

Explanatory Notes WA Anticoagulation Medication Chart (WAAMC)

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Introduction	3
Preamble	3
When Should This Chart Be Used?	3
Important	3
Recommendations For Use Of Anticoagulants	3
Patient Information	4
Patient Location	4
Patient Identification	4
Patient Weight And Height	4
Number Of Charts	4
Adr Alert Sticker	4
Relevant Medical History	4
Once Only And Telephone Orders	5
Regular Dose Orders	5
Best Practice In The Use Of Lmwh	5
Completing The Chart	6
Variable Dose Orders	7
Best Practice	7
Completing The Chart	9
Discharge Supply	11
Intravenous Unfractionated Heparin	12
Best Practice	12
Completing The Chart	13

INTRODUCTION

Preamble

This chart was developed by a multidisciplinary working group convened by the Western Australian Medication Safety Group. The aim of the chart is to improve dosing and monitoring of anticoagulants and subsequently reduce the risk of anticoagulant related patient harm. To achieve this, the chart co-locates recommended dosing and monitoring regimen with the prescription orders. The chart also co-locates important information where required for dosing including test results, weight and GFR.

The dosing and monitoring regimen provided represent current best practice in the majority of patients; however they do not cover all clinical scenarios and do not replace the need for clinical judgement.

The best practice recommendations included in this book refer to the in hospital management of anticoagulants and may not be appropriate in ambulatory care.

When should this chart be used?

This chart should be used for every hospital episode where a patient is prescribed an oral, intravenous or subcutaneous anticoagulant. This includes but is not limited to warfarin, unfractionated heparin (UFH) and low molecular weight heparin (LMWH).

Important

In principle, the requirements for using the Anticoagulation Medication Chart are the same as those of the National Inpatient Medication Chart (NIMC). Refer to "Guidelines for the use of the NIMC" available at

http://www.health.wa.gov.au/nimc/docs/NIMC_WAGuidelines.pdf.

Ensure that use of the anticoagulation chart is documented on the main medication chart (NIMC) by following the guidelines for additional charts (Section 3.5) and warfarin (Section 4.2) in the NIMC guidelines.

Recommendations for use of anticoagulants

The recommendations for the use of subcutaneous LMWH, warfarin and intravenous UFH represent current best practice. However these do not cover all clinical scenarios and do not replace the need to clinical judgement.

PATIENT INFORMATION

The following sections are identical to the NIMC and should be completed following the Health Department Guidelines.

Patient location

Patient Identification

Patient weight and height

Number of charts

ADR alert sticker

Relevant medical history

Best practice

Prior to initiating any anticoagulant therapy, patients must be screened for:

- co-existing diseases or conditions that could affect the decision to prescribe or dose requirements
- past anticoagulant related adverse incidents
- concomitant antiplatelet or antithrombotic therapy

This recommendation is based on the Medication Safety Self Assessment for Antithrombotics Therapy in Australian Hospitals¹ and alerts the prescriber to a possible need for dose modification or a need to monitor more closely.

Completing the chart

PRE-PRESCRIPTION SCREEN (First prescriber to complete and sign)					
Co-existing conditions relevant to anticoagulants					
<input type="checkbox"/> Pregnancy	<input type="checkbox"/> Renal dysfunction	<input type="checkbox"/> Recent trauma	<input type="checkbox"/> Hepatic impairment	<input type="checkbox"/> Hypoalbuminaemia	<input type="checkbox"/> Recent surgery
<input type="checkbox"/> Thyroid disorder	<input type="checkbox"/> High Vitamin K intake	<input type="checkbox"/> Recent bleeding	<input type="checkbox"/> Congestive Heart Failure	<input type="checkbox"/> Thrombocytopaenia	<input type="checkbox"/> Active peptic ulcer
Anticoagulants history		<input type="checkbox"/> Allergy to warfarin	<input type="checkbox"/> Bleeding with anticoagulants	<input type="checkbox"/> Heparin Induced Thrombocytopaenia	
Concomitant therapy		<input type="checkbox"/> Antiplatelet therapy	<input type="checkbox"/> Other antithrombotic agent (specify)		
<input type="checkbox"/> Other precaution (Specify)					
<input type="checkbox"/> Nil known	Sign and print name				Date

This section should be completed by the first prescriber on the anticoagulant chart. The prescriber should sign and date this section on completion. The “Nil significant” box should be ticked where there are no confounding conditions.

