



# Venous Thromboembolism Prevention - Clinical Practice Standard

## 1. Purpose

The purpose of this policy is to establish minimum practice standards for the care and management of prevention of venous thromboembolism (VTE) throughout the WA Country Health Service (WACHS).

This policy is to be used in conjunction with [MP 0078/18 Medication Chart Policy](#) and the [Guidelines for the WA Hospital Medication Chart](#)

Further information relating to specialty areas including Child and Adolescent Health Service (CAHS), Women and Newborn Health Services (WHNS) can be found via [HealthPoint](#).

## 2. Scope

All medical, nursing, midwifery and allied health staff employed within the WACHS.

All health care professionals are to work within their scope of practice appropriate to their level of training and responsibility.

Patient cohort: All **adult** inpatients except day admitted patients having a procedure under mild sedation or local anaesthetic.

Further information may be found via [HealthPoint](#) or the [Australian Health Practitioner Regulation Agency](#).

## 3. Considerations

### Minimum Requirements:

- Assessment of VTE risk.
- Assessment of bleeding risk / relative contraindications.
- Develop a plan in consultation with the patient.
- Treating team sign or initial documentation with in VTE risk assessment section of the WA Hospital Medication Chart (HMC).
- Documentation of the date and time of the VTE risk assessment.
- Documentation of the management of the VTE risk – i.e. prevention through use of pharmacological and /or mechanical prophylaxis where required.
- Document and communicate the plan for management on discharge.

## 4. General Information

All patients admitted as inpatients to WACHS are to have a VTE Risk Assessment and a prophylaxis plan documented in the medical record (as appropriate) within 24 hours of a patient's admission or prior to any elective and day surgery in pre-admission/anaesthetic clinics. Medical staff should consider the risk of developing a VTE, risk of bleeding and any relative contraindications to prevention strategies in the assessment and involve the patient in developing a management plan.

There is no Australian clinical practice guideline for the prevention of VTE<sup>1</sup>. Treatment recommendations do not cover all clinical scenarios and do not replace the need for clinical judgement. The following resources may be useful to guide clinicians in decisions making:

- [Stroke Foundation: Clinical guidelines for stroke management \(2017\)](#)
- [Arthroplasty Society of Australia guidelines for VTE prophylaxis for hip and knee arthroplasty](#)
- [Therapeutic Guidelines: Cardiology July 2018](#)
- [European guidelines on perioperative venous thromboembolism prophylaxis \(2017\)](#)
- [International Medical Preventions Registry on Venous Thromboembolism](#)

General measures for thromboembolic prophylaxis should be considered for all patients including:

- early mobilisation
- adequate hydration
- leg exercises and functional activity programs.

## 5. Assessment of VTE Risk

Initial risk assessment should be completed within 24 hours of a patient's admission<sup>(1)</sup>. This assessment may be completed as part of a preadmission appointment for elective surgery patients. VTE risk should be reassessed regularly (as a minimum every 7 days<sup>(1)</sup>) or if a patient's clinical condition changes.

### Exclusions to completion of a risk assessment

- Patients having procedures performed under mild sedation or local anaesthetic
- Day patients having outpatient clinic treatment
- Children 12 years and below

### VTE risk factors

The presence of multiple risk factors leads to a higher risk of associated VTE complications. Some of the risk factors are listed below (2)

For maternity patients refer to the [MR80A WACHS Maternity Inpatient Risk Assessment](#).

Risk factors to VTE complications	
History of venous thromboembolism	Cancer therapy (hormonal, chemotherapy, or radiotherapy)
Increasing age (incidence of VTE rises with each decade >40 years of age)	Obesity (BMI >30kg/m <sup>2</sup> )
Prolonged severe immobility including limb immobility	Acute ischaemic stroke with immobility
Inherited or acquired thrombophilia	Acute / acute on chronic chest infection
Oestrogen-containing hormone replacement therapy (HRT) or oral contraceptive	Heart or respiratory failure
Inflammatory bowel disease	Active rheumatic disease
Malignancy (active or occult)	Acute myocardial infarction
Myeloproliferative disorders	Rheumatologic disorders
Varicose veins with phlebitis	Smoking
All surgical procedures but especially abdominal, pelvic, thoracic and orthopaedic surgery.	

50% patients with a DVT have no predisposing factors

## 6. Bleeding Risk Assessment and Relative Contraindications for Prophylaxis

Patients at increased risk of bleeding have a relative contraindication to pharmacological management of VTE risk. Mechanical prophylaxis may cause reduced blood flow, pressure ulcers and can exacerbate peripheral arterial disease or arterial ulcer. See [Appendix 1](#) for additional information.

Clinicians should consider and document any relative contraindications for VTE prophylaxis.

