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

RECOMMENDATIONS FOR DIRECT ORAL ANTICOAGULANTS

Direct Oral Anticoagulant Agents (DOACs) – Apixaban, Dabigatran, Rivaroxaban (also known as NOACs)
- Prescribe with care in elderly (>75 years), underweight (<50kg), overweight (>150kg) and patients with renal impairment (CrCl < 50mL/min).
- Prior to DOAC initiation: Record: FBC, Coagulation status (INR, aPTT and PT), renal and liver function. Check for drug interactions prior to prescribing.
- If the patient is on warfarin: Discontinue warfarin and start DOAC when INR is 2.0 or less
- Refer to local prescribing guidelines for further information.

Apixaban (Eliquis®)	**Dabigatran** (Pradaxa®) Idarucizumab is the reversal agent for dabigatran Refer to local hospital guidelines.	**Rivaroxaban** (Xarelto®) (Use with caution if CrCL 15-29mL/min)
Treatment of DVT/PE: • CrCl >25 mL/min: 10mg twice daily for first 7 days, then 5mg twice daily thereafter		**Treatment and Prevention of DVT/PE:** • CrCl ≥ 15 mL/min: 15mg twice daily for 3 weeks, then 20mg once daily • Seek specialist advice if CrCl 15-29mL/min
Non-Valvular Atrial Fibrillation (therapeutic dose): 5mg twice daily Reduce to 2.5mg twice daily IF at least 2 of the following risks: ☐ SCr ≥ 133 micromol/L ☐ Age ≥ 80 years, ☐ Weight ≤ 60 kg	**Non-Valvular Atrial Fibrillation (therapeutic dose):** • CrCl ≥ 50 mL/min: 150mg twice daily • CrCl 30-49 mL/min or ≥ 75years: 110mg twice daily	**Non-Valvular Atrial Fibrillation (therapeutic dose):** • CrCl ≥ 50 mL/min: 20mg once daily • CrCl 30-49 mL/min: 15mg once daily • CrCl 15-29 mL/min: seek specialist advice
VTE prophylaxis: **Total Hip or Knee Replacement** • CrCl > 25mL/min: 2.5mg twice daily Hip: up to 38 days | Knee: up to 14 days	**VTE prophylaxis:** **Total Hip or Knee Replacement** • CrCl > 50 mL/min: 220mg (2 x 110 mg) once daily • CrCl 30-50 mL/min: 150mg (2 x 75 mg) once daily Hip: up to 35 days | Knee: up to 10 days	**VTE prophylaxis:** **Total Hip or Knee Replacement** • CrCl ≥ 15 mL/min: 10mg once daily Hip: up to 35 days | Knee: up to 14 days
		Prevention of cardiovascular events in chronic stable CAD/PVD (in combination with aspirin): • CrCl≥ 15mL/min: 2.5 mg twice daily

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)
2.0-3.0	• Aortic bileaflet mechanical heart valve – if no other risk factors
2.5-3.5	• Starr-Edwards mechanical heart valves. Mitral bileaflet mechanical heart valve or aortic if risk factors for thromboembolic event including AF, previous thromboembolism, LV dysfunction, hypercoagulable condition.

(ADULT) DOSING FOR WARFARIN NAÏVE PATIENTS (TARGET INR 2-3)

Consider if bridging with heparin is indicated. Refer to WATAG or local warfarin guidelines for further information. Record baseline FBC, coagulation status (INR, aPTT and PT) and liver function.
- Suggested initial dosing of 5mg daily for first 2 days, modify dosing for day 3 based on day 3 INR.
- For younger patients (< 60 years) 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, is at high bleeding risk or has severe chronic renal impairment.
- Consider dose modification in the presence of interacting drugs.
- Discontinue heparin after a minimum of 5 days therapy and INR is 2.0 or greater.

