**Canberra Health Services**

**High-Risk Medicine Standard**

**Heparin and other Anticoagulants**

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| Contents |

[Contents 1](#_Toc86419707)

[Introduction 2](#_Toc86419708)

[Background 2](#_Toc86419709)

[Key Objective 2](#_Toc86419710)

[Alerts 2](#_Toc86419711)

[Scope 3](#_Toc86419712)

[Section 1 – Guideline and Policy Requirements 3](#_Toc86419713)

[Section 2 – Prescriber Responsibilities 3](#_Toc86419714)

[Section 3 – Medication Administration 4](#_Toc86419715)

[Section 4 – Monitoring 5](#_Toc86419716)

[4.1 Patient Monitoring 5](#_Toc86419717)

[4.2 Medication Review 5](#_Toc86419718)

[Section 5 – Storage and Supply 5](#_Toc86419719)

[Section 6 – Training/Qualifications Required 6](#_Toc86419720)

[Section 7 – Patient Information 6](#_Toc86419721)

[Evaluation 6](#_Toc86419722)

[Related Policies, Procedures, Guidelines and Legislation 7](#_Toc86419723)

[References 7](#_Toc86419724)

[Search Terms 7](#_Toc86419725)

|  |
| --- |
| Introduction |

## Background

Canberra Health Services (CHS) maintains a [High-Risk Medicines Register](https://actgovernment.sharepoint.com/sites/intranet-health/ppr/Policy%20and%20Plans%20Register/Forms/AllItems.aspx?viewid=ffd4eb4d%2D173e%2D4e29%2D81ac%2D2f0c09f8ae03). This register, its correlating standards and the *High-Risk Medicine Policy* form a high-risk medication framework that supports clinical staff to safely manage high-risk medicines and minimise risks associated with their use.

Anticoagulant medicines have a narrow therapeutic index and over or under anticoagulation can result in significant adverse patient outcomes. The incorrect dose or failure to monitor therapy can contribute to this event and there is the potential for excessive bleeding and death if over anticoagulation occurs.

Due to the potential for significant patient harm, should an error occur, all anticoagulants including warfarin, direct oral anticoagulants (e.g dabigatran, apixaban, rivaroxaban), unfractionated heparin and low molecular weight heparin, are included on the CHS High-Risk Medicine Register.

Errors involving anticoagulant medicines can include1:

* Duplication of therapy. For example, ordering pharmacological venous thromboembolism (VTE) prophylaxis for patients who are receiving therapeutic anticoagulation
* Use of a therapeutic dose when a prophylactic dose was intended and vice versa
* Failure to adjust an anticoagulant dose according to patient factors. For example, haematology parameters, biochemistry, estimated creatinine clearance, age
* Incorrect protocol use. For example, administration of a concentration of unfractionated heparin solution contrary to the protocol resulting in administration of an incorrect dose
* Incorrect use following discharge. For example, inadequate patient and / or carer education for patients being discharged on anticoagulants resulting in adverse events.

The following standard outlines the **minimum** actions required to ensure anticoagulants are stored, prescribed, dispensed, and administered safely.

## Key Objective

This document sets out the standards for the safe management and use of anticoagulants.

Compliance with this standard is mandatory and will support the clinical workforce in the safe management and use of anticoagulants and help prevent prescription, dispensing and administration errors.

## Alerts

This standard does not contain clinical guidance on the prophylactic or therapeutic use of anticoagulants. It is recommended that prescribers contact the Haematology team for advice on dosing if required.

[*Back to Table of Contents*](#Contents)

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| --- |
| Scope |

This standard applies to all Canberra Health Services health professionals involved in prescribing, dispensing, and administration of anticoagulants. It will also apply to all health professionals who interact with a patient who has been administered an anticoagulant.

[*Back to Table of Contents*](#Contents)

|  |
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| Section 1 – Guideline and Policy Requirements |

Prescribing of unfractionated heparin, warfarin, low molecular weight heparin and non-vitamin K antagonist oral anticoagulants (NOAC) must be in accordance with local or national guidelines and policies such as CHS Anticoagulation Therapeutic Management (Adults only) – or Venous Thromboembolism (VTE) Prevention (Adults & Children).

CHS policies/guidelines pertaining to the use of anticoagulants must outline the specific risk reduction strategies that must be used to support the safe management of the anticoagulant described in the policy.

These policies/guidelines must include

* The requirement for recording accurate patient weight (where practical) for all patients receiving anticoagulant therapy
* Instructions for estimating renal function
* Managing anticoagulation in high-risk patients
* Evidence-based dosing guidelines and guidance for prescribing
* Monitoring requirements including coagulation status and monitoring for HITs or new/extension of thrombosis
* Use of reversal agents and management of bleeding
* Instructions for switching to and from other anticoagulant medicines
* Instructions (or reference to the local peri-operative guidelines) for managing anticoagulants during the perioperative period
* Requirements for patient and / or carer education.