Where any ADRs including allergies are listed on the NIMC an ADR sticker should be affixed to the anticoagulant chart.

¹ Clinical Excellence Commission, NSW (2007). Medication Safety Self Assessment for Antithrombotic Therapy in Australian Hospitals (sections 1.17-1.19), <http://www.cec.health.nsw.gov.au/pdf/MSSA-AT.pdf>

ONCE ONLY AND TELEPHONE ORDERS

ONCE ONLY AND TELEPHONE (Prescriber to sign within 24 hours of order)										
Date prescribed	Medication (print generic name)	Route	Dose	Date/Time of dose	Nurse initials		Sign	Prescriber Print name	Given by	Time given
					N1	N2				

This section of the chart should be used for all one-off doses of oral, subcutaneous or intravenous anticoagulant drugs. This applies to both once only and telephone orders. Telephone orders should all be signed by the prescriber with 24 hours.

This is identical to the "Telephone Orders" section of the NIMC and should be completed following the NIMC guidelines.

REGULAR DOSE ORDERS

This section of the chart should be used for all regular dose orders, both subcutaneous LMWH and UFH and the oral anticoagulant, rivaroxaban.

Best practice in the use of LMWH

- Dosing of LMWH is recognised to be a function of the indication, perception of bleeding risk and modifying factors (eg renal failure). In WA the recommended dosing regimen for enoxaparin (Clexane®) is:

INDICATION	DOSE AND FREQUENCY	
	Normal renal function	Impaired renal function (GFR <30 mL/min)
Venous Thromboembolism (VTE) prophylaxis	40 mg once daily	20 mg once daily
DVT treatment	1.5 mg/kg once daily or 1 mg/kg twice daily	1 mg/kg once daily
Acute Coronary Syndromes (ACS)/VTE treatment	1 mg/kg twice daily	1 mg/kg once daily

- Dose modification of these drugs is required when the creatinine clearance (CrCl) is less than 30 ml/min. GFR should be estimated using the Cockcroft-Gault equation. This is especially important in the elderly. The Modification of Diet in Renal Disease (eGFR) provided with laboratory results should not be used².
- Routine monitoring of residual anti-Xa activity as a measure of LMWH therapy is not required. However, in the case of patients at high risk of bleeding, anti-factor Xa monitoring may be appropriate.
- While the risk of heparin induced thrombocytopenia (HIT) is lower with LMWH than unfractionated heparin, screening for HIT with a platelet count at day 5 of therapy is recommended.
- Guidelines for treatment reversal: Seek specialist/senior advice.
As a guide: Give 1mg protamine sulphate per 1mg enoxaparin/100 units of heparin. Give half the protamine sulphate dose as a slow IV push (10 minutes) and the remainder as an infusion (in 5% glucose or 0.9% saline) over 6-8 hours.

² Roberts, G. W. (2006). "Dosing of key renally cleared drugs in the elderly - Time to be wary of the eGFR." *Journal of Pharmacy Practice and Research*, 36(3): 204-209.

- Timing of VTE prophylaxis in the peri-operative/invasive procedures setting
 - Interventional (surgical) procedure: may commence treatment 4-6 hours after procedure.
 - Spinal/epidural anaesthesia: do not institute anaesthesia or remove catheter within 12 hours of a dose of LMWH. Treatment may be commenced 2 hours after catheter removal.
 - Consider longer exclusion periods in the presence of complications or high risk of bleeding.
- Timing of VTE/ACS treatment in the peri-operative/invasive procedures setting
 - Interventional (surgical) procedure: withhold treatment 12-24 hours before and after procedure.
 - Spinal/epidural anaesthesia: do not institute anaesthesia or remove catheter within 24 hours of a dose of LMWH. Treatment may be commenced 2 hours after catheter removal.
 - Consider longer exclusion periods in the presence of complications or high risk of bleeding.