DOSING WITH ONGOING WARFARIN THERAPY

- **Patients being re-initiated on warfarin post surgery/ intervention should be restarted on the dose prescribed prior to intervention and check INR day 3.**
- 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 (seek advice if cardiac valve replacement)**	**Prothrombinex VF**	**Comments**
Greater than therapeutic range but <4.5	**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.
4.5 – 10	**Absent** (Low risk)	Stop			Measure INR in 24 hours. Resume warfarin at reduced dose when INR approaches the therapeutic range.
	Absent (High Risk)*	Stop	Consider 1–2 mg (oral)[1] Or 0.5–1mg IV[2]		Measure INR within 24 hours. Resume warfarin at reduced dose when INR approaches the therapeutic range.
>10	**Absent** (Low risk)	Stop	3–5mg (oral)[1] Or IV[2]		Measure INR in 12-24 hours. Resume warfarin at reduced dose when INR approaches the therapeutic range.
	Absent (High Risk)*	Stop	3–5mg IV[2]	Consider 15-30 Units/kg[3,4] See weight based nomogram	Measure INR in 12-24 hours. Resume warfarin at reduced dose when INR approaches the therapeutic range. Close monitoring over the following week.
Clinically significant bleeding where warfarin is a contributing factor. **e.g. Intracranial or massive haemorrhage**		**Stop**	**5–10 mg (IV)[2]**	**25–50 Units/kg[3,4] doses may be appropriate as per warfarin reversal guidelines, See weight based nomogram**	***Only add Fresh Frozen Plasma (FFP) if critical organ bleeding (150-300mL) or if Prothrombinex VF is unavailable (FFP 15mL/kg).*** ***If required seek consultation with a haematologist / specialist.***

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 Prothrombinex VF*
[4] *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
05/22

Facility/Service: XXX

Ward/Unit:_____

Consultant:_____

WA Anticoagulation Chart

AFFIX PATIENT IDENTIFICATION LABEL HERE AND OVERLEAF

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

Attach ADR Sticker
Attach sticker and refer to HMC for details

Patient weight_____**kg** **Date weighed**__/__/__
Height_____**cm**

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

Bleeding Risk considered before prescribing anticoagulants ☐ **Completed by (prescriber)** _____ **Date:** ____/____/____
Please refer to Local Venous Thromboembolism Guidelines for Bleeding Risk Assessment. Caution should be considered for patients on Dual Antiplatelet Therapy (DAPT)

ONCE ONLY AND TELEPHONE (Prescriber to sign within 24 hours of order)

Date prescribed	Medicine (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

Check platelets and coagulation profile before commencing
(Subcutaneous unfractionated and low molecular weight heparins and direct oral anticoagulants - DOACs)

YEAR 20____ **DAY AND MONTH ➔**

Date | **Medicine** (Print generic name)
CrCl mL/min | Route | Dose AND Frequency NOW enter times ➔
Indication: **VTE Prophylaxis** | Pharmacy | Creatinine
Prescriber Sign | Print Name | Contact No. | Platelets

Continue at Discharge: YES / NO Dispense YES / NO Duration:____days. Qty:____

YEAR 20____ **DAY AND MONTH ➔**

Date | **Medicine** (Print generic name)
CrCl mL/min | Route | Dose AND Frequency NOW enter times ➔
Indication: **VTE Prophylaxis** | Pharmacy | Creatinine
Prescriber Sign | Print Name | Contact No. | Platelets

Continue at Discharge: YES / NO Dispense YES / NO Duration:____days. Qty:____

REGULAR DOSE ORDERS - THERAPEUTIC DOSES

Check platelets and coagulation profile before commencing
(Subcutaneous low molecular weight heparins and direct oral anticoagulants - DOACs)

YEAR 20____ **DAY AND MONTH ➔**

Date | **Medicine** (Print generic name)
CrCl mL/min | Route | Dose AND Frequency NOW enter times ➔
Indication: _____ **Therapeutic** | Pharmacy | Creatinine
Prescriber Sign | Print Name | Contact No. | Platelets