[*Back to Table of Contents*](#Contents)

|  |
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| Section 2 – Prescriber Responsibilities |

In addition to the general requirements for prescribing and administering high-risk medicines as outlined in the High-Risk Medicine Policy located on the CHS Policy and Guidance Documents Register, the following apply at the point of prescribing an anticoagulant:

* The indication for anticoagulation and therapeutic targets where appropriate, must be documented in the health care record. Details should include the anticoagulant name, dose, intended duration of therapy, timeframe for review and whether anticoagulation is newly initiated or a continuation of previous therapy. The indication should also be recorded in the appropriate section of the Electronic Medication Management (EMM) system or National Inpatient Medication Chart (NIMC).
* Where National Inpatient Medication Charts (NIMC) are in use, warfarin, VTE Prophylaxis and other anticoagulant medicines must be prescribed in designated dedicated sections for anticoagulant medicines according to the Australian Commission on Safety and Quality in Health Care NIMC User Guide.
* Due to the teratogenic nature of some anticoagulants, the prescriber must determine if a female of childbearing age is pregnant or breastfeeding. If there is any doubt, a pregnancy test should be ordered.
* When assessing VTE risk, the prescriber must ascertain if the patient is already receiving any other anticoagulant medicines.
* Check for drug interactions and for any existing co-morbidities with high risk of bleeding.
* Heparin for intravenous infusion must only be prescribed and administered using the Heparin Intravenous Infusion Order and Administration chart – Adult.
* It is mandatory for prescribers to prescribe standard concentrations of heparin 25,000 units in 0.9%sodium chloride 250mL pre-mixed infusion bags for all heparin infusions.

[*Back to Table of Contents*](#Contents)

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| Section 3 – Medication Administration |

* Before administration to a patient, all parental anticoagulants require a fully independent double-check, carried out by a second clinician. The check should be conducted using independent double check principles. That is, clinicians separately check (alone and apart from each other, then compare results) each component of prescribing, dispensing, and verifying the medicine before administering it to the patient.
* Intravenous heparin infusions must be administered using a standard concentration of - heparin 25,000 units in 0.9% sodium chloride 250mL premixed infusion bag using the B-Braun pump heparin library setting.
* Bolus heparin doses that are required during a heparin infusion must be administered using a standard concentration heparin 25,000 units in 0.9% sodium chloride 250mL pre-mixed infusion bag and the heparin bolus library setting selected in the B-Braun pump.
* Administration of intravenous heparin must be recorded on the Heparin Intravenous Infusion Order and Administration Chart-Adult. This includes bag/rate changes and loading doses.
* Appropriate reversal agents or antidotes for anticoagulants (protamine, vitamin K) must be readily accessible on every ward.

[*Back to Table of Contents*](#Contents)

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| Section 4 – Monitoring |

## 4.1 Patient Monitoring

* Monitoring requirements must be clearly documented and include the frequency and type of laboratory testing, as well as instructions for monitoring patients for bleeding. The Heparin Intravenous Infusion Order and Administration Chart-Adult must be used to document blood monitoring requirements and results.
* To ensure the dosing information in the Heparin Intravenous Infusion Order and Administration Chart-Adult is current, the Director of Pathology must notify Pharmacy if a reagent batch change requires alteration of the nomogram.
* Patients on anticoagulants who fall are at an increased risk of bleeding and serious

trauma including brain injury and will require close observation and monitoring according to Canberra Health Services Clinical Procedure for Falls Prevention and Management (including safe use of bed rails).

## 4.2 Medication Review

Patients receiving anticoagulant medicines should be prioritised for both Medication Reconciliation and Medication Review.

[*Back to Table of Contents*](#Contents)

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| Section 5 – Storage and Supply |

* The range of unfractionated heparin vial/ampoule concentrations and sizes is limited to reduce the risk of unintentionally administering an incorrect dose.
* High concentration heparin vials/ampoules such as 25,000 units/5mL are not available within CHS due to the risk of patient harm.
* Patients requiring a heparin infusion will be supplied with a standard concentration heparin 25,000 units in 0.9% sodium chloride 250mL premixed infusion bags, either as an imprest item or dispensed by pharmacy and labelled specifically for the patient. Standard heparin infusion bags have a distinct blue plastic outer wrap.
* Store unfractionated heparin ampoules in patient care areas in their original packaging and separate from each other to reduce risk of selection error. Maximise differentiation by using physical separation, labelling, and other techniques.
* To reduce likelihood of preventable harm, direct oral acting anticoagulants such as rivaroxaban, apixaban and dabigatran must be reviewed by a pharmacist, dispensed by pharmacy and labelled specifically for the patient. These medicines must only be used for the patient on the pharmacy label and returned to pharmacy when the patient has been discharged. If direct oral acting anticoagulants are required after hours a small quantity of these can be obtained via the After-Hours Hospital Manager from the After-Hours cupboard. These patients will be followed up by pharmacy in business hours.