Pharmacological prophylaxis should be withheld for 6 hours after lumbar puncture, epidural or spinal anaesthetic or if these are planned within the next 12 hours. Consult with the Anaesthetist if unsure. Specific requirements for administration after epidural removal are documented on the [MR 170.2 WACHS Epidural/Spinal Prescription and Additional Observation Chart](#)

There may be a delay in the administration or initiation of pharmacological prophylactic agents post procedures, where unclear the treating team should be consulted.

## 7. VTE prophylaxis

### Pharmacological prophylaxis

A range of pharmacological agents are available. Clinicians should consult current literature and guidelines for their specialities to determine the most appropriate agent for patients. Agents commonly available in WACHS include:

- Low molecular weight heparin (e.g. enoxaparin) (LMWH) (3)
  - Enoxaparin 40mg subcut daily
  - Enoxaparin 20mg subcut daily for CrCl < 30ml/min
- Low dose unfractionated heparin (LDUH) (3)
  - Heparin 5000 units subcut 12 hourly (BD)
  - Heparin 5000 units subcut 8 hourly (TDS) for high risk

Heparins including low molecular weight heparin formulations are contraindicated in patients with a history of heparin induced thrombocytopenia (HIT). Discuss options with a haematologist.

Patients who develop thrombocytopenia (platelet levels below  $150 \times 10^9$  or a 50% reduction in platelets) are at risk of HIT and should be discussed with a haematologist or senior colleague.

Hip and knee arthroplasty is considered a high risk procedure. Direct acting oral anticoagulants (DOAC) may be an option for these patients.

- Apixaban 2.5mg twice daily (BD) commencing 12-24 hours post operatively (3)
- Dabigatran 110mg daily 1-4 hours post operatively followed by 220mg daily (3).
- Rivaroxaban 10mg daily commencing 6-10 hours post operatively (3)  
Duration is generally 10-14 days post knee arthroplasty and 28-35 days post hip arthroplasty (3).

Aspirin is also considered an option for use after hip and knee arthroplasty(4). Low dose aspirin (100mg daily) appears to be as effective as higher doses.(5)

Obese patients may require higher doses for VTE prophylaxis (6). Seek specialist advice for these patients

### **Mechanical Prophylaxis**

- Graduated Compression Stockings (GCS)
- Intermittent Pneumatic Compression (IPC)
- Venous Foot Pumps (VFP)

## **8. Equipment Required**

- Various graduated compression stocking sizes
- Tape measures
- Pharmaceutical stocks for anticoagulation medications and reversal agents
- Intermittent pneumatic compression (IPC) devices such as foot Flowtron® devices if required
- Equipment must be appropriate for the age and/or size of the patient
- Equipment must be serviced and calibrated in accordance with manufacturer's recommendations to ensure reliability and accuracy
- Equipment stocks to be maintained for mechanical preventative equipment

## 9. Clinical Communication and documentation

### Clinical Handover

Information exchange is to adhere to the Department of Health [Clinical Handover Policy](#) using the iSoBAR framework.

### Documentation

Venous Thromboembolism (VTE) risk assessment / Anticoagulation		Risk Assessment completed by: (name)	Date/Time	Continue Y / N
<input type="checkbox"/> VTE risk considered (refer guidelines)	<input type="checkbox"/> Bleeding risk considered			
Pharmacological Prophylaxis: <input type="checkbox"/> Indicated* <input type="checkbox"/> Not Indicated <input type="checkbox"/> Contraindicated <small>*Consider surgical and anaesthetic implications prior to prescribing</small>				
Mechanical Prophylaxis: <input type="checkbox"/> GCS <input type="checkbox"/> IPC <input type="checkbox"/> VFP <input type="checkbox"/> Not Indicated <input type="checkbox"/> Contraindicated		If risk changes document VTE prophylaxis requirements on new chart		
<small>Key: GCS – Graduated Compression Stockings; IPC – Intermittent Pneumatic Compression; VFP – Venous Foot Pumps</small>				

**Warfarin / Anticoagulant in use**  
Refer to Anticoagulation Chart for administration details

The VTE prophylaxis section on the WA HMC is designed to prompt documentation of:

- VTE risk assessment
- Contraindications to VTE prophylaxis
- Prescribing of pharmacological and mechanical VTE prophylaxis, if indicated.

The clinician responsibility for assessing a patient’s VTE risk (usually the admitting medical officer or authorised prescriber) should review the VTE risk, bleeding risk and contraindications, then document the outcome on the WA HMC.

For patients with multiple charts, the VTE risk assessment should be documented on the first chart.