Completing the chart

REGULAR DOSE ORDERS											
YEAR 20 _____				DAY AND MONTH →							
Date	Medication (Print generic name)										
CrCl mL/min	Route	Dose Frequency NOW enter times →									
Indication <input type="checkbox"/> PROPHYLAXIS <input type="checkbox"/> TREATMENT		Pharmacy									
Prescriber Sign		Print name	Contact	Creatinine							
				Platelets							

This section is similar to the Regular Orders section of the NIMC and should be completed following the NIMC guidelines.

Date: Date the medication order was commenced in hospital.

Medication: Print the generic name of the drug.

CrCl: Document the baseline GFR used to determine LMWH dose. Ideal body weight should be used in cases of extreme weight. Calculators for GFR and IBW are available online (CIAO/Therapeutic Guidelines/Popular links/Creatinine clearance and ideal body weight calculators). Do not use eGFR provided with the laboratory results.

Route Indicate whether subcutaneous (subcut) or oral.

Dose and frequency: Follow recommended dose and frequency. Seek specialist advice for obese patients or weight >150 kg.

Times: Preferred administration times for twice daily dosing are 0600 and 1800. Daily thromboprophylaxis should be given in the evening.

Indication: Tick the appropriate box. If TREATMENT, specify the condition.

Pharmacy: This section is for use by the ward/clinical pharmacist

Creatinine/Platelets: There is provision to record creatinine and platelets to assist monitoring. As a minimum platelets should be measured on Day 5.

Prescriber The signature of the prescriber must be written to complete each

Sign, medication order. For each signature, the name must be written in print at
Print name, least once on the medication chart.
Contact:

VARIABLE DOSE ORDERS

This section of the chart should be used for all variable dose anticoagulants, usually warfarin.

Best practice

- Warfarin should be prescribed without brand substitution. Individual patients should remain on one brand of warfarin. Within the WA Public sector Marevan® is the preferred brand.
- Before initiating warfarin therapy measure baseline INR. If INR>1.4 do not commence warfarin - seek senior/specialist advice.
- Warfarin should be monitored and dose modified based on the INR result.
Initiating treatment: A dose nomogram should be available to provide decision support to junior staff so as to provide assistance with the initiation of warfarin therapy. The warfarin initiation nomogram should be simple and easy to use and balance rapid anticoagulation with bleeding risk. In WA is the recommended nomogram for an INR 2-3 is:

Day	INR	Suggested dose
1	1.0-1.4	5 mg
2	No INR required	5 mg
3	<1.8	5 mg
	≥1.8	1 mg
4&5	<1.5	7 mg
	1.5-1.9	5 mg
	2.0-2.5	4 mg
	2.6-3.5	3 mg
	3.6-4.0	2 mg
	4.1-4.5	1 mg
	>4.5	see treatment reversal
6 onwards	Measure on alternate days until stable (daily if drug interaction or high bleeding risk)	as for days 4&5 or per clinical judgement

This dosing regimen takes about 6 days to achieve therapeutic INR, longer in those under 60 years. If a shorter time to therapeutic levels is indicated or for younger patients consider 7 to 10 mg on day 1 and day 2. Consider smaller starting doses when the patient is elderly, has low body weight or abnormal liver function, or, is at high bleeding risk. Consider dose modification in the presence of interacting drugs.

Ongoing treatment: In acutely ill patients daily monitoring of INR may be appropriate. Monitor INR more frequently when any change in treatment involves drugs known to interact with warfarin.

- Recommended time for inpatient dosing is 1600. This allows the medical team caring for the patient to order the next dose based on INR results, rather than leaving it for after-hours staff.
- INR testing is recommended at morning blood round.