[*Back to Table of Contents*](#Contents)

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| Section 6 – Training/Qualifications Required |

A once off completion of the National High Risk Medicines e-learning package is mandatory for all CHS medical officers, pharmacists, nurses and midwives and can be found at <https://www.hrmeducation.health.gov.au/> An optional High Risk Medicine Anticoagulant specific module which promotes the safe management of anticoagulants is also available to all staff at [Anticoagulants - High Risk Medicine Education (health.gov.au)](https://hrmeducation.health.gov.au/course/details/anticoagulants)

[*Back to Table of Contents*](#Contents)

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| Section 7 – Patient Information |

All patients initiated on oral or injectable anticoagulants such as warfarin, Direct Oral Anticoagulants (e.g rivaroxaban) or low molecular weight heparin (e.g enoxaparin) for ongoing treatment, must receive verbal and written information about their new medicine at the time of commencement on the medicine. Provision of anticoagulant education should be documented by the clinician who provided the education in the patient’s clinical record and /or in the designated section on the NIMC.

Information and education should address:

* Name and dose of anticoagulant and reason for prescribing
* Intended duration of therapy and timeframe for specialist review
* How to identify bleeding, who to contact and action to be taken
* What to do in the case of a missed dose
* Instruction for any laboratory testing and review
* Any medication or food interactions and other lifestyle factors that influence therapy
* Any specific storage and administration instructions.

Patients on warfarin should be provided with a warfarin booklet for tracking warfarin therapy and results.

[*Back to Table of Contents*](#Contents)

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| Evaluation |

Compliance with the Heparin and other Anticoagulants High-Risk Medicine Standard and associated High-Risk Medicines Policy must be evaluated through regular medication storage audits, hospital acquired complication data and analysis of incident reports. This should also include evaluation of safety controls and identification of quality improvement opportunities2.

Feedback of evaluation results should be provided to staff to assist with motivation, compliance and continued improvement. Audit results will also be reported to the Medication Safety Committee who will be responsible for ensuring the standard is being implemented as intended.

[*Back to Table of Contents*](#Contents)

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| --- |
| Related Policies, Procedures, Guidelines and Legislation |

**Policies, Procedures and Guidelines**

* Medication Handling
* High-Risk Medicines
* High-Risk Medicine Standard – Insulin
* High-Risk Medicine Standard – Neuromuscular Blocking Agents
* CHS Anticoagulation Therapeutic Management (Adults only)
* Venous Thromboembolism (VTE) Prevention (Adults & Children)
* Venous Thromboembolism Prevention Clinical Care Standard, Australian Commission of Safety and Quality in Health Care, January 2020
* Falls Prevention and Management

**Legislation**

* *Australian Charter of Healthcare Rights*
* *Human Rights Act* 2019
* *Medicines, Poisons and Therapeutic Goods Act* 2008
* *Medicines, Poisons and Therapeutic Goods Regulation* 2008
* *Health Practitioner Regulation National Law Act* 2010
* *Therapeutic Goods Act* 1989
* *Therapeutic Goods Regulations* 1990

**Other**

* Australian Charter of Health Care Rights

[*Back to Table of Contents*](#Contents)

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| --- |
| References |

1. High Risk Medicines, Anticoagulants. Clinical Excellence Commission
2. Medication Safety Self-Assessment for Antithrombotic Therapy. Institute for Safer Medication Practices

[*Back to Table of Contents*](#Contents)

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| --- |
| Search Terms |

High-Risk, high risk, high risk medicines, high-risk medicines, high-risk medications, High-Risk Medicines Register, high risk medicine register, High-Risk Medicine Standards, High risk medicines standards, High-Risk Medicines Guidelines, Standards, Heparin, rivaroxaban, Medication Administration, High Risk, enoxaparin, dalteparin, fragmin, clexane, apixaban, warfarin, dabigatran, anticoagulants, anticoagulation, LMWH, unfractionated, NOAC, DOAC, NOACs, oral anticoagulants.

[*Back to Table of Contents*](#_top)

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*Policy Team ONLY to complete the following:*

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| *Date Amended* | *Section Amended* | *Divisional Approval* | *Final Approval* |
| *29 October 2021* | *New Document* | *Nick Coatsworth, EDMS* | *CHS Policy Committee* |
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*This document supersedes the following:*

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| *Document Number* | *Document Name* |
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