NHS Wirral

Wirral University Teaching Hospital NHS
NHS Foundation Trust

Clinical Guideline

Oral Anticoagulant Prescribing Guidelines

This guidance covers:

- Improving management of patients on oral anticoagulants
- Risk benefit assessment for patients requiring oral anticoagulation
- Alternative treatments to oral anticoagulation
- Clinical indications, treatment duration and target INR for oral anticoagulation
- Treatment duration in venous thrombo-embolism
- Prescribing oral anticoagulants in primary and secondary care
- Co-prescribing interacting medicines and antiplatelet medication
- Initiation of oral anticoagulant
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Improving management of patients on oral anticoagulants

Anticoagulants are one of the classes of medicines which frequently cause harm and admission to hospital. Managing the risk associated with anticoagulants was the subject of The National Patient Safety Agency Patient Safety Alert number 18 March 2007. High risks identified with prescribing anticoagulation include:

- Failure to initiate oral anticoagulant therapy where indicated
- Poor documentation of reason and treatment plan at commencement of therapy
- Incorrect prescribing of oral anticoagulant doses (especially loading doses)

The aim of this document is to provide details of prescribing guidelines and procedures relating to prescribing for oral anticoagulation within primary and secondary care for the Wirral population.

The formulary choice of oral anticoagulant is warfarin. Patients who are unable to tolerate warfarin should be referred to a haematologist for consideration of an alternative agent (e.g. phenindione).

Risk benefit assessment for patients requiring oral anticoagulation

Anticoagulation is not advisable if the risk of harm is likely to outweigh the benefits of treatment. Consideration should be given to the safety of initiating oral anticoagulants in patients with:

- cognitive impairment
- risk of falls/ with a history of falls,
- history of bleeding,
- excess alcohol intake
- liver disease
- visual acuity

Patients who fail to attend for regular blood tests and those with poor compliance should be counselled and consideration given to whether or not it is safe to continue with treatment.

Oral anticoagulants prescribed in pregnancy should be in consultation with an obstetrician.

Alternative treatments to oral anticoagulation

The following alternative therapies may be considered in patients for whom oral anticoagulation is not advisable:

- Atrial fibrillation consider aspirin 75 to 300mg once daily (NICE guidelines CG36 2006)
- Low molecular weight heparin in patients with venous thromboembolism.
- In venous thrombo-embolism a vena cava filter can be considered.

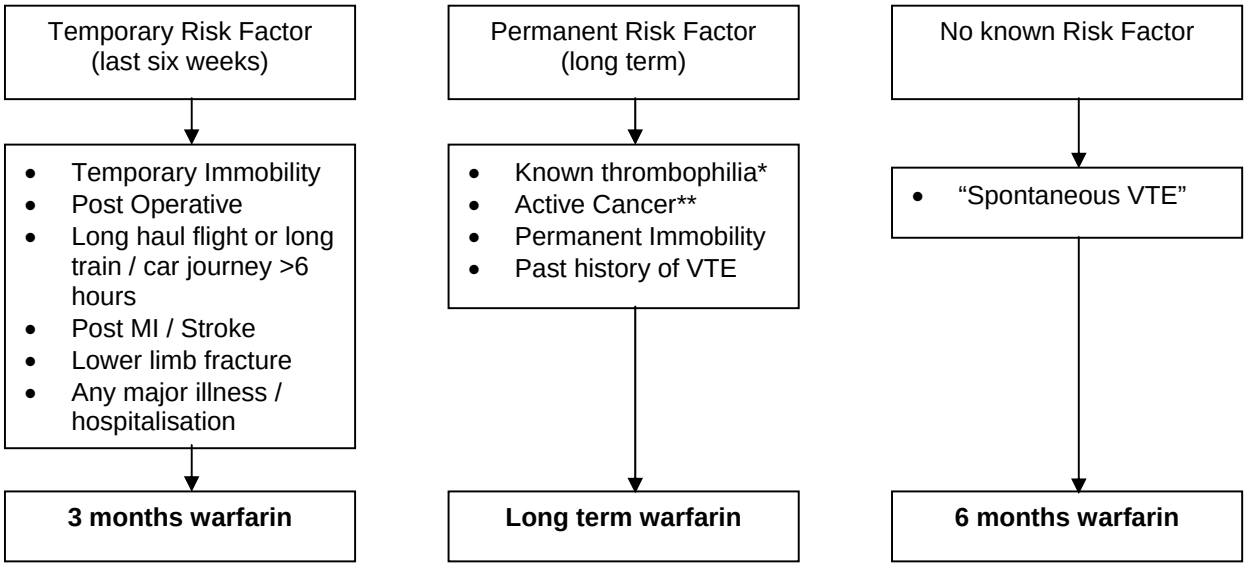
Clinical indications, treatment duration and target INR for oral anticoagulation