- Indication for treatment, appropriate target range and planned duration of treatment should all be documented.
 - All patients should receive warfarin education, including written information prior to discharge. This should be documented. It is recognised that education may be completed by pharmacy, nursing or medical staff.
 - The dose modifications made to warfarin therapy should be communicated to the primary care practitioner to assist further dose modification in the early post-discharge phase.
 - In the case of acute VTE treatment, heparin (unfractionated or low molecular weight) should be given for at least of 5 days and until the INR is greater than 2 for two consecutive days.
 - Reversal of overtreatment should be managed in accordance with the Australasian Society of Thrombosis and Haemostasis³. In the case of bleeding, always seek advice from senior staff or a specialist.
- Risk factors for bleeding complications include: recent surgery/trauma/bleed, advanced age, renal failure, hypertension, alcohol abuse, active GI disease, antiplatelet therapy and other relevant comorbidity.

Clinical setting	Action
INR <5; no bleeding	<ul style="list-style-type: none"> • Lower the dose or omit the next dose. Resume therapy at reduced dose when INR approaches therapeutic range. • If INR is only minimally above therapeutic range (up to 10%), dose reduction may not be necessary.
INR 5-9; no bleeding	<ul style="list-style-type: none"> • Cease warfarin; consider reasons for elevated INR and patient-specific factors. • If high bleeding risk, give vitamin K (1-2 mg orally¹ or 0.5-1 mg IV²). • Measure INR within 24 hours. Resume warfarin at reduced dose once INR is in therapeutic range.
INR >9; no bleeding	<ul style="list-style-type: none"> • If low bleeding risk, cease warfarin, give vitamin K either (2.5-5 mg orally¹ or 1 mg IV²). Measure INR in 6-12 hours. Resume warfarin at reduced dose once INR <5. • If high bleeding risk, cease warfarin, give vitamin K 1 mg IV². Consider Prothrombinex VF (25-50 units factor IX/kg)³⁴ and 300 ml of fresh frozen plasma. Measure INR in 6-12 hours. Monitor patient, resume warfarin at reduced dose when INR <5.
Warfarin-related clinically significant bleeding.	<ul style="list-style-type: none"> • Cease warfarin, give 5.0–10.0mg vitamin K IV², as well as Prothrombinex VF (25-50 units of factor IX/kg)³⁴ and fresh frozen plasma⁴ (300mL), assess patient continuously until INR < 5.0, and bleeding stops. <p>OR</p>
Seek senior advice.	<ul style="list-style-type: none"> • If fresh frozen plasma is unavailable, cease warfarin, give 5.0–10.0mg vitamin K IV², and Prothrombinex-VF (25-50 units of factor IX/kg)³⁴,

³ Baker, R. I., P. B. Coughlin, et al. (2004). "Warfarin reversal: consensus guidelines, on behalf of the Australasian Society of Thrombosis and Haemostasis." *Medical Journal of Australia* **181**(9): 492-7.

assess patient continuously until INR < 5.0, and bleeding stops.
OR

- If Prothrombinex-VF is unavailable, cease warfarin therapy, give 5.0–10.0mg vitamin K IV², and 10–15mL/kg of fresh frozen plasma⁴, assess patient continuously until INR < 5.0, and bleeding stops.

NOTES:

¹Oral Vitamin K: use undiluted paediatric IV formulation.

²IV Vitamin K: use undiluted as slow IV bolus over at least 30 seconds.

³Prothrombinex VF should be dosed to deliver 25-50 units of factor IX/kg at a rate of 3mL/min. 1 vial of Prothrombinex VF contains 500 units of factor IX.

⁴Prothrombinex VF and fresh frozen plasma are available from transfusion service.

