihw.gov.au/content/index.phtml/itemId/697323

More information about this indicator and the definitions needed to collect and calculate it can be found online in the above METeOR link.

Quality statement 5 –

Use appropriate VTE prevention methods

Key Considerations for the safe and effective use of VTE prevention methods

Medicines:

Medicines are the preferred method of VTE prevention in most at-risk patients because of their demonstrated superior efficacy to mechanical compression in most patient groups.[42]

Medicines commonly used to prevent VTE include:[42,44,49]

- Low molecular weight heparins (LMWH), and heparins
- Direct oral anticoagulants (DOACs, including direct thrombin inhibitors and Factor Xa inhibitors),
- Vitamin K antagonists.

Other medicines less commonly used include:[42,44,49]

- Danaparoid – for patients who experience heparin induced thrombocytopenia
- Aspirin – for use in *hip and knee replacement surgery only*, usually in combination with mechanical methods and in patients without major risk factors for VTE and bleeding. Refer to *Appendix 2* for information about the potential role of aspirin to prevent VTE in hip and knee replacement surgery, current guideline recommendations, and current clinical consensus regarding its use.

Note: DOACs have been implicated in adverse events associated with erroneous concomitant prescribing with other anticoagulants for example, apixaban (a DOAC) for atrial fibrillation combined with enoxaparin (a LMWH) for VTE prevention. Clinicians need to be aware of both the generic and trade names of these medicines to avoid such adverse events.

Refer to *Appendix 2* for generic and trade names of medicines used to prevent VTE, as well as limited prescribing information.

Considerations for local policy development and individual clinical judgement:
Medicines used to prevent VTE, specifically anticoagulants, are considered high-risk medicines[44,53,73,81] and can increase the risk of bleeding. Therefore, in supporting clinical judgement and the safe selection of appropriate VTE prevention, it is important to ensure local policies and procedures promote consideration of:

- The risk and consequences of thrombosis and bleeding, taking into consideration the patient's clinical condition, reason for admission, and their individual risk factors for thrombosis and bleeding (see Quality Statement 1 and 2)
- Other medicines the patient is taking that can interact with medicines used to prevent VTE
- The need for monitoring kidney function (Creatinine Clearance (CrCl)) and liver function, and whether an antidote is available and likely to be required given the patient's clinical condition
- Any personal beliefs of the patient that could preclude them from receiving medicines (such as needle-phobia, or religious beliefs)
- Potential issues with adherence, considering the frequency of dosing, and whether the patient can self-administer or requires a dose administration aid (DAA).

For example, DOACs are available for VTE prevention in major joint surgery (See the Therapeutic Goods Association (TGA)[83] and Pharmaceutical Benefits Scheme (PBS)[84] websites for the most up-to-date listings). While they can be given orally and do not require routine monitoring of therapeutic effect, the risk of thrombosis is greater if a dose is missed, and it can be difficult to monitor adherence. Kidney and liver function also require ongoing monitoring.[85–89]

Mechanical methods:

Mechanical methods of VTE prophylaxis include a range of passive or intermittent compressive devices to prevent pooling of blood in the deep veins (venous stasis) caused by immobility associated with hospitalisation.[35] There are three main types of mechanical methods[35]:

- Pneumatic venous pumping devices (for example, mechanical sequential compression devices) that intermittently compress the veins in the calf and/or thigh. This is known as intermittent pneumatic compression (IPC)
- Venous foot pumps (VFP)
- Thigh or knee-length graduated compression stockings (GCS), although the evidence for the effectiveness of GCS in preventing VTE is unclear, and some grades of stockings are usually used for leg oedema.

Considerations for local policy development and individual clinical judgement:

- Mechanical methods of VTE prevention are considered relatively safe because they do not increase bleeding risk. However, the efficacy of mechanical compression is reportedly less than anticoagulant medicines in many patient groups. Furthermore, consistent use is required for maximum effect.[35,90]
- While mechanical methods may be useful in at-risk patients who are still able to mobilise to some extent, they may be more appropriate for patients who are unable to mobilise, or who are at high-risk of bleeding.
- Mechanical methods can also be combined with anticoagulant medicines to enhance their effect.[35,90]

Refer to the list of published guidelines in the *Key considerations* section on page 15 which have more information about the safe selection and use of mechanical methods.