Continue at Discharge: YES / NO Dispense YES / NO Duration:____days. Qty:____

Pharmaceutical review:

WARFARIN OR DOAC DRUG INTERACTIONS (Pharmacy: Indicate drug and expected interaction) Sign
Details: Date

WARFARIN VARIABLE DOSE ORDERS

YEAR 20____ **DAY AND MONTH ➔**

Dose at admission: Dose_____mg ☐ Not applicable
Brand: ☐ Marevan® or ☐ Coumadin®

Date | Medicine **WARFARIN** | **Dose Time 16:00 hr**
Indication | Route **ORAL**
Target INR | Pharmacy
Prescriber Sign | Print Name | Contact No.

INR Result
DOSE mg mg mg mg mg mg mg mg mg mg mg mg
Prescriber
Telephone order N1/N2
Given by

Continue at Discharge YES / NO Dispense YES / NO
☐ Take as Directed 1mg 2mg 3mg
Marevan Qty: 5mg
OR
Coumadin Qty: 5mg 1mg 2mg

Warfarin Discharge Plan **Dose**____**mg** **Target INR** _____ **Duration**_____ **next INR due** ___/___/___ **Prescriber**_____

ANTICOAGULANT DISCHARGE PLANNING ☐ **Patient has booklet** ☐ **Patient education completed**
☐ **Warfarin** ☐ **DOAC**_____ ☐ **LMWH** ☐ **Patient given treatment plan** ☐ **Duration**_____ ☐ **GP informed** ☐ **GP faxed chart**
Signature: _____ **Designation:** _____ **Date:** _____

Version 10

Date __/__/__ Pharmacist _____ Print Name _____ Prescriber sign _____

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

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**
Target aPTT	• VTE/ACS: xx - xx seconds or as otherwise specified by consultant. • **Target aPTT and dose nomograms are HOSPITAL SPECIFIC** – consult Pathology Laboratory for correct aPTT ranges.
Monitoring	• Measure baseline aPTT prior to commencing treatment, then within 6 hours of every rate change, otherwise daily. • Measure platelets at baseline and at least twice weekly. • Contact haematologist in all suspected cases of Heparin Induced Thrombocytopenia (HIT).
Reversing heparin treatment	• Seek specialist or senior colleague advice. Protamine reversal should be used for cases of major bleeding or where required prior to emergency surgery. For a high aPTT without bleeding follow nomogram (page 3). • As a guide: Estimate heparin dose received in last hour. Administer 1 mg protamine sulphate per 100 units of heparin (maximum 50mg) as a slow IV push (over 10 minutes). Monitor aPTT after bolus then as required.

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	Baseline Platelets	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 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)	Platelets

INFUSION CEASED: **Date** ___/___/___ **Time** : **Prescriber Signature** **Print Name**

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.

INFUSION NOMOGRAM FOR INTRAVENOUS UNFRACTIONATED HEPARIN USE

- This nomogram (weight-based guide) is only valid when using an unfractionated heparin concentration of **25,000 units in 500mL and STANDARD aPTTtargets**.
- **Fluid Restricted Patients:** A dilution of 25,000 units of unfractionated heparin in 50mL sodium chloride 0.9% infusion with associated nomogram is available for patients requiring severe fluid restrictions. Please contact your pharmacist for advice. If required, strike out nomogram below and staple Fluid Restricted Nomogram over page 3 of this chart.

INITIAL ORDER : Prescriber should complete order (initial bolus and initial infusion rate) on page 2. See below for recommended dose for Venous Thromboembolism (VTE) or Acute Coronary Syndrome (ACS).

- It is important that a bolus dose of unfractionated heparin is prescribed and administered on initiating an unfractionated heparin infusion to ensure that the therapeutic range is reached within the first 24 hours of therapy.

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 ALL BOLUS DOSES BE DRAWN UP FROM SEPARATE AMPOULES INTO A SYRINGE FOR ADMINISTRATION.

