Treatment recommendations do not cover all clinical scenarios and do not replace the need for clinical judgement

RECOMMENDATIONS FOR LOW MOLECULAR WEIGHT HEPARIN (LMWH)

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

ENOXAPARIN DOSAGE AND FREQUENCY (Seek specialist advice in patients weighing < 40kg or > 150kg)

INDICATION	**Normal renal function***	**Impaired renal function** (CrCl <30 mL/min)*
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/VTE treatment	1 mg/kg twice daily	1 mg/kg once daily

Creatinine Clearance (CrCl) [{(140-age) x Ideal Body Weight(kg)}/Serum Creatinine(µmol/L][1.2 for males]
Seek advice on **Dalteparin (LMWH)** doses, adjustment in renal failure, monitoring and reversal from your clinical pharmacist or specialist.

Monitoring	• Seek specialist advice for monitoring anti-Xa, dose modification or alternative therapeutic options. • Consider anti-Xa levels for patients on high doses, and in obese, pregnant, renally impaired and frail elderly patients.
Withholding LMWH prophylaxis and treatment prior and post invasive procedures	• Interventional (surgical) procedure: for prophylactic doses withhold 12 hours before procedure and 4-6 hours after procedure. For treatment doses withhold 24 hours before procedure and 24 hours after procedure **(48-72 hours for patients at high risk of bleeding).** • Spinal / epidural anaesthesia: do not institute anaesthesia or remove catheter within 12 hours of a prophylactic dose of LMWH, or 24 hours within a treatment dose of LMWH. Treatment may recommence 2 hours after catheter removal. • Consider longer exclusion periods in the presence of complications or high risk of bleeding.
Reversing Overtreatment	• Seek specialist advice. • As a guide: Give 1mg protamine sulfate per 1mg enoxaparin. Give half of the protamine dose as a slow IV push (10minutes) and the remainder as an infusion (5% glucose or 0.9% sodium chloride) over 6-8 hours.

RECOMMENDATIONS FOR WARFARIN

Warfarin brands are NOT equivalent and cannot be used interchangeably.

TARGET INR RANGE

2.0-3.0	■ Therapy for DVT or PE ■ Preventing DVT: high risk patients e.g. hip or knee surgery ■ Preventing systemic embolism: AF valvular heart disease, post MI, bioprosthetic heart valves (first 3 months)
2.5-3.5	■ Bileaflet mechanical heart valve (aortic)
3.0-4.0	■ Mechanical prosthetic valve (high risk)

(ADULT) INITIATION DOSING FOR WARFARIN – TARGET INR 2-3 – For Guidance Only

Day	INR	Suggested dose
1	1.0-1.4	5 mg
2	No INR	5 mg
3	<1.8	5 mg
	≥1.8	1 mg
4&5	<1.5	7 mg
	1.5-1.9	5mg
	2.0-2.5	4mg
	2.6-3.5	3mg
	3.6-4.0	2mg
	4.1-4.5	1mg
	>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.
- For younger patients consider 7–10mg 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.
- INR testing is recommended at morning blood rounds.
- Discontinue heparin after a minimum of 4 days therapy and when INR is therapeutic (>2) for two consecutive days.

DOSING WITH ONGOING WARFARIN THERAPY

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

REVERSING WARFARIN OVER-TREATMENT (bleeding risk increases exponentially from INR 5 to 9. Monitor closely INR ≥ 6)