Quality statement 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.

Purpose

To ensure that the VTE prevention plan is adapted to respond to changes in a patient's thrombosis and bleeding risk while they are in hospital[34,35], and that there is early recognition of VTE-related complications such as bleeding, thrombosis, or erroneous concomitant prescribing of medicines used to prevent VTE.

What the quality statement means

For patients

Your risk of developing blood clots, bleeding, or other problems relating to clot-prevention will be regularly reassessed throughout your hospital stay to make sure you continue to get the care you need.

If there are any changes to your risk or if you have had any problems because of your clot-prevention (for example a clot or bleed), your doctor or other member of your clinical team will discuss this with you. There may be a need to adjust your clot-prevention plan or to review whether you might be at further risk of clotting or bleeding.

For clinicians

During a patient's hospitalisation, reassess and document the risk of VTE and bleeding at intervals no longer than every seven days[33,44], whenever there is a change in the patient's clinical condition or goals of care, and on discharge from hospital.[10,27,28, 33,35,39,44,55] Ensure that reassessments also include a review of any VTE-related complications that may have occurred (such as a clot or bleed) and of any medicine-related problems[9,50] related to the use of medicines to prevent VTE, such as erroneous concomitant prescribing. If VTE risk or bleeding risk changes during the admission, review VTE prophylaxis and adjust in line with a current, locally endorsed, evidence-based guideline and the patient's preference.

For health services

Ensure there are systems in place to support regular reassessment of VTE risk during a patient's hospitalisation, with intervals no longer than every seven days, whenever there is a change in the patient's clinical condition or goals of care, and on discharge from hospital. Ensure systems are in place to support monitoring and documentation of complications such as bleeding or thrombosis, or medicine-related problems associated with the use of medicines to prevent VTE.

Quality statement 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.

Purpose

To minimise the likelihood of adverse events following transitions of care by ensuring a patient at risk of VTE and their general practitioner or ongoing clinical provider receive a discharge plan or care plan that describes the ongoing care the patient requires to prevent VTE after they leave hospital.

See *Key considerations* on pages 32–33 to support successful transition from hospital and ongoing care.

What the quality statement means

For patients

Before you leave hospital, your doctor or another member of your clinical team will provide you with a written discharge plan or care plan, as well as information and education about the ongoing care you need to help prevent blood clots after you leave hospital.

You will be involved in the development of your plan, which may need to be updated as your condition changes. The plan will summarise the reason why you came to hospital, any clot-prevention methods you received, whether you require clot-prevention blood tests or follow-up appointments after you leave hospital, and a list of any medicines you need to keep taking. You will also be provided with information to ensure you know how to use any medicines safely.

Your general practitioner or other ongoing clinical provider will also receive a copy of your plan within two days of you leaving hospital so that they can ensure the care you need to prevent blood clots is completed in line with your plan.

For clinicians

Before a patient leaves hospital, reassess their risk of VTE and bleeding to determine the need for prophylaxis after discharge.[33] Develop a written discharge plan or care plan[55,91] with the patient and provide them with information about the ongoing care required to prevent VTE.[10,27,33,35,39,42,55,92] Ensure the plan summarises the reason for the patient's admission, their risk factors for VTE, any VTE prophylaxis used while in hospital and any ongoing prophylaxis needed on discharge. If the patient needs medicines to prevent VTE following discharge, ensure they are not already taking an anticoagulant for another

condition. Include details about monitoring requirements specific to VTE prophylaxis, any precautions that need to be taken, and the need for follow-up tests and appointments.[74] Provide a current medicines list[42] of all the medicines the patient needs to continue on discharge. Assess the patient's ability to self-administer their medicine, and include information to ensure their safe use and appropriate disposal.[35,73,74]

Give the patient a copy of the discharge plan or care plan before they leave hospital. Ensure a copy of the plan is communicated to their general practitioner or ongoing clinical provider within 48 hours[10,35,93] of the patient leaving hospital so that care to prevent VTE can be completed by the ongoing care provider, in accordance with the plan.