Completing the chart

Warfarin-Drug Interactions

WARFARIN DRUG INTERACTIONS (PHARMACIST: Indicate drug, type of change (if any) and expected interaction)		
Details	Sign	Date

Completing this section is pharmacy responsibility, and allows the pharmacist to communicate potential clinically significant interactions to the prescriber. Details of drug interactions are available online (CIAO/Australian Medicines Handbook/Appendix B Drug interactions/Warfarin or eMIMS/Essential resources/MIMS DrugAlert Interactions).

AT THE TIME OF ADMISSION

- List all concomitant therapy that has a significant warfarin interaction.

DURING THE HOSPITAL EPISODE

- Add any new medications that that have a significant interaction, and
- Highlight any change made to the medications listed.

Each entry should be signed and dated.

YEAR 20_____ DAY AND MONTH →														
<input type="checkbox"/> Dose at admission		<input type="checkbox"/> Not Applicable		INR Result										
Dose _____ Brand: <input type="checkbox"/> Marevan® <input type="checkbox"/> Coumadin®														
Date	Medication (Print generic name) WARFARIN	Route	Dose Time 1600 (4pm)	DOSE		mg	mg	mg	mg	mg	mg	mg	mg	mg
Indication				Prescriber										
Target INR	Pharmacy		Telephone order N1/N2	Given by										
Prescriber sign	Print name	Contact												

The left hand side of the chart is completed at the time the order is started:

Dose at admission: This refers to the use of warfarin prior to hospital presentation. If not used prior to hospital presentation tick Not Applicable, otherwise indicate the brand of warfarin and the last pre-hospital dose.

Date: Date medication order was started in hospital.

Medication: Warfarin is pre-printed. If not appropriate, print generic drug name. Warfarin brands are not equivalent and cannot be used interchangeably. Marevan® is the brand of warfarin recommended for use in WA hospitals. If Coumadin® used prior to hospital presentation use patient's own Coumadin® if available. If switching from Coumadin® to Marevan® monitor INR daily.

Indication: Indication for oral anticoagulant therapy.

Route: In the case of warfarin this will be oral.

Target INR: Document the target INR.

2.0-3.0

- Preventing DVT: high risk patients eg hip or knee surgery
- Therapy for DVT or PE
- Preventing systemic embolisation: AF, valvular heart disease, post MI, bioprosthetic heart valves (first 3 months)

2.5-3.5

- Bileaflet mechanical heart valve (aortic)

3.0-4.5

- Mechanical prosthetic valve (high risk)

Pharmacy: This section is for use by the ward/clinical pharmacist

Prescriber Sign
Print name,
Contact: The signature of the prescriber must be written to complete each medication order. For each signature, the name must be written in print at least once on the medication chart.

Dose time: The recommended time is 1600. This time is pre-printed on the chart. If this is not suitable, cross out 1600 and enter appropriate time.

The right hand side of the chart must be completed each day:

INR result: Recommended time for INR testing is 0700 (morning blood round). Document the INR result for this day. If no test was performed this day, leave blank.

Dose: Dose prescribed for this day. If a dose is to be withheld this should be documented following the NIMC guidelines. If initiating warfarin, see nomogram on page 4.

Prescriber: Initials of doctor prescribing the daily warfarin dose. If the name is not already printed on the chart document the medical notes included printed name and signature.

Phone orders: Phone orders are not appropriate at all institutions - check local policy. Where allowed, two nurses must check the prescription and sign appropriately. Nursing staff should record full details in Clinical Record and doctor must sign order within 24 hours.

Given by: Initials of the nurse administering the daily dose.

Discharge Treatment Plan

This should be completed by the prescriber at the time of hospital discharge.

Warfarin discharge plan: Dose _____ Target INR _____ Duration _____ next INR due / /

Dose: Dose to be taken until the next INR test.

Target INR: as above

Duration: The expected duration of therapy eg long-term, 3-6 months.

Next INR: Date the next INR test is due.

To ensure continuity of care, the front page should be copied or preferably faxed to the GP. This provides information about the treatment plan as well as informing the GP about the course of treatment during the hospital episode of care.