### Related Documents / Forms

- [MR170A WA Hospital Medication Chart – Adult Short Stay](#)
- [MR171 WA Hospital Medication Chart – Adult Long Stay](#)
- [MR170C Anticoagulant Medication Chart](#)
- [MR80A WACHS Maternity Inpatient Risk Assessment](#)
- [MR170.2 WACHS Epidural/Spinal Prescription and Additional Observation Chart](#)

### Patient Education

During their admission and on discharge all patients and/or their family/ carers should be offered verbal and written information relevant to them by clinical staff on:

- Risk factors for developing a Deep Vein Thrombosis (DVT) / Pulmonary Embolus (PE)
- Signs and symptoms of DVT and PE
- Importance of seeking medical guidance and who to contact if DVT, PE or other adverse event suspected
- Importance of using VTE prophylaxis at home correctly and for the recommended duration
- Signs and symptoms of adverse events related to VTE prophylaxis

There are a range of resources available on line

- Healthy WA [Deep Vein Thrombosis](#)
- ACSQHC [Consumer fact sheet on Venous Thromboembolism Prevention Clinical Care Standard](#)
- ACSQHC [Consumer fact sheet – Quick Facts](#)

### Discharge

Prior to discharge any plan to continue VTE prophylaxis must be communicated with patients and their carer, including how to use the prophylaxis.

On discharge clinical staff must ensure that the:

- Patient/carer is able to apply/administer the mechanical/pharmacological VTE prophylaxis
- Patient's General Practitioner (GP) is notified of VTE prophylaxis measures via the patients discharge summary.

The provision of information should be included in the patient discharge documentation

## 10. Roles and Responsibilities

**Prescribers** on the medical treating team are responsible to ensure the risk assessment is complete and documented on the hospital medication chart. A plan for VTE prophylaxis on discharge if required should be documented in the patient notes and within the discharge summary.

**Nursing staff** are responsible to ensure treatments for the prevention of VTE are administered and mechanical prevention measures are used as prescribed.

**Allied Health** staff are responsible to ensure that education is provided for the general prevention of VTE, mechanical measures are used as prescribed, exercises and activity are prescribed as appropriate, and post-operative screening and education are provided in the rehabilitation setting.

## 11. Compliance Monitoring

Evaluation, audit and feedback processes are to be in place to monitor compliance. Regional Patient Safety and Quality units facilitate audits based on local risk assessment using the national inpatient medication chart audit tool for WA Hospital Medication Chart.

Failure to comply with this policy may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the [Employment Policy Framework](#) issued pursuant to section 26 of the [Health Services Act 2016](#) (HSA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

## 12. Relevant Standards

[National Safety and Quality Healthcare Standards](#) (Second edition 2017) 1.7, 4.15, 5.10, 5.11, 5.13, 5.24

## 13. Related WA Health Policies

- [Medication Chart Policy](#)
- [WA Health Consent to Treatment Policy](#)
- [Western Australian Patient Identification Policy 2014](#)



## 14. Relevant WACHS documents

- [MR170A WA Hospital Medication Chart – Adult Short Stay](#)
- [MR171 WA Hospital Medication Chart – Adult Long Stay](#)
- [MR170C Anticoagulant Medication Chart](#)
- [MR80A WACHS Maternity Inpatient Risk Assessment](#)
- [MR 170.2 WACHS Epidural/Spinal Prescription and Additional Observation Chart](#)

## 15. WA Health Policy Framework

[Clinical Governance, Safety and Quality Policy Framework](#)

## 16. Acknowledgement

Acknowledgment is made of the previous SMHS / WACHS site endorsed work used to compile this VTE Clinical Practice Standard.

## 17. References

1. Australian Commission of Safety and Quality in Health Care. Venous Thromboembolism Prevention Clinical Care Standard. Sydney: ACSQHC; 2018.
2. Guyatt GH, Eikelboom JW, Gould MK, Garcia DA, Crowther M, Murad MH, et al. Approach to outcome measurement in the prevention of thrombosis in surgical and medical patients: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest. 2012;141(2 Suppl):e185S-e94S.
3. Australian Medicine Handbook 2018 (online). Adelaide: Australian Medicines Handbook Pty Ltd; 2018. Available from: <https://amhonline-amh-net-au.wachslibresources.health.wa.gov.au/>.
4. Agaba P, Kildow BJ, Dhotar H, Seyler TM, Bolognesi M. Comparison of postoperative complications after total hip arthroplasty among patients receiving aspirin, enoxaparin, warfarin, and factor Xa inhibitors. Journal of orthopaedics. 2017;14(4):537-43.
5. Faour M, Piuizzi NS, Brigati DP, Klika AK, Mont MA, Barsoum WK, et al. Low-Dose Aspirin Is Safe and Effective for Venous Thromboembolism Prophylaxis Following Total Knee Arthroplasty. The Journal of arthroplasty. 2018;33(7s):S131-s5.
6. Freeman AL, Pendleton RC, Rondina MT. Prevention of venous thromboembolism in obesity. Expert review of cardiovascular therapy. 2010;8(12):1711-21.