For health services

Ensure systems are in place so that clinicians can develop a written discharge plan or care plan prior to a patient's discharge, and can provide patients with individualised information about the ongoing care that they need before they leave hospital. This should include information about the safe use and disposal of medicines, if they form part of the discharge plan.

Ensure a multidisciplinary approach to discharge planning is taken, involving a range of clinicians appropriate to the patient's needs. Ensure there are systems to support communication of the discharge plan or care plan to the patient's general practitioner or other ongoing clinical provider within 48 hours of discharge, so that there is continuity of care to prevent VTE, and that care can be provided and completed by the ongoing care provider in accordance with the plan to reduce the likelihood of VTE-related complications following hospital discharge.

Indicator for local monitoring

Proportion of patients discharged on VTE prophylaxis that had a documented care plan that included the prescribed medicine(s), dose and duration of treatment.

METeOR link: http://meteor.aihw.gov.au/content/index.phtml/itemId/697348

More information about this indicator and the definitions needed to collect and calculate it can be found online in the above METeOR link.

Quality statement 7 –

Transition from hospital and ongoing care

Key considerations to support successful transition from hospital and ongoing care

For the hospital clinician in transferring care

What's in the care plan:

- A summary of the reason for admission and the patient's VTE risk
- Details about VTE prophylaxis used while in hospital and whether it is required on discharge
- Monitoring requirements
- Instructions about any precautions to be taken
- The need for follow-up tests or appointments
- A current medicines list.

For the patient – what they need to know

If a patient needs VTE prevention following hospital discharge, ensure they understand:

- Their VTE risk and possible consequences of VTE
- The importance of VTE prevention and its possible side effects
- How to correctly use their prevention methods, including appropriate disposal, any precautions that need to be taken while using prevention, and the consequences if it is not used correctly
- The symptoms of VTE-related complications, and what to do if they occur
- Any monitoring requirements and whether they require follow-up tests or appointments after discharge
- Where to seek help if there are problems with using prevention.

If anti-clotting medicines are required, ensure the patient also understands:

- The name of the medicine (including the generic name and brand name), how much to take, when to take it, and how long for
- The influence of diet and alcohol on some medicines to prevent VTE
- The importance of advising all clinicians involved in their care, including their dentist, that they are taking medicine to prevent VTE.

For the GP providing ongoing care

The GP's role is to:

- Continue to prescribe VTE prevention for the duration specified in the care plan
- Monitor the patient for:
  - adherence and the response to VTE prevention
  - any adverse events including signs and symptoms of VTE or bleeding, their overall clinical condition including kidney and liver function anticoagulant effect (where appropriate) and full blood count if anaemia is suspected[94]
- Review all prescribed, over-the-counter, and complementary medicines the patient may be taking and their potential for interactions. particularly with any anticoagulant medicines the patient might be taking
- Re-assess VTE risk, if the patient's clinical condition changes
- Take appropriate action to address adverse events and adjust medicine doses where required.

Appendix 1: Medicines that affect bleeding risk

Table 1: Medicines that can affect bleeding risk[49]

Note: This table is not exhaustive and is current at the time of publication (Oct 2018). It also does not include known or suspected drug interactions that may affect bleeding risk. Refer to the latest version of the full Australian approved Product Information for information about drug interactions when prescribing.