Clinical Setting		Management			
INR	**Bleeding**	**Warfarin**	**Vitamin K**	**Prothrombinex VF**	**Comments**
Greater than therapeutic range but <5	**Absent**	Reduce dose or omit next dose			Resume warfarin at reduced dose when INR approaches therapeutic range. If INR <10% above therapeutic level, dose reduction may not be necessary.
5 – 9	**Absent** (Low risk)	Stop			Measure INR in 24 hours. Resume warfarin at reduced dose when INR is within the therapeutic range.
	Absent (High Risk)*	Stop	1–2 mg (oral)[1] Or 0.5-1mg IV[2]		Measure INR within 24 hours. Resume warfarin at reduced dose when INR is within the therapeutic range.
>9	**Absent** (Low risk)	Stop	2.5–5mg (oral)[1] Or 1 mg (IV)[2]		Measure INR in 6–12 hours Resume warfarin at reduced dose when INR is within the therapeutic range.
	Absent (High Risk)*	Stop	1 mg (IV)	Consider 25 IU/kg [3,4] See weight based nomogram	Measure INR in 6–12 hours Resume warfarin at reduced dose when INR is within the therapeutic range.
Clinically significant bleeding where warfarin is a contributing factor. **High Risk Bleeding e.g. Intracranial Haemorrhage (ICH) or massive haemorrhage.** ***Seek consultation with a haematologist / specialist.***		Stop	5 – 10 mg (IV)[2]	25 IU/kg [3,4] See weight based nomogram	Assess patient continuously until INR < 5 and bleeding stops. Reassess need for warfarin therapy with supervising team. If Prothrombinex VF is unavailable, give FFP (10 – 15mL/kg)[4] in addition to vitamin K. ***FFP (10-15mL/kg)[4] should be considered in addition to Prothrombinex VF for high risk bleeding e.g. ICH or massive haemorrhage.***
Notes		*[1] undiluted paediatric IV formulation* *[2] undiluted as slow IV bolus over at least 30 seconds* *[3] at a rate of 3mL/min. 500 Units of factor IX in 1 vial of ProthrombinexVF* *[4] Fresh Frozen Plasma (FFP) available from transfusion service* ***For reversal prior to a procedure – Refer to hospital guidelines or seek specialist advice.*** ***Seek advice with vitamin K in cardiac valve replacement.***			
***High Bleeding Risk One or more →**		■ Recent surgery / trauma / bleed ■ Advanced age ■ Renal Failure ■ Hypertension ■ Alcohol abuse ■ Active GI bleed ■ Antiplatelet therapy ■ Other relevant co-morbidity			

XXX
11/13

AFFIX PATIENT IDENTIFICATION LABEL HERE AND OVERLEAF

URMN:
Family Name:
Given Name:
Address:
DOB: Gender: ☐ M ☐ F

Facility/Service: XXX
Ward/Unit:_____
Consultant:_____

Anticoagulation Chart

No:_____of_____

Attach ADR Sticker
Attach sticker and refer to NIMC for details

1st Prescriber to print patient name and check label correct: _____

Patient weight_____kg **Date weighed**__/__/__
Height_____cm

PRE-PRESCRIPTION SCREEN (First prescriber to complete)

Co-existing conditions relevant to anticoagulants ☐ **Nil Known**
☐ Pregnancy ☐ Renal dysfunction ☐ Recent trauma ☐ Hepatic impairment ☐ Hypoalbuminaemia ☐ Recent surgery
☐ Thyroid disease ☐ Active peptic ulcer ☐ Thrombocytopaenia ☐ High Vitamin K intake ☐ Congestive heart failure
Anticoagulant history ☐ Allergy to warfarin ☐ Bleeding with anticoagulants ☐ Heparin Induced Thrombocytopenia
Concomitant Therapy ☐ Antiplatelet therapy ☐ Other antithrombotic agent ☐ Fixed dose oral anticoagulant ☐ Other

Fixed Dose Novel Oral Anticoagulants (NOACs) – eg . Dabigatran (Pradaxa®), **Rivaroxaban** (Xarelto®), **Apixaban** (Eliquis®).
Prescribe with care in elderly (>75 years), underweight (<50kg) and with renal impairment (Cr Cl < 50mL/min).
Newer oral anticoagulants have **no specific reversal agent.** Refer to hospital guidelines or seek Haematologist/Specialist advice.

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 N1	Nurse N2	Prescriber Sign	Prescriber Print name	Given by / Checked by	Time given

REGULAR DOSE ORDERS - PROPHYLACTIC DOSES (Subcutaneous and fixed dose oral anticoagulants)

YEAR 20____ **DAY AND MONTH →**

Date | Medication (Print generic name)
CrCl mL/min | Route | Dose Frequency NOW enter times →
Indication: **VTE PROPHYLAXIS** | Pharmacy
Prescriber Sign | Print name | Contact No.
Creatinine
Platelets

Continue on discharge YES / NO
Dispense YES / NO Duration___days___date___

Date | Medication (Print generic name)
CrCl mL/min | Route | Dose Frequency NOW enter times →
Indication: **VTE PROPHYLAXIS** | Pharmacy
Prescriber Sign | Print name | Contact No.
Creatinine
Platelets

Continue on discharge YES/NO
Dispense YES / NO Duration___days___date___

REGULAR DOSE ORDERS - TREATMENT DOSES (Subcutaneous and fixed dose oral anticoagulants)

Date | Medication (Print generic name)
CrCl mL/min | Route | Dose Frequency NOW enter times →
Indication: **TREATMENT** | Pharmacy
Prescriber Sign | Print name | Contact No.
Creatinine
Platelets