Discharge Process

DISCHARGE PROCESS					
Mandatory activity	Signature	Print name	Mandatory activity	Signature	Print name
<input type="checkbox"/> Patient has warfarin booklet			<input type="checkbox"/> Patient given treatment plan		
<input type="checkbox"/> Patient education completed			<input type="checkbox"/> GP informed		
Fax or copy this page to GP					

This is a checklist and all activities should be completed by the time of hospital discharge. This is the official warfarin education and discharge record and will usually be completed by the pharmacist. However in some cases such as after-hours discharge this will need to be completed by another member of the clinical team. The person completing each of these mandatory activities must sign that the activity has been completed and print name.

- Patient has warfarin booklet: This may include on a previous episode. "Living with warfarin – information for patients" is available through the pharmacy department or contact wamsg@health.wa.gov.au.
- Patient education completed: This may include on a previous episode, provided the patient's knowledge has been checked.
- Patient given treatment plan: The patient should be informed about the **discharge dose** and **date of next INR test**. The warfarin book contains a detachable wallet/purse size warfarin treatment card. Document the treatment plan on this card.
- GP communication: Indicate whether the patient's GP has been contacted about the management plan. Fax or copy this page to the GP at discharge.

DISCHARGE SUPPLY

Continue on discharge YES / NO Dispense YES / NO Marevan: 5mg qty _____ / 3mg qty _____ / 1mg qty _____	<input type="checkbox"/> Take as directed	Continue on discharge YES / NO Dispense YES / NO Duration _____ days _____ / qty _____
Prescriber sign _____ Print Name _____ date / /		Pharmacist _____ date / /

This section is similar to the NIMC and should be completed following the NIMC guidelines. Note that warfarin tablet strengths are pre-printed. Indicate the number of tablets of each strength required.

INTRAVENOUS UNFRACTIONATED HEPARIN

Best practice

- Given the common use of dual antiplatelet therapy in the setting of ACS management, less intensive initial and maintenance dosing is advisable compared with the treatment of VTE. Accordingly indication-dependent nomograms are appropriate.
- Intravenous heparin should be prescribed using weight based initial bolus and infusion rates.

	Initial bolus dose	Initial infusion rate
VENOUS THROMBOEMBOLISM	80 units/kg (max 7200 units)	18 units/kg/h (max 1600 units/hr)
ACUTE CORONARY SYNDROMES	60 units/kg (max 4000 units)	12 units/kg/h (max 1000 units/hr)

- Intravenous UFH should be monitored using the Activated Partial Thromboplastin Time (aPTT).
- aPTT levels should be measured at baseline, then within 6 hours of each infusion rate change. When the aPTT is within the therapeutic range it should be remeasured within 24 hours (or the next morning).
- Each laboratory should determine its own therapeutic target range for heparin against a gold standard test (eg residual anti-Xa activity).
- Dose modification of intravenous UFH should be based on the aPTT using a weight based maintenance nomogram. The nomograms can only be used with the standard therapeutic aPTT range.

VENOUS THROMBOEMBOLISM		
aPTT	Action required	Rate change
<55	80 units/kg bolus	Increase 4 units/kg/h
55-<70	40 units/kg bolus	Increase 2 units/kg/h
70-105 (Therapeutic range)	No change	No change
>105-120	No change	Decrease 2 units/kg/h
>120	Contact doctor, hold infusion for 60 minutes	Decrease 3 units/kg/h
ACUTE CORONARY SYNDROMES		
aPTT	Action required	Rate change
<55	60 units/kg bolus	Increase 3 units/kg/h
55-<70	No change	Increase 2 units/kg/h
70-90 (Therapeutic range)	No change	No change
>90-105	No change	Decrease 1 units/kg/h
>105-120	Hold infusion for 30 minutes	Decrease 2 units/kg/h
>120	Contact doctor, hold infusion for 60 minutes	Decrease 3 units/kg/h

Medical responsibilities include –

- Prescription of initial bolus dose and infusion rate,
 - Selection of maintenance nomogram for nurse to use, including indication and weight,
- or
- Prescription of dose modification following each aPTT test,
 - Monitoring for complications of anticoagulation, and
 - Identification of treatment end points.

