SW1206
v1.00 - 04/2023
WINC Code: 1NY42412

DO NOT WRITE IN THIS BINDING MARGIN

Reviewed by Queensland Health Statewide Anticoagulant Working Party
(membership includes representatives from SNP and QML)

Contact: medicationsafety@health.qld.gov.au

Queensland Government

Quick Reference Guide – Anticoagulants for Hospitalised Adult Patients (Dosing)

Refer to 'Queensland Health Anticoagulant Guideline for Hospitalised Adult Patients' for more detailed guidance, and information relating to perioperative management, potential drug interactions and references.

To remain in end-of-bed folder

Decision to Prescribe Anticoagulant

Consider if benefits of anticoagulation outweigh bleeding risks:

- Past medical history of bleeding.
- Baseline INR greater than 1.4 (INR = International Normalised Ratio).
- Patients who are nil by mouth (i.e. not eating).

Manage reversible bleeding risks prior to prescribing an anticoagulant:

- Treat uncontrolled hypertension.
- Cease concomitant antiplatelet agents if greater than 12 months since previous myocardial infarction.
- Consider using prophylactic proton pump inhibitor (i.e. omeprazole or pantoprazole) for patients with a history of gastrointestinal bleeding/ulcer, or taking dual antiplatelet therapy.
- Encourage stable diet to maintain good INR control if prescribing warfarin.

Warfarin Dosing

Note: Different brands (Marevan®/Coumadin®) are not interchangeable

Day of initiation	INR	Recommended dose
1	Less than 1.4	5mg
2	Less than 1.8	5mg
	1.8 to 2	1mg
	Greater than 2	Nil
3	Less than 2	5mg
	2 to 2.5	4mg
	2.6 to 2.9	3mg
	3 to 3.2	2mg
	3.3 to 3.5	1mg
	Greater than 3.5	Nil
4	Less than 1.4	10mg
	1.4 to 1.5	7mg
	1.6 to 1.7	6mg
	1.8 to 1.9	5mg
	2 to 2.3	4mg
	2.4 to 3	3mg
	3.1 to 3.2	2mg
	3.3 to 3.5	1mg
	Greater than 3.5	Nil
5 and onwards	Target INR = 2 to 3	Dose based on clinical judgement

- *If patient has high bleeding risk (consider HAS-BLED score), seek specialist advice and consider reduced initial dose (2 to 4mg).*
- *Indications with high thromboembolic risk may have higher target INR—check with cardiologist.*

Rivaroxaban (Xarelto®) Dosing

Stroke Prevention in Non-valvular Atrial Fibrillation	
Estimated kidney function 50mL/min or greater	20mg once daily with food
Estimated kidney function 31 to 49mL/min	15mg once daily with food
Estimated kidney function 15 to 30mL/min	Specialist opinion
Estimated kidney function less than 15mL/min	**Not recommended**

Treatment of Venous Thromboembolism (VTE)		
Estimated kidney function	**Initial treatment**	**Prevention of recurrent VTE**
30mL/min or greater	15mg twice daily with food for 3 weeks, THEN 20mg once daily with food.	Following 6 months of treatment, dose reduction to 10mg once daily may be considered. Duration depends on patient requirement.
15 to 29mL/min	Seek specialist opinion	
Less than 15mL/min	**Not recommended**	

Administration *(Note: Crushed tablets are stable in water or apple puree for 4 hours. 15mg and 20mg tablets should be given with food to maximise bioavailability. 2.5mg and 10mg tablets can be given without food.)*
Swallowing difficulties: Crush tablet and mix with water or apple puree.
Gastric tube administration: Crush tablet and mix with 50mL water, then draw into enteral syringe. Rinse mortar or crushing device with 15mL water twice to ensure the entire dose is given. Flush tube with 30mL water before and after administration. For 15mg and 20mg dose, give immediately after a bolus feed. For continuous feeds, restart the feed immediately after giving the dose and flushing the tube.

Apixaban (Eliquis®) Dosing

Note: Apixaban is not listed on the Queensland Health List of Approved Medicines

Stroke Prevention in Non-valvular Atrial Fibrillation		
Estimated kidney function 25mL/min or greater **AND no more than one of the following risk factors:**	• Age 80 years or older • Bodyweight less than or equal to 60kg • Creatinine greater than 133micromol/L	5mg twice daily
Estimated kidney function 25mL/min or greater **AND at least two of the following risk factors:**		2.5mg twice daily
Estimated kidney function less than 25mL/min		**Not recommended**

Treatment of Venous Thromboembolism (VTE)		
Estimated kidney function	**Initial treatment**	**Prevention of recurrent VTE**
25mL/min or greater	10mg twice daily for 7 days, THEN 5mg twice daily.	Following 6 months of treatment, dose reduction to 2.5mg twice daily may be considered. Duration depends on patient requirement.
Less than 25mL/min	**Not recommended**	

Administration *(Note: Crushed tablets are stable in water, apple juice, apple puree or glucose 5% for up to 4 hours.)*
Swallowing difficulties: Crush tablet and mix with water, apple juice, apple puree or glucose 5%. If aspiration risk use apple puree.
Gastric tube administration: Crush tablet and mix with 60mL water or glucose 5%, then draw into enteral syringe. Flush tube well. Absorption may be reduced when followed immediately by a nutritional supplement.