Continue on discharge YES/NO
Dispense YES / NO Duration___days___date___

PHARMACY USE ONLY

WARFARIN VARIABLE DOSE ORDERS

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

YEAR 20_____ **DAY AND MONTH →**
☐ Dose at admission ☐ Not Applicable
Dose_____ Brand: ☐ Marevan® ☐ Coumadin®
Date | Medication (Print generic name) **WARFARIN**
Indication | Route **ORAL**
Target INR | Pharmacy
Prescriber sign | Print name | Contact No.
Dose Time 16:00 hr
INR Result
DOSE mg mg mg mg mg mg mg mg mg mg
Prescriber
Telephone order N1/N2
Given by

☐ Take as directed
Continue on discharge YES / NO
Dispense YES / NO Marevan® / Coumadin® 1mg qty_____
Marevan: 5mg qty_____ 3mg qty_____

Warfarin Discharge Plan **Dose**_____mg **Target INR**_____ **Duration**_____ **Next INR due**___/___/___ **Prescriber**_____
☐ **Patient has booklet** ☐ **Patient education completed** **Sign**_____ ☐ **Patient given treatment plan** ☐ **GP informed** ☐ **GP faxed chart**

Date__/__/__ Pharmacist_____
Date__/__/__ Print Name_____
Prescriber sign_____

Version 4

ANTICOAGULATION MEDICATION CHART
MRXXX

Attach Patient Sticker

REASON FOR NURSES NOT ADMINISTERING Codes MUST be circled			
Absent	A	Refused – notify Doctor	R
Fasting	F	Not Available Obtain supply or contact doctor	N
Vomiting	V	Self Administering	S
On Leave	L	Withheld Enter reason in clinical record	W

INTRAVENOUS PRESCRIPTION ORDER

Prescriber to complete. (A new prescription is required if the order (total dose, fluid or volume) is changed)

Target aPTT: | **Indication**: ☐ **VTE** ☐ **Acute Coronary Syndrome (ACS)** ☐ **Other(specify)** | **Weight: kg**

Date	Drug	Total dose (units)	Fluid	Volume (mL)	Signature	Print name	Contact
	HEPARIN	25,000 units	0.9% SODIUM CHLORIDE	500 mL			

INITIAL BOLUS DOSE AND INITIAL INFUSION RATE Prescriber to complete ORDER

Date	Baseline aPTT	Date/Time of dose	Initial Bolus (units)	Initial Infusion Rate (mL/hour)	Prescriber		Nurse	
					Signature	Print Name	Time	N1/N2

MAINTENANCE INFUSION RATE CHANGES AND BOLUS DOSES

Prescriber to complete order ☐ **Prescriber to be contacted following each aPTT test**
☐ **Nursing staff to adjust dose based on nomogram for** ☐ **VTE** ☐ **ACS using_____kg column**

Date	Prescriber signature	Print name	Contact	Pharmacy

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/hour)	Rate Sign	Prescriber Sign
INFUSION CEASED:			Date		Time	Prescriber signature		Print name			Contact	Pharmacy

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 (mL)	Date	Time Commenced	Checked	Given	Time Completed	Volume Infused (mL)

Treatment recommendations do NOT cover all clinical scenarios and do not replace the need for clinical judgement

RECOMMENDATIONS FOR INTRAVENOUS UNFRACTIONATED HEPARIN

Standard dilution	■ 50 units / mL : dilute 25, 000 units of unfractionated heparin in 500mL of 0.9% sodium chloride or 5% glucose ■ Nomograms below apply to this dilution only. Rates will vary for more concentrated dilutions. Please seek pharmacy advice.
Target aPTT	■ VTE: Dd – Ee seconds and ACS Nn – Pp seconds, or as otherwise specified by consultant. ■ **Target aPTT and dose nomograms are HOSPITAL SPECIFIC** – consult Pathology Laboratory for correct aPTT ranges. ■ Measure baseline aPTT prior to commencing treatment, then within 6 hours of every rate change, otherwise daily.
Other monitoring	■ Measure platelets at baseline and at least twice weekly. ■ Contact haematologist in all suspected cases of Heparin Induced Thrombocytopaenia (HIT).
Reversing heparin treatment	■ Protamine reversal should be reserved for cases of major bleeding or where required prior to emergency surgery. For a high aPTT without bleeding apply relevant nomogram. ■ Seek specialist or senior colleague advice. As a guide: Estimate heparin dose received in last hour. Administer 1 mg protamine sulphate per 100 units of heparin (max 50mg) as a slow IV push (over 10 minutes). Monitor aPTT after bolus then as required.