Medication class	Generic name (Trade name(s))	
Anti-platelets	Glycoprotein IIb/IIIa inhibitors	• Abciximab (ReoPro) • Eptifibatide (Integrilin) • Tirofiban (Aggrastat)
	$P2Y_{12}$ antagonists (thienopyridines)	• Clopidogrel (Clovix, Iscover, Piax, Plavicor, Plavix, Plidogrel) • Clopidogrel + Aspirin (CoPlavix, DuoCover, DuoPlidogrel, Piax Plus Aspirin) • Prasugrel (Effient) • Ticagrelor (Brilinta)
	Other antiplatelets	• Aspirin (Aspro, Astrix, Cardasa, Cardiprin, Cartia, Disprin, Spren, Solprin) • Dipyridamole (Persantin, Persantin-SR) • Dipyridamole + Aspirin (Asasantin)
Parenteral anticoagulants	Low molecular weight heparin	• Dalteparin (Fragmin) • Enoxaparin (Clexane, Clexane Forte) • Nadroparin (Fraxiparine, Fraxiparine Forte)
	Low molecular weight heparinoid	• Danaparoid (Orgaran)
	Heparins	• Unfractionated heparin (Heparin, Heparin Sodium)
	Factor Xa inhibitors	• Fondaparinux (Arixtra)
	Direct thrombin inhibitors	• Bivalirudin
Direct oral anticoagulants (DOAC)	Factor Xa inhibitors	• Apixiban (Eliquis) • Rivaroxaban (Xarelto)
	Direct thrombin inhibitors	• Dabigatran (Pradaxa)
Other oral anticoagulants	Vitamin K antagonists	• Warfarin (Coumadin, Marevan)
Thrombolytics		• Alteplase (Actilyse) • Reteplase (Rapilysin) • Tenecteplase (Metalyse) • Urokinase

Medication class	Generic name (Trade name(s))	
Other medicines affecting haemostasis		• Tranexamic acid (Cyklokapron)
Medicines for reversing anticoagulation		• Idarucizumab (Praxbind) • Protamine (Protamine Sulphate BP) • Vitamin K_1, also known as phytomenadione (Konakion MM) • Prothrombin Complex Concentrate
Non-steroidal anti-inflammatory drugs (NSAIDs)	COX 1 and COX 2 inhibitors	• Diclofenac (Eg: Clonac, Fenac, Imflac, Viclofen, Voltaren, Voltfast) • Ibuprofen (Eg: Advil, Bugesic, Nurofen, Rafen, Tri-Profen, Brufen) (NB: Also available in combination with paracetamol containing products) • Indomethacin, also known as indometacin (Arthrexin, Indocid) • Ketoprofen (Orudis, Oruvail SR) • Ketorolac (Ketoral, Toradol) • Mefenamic acid (Mefic, Ponstan) • Naproxen (Inza, Naprofen, Naprosyn, Proxen) • Naproxen Sodium (Anaprox, Crysanal, Naprogesic • Piroxicam (Feldene, Mobilis) • Sulindac (Aclin)
	Selective COX-2 Inhibitors	• Celecoxib (Celaxib,Celebrex, Celexi) • Etoricoxib (Arcoxia) • Meloxicam (Meloxiaurio, Meloxibell, Mobic, Movalis, Moxicam) • Parecoxib (Dynastat)

Appendix 2: VTE prevention medicines

Table 1: Medicines commonly used to prevent VTE[49,50,87–89,95–103]

Note: The information in this table is not exhaustive, and current at the time of publication (Oct 2018). Please refer to the latest version of the full Australian approved Product Information when prescribing.

Medication class		Generic name (Trade name(s))	TGA approved indication for VTE prophylaxis	Frequency of dosing for VTE prophylaxis
Injectable anticoagulants (Administered subcutaneously)	**Low molecular weight heparin (LMWH)**	Dalteparin (Fragmin)	• Surgical patients	Once daily
		Enoxaparin (Clexane)	• Surgical patients • Medical patients bedridden due to acute illness	
		Nadroparin (Fraxiparine)	• Surgical patients	
	Heparin sodium	Unfractionated heparin (UFH)	• Surgical patients • High-risk medical patients	Two or three times daily
	Factor Xa inhibitors	Fondaparinux (Arixtra)	• Major orthopaedic surgery of the lower limbs • Abdominal surgery	Once daily