Venous Thromboembolism (DVT/PE) Bolus and Initial Rate Requirements

		Weight Based Guide For Initial Dose											
		Weight	≤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
Initial Rate	18 units/kg/hour	Rate (mL/hour)	14	16	18	20	22	23	25	27	29	31	32	32

Acute Coronary Syndrome Bolus and Initial Rate Requirements

		Weight Based Guide For Initial Dose											
		Weight	≤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
Initial Rate	12 units/kg/hour	Rate (mL/hour)	10	11	12	13	14	15	17	19	20	20	20	20

Nomogram for modifying rate of administration for Venous Thromboembolism and Acute Coronary Syndrome

MAINTENANCE ORDER			Weight Based Rate For Maintenance Dose											
			Weight	≤40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg	85kg	90kg	≥95kg
MAINTENANCE	aPTT	**Dose Adjustment** Use weight column on nomogram and row for aPTT range for mL/hour conversion of unit/kg/hour		**Rate Change (mL/hour)** This rate equals recommended change in units/hour for a 50 unit/mL dilution. Remeasure aPTT within 6 hours of each rate change.											
	≤ Kk	**Bolus dose** as per indication (VTE OR ACS listed above) Then **increase** 3 units/kg/hour		+2	+3	+3	+3	+4	+4	+4	+5	+5	+5	+5	+6
	Ll-Mm	**Increase** 2 units/kg/hour For VTE consider 40 units/kg bolus dose		+2	+2	+2	+2	+2	+3	+3	+3	+3	+3	+4	+4
	Nn-Pp	**No Change**		Remeasure 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

Slight variances of aPTT ranges may occur due to changes in laboratory reagents used. Please check with your Pathology Laboratory.

RECOMMENDATIONS FOR UNFRACTIONATED SUBCUTANEOUS HEPARIN

Dosing	***VTE prophylaxis*:** 5000 units bd (0600 & 1800) ***High Risk Thromboembolism:*** 5000 units tds (0600,1200,1800)
Withholding subcutaneous UFH	• Withhold subcutaneous heparin a minimum of 6 to 8 hours prior to intervention • Interventional (surgical) procedure: may commence prophylactic doses 2 hours after procedure.
Monitoring	• Full blood count: Measure platelets at baseline and at least twice weekly. Medical review if platelets less than 50 x 10^9/L

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 and > 120kg)

INDICATION	**Normal renal function**	**Impaired renal function** (CrCl<30mL/min)
VTE prophylaxis	40mg once daily	20mg once daily or consider alternative
DVT/PE treatment	1.5mg/kg once daily OR 1 mg/kg twice daily	1mg/kg once daily or consider alternative
Acute Coronary Syndrome/Cardiac Valves	1mg/kg twice daily	1mg/kg once daily or consider alternative

Dalteparin is commonly used for VTE treatment in cancer patients: dose 200 Units/kg daily subcutaneously for 30 days, then 150 Units/kg daily for 5 months. Total daily dose should not exceed 18,000 Units. Dose adjustment is required for renal impairment and thrombocytopenia. See prescribing guidelines.

Monitoring	• Baseline full blood count and U&Es. Measure platelets at baseline and at least twice weekly. Medical review if platelets lessthan 50 x 10^9/L • 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, renal impairment and frail elderly patients.
Reversing Overtreatment	• Seek specialist advice as protamine only partially neutralises low molecular heparin. Only consider protamine if LMWH has been given within the last 12 hours. • Check hospital guidelines for more detailed advice on protamine use. As a guide: Give 1mg protamine sulfate per 1mg enoxaparin (maximum 50mg as a single dose). • Administer initial dose (up to 50mg) by slow IV push (over 10 minutes) and remaining dose by intravenous infusion (maximum infusion rate 5mg/minute). Reassess the patient and the APTT in 2-4 hours and consider a repeat dose if the patient is still bleeding or the aPTT remains prolonged.