Indication	Target INR	Recommended Treatment Duration
Pulmonary embolism	2.5	Temporary risk factor -3 months Permanent risk factor -Life No risk factor -6 months
Proximal deep vein thrombosis	2.5	
Calf vein thrombus	2.5	
Recurrence of venous thromboembolism when no longer on warfarin therapy	2.5	Life
Recurrence of venous thromboembolism whilst on warfarin therapy	3.5	Life
Antiphospholipid syndrome	2.5	Life
Non rheumatic atrial fibrillation	2.5	Life
Atrial fibrillation due to rheumatic heart disease, congenital heart disease and thyrotoxicosis	2.5	Life
Cardioversion	2.5	Life
Mural thrombus	2.5	Life
Cardiomyopathy	2.5	Life
Mechanical prosthetic heart valve: • aortic bi-leaflet • aortic tilting disk • aortic caged ball or caged disk • mitral bi-leaflet • mitral tilting disk • mitral caged ball or caged disk	 2.5 3.0 3.5 3.0 3.0 3.5	Life* (see note below)
Bioprosthetic valve (if anticoagulated)	2.5	Life
Arterial grafts (if anticoagulated)	2.5	Life
Coronary artery thrombosis (if anticoagulated)	2.5	Life

*Please note: It is not always possible to precisely determine the type of valve and it is therefore recommended that prescribers confirm the target INR and duration of treatment with Liverpool Heart and Chest Centre.

Modified from -Guidelines on oral anticoagulation (warfarin): third edition – 2005 update 2005 British Society for Haematology, **132**, 277-285

Recommended treatment duration in venous thromboembolism



*Patients with thrombophilia must be assessed by a Haematologist regarding duration of warfarin treatment and/or further prophylaxis

**It should be noted that warfarin is generally inferior to therapeutic low molecular weight heparin (LMWH) for treatment of VTE in patients with cancer. Discussion with haematology prior to warfarin initiation may be appropriate.

Prescribing oral anticoagulants

Secondary care
Oral anticoagulants must be prescribed in accordance with the Trust's Medicines Management (General) Policy:

> "Oral anticoagulants must be prescribed via PCIS identifying the name of the oral anticoagulant and its dosing schedule. The dose should not be specified but the words 'see chart' should be inserted to direct medical and nursing staff to the separate paper oral anticoagulant therapy chart. This chart is used to prescribe the individual daily doses of anticoagulant and for recording the INR results as appropriate."

It is imperative that the dosages of anticoagulants are not indicated on PCIS but a reference to 'see chart' is selected. Duplication of doses on PCIS and the anticoagulant sheet is considered dangerous as the dose may be altered on one system and not on the other leading to ambiguity and error.

The PCIS prescribing pathway requires input of the indication for therapy, target INR, duration of therapy and name of the referring clinician. These details are transferred to the discharge letter and must be checked for accuracy at the time of discharge by two members of staff. This can be undertaken by trained nurses, doctors and pharmacists.

In addition to all the prescribing standards listed in section 6 of the Medicine Management (General) Policy, the following must be clearly identified on the anticoagulant therapy chart:

- The date and time for administration of oral anticoagulant
- The approved name of the oral anticoagulant, the indication for use and duration of treatment
- The target INR for the patient and an indication of whether treatment is newly commenced or continuation therapy
- If continuation therapy the usual maintenance dose
- The INR on the specified date and the dose of oral anticoagulant to be administered on that date
- Specify the dose in number of milligrams not as number of tablets

Prescribing oral anticoagulants

Primary Care
For Practices who Prescribe:

- Indication for anticoagulation, target INR and stop date, dates of INR testing and results, and doses prescribed should be recorded on the GP clinical system using a standard template
- The dose of anticoagulant should be expressed as milligrams and not as number of tablets
- The use of 0.5mg tablets is not recommended without good clinical reason and following a formal risk assessment because of the confusion with 5mg tablets
- Dosage changes should be communicated to patients or their carers in writing
- Practices are encouraged to use the diary feature of their clinical systems to help identify when patients should stop anticoagulation

For Practices who Dose and Prescribe
In addition to above points:

- Suitable dosing software should be used to calculate the dose of anticoagulant to be taken
- Dosage recommendations should use constant daily dosing where clinically appropriate, rather than alternate daily dosing

Co-prescribing Interacting Medicines and Anti-platelet Medication

If possible, medicines should be selected that do not produce clinically significant interactions. If this is not possible, the prescriber who initiated **or discontinues** an interacting medicine is responsible for informing the patient of the change in therapy and ensuring that an INR check is performed **four to seven days** after the change in therapy. The anticoagulant clinic must be informed of the change.