Abbreviations: CrCl = Creatinine Clearance; LFT = Liver function tests, THR = Total hip replacement; TKR = Total knee replacement; INR = International normalised ratio

	Elimination	Antidote to reverse bleeding	Side effects other than bleeding (includes common and infrequent)	Monitoring requirements
	Renal	Partially reversible with protamine (60–75%)	• Bruising and pain at injection site • Hyperkalaemia • Mild reversible thrombocytopenia • Transient elevation of LFTs • Severe thrombocytopenia (Note: from UFH or LMWH (incidence is higher with UFH). Danaparoid is often used as an alternative if this develops)	• Baseline CrCl prior to initiation then periodically for the duration of prophylaxis, particularly if baseline CrCl is abnormal. Consider monitoring antifactor Xa levels in patients with renal impairment or high risk of bleeding • Baseline platelets then periodically for the duration of prophylaxis • Signs of bleeding • Serum potassium
		Partially reversible with protamine (60%)		
		Partially reversible with protamine (60–80%)		
	Liver and reticuloendothelial system	Completely reversible with protamine		• Baseline platelets then periodically for the duration of prophylaxis • Signs of bleeding
	Renal	• Nil specific antidotes available in Australia (at time of publication) • Prothrombin complex concentrates or recombinant factor VIIa may be tried, however there are no human study results to support their use • Seek specialist advice		• Baseline CrCl prior to initiation then periodically for the duration of prophylaxis. Consider monitoring antifactor Xa levels in patients with renal impairment • Baseline platelets then periodically for the duration of prophylaxis • Signs of bleeding • Serum potassium

Table 1: Medicines commonly used to prevent VTE[49,50,87–89,95–103] (continued)

Note: The information in this table is not exhaustive, and current at the time of publication (Oct 2018). Please refer to the latest version of the full Australian approved Product Information when prescribing.

Medication class		Generic name (Trade name(s))	TGA approved indication for VTE prophylaxis	Frequency of dosing for VTE prophylaxis
Direct oral anticoagulants (DOAC)	**Factor Xa inhibitors**	Apixaban (Eliquis)	• THR (32–38 days)* • TKR (10–14 days)*	Twice daily with or without food
		Rivaroxaban (Xarelto)	• THR (28–35 days)* • TKR (14 days)*	Once daily with food
	Direct thrombin inhibitors	Dabigatran (Pradaxa)	• THR (28–35 days)* • TKR (10 days)*	Once daily with or without food. Swallow whole (do not crush, chew, or empty pellets from capsule)
Other oral anticoagulants	**Vitamin K antagonists**	Warfarin (Coumadin, Marevan)	• Surgical patients • Medical patients	Usually once daily, according to INR with or without food

Abbreviations: CrCl = Creatinine Clearance; LFT = Liver function tests, THR = Total hip replacement; TKR = Total knee replacement; INR = International normalised ratio

*Therapeutic Goods Administration (TGA) approved indication for DOACs is for a defined period. Refer to Australian Approved Product Information (available via the TGA website) for the most up-to-date TGA approved duration of therapy when prescribing.

	Elimination	Antidote to reverse bleeding	Side effects other than bleeding (includes common and infrequent)	Monitoring requirements
	• 27% renal	• Nil specific antidotes available in Australia (at time of publication) • Prothrombin complex concentrates or recombinant factor VIIa may be tried, however there are no human study results to support their use • Seek specialist advice	• Nausea • Thrombocytopenia • Abnormal LFTs	• No method to guide dose adjustment • Baseline CrCl prior to initiation then: – periodically for the duration of prophylaxis (especially in older people) – in certain conditions such as low blood volume, dehydration, when certain medicines are concomitantly prescribed, or when clinically indicated • Signs of bleeding • Adherence to regimen (risk of thrombosis is greater if a dose is missed) • Development of thrombosis • Changing co-morbidities and concomitant medicines • Potential interactions with other concomitant medicines (including medicines that affect haemostasis)
	• 33% renal • 33% renal metabolite • 33% hepatic		• Nausea • Thrombocytheaemia • Abnormal LFTs • Itch • Muscle spasm • Peripheral oedema	
	• 85% renal	• Idarucizumab (Praxbind)	• Nausea • Dyspepsia • Gastritis • Oesophageal ulcers • Abnormal LFTs	
	Liver	• Blood products • Vitamin K_1, also known as phytomenadione (Konakion MM)	• Skin necrosis (rare) (stop medicine if this occurs and seek specialist advice)	• Adherence to regimen, and brand prescribed • Potential interactions with food or other concomitant medicines (including medicines that affect haemostasis) • Changes in concomitant medicines, diet, or lifestyle