INFUSION NOMOGRAMS FOR INTRAVENOUS UNFRACTIONATED HEPARIN USE

The nomograms (weight-based guides) are only valid when using an unfractionated heparin concentration of 50 units/mL and STANDARD aPTT targets.

INITIAL ORDER: Prescriber should complete order (initial bolus and initial infusion rate) on page 2. See below for recommended doses.

MAINTENANCE: Prescriber to indicate on page 2 whether nurse should maintain infusion rate based on nomogram as indicated OR whether the prescriber is to be contacted following each aPTT test.

IT IS RECOMMENDED THAT BOLUS DOSES BE DRAWN UP (AS PRESCRIBED) FROM SEPARATE AMPOULES INTO A SYRINGE FOR ADMINISTRATION. THE PRESCRIBER SHOULD ALWAYS BE CONTACTED FOR EXTREME aPTT LEVELS.

VENOUS THROMBOEMBOLISM

INITIAL	INITIAL ORDER	WEIGHT BASED GUIDE FOR INITIAL DOSE												
		Weight (kg)	<40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg	85kg	90kg	≥95kg
	Bolus dose 80 units/kg	Units	3200	3600	4000	4400	4800	5200	5600	6000	6400	6800	7200	7200
	Infusion 18 units/kg/hour	Rate (mL/hr)	14	16	18	20	22	23	25	27	29	31	32	32

MAINTENANCE	MAINTENANCE ORDER		WEIGHT BASED RATE FOR MAINTENANCE DOSE											
		Weight (kg)	<40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg	85kg	90kg	≥95kg
	aPTT	**Dose Adjustment**	**Rate change (mL/hour)** Re-measure aPTT within 6 hours of each rate change											
	< Aa	**80 units/kg bolus (as per initial bolus) plus increase rate by 4 units/kg/hour**	+3	+4	+4	+4	+5	+5	+6	+6	+6	+7	+7	+8
	Bb – Cc	**40 units/kg bolus (half initial bolus) plus increase rate by 2 units/kg/hour**	+2	+2	+2	+2	+2	+3	+3	+3	+3	+3	+4	+4
	Dd – Ee	No change	Re-measure aPTT within 24 hours (or next morning)											
	Ff – Gg	Reduce 2 units/kg/hour	-2	-2	-2	-2	-2	-3	-3	-3	-3	-3	-4	-4
	Hh – Jj	**Contact Doctor, hold 60 minutes then reduce 3 units/kg/hour**	-2	-3	-3	-3	-4	-4	-4	-5	-5	-5	-5	-6

ACUTE CORONARY SYNDROME (and for patients at higher risk of bleeding and/or on dual antiplatelet therapy)

INITIAL	INITIAL ORDER	WEIGHT BASED GUIDE FOR INITIAL DOSE												
		Weight (kg)	<40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg	85kg	90kg	≥95kg
	Bolus dose 60 units/kg	Units	2400	2800	3000	3300	3600	4000	4000	4000	4000	4000	4000	4000
	Infusion 12 units/kg/hour	Rate (mL/hr)	10	11	12	13	14	15	17	18	19	20	20	20

MAINTENANCE	MAINTENANCE ORDER		WEIGHT BASED RATE FOR MAINTENANCE DOSE											
		Weight (kg)	<40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg	85kg	90kg	≥95kg
	aPTT	**Dose Adjustment**	**Rate change (mL/hour)** Re-measure aPTT within 6 hours of each rate change											
	< Kk	**60 units/kg bolus (as per initial bolus) plus increase rate by 3 units/kg/hour**	+2	+3	+3	+3	+4	+4	+4	+5	+5	+5	+5	+6
	Ll – Mm	Increase 2 units/kg/hour	+2	+2	+2	+2	+2	+3	+3	+3	+3	+3	+4	+4
	Nn – Pp	No change	Re-measure aPTT within 24 hours (or next morning)											
	Qq – Rr	Reduce 1 unit/kg/hour	-1	-1	-1	-1	-1	-1	-1	-2	-2	-2	-2	-2
	Ss – Tt	**Hold 30 minutes** then reduce 2 units/kg/hour	-2	-2	-2	-2	-2	-3	-3	-3	-3	-3	-4	-4
	> Zz	**Contact doctor, hold 60 minutes then reduce 3 units/kg/hour**	-2	-3	-3	-3	-4	-4	-4	-5	-5	-5	-5	-6