Guidelines on Warfarin Usage in Adults

This brief guideline summarises advice to help doctors in primary and secondary care, implement the prescription of warfarin.

Use of anticoagulants

- Do benefit/risk assessments on all patients, particularly those with Atrial Fibrillation (AF) as they tend to be older, with multiple pathologies and higher risks for bleeding.
- Warfarin should only be considered in AF if there is at least one other risk factor e.g. hypertension, previous stroke, heart failure, diabetes, age >75 or abnormal left ventricular function on echocardiogram (CHADS2 score).
- Estimates risk of major bleeding for patients on anticoagulation to assess risk-benefit in atrial fibrillation can be obtained by use of the HAS-BLED score for Major Bleeding Risk.

TARGET INR	
2.5 (Range 2 - 3)	3.5 (Range 3 - 4)
• Treatment of DVT or PE • Recurrent VTE whilst off warfarin • Prophylaxis of stroke in AF • Cardioversion • VTE in antiphospholipid syndrome • Dilated cardiomyopathy • Mural thrombus following MI or mitral valve disease • Prosthetic aortic valve (target 2.5 or 3.0)	• Recurrent DVT or PE occurring in patients who were already anticoagulated with INR above 2 • Prosthetic mitral valves (target 3.0 or 3.5) • Thromboses in antiphospholipid syndrome

Starting Warfarin in new patients

Day	INR	Standard Loading Schedule	Reduced Dose Loading Schedule
1st	<1.3 (i.e. pre-treatment	10mg	5mg
2nd	<1.8	10mg	5mg
	1.8	1mg	1mg
	>1.8	Nil	Nil
3rd	<2.0	10mg	5mg
	2.0 - 2.5	4mg	2mg
	2.6 - 3.0	3mg	2mg
	3.1 - 3.4	2mg	1mg
	3.5 - 4.0	1mg	1mg
	>4.0	Nil	Nil
4th	<1.4	Refer to Haematology Department for advice	
	1.4	8mg	4mg
	1.5 - 1.7	7mg	4mg
	1.8 - 2.0	6mg	3mg
	2.1 - 2.6	5mg	3mg
	2.7 - 3.0	4mg	2mg
	3.1 - 3.5	3mg	2mg
	3.6 - 4.0	2mg	1mg
	>4.0	Omit dose	

Cautionary Notes

Check clotting screen, FBC, renal and liver function before starting anticoagulants.

If anticoagulation is urgent, start heparin (usually LMWH) at treatment doses, with warfarin. Give heparin for at least 5 days and until INR has been in therapeutic range for 2 consecutive days.

Use reduced dose loading schedule for AF or if risk factors for bleeding: abnormal baseline clotting, platelets < $50x10^9$, low body weight (♀ <50kg, ♂ <60kg), age over 60, congestive cardiac failure, abnormal LFTs, renal impairment and interacting drugs.

For new patients being loaded on anticoagulant, request aily INRs for the first 4 days.

For AF in the community consider giving 2mg daily and check INR in 4-7 days.

Maintenance of anticoagulation for inpatients

Cautionary notes

Keep patients on the same dose as on admission unless otherwise indicated by INR.

Frequent changes in dose should be avoided.

Check INR in 2 - 3 days unless patient over anticoagulated.

Be aware of other factors which may affect INR and monitor more frequently, for example addition/alteration of interacting drug, patient acutely unwell, change in liver function or changes in alcohol consumption.

For target INR 2.0 – 3.0 (no bleeding)	
INR	ADJUSTMENT
<1.5	Increase dose 10 - 20%
1.5 - 1.9	Increase dose 5 - 10%
2.0 - 3.0	No change
3.1 - 3.9	Decrease dose 5 - 10%
4.0 - 4.9	Stop for 0 - 1 day then decrease dose 10%
>5.0	See management of over anticoagulation
For target INR 3.0 – 4.0 (no bleeding)	
INR	ADJUSTMENT
<1.5	Increase dose 10 - 20%
1.5 - 2.4	Increase dose 5 - 10%
2.5 - 3.5	No change
3.6 - 4.5	Decrease dose 5 - 10% consider holding one dose
4.5 - 6.0	Stop for 1-2 days then decrease dose by 5-15%
>6.0	See management of over anticoagulation

Drug interactions with warfarin

- Assume all newly prescribed drugs interfere with warfarin control.
- Check INR within 3 to 4 days of starting or stopping other drugs.
- Be very cautious about prescribing anti-platelet drugs and NSAIDS with warfarin. If antiplatelet drugs are to continue with warfarin this decision must be clearly documented in the medical notes and on the drug chart for inpatients.
- Many antibiotics are a common contributing factor to increased INR. Monitor INR closely.

Management of over anticoagulation with warfarin

- Haemorrhage is the main adverse effect of all oral anticoagulants. The risk of serious bleeding associated with warfarin increases significantly with INR > 5.0.
- The dose and route of vitamin K (phytomenadione) depends on presence of bleeding and INR. Oral doses are given using the IV preparation (unlicensed use).

MANAGEMENT OF OVER ANTICOAGULATION	
Unexpected bleeding at therapeutic INR	Investigate cause of bleeding. Consider stopping warfarin and/or reversing its effect (see below)
INR < 5.0 but more than 0.5 above the target value	Reduce dose or omit warfarin. Check INR 24 hours later.
INR 5.0 - 8.0 No bleeding or minor bleeding	Withhold 1-2 doses of warfarin and reduce subsequent maintenance dose. If minor bleeding, give vitamin K 1-3mg by slow IV injection. Restart warfarin when INR < 5.0 and bleeding stopped. Investigate cause of raised INR.
INR > 8.0 No bleeding or minor bleeding	Stop warfarin. If minor bleeding give vitamin K 1-3mg IV (if complete reversal is required give 5mg IV). If no bleeding give vitamin K 1-5mg orally. Check INR 24 hours later and repeat dose of vitamin K if INR still too high. Restart warfarin when INR <5.0.
Major Bleeding	Stop warfarin. Give vitamin K 5mg slow IV injection. Give prothrombin complex concentrate 25-50units/kg (available from Blood Bank). Discuss with consultant Haematologist. Repeat INR 12-24 hours later.

Alternatives to warfarin

- Other coumarins may be available. These include Acenocoumarol (Sinthrome) and Phenindione (Dindevan). The dosing is not the same as warfarin. If considering these alternatives please consult the summary of product characteristics (SPC).
- Direct Oral Anticoagulants (not limited to and including): Direct Anti-Xa inhibitors – Rivaroxaban, Apixaban, & Edoxaban. Direct Anti-Thrombin Inhibitors – Dabigatran. See 'Guideline on the use of Direct Oral Anticoagulants'.

Trust Guidelines	NHS University Hospitals Plymouth NHS Trust

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Accountabilities	
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Links to other documents

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