Dabigatran (Pradaxa®) Dosing

Note: Dabigatran is not indicated for the Treatment of Venous Thromboembolism (VTE)

Stroke Prevention in Non-valvular Atrial Fibrillation		
**Consider HAS-BLED score when determining dose.*	Patient younger than 75 years with estimated kidney function greater than 50mL/min AND low bleeding risk*	150mg twice daily
	Patient **with at least one of the following risk factors:** 75 years or older, estimated kidney function 30 to 50mL/min, high bleeding risk*	110mg twice daily
	Patient with estimated kidney function less than 30mL/min	**Not recommended**

Administration **Not suitable for patients with swallowing difficulties or enteral feeding tubes.** *(Note: Do not open capsule. Do not crush or chew capsule or pellets. Do not give by enteral feeding tube.)*

Low Molecular Weight Heparin (LMWH) Dosing

Note: Dose adjustment required for extremes of bodyweight—see Queensland Health Anticoagulant Guideline for Hospitalised Adult Patients

Treatment of Venous Thromboembolism (VTE)	Non-ST Elevation Myocardial Infarction (NSTEMI)	ST Elevation Myocardial Infarction (STEMI) with Thrombolysis	
Enoxaparin: 1mg/kg subcut every 12 hours **Dalteparin:** 100units/kg subcut every 12 hours Cancer patients: Dalteparin 200units/kg subcut once daily for 30 days, then reduce to 150units/kg subcut once daily for months 2 to 6 (max 18,000units daily)	**Enoxaparin:** 1mg/kg subcutaneous twice daily	**Younger than 75 years**	**Enoxaparin:** 30mg IV bolus immediately prior to thrombolysis then, after 15 min start maintenance enoxaparin 1mg/kg subcut twice daily (max 100mg each of first 2 doses)
		75 years or older	**Enoxaparin:** No bolus. Start at 0.75mg/kg subcut twice daily (max 75mg each of first 2 doses)

Estimated kidney function 30 to 50mL/min – Caution with use. Continue monitoring kidney function. Consider anti-Xa levels and modify dose if required.

Estimated kidney function less than 30mL/min – Not recommended. Use unfractionated heparin (UFH) or discuss with consultant.

ANTICOAGULANTS GUIDELINES – ADULT (DOSING)

Queensland Government

Quick Reference Guide – Anticoagulants for Hospitalised Adult Patients (Monitoring and Reversal)

Refer to 'Queensland Health Anticoagulant Guideline for Hospitalised Adult Patients' for more detailed guidance, and information relating to perioperative management, potential drug interactions and references.

To remain in end-of-bed folder

Anticoagulant Monitoring *Note: Routine monitoring not required for apixaban, rivaroxaban, dabigatran*

Anticoagulant	Monitoring	Testing frequency
Dalteparin *OR* **Enoxaparin**	**Anti-Xa (specify anticoagulant – enoxaparin or dalteparin):** Consider for estimated kidney function less than 50mL/min, obese patients (BMI greater than 40kg/m^2 or bodyweight greater than 120kg), low bodyweight (less than 50kg), fluid overload/fluctuating weight, elderly (older than 75 years), pregnancy, signs of bleeding, or thromboembolic event despite therapeutic anticoagulation and for patients on extended therapy (i.e. greater than 5 days treatment).	Every 48 hours as clinically indicated. Less frequent or cessation of monitoring may be appropriate if therapeutic levels stable and no change to clinical condition.
	Platelet count: Used to screen for heparin-induced thrombocytopenia (HIT). Seek advice about ongoing management if platelet count less than 100 × 10^9/L or drops by more than 30% from baseline.	3 times per week from day 4 to 14 or until therapy stopped (whichever is sooner).
	Kidney function: Therapeutic dose not recommended if kidney function unstable or less than 30mL/min or dialysis-dependent—use UFH instead.	Every 48 hours; stable patients may require less frequent monitoring.
Warfarin	**INR:** If patient is admitted on warfarin, INR must be performed within 24 hours of admission—do not give warfarin until an INR is available. If warfarin is to be re-started after therapy interruption, start at previously effective dose. If patient has not previously been prescribed warfarin, check baseline INR prior to initiating therapy to evaluate underlying coagulopathies that might justify a lower starting dose.	Check pre-treatment INR, platelet count and liver function tests normal—if not, seek advice. Monitor INR daily until therapeutic and stable dose reached. Ongoing monitoring frequency depends on INR stability, changes in clinical condition or other medications.