NOTE: The weight based guide provided with the WA Anticoagulation Medication Chart is only valid when using the standard heparin dilution of 50 units/mL of heparin. Where other dilutions are used or, the target aPTT is not the standard therapeutic range, the prescriber is responsible for dose modification following each aPTT test.

Nursing responsibilities include –

- Ensuring that an aPTT has been taken at the indicated time,
 - Obtaining the aPTT result in a timely manner,
 - Alerting the prescriber to extreme aPTT results
 - Implementing dose modification as indicated by prescribed nomogram
- or
- Contacting the prescriber with the aPTT result for prescription of dose modification.
- Nursing staff are to ensure that unfractionated heparin infusions are not stopped to allow patients to attend investigations; a nurse escort is required in this setting.
 - In the setting of VTE treatment, where warfarin therapy is being initiated, intravenous unfractionated heparin should be continued until the INR is greater than 2.0 in two consecutive days.
 - Measure platelets at baseline and at least twice weekly.
 - Contact haematologist in all suspected cases of Heparin Induced Thrombocytopenia (HIT).
 - Protamine reversal should be reserved for cases of major or bleeding or where required prior to emergency surgery. For high aPTT without bleeding apply relevant nomogram. Protamine reversal should always be carried out with senior/specialist advice. As a guide: Estimate heparin dose received in last hour. Administer 1mg protamine sulphate per 100 units of heparin (max 50 mg) as a slow IV push (over 10 minutes). Monitor aPTT immediately after the bolus then as required.

Completing the chart

NOTE: The management of IV heparin using the WA Anticoagulation Medication Chart assumes the use of a standard heparin solution of 50 units/mL. Where non-standard solutions are used management of IV heparin infusions is solely the responsibility of the individual unit.

Intravenous injection/infusion orders

INTRAVENOUS PRESCRIPTION ORDER Prescriber to complete. A new prescription is required if the order (total dose, fluid or volume) is changed.							
Target aPTT:		Indication: <input type="checkbox"/> VTE <input type="checkbox"/> ACS <input type="checkbox"/> Other(specify)				Weight:	
Date	Drug	Total dose (units)	Fluid	Volume (mL)	Signature	Print name	Contact
	HEPARIN	25,000	0.9% SODIUM CHLORIDE	500			

This must be completed by the prescriber. A new prescription is required if the order (total dose, fluid or volume) is changed. This requires a new anticoagulation chart.

Target aPTT: See the recommendations on page 3 or as specified by consultant. Note that standard therapeutic ranges vary between test centres and are hospital specific. Where the target aPTT is not the hospital specific standard therapeutic range, the prescriber is responsible for all dose adjustments.

Indication: Tick appropriate box.

Weight: The patient weight used to determine the dose should be documented.

Date: Date of prescription (total dose, fluid or volume).

Drug: Heparin is pre-printed. If not appropriate, print generic name.

Total dose: Number of **units** to be diluted. 25,000 is pre-printed. Amend if required.

Fluid: Type of dilution fluid. 0.9% Saline may be pre-printed.

Volume: Volume of dilution fluid. 500 mL may be pre-printed.

Prescriber Sign
Print name,
Contact: The signature of the prescriber must be written to complete each medication order. For each signature, the name must be written in print at least once on the medication chart.

Initial dose order and administration

INITIAL BOLUS AND INFUSION RATE Prescriber to complete ORDER.								
Date	Baseline aPTT	Date/time of dose	Bolus (units)	Infusion (mL/hr)	Prescriber		Nurse	
					Signature	Print name	Time	N1/N2

The prescriber should document:

Date: Date of order.

Baseline aPTT: aPTT should be measured prior to treatment commencing, although treatment may commence before the test result is available. The result should be documented, when available and, treatment modified if required.