Table 2: Medicines less commonly used to prevent VTE

Medication class	Generic name (Trade name(s))	Comment
Antiplatelets	Aspirin Eg (Aspro, Astrix, Cardiprin, Cartia, Disprin, Spren, Solprin)	Aspirin might also be used in combination with mechanical compression for the prevention of VTE following hip or knee replacement surgery in patients without major risk factors for VTE or bleeding. Note: The use of aspirin for the primary prevention of VTE *specifically in hip and knee replacement surgery* is ***controversial***. Aspirin in combination with mechanical compression ***may be appropriate*** in patients undergoing hip or knee replacement surgery with no additional risk factors for VTE or postoperative bleeding. Guidelines to support clinical decision making regarding the use of aspirin to prevent VTE following hip and knee replacement surgery include: • The Scottish Intercollegiate Guidelines Network (SIGN)[10], which do not recommend use of aspirin, highlighting 'other available agents are more effective' • North American guidelines, which list aspirin as an acceptable agent without a preference for one agent over another (highlighting that evidence is insufficient to do so)[37], or with a preference for LMWH[4] • Guidelines issued in March 2018 by the United Kingdom's National Institute for Health and Care Excellence (NICE)[35], which list aspirin as an acceptable agent. This is in contrast to previous editions of the guideline which have historically recommended against the use of aspirin for VTE prophylaxis in these patients

Medication class	Generic name (Trade name(s))	Comment
Antiplatelets	Aspirin Eg (Aspro, Astrix, Cardiprin, Cartia, Disprin, Spren, Solprin)	• The Arthroplasty Society of Australia, which recommends aspirin an option for the prevention of VTE in hip or knee surgery in combination with mechanical compression when there are no additional risk factors for VTE or postoperative bleeding.[41] A rapid review of the evidence in relation to aspirin use for the primary prevention of VTE in hip and knee replacement surgery was conducted by the Commission in July 2017. Findings from this review are equivocal. Much of the evidence supporting the use of aspirin has methodological limitations and is therefore suggestive rather than definitive. In contrast, clear evidence that aspirin is ineffective was also not found. This review is an appendix to the *Venous Thromboembolism Prevention Clinical Care Standard Evidence Sources* document.
LMWH	Danaparoid (Orgaran)	May be used to prevent VTE in patients who experience severe thrombocytopenia from heparin or LMWH.[49]

For up-to-date information on the safe and effective prescribing, administration, and monitoring of medicines used to prevent VTE see:

- Australian Approved Product Information (available via the Therapeutics Goods Administration (TGA)[83] website)
- Pharmaceutical Benefits Scheme (PBS)[84]
- Therapeutic Guidelines (TG)[42]
- Australian Medicines Handbook (AMH)[49]
- The Australian Injectable Drugs Handbook (AIDH)[104]

Glossary

Adverse events
Adverse events are unintended and sometimes harmful occurrences associated with the use of a medicine, vaccine or medical device (collectively known as therapeutic goods). Adverse events include side effects to medicines and vaccines, and problems or incidents involving medical devices.[105]

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 (including data obtained through tests, physical examination, medical history, and information reported by family members and other healthcare team members).[106]

Anticoagulant medicines
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).