Recommendations for Reversal of Anticoagulants

Anticoagulant	Strategies to reverse or minimise anticoagulant effect in the event of major bleeding or need for urgent surgery *If life threatening or critical organ bleeding,* ***SEEK SENIOR ADVICE.***
Apixaban *OR* **Rivaroxaban**	• Currently no antidote available in Australia. Haemodialysis not suitable. • Request anti-Xa assay (specify which anticoagulant the patient is taking on pathology request form; discuss results with haematologist). • Half-life: Apixaban = 8 to 15 hours; Rivaroxaban = 5 to 9 hours (11 to 13 hours if elderly). Longer if kidney impairment. • If ingested within the previous 2 hours, administer activated charcoal; caution in patients going for surgery due to aspiration risk. • If patient is vitamin K deplete (e.g. poor nutrition) or has taken warfarin in the last 4 days, administer phytomenadione (vitamin K) 10mg IV. • Administer Prothrombinex® (prothrombin complex concentrate) 50units/kg. • Consider tranexamic acid. (Limited evidence of clinical benefit; do not delay other treatment.) • If condition critical, discuss with haematologist the potential benefit of Novoseven® recombinant activated factor VIIa.
Dabigatran	• Check coagulation profile (APTT, PT, TT, fibrinogen). • Dabigatran assay may be helpful to guide subsequent management. • Half-life: Dabigatran = 14 to 17 hours (up to 34 hours if severe kidney impairment). • Consider haemodialysis as dabigatran may be removed by up to 65%. • If ingested within the previous 2 hours, administer activated charcoal; caution in patients going for surgery due to aspiration risk. • If patient is vitamin K deplete (e.g. poor nutrition) or has taken warfarin in the last 4 days, administer phytomenadione (vitamin K) 10mg IV. • If life-threatening bleeding / emergency surgery, consider idarucizumab (Praxbind®) 5g IV.
Dalteparin *OR* **Enoxaparin**	• Assess anticoagulant activity using anti-Xa assay (specify which LMWH the patient is taking on pathology request form). • Half-life: LMWH = 3 to 9 hours. Longer if kidney impairment. Removal by haemodialysis is approximately 20%. • Use protamine sulfate for partial neutralisation (approximately 60% effective) – *see Queensland Health Anticoagulant Guideline for Hospitalised Adult Patients.*

Recommendations for Reversal of Warfarin

If rapid reversal of warfarin is required for urgent surgery, see perioperative management section of *Statewide Anticoagulant Guideline for Hospitalised Adult Patients* for recommendations.

Strategies to reverse or minimise anticoagulant effect of warfarin

Clinical setting	Recommendations
Life-threatening or critical organ bleeding and INR 1.5 or greater	• **SEEK SENIOR ADVICE.** Cease warfarin. • Give phytomenadione (vitamin K[#]) 5 to 10mg IV, FFP 150 to 300mL and ProthrombinexTM-VF 50units/kg IV—if unavailable, increase FFP dose to 15mL/kg. • Assess INR frequently until clinically stable.
Clinically significant bleeding (i.e. not life-threatening or associated with critical organ) and INR 1.5 or greater	• **SEEK SENIOR ADVICE.** Cease warfarin. • Give phytomenadione (vitamin K[#]) 5 to 10mg IV and ProthrombinexTM-VF 35 to 50units/kg IV—if unavailable, give FFP 15mL/kg. • Assess INR frequently until clinically stable.
Minor bleeding with any INR	• Omit warfarin. Repeat INR the following day and adjust warfarin dose to maintain INR in target therapeutic range. • If bleeding risk is high[Φ] or INR greater than 4.5, consider phytomenadione (vitamin K[#]) 1 to 2mg orally or 0.5 to 1mg IV.
No bleeding and INR greater than 10	• **SEEK SENIOR ADVICE.** Cease warfarin. • Give phytomenadione (vitamin K[#]) 2 to 5mg orally (noting the higher dose may lead to delayed achievement of therapeutic INR results when recommencing warfarin) or 0.5 to 1mg IV. • If bleeding risk is high[Φ], consider ProthrombinexTM–VF 15 to 30units/kg IV. • Check INR in 12 to 24 hours if only vitamin K administered. Check INR in 30 to 60 minutes if prothrombinex has also been administered, and again in 12 to 24 hours. Continue monitoring every 1 to 2 days over the following week. • Resume lower dose of warfarin once INR approaches therapeutic range.
No bleeding and INR 4.5 to 10	• Cease warfarin. Consider reasons for elevated INR and patient specific factors. Phytomenadione (vitamin K[#]) is usually not required unless bleeding risk high[Φ], then give 1 to 2mg orally or 0.5 to 1mg IV. • Check INR within 12 to 24 hours. Resume lower dose of warfarin once INR approaches therapeutic range.
No bleeding and INR greater than therapeutic range but less than 4.5	• Reduce or withhold next dose of warfarin based on sensitivity risk factors. • Resume lower dose of warfarin once INR approaches therapeutic range. If INR is only minimally above therapeutic range (i.e. within 10%) dose reduction is generally not necessary.

FFP = fresh frozen plasma; INR = international normalised ratio

[#] *Note: Konakion MM®, the intravenous preparation of phytomenadione (vitamin K), may be given orally. It is NOT for intramuscular injection.*

[Φ] *Major bleed in previous 4 weeks, major surgery in previous 2 weeks, thrombocytopenia with platelets less than 50 x 10^9/L, known liver disease or concurrent antiplatelet therapy.*