## 18. Definitions

<b>ACSQHC</b>	Australian Commission on Safety and Quality in Health Care
<b>Carer</b>	A person who provides personal care, support and assistance to another individual who needs it because they have a disability, a medical condition (including a terminal or chronic illness) or a mental illness, or are frail and/or aged
<b>DVT</b>	Deep Vein Thrombosis
<b>Patient</b>	A person who is receiving care in a health service organisation
<b>VTE</b>	Venous Thromboembolism

## 19. Records Management

[Records Management Policy](#)

[Health Record Management Policy](#)

## 20. Appendices

Appendix 1: [VTE Risk Assessment and Thromboprophylaxis](#)

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on request for a person with a disability**

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## Appendix 1: VTE Risk Assessment and Thromboprophylaxis Management Guideline

Step 1: Assess the Risk Factors		
<b>Baseline risk:</b> <ul style="list-style-type: none"> <li>Prior history of VTE</li> <li>Pregnancy or puerperium</li> <li>Malignancy</li> <li>Marked obesity</li> <li>Prolonged severe immobility including limb immobility</li> <li>Prolonged travel resulting in limited movement</li> <li>Oestrogen-containing hormone replacement therapy or oral contraceptive</li> <li>Thrombophilia</li> <li>Age (incidence of VTE rises with each decade &gt;40 years of age)</li> <li>Varicose veins with phlebitis</li> </ul>		
Surgical Patients	Medical patients	Obstetric
<b>HIGH RISK</b> <ul style="list-style-type: none"> <li>Orthopaedic surgery (hip #, pelvic, hip / knee arthroplasty, lower limb)</li> <li>Multiple trauma</li> <li>Prolonged surgery (&gt;45 Min)</li> <li>Other surgery with prior VTE or active cancer</li> </ul> <p>LOW RISK - Consider GCS for all surgery unless contraindicated</p>	<b>HIGH RISK</b> <ul style="list-style-type: none"> <li>Acute / acute on chronic chest Infection</li> <li>Congestive heart failure</li> <li>Myocardial infarction</li> <li>Stroke with immobility</li> <li>Undergoing cancer therapy</li> <li>Acute inflammatory bowel disease</li> <li>Active rheumatic disease</li> </ul>	<p>Refer to <a href="#">MR80A WACHS Maternity Inpatient Risk Assessment</a></p>
Step 2: Bleeding Risk and Relative Contraindication		
<b>Pharmacological Contraindication</b> <ul style="list-style-type: none"> <li>Active bleeding (≥2 units of blood products within 24 hours)</li> <li>high risk of bleeding or recent major surgery at high risk of bleeding.</li> <li>Bleeding disorders</li> <li>Severe platelet dysfunction</li> <li>Liver disease with associated coagulopathy</li> <li>Regional axial anaesthesia or recent lumbar puncture</li> <li>Severe renal dysfunction</li> <li>High risk of falls – take precautions</li> <li>Known hypersensitivity to LMWH or LDUH - consider discussion with haematologist</li> </ul>		<b>Mechanical Contraindications</b> <p>Mechanical prophylaxis may cause reduced blood flow, pressure ulcers or increase the risk of falls, and are contraindicated with:</p> <ul style="list-style-type: none"> <li>Morbid obesity (where correct fitting of stocking cannot be achieved)</li> <li>Inflammatory conditions of the lower leg</li> <li>Severe peripheral vascular disease</li> <li>Diabetic neuropathy</li> <li>Severe oedema of the leg.</li> <li>Severe fall risk</li> </ul> <p>IPC and VFP can exacerbate ischemic disease, so are contraindicated with peripheral arterial disease or arterial ulcers.</p>
Step 3: Determine Appropriate Prophylaxis		
Surgical patients	Medical patients	Obstetric
<p><b>High risk</b> - LMWH or LDUH and GCS / IPC</p> <p>Low risk – consider GCS</p> <p>Other oral agents may be appropriate for THA or TKA</p>	<p>Ischaemic Stroke - LMWH</p> <p>General Medical – consider GCS and/or LMWH depending on risk</p>	<p>Refer to <a href="#">MR80A WACHS Maternity Inpatient Risk Assessment</a></p>
Step 4: Document Risk Assessment on WA Hospital Medication Chart		
<p>Pharmacological management is prescribed on the Anticoagulant chart. Mechanical treatment are recorded on the care plan</p>		
<p>KEY- GCS – Graduated Compression Stocking. IPC – Intermittent Pneumatic Compression. VFP – Venous Foot Pump. LMWH – Low Molecular Weight Heparin. LDUH – Low Dose Unrationed Heparin</p>		

This appendix should be used in conjunction with the full practice standard

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