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

Best possible medication history (BPMH)
A list of all the medicines a patient is using at presentation to a clinician or healthcare service. The list includes the name, dose, route, and frequency of the medicine, and is documented on a specific form or in a specific place. All prescribed, over-the-counter, and complementary medicines should be included. This history is obtained by a clinician trained to interview the patient for this information (and/or their carer) and is confirmed, where appropriate, by using other sources of medicines information (for example, the patient's general practitioner, or community pharmacy).[107] Other approaches to confirm a patient's medication history might also include checking whether the patient already carries a current medicines list, or is registered with My Health Record.

Best practice
The diagnosis, treatment, or care provided, based on the best-available evidence, which is used to achieve the best possible outcomes for the patient.

Blood clot
See 'thrombus'.

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. They provide clinicians with evidence-informed recommendations that support clinical practice and guide clinician and patient decisions about appropriate health care in specific clinical practice settings and circumstances.[108] Examples of organisations that have produced evidence-based guidelines include the United Kingdom's National Institute for Health and Care Excellence (NICE)[35], the Scottish Intercollegiate Guidelines Network (SIGN)[10], the American College of Chest Physicians (ACCP)[36], the American Academy of Orthopaedic Surgeons (AAOS)[37], and the Royal College of Obstetrics and Gynaecology (RCOG).[39]

Carers
People who provide care and support to family members or friends who have a disease, disability, mental illness, chronic condition, terminal illness or general frailty. Carers include parents and guardians caring for children.[75]

Clinician
A trained health professional who provides direct clinical care to patients. Clinicians may be registered or non-registered practitioners working individually or in teams. They include doctors, nurses, midwives, allied health professionals, nurses' assistants, Aboriginal health workers and all other people who provide health care services.[75,80]

Complementary medicines
These include products containing herbs, vitamins, minerals, nutritional supplements, homoeopathic medicines, aromatherapy oils, and traditional Chinese medicines. Also called herbal, natural and alternative medicines.[109]

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

Doctor
See 'medical practitioner'.

Dose administration aid (DAA)
A tamper-evident, well-sealed device or packaging system that allows for organising doses of medicine according to the time of administration. Different types of DAAs are available, and can include blister or bubble packs, and packs that are provided by automated dose-packaging systems. A DAA is a tool that can be used as a part of coordinated medication management.[110]

Graduated Compression Stockings (GCS)
Stockings manufactured to provide compression around the legs at gradually increasing pressures.

Health service organisation
A service responsible for the clinical governance, administration and financial management of unit(s) providing health care. A service unit involves a grouping of clinicians and others working in a systematic way to deliver health care to patients and can be in any location or setting, including pharmacies, clinics, outpatient facilities, hospitals, patients' homes, community settings, practices and clinicians' rooms.[75]

Heparin-induced thrombocytopenia
Low blood platelet count resulting from the administration of heparin (or heparin-like agents). Despite having a low platelet count, people with this condition are still at risk of VTE.[35]

High-risk medicine
A medicine that has a high risk of causing significant patient harm or death if used incorrectly.[80] High-risk medicines may vary between hospitals and other healthcare settings, depending on the types of medicines used and patients treated. Errors with these medicines are not necessarily more common than with other medicines. Because they have a low safety margin, the consequences of errors with these medicines can be more devastating. At a minimum, the following classes of high-risk medicines should be considered:

- Medicines with a narrow therapeutic index
- Medicines that present a high risk when other system errors occur, such as administration via the wrong route.

Hospital
A licensed facility providing healthcare services to patients for short periods of acute illness, injury or recovery.[111]

Hospital-acquired VTE
All VTE that occurs in hospital and for 90 days after a hospital admission.[35]

Mechanical compression (or mechanical methods)
See 'mechanical prophylaxis'.

Mechanical prophylaxis
A physical agent that is used, in this context, to prevent thrombosis. Mechanical methods of VTE prophylaxis include: graduated compression stockings (GCS), intermittent pneumatic compression (IPC), and foot impulse technology (FIT), also known as venous foot pumps or foot impulse devices (FID).[35]

Medical practitioner
A medically qualified person whose primary role is the diagnosis and treatment of physical and mental illnesses, disorders and injuries. This could include general practitioners, medical specialists, and non specialists.