Date/time of dose: Date/time of initial bolus dose.

Bolus dose (units): Total number of units to be given by bolus. This should be based on the patient weight and indication. Recommendations are provided on page 3.

Infusion rate (mL/hr): mL of prepared solution to be infused each hour. This should be based on the patient weight and indication. Recommendations are provided on page 3.

Prescriber:
Signature, Print
name The signature of the prescriber must be written to complete each medication order. For each signature, the name must be written in print at least once on the medication chart.

The nurse administering the initial dose then documents:

Time: The time the therapy commenced.

N1/N2: Two nurses to check/sign initial dose. The volume (of standard solutions) corresponding to each bolus dose is shown on page 3.

Maintenance infusion rate changes and bolus doses

MAINTENANCE INFUSION RATE CHANGES AND BOLUS DOSES				
Prescriber to complete order <input type="checkbox"/> Prescriber to be contacted following each aPTT test <input type="checkbox"/> Nursing staff to adjust dose based on nomogram for <input type="checkbox"/> VTE <input type="checkbox"/> ACS using _____ kg column				
Date	Prescriber signature	Print name	Contact	Pharmacy

The prescriber has the option to be contacted following each aPTT result for a decision about dosing, or, allowing nursing staff to make adjustments as indicated by appropriate nomograms. In the latter case the prescriber must show which nomogram is to be used (VTE or ACS) and the column (based on patient weight) to be used. This is only valid when using the standard heparin dilution and the standard aPTT therapeutic ranges.

Date: Date of the order.

Prescriber: The prescriber sign to complete the order. For each signature, the Signature, Print name, Contact name must be written in print at least once on the medication chart.

Pharmacy: This section is for use by the ward/clinical pharmacist

On page 3, the first nurse should strike out the nomogram that is not applicable and highlight the appropriate weight column.

aPTT test			Bolus and infusion rate administration									
Date	Time taken	aPTT	Time	IV bolus (units)	Bolus Sign	Hold (mins)	Time stopped	Hold Sign	Time started	New Rate (mL/hr)	Rate Sign	Prescriber Sign

aPTT test

The nurse records the date and time the blood was taken and the aPTT result. Where the aPTT is within the highest band – the doctor should always be notified.

Infusion change and bolus dose

This will usually be completed by nursing staff following the prescribed nomogram or as specifically ordered by the prescriber.

Time: If a bolus dose is indicated, record the time the dose is administered.

IV bolus (units): If a bolus dose is indicated, record the total number of units given.

Bolus sign: Two nurses to check/sign the bolus dose.

Hold (mins): If temporary stop to infusion indicated, record the length of the pause.

Time stopped: If infusion stopped record the time the infusion was stopped.

Hold sign: Two nurses to check/sign infusion temporarily stopped.

Time started: Record the time an infusion rate is changed. This includes following a pause. If the aPTT is within the target range and no change is required indicate the time that the aPTT result noted.

Rate (mL/hr): Record the rate of infusion. Where the aPTT is within the target range this will be the same as the previous, otherwise document the new rate.

Rate sign: Two nurses check/sign the rate of infusion.

Dr Sign: Each aPTT result and subsequent action should be reviewed by the responsible prescriber.

Infusion bag changes

INFUSION BAG CHANGES Nursing staff to document each new bag. Infusion should only be interrupted when indicated by aPTT.											
Date	Time commenced	Checked	Given	Time completed	Volume infused	Date	Time commenced	Checked	Given	Time completed	Volume infused

This section must be completed by nurses every time a new infusion bag is hung. An infusion of unfractionated heparin is a continuous infusion and should not be interrupted (eg for showering, imaging) unless ordered by the doctor.

Date: Date the bag was hung.

Time commenced: Time infusion commenced.

Checked: Name/signature of nurse checking infusion.

Given: Name/signature of nurse putting up infusion.

Time completed: Time the bag was removed.

Volume infused: Total volume infused.