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. Prescription, non-prescription, investigational and clinical trial, and complementary medicines are included, irrespective of how they are administered.[75]

Medicine-related problem
Any event involving treatment with a medicine that has a negative effect on a patient's health or prevents a positive outcome. Consideration should be given to disease-specific, laboratory test-specific and patient-specific information. Medicine-related problems include issues with medicines such as:

- Underuse of a medicine
- Overuse of a medicine
- Use of inappropriate medicines (including therapeutic duplication)
- Adverse drug reactions, including interactions (drug-drug, drug-disease, drug-nutrient, drug-laboratory test)
- Non-adherence to therapy.[75]

Medicines list
A list prepared by a clinician, that contains, at a minimum:

- All medicines a patient is taking, including over-the counter, complementary, prescription and non-prescription medicines. For each medicine, the medicine name, form, strength and directions for use must be included[112]
- Any medicines that should not be taken by the patient, including those causing allergies and adverse drug reactions. For each allergy or adverse drug reaction, the medicine name, the reaction type and the date on which the reaction was experienced should be included.

Ideally, a medicines list also includes the intended use (indication) for each medicine.

It is expected that the medicines list is updated and correct at the time of transfer (including clinical handover) or when health services cease, and that it is tailored to the audience for whom it is intended (i.e. patient or clinician).[75]

Pharmaceutical treatment
See 'medicine'.

Pharmacological prophylaxis
See 'medicine'.

Post-thrombotic syndrome
Chronic pain, swelling, and occasional ulceration of the skin of the leg that occurs as a consequence of previous venous thrombosis.[35] Also known as post-phlebitic syndrome.

Prevention
Care that is provided to reduce the risk of developing VTE.

Primary care
The first level of care or entry point to the health care system, such as general practice clinics, community health practice (for example, clinics, outreach or home visiting services), ambulance services, pharmacists, or services for specific populations (for example Aboriginal or refugee health services).

Prophylaxis
A measure taken for the prevention of a disease.[35] Also see 'prevention'.

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). Most deaths arising from DVT are caused by PE.[35]

Pulmonary hypertension
Abnormally elevated blood pressure in the lung arteries.

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. Quality improvement activities may be undertaken in sequence, intermittently, or on a continuous basis.[75] Numerous models can be used, all sharing the same focus to reduce errors and unnecessary morbidity and mortality.

Quality of life
The general wellbeing of a person in terms of health, comfort, functional status and happiness.

Risk factor
A characteristic, condition, or behaviour that increases the possibility of disease, injury, or loss of well-being.[113]

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.[75]

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.[75]

Side effects
Unintended effects from a medicine or treatment.[114]

Significantly reduced mobility
Patients who are bedbound, unable to walk unaided or likely to spend a substantial proportion of the day in bed or in a chair.[35]

System
The resources, policies, processes and procedures that are organised, integrated, regulated and administered to provide health care. Systems enable the objectives of healthcare standards to be accomplished by addressing risk management, governance, operational processes and procedures, implementation and training, and by influencing behavior change to encourage compliance.[75]

Teach-back
A method that healthcare providers can use to confirm they have explained to patients what they need to know about their condition in a manner that the patient understands. The healthcare provider asks the patient to state in their own words the key points of the discussion. The cycle continues until the healthcare provider is certain the key messages have been delivered and understood.[80]

Thrombophilia
Genetic or acquired prothrombotic states that increases a person's tendency to develop venous thromboembolism due to their blood clotting inappropriately.[35]

Thrombosis
The formation of a blood clot in a blood vessel.

Thrombus
A stationary blood clot along the wall of a blood vessel, which causes obstruction of the vessel.[115]

Veins
Vessels that return blood from tissues towards to the lungs.

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.[35]

Venous thrombosis
A condition in which a blood clot (thrombus) forms in a vein.[35]

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

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RCPA The Royal College of Pathologists of Australasia

shpa

THANZ Thrombosis & Haemostasis society of Australia and New Zealand

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