Special Considerations:

- Concomitant use of certain antibiotics. Always check current BNF Appendix 1 for significance of interaction and guidance.
- Concomitant use of amiodarone

The dose of oral anticoagulant may need to be reduced by up to one third if amiodarone is added to anticoagulant therapy. Weekly INR monitoring for a minimum of 4 weeks of initiating or discontinuing amiodarone is advised.

If an anti-platelet is indicated in addition to oral anticoagulation this must be clearly communicated between care providers, preferably by documenting the need for combination therapy in the oral anticoagulant therapy record book and clearly stated in the hospital discharge letter.

Initiation of Warfarin

Check baseline LFTs, INR and FBC.
Seek senior medical advice if any abnormalities.

NB: There are no dosing guidelines for patients with a baseline INR of ≥1.4.

Consideration should be given to the safety of initiating therapy in patients who have a raised baseline INR.

Check for the following risk factors:

- Age >70 years
- Increased bleeding risk (other causes)
- Liver impairment
- Parenteral feeding
- Weight <60kg
- Low albumin <36g/L
- Interacting medications
- History of significant bleed

Primary care
Only Algorithm C should be used. See below.

Secondary care
If the patient has no risk factors **and does not have chronic atrial fibrillation** – use standard Initiation algorithm A. See below.

If risk factors are present- consider if anticoagulation is still appropriate. For those patients requiring smaller loading doses consider using the "Reduced Dose Initiation of Warfarin" - algorithm B. See below.

In chronic atrial fibrillation not needing cardioversion, consider using Algorithm C. See below.

Algorithm A

The protocol for anticoagulation (below) is recommended where rapid anticoagulation is desired AND the patient has no risk factors outlined above.

Day	INR	Warfarin dose (mg) Given between 4-7pm
A baseline INR must be taken and then daily INR for at least three days		
1	<1.4 (before treatment)	10 (1st dose)
	>1.4	Seek senior medical advice
2	<1.8	10
	1.8	1
	>1.8	0.5
3	<2	10
	2 - 2.1	5
	2.2 - 2.3	4.5
	2.4 - 2.5	4
	2.6 - 2.7	3.5
	2.8 - 2.9	3
	3 - 3.1	2.5
	3.2 - 3.3	2
	3.4	1.5
	3.5	1
	3.6 - 4	0.5
	4	0
Predicted Maintenance Dose		
4	<1.4	>8
	1.4	8
	1.5	7.5
	1.6 - 1.7	7
	1.8	6.5
	1.9	6
	2 - 2.1	5.5
	2.2 - 2.3	5
	2.4 - 2.6	4.5
	2.7 - 3	4
	3.1 - 3.5	3.5
	3.6 - 4	3
	4.1 - 4.5	Miss out next days dose then give 2mg
	>4.5	Miss out 2 days doses then give 1mg

Ref: Based on Fennerty.A, et.al. BMJ 1984; 288: 1268-1270.

Algorithm B

Day	INR (9-11am)	Warfarin dose (mg) Given between 4-7pm
A baseline INR must be taken and then daily INR for at least three days		
1	<1.4 (before treatment)	10mg
	>1.4	Seek senior medical advice
2	<1.8	5mg
	1.8 – 2	1mg
	>2	0mg
3	<2	5mg
	2- 2.5	4mg
	2.6-2.9	3mg
	3-3.2	2mg
	3.3-3.5	1mg
	>3.5	0mg
Predicted Maintenance Dose		
4	<1.4	>7mg
	1.4-1.5	7mg
	1.6-1.7	6mg
	1.8-1.9	5mg
	2-2.3	4mg
	2.4-3	3mg
	3.1-3.2	2mg
	3.3-3.5	1mg
	3.6-4	0mg
	>4	Seek senior medical advice

Ref: Based on Gedge et al. Age and Ageing 2000:29:31-34

Algorithm C

In the treatment of atrial fibrillation in elderly patients (>75years) who **do not** require cardioversion, slow induction of anticoagulation is suitable. This group of patients may be at risk of over anticoagulation with the standard protocol for initiation. A local audit found that the majority of patients (mean age 82 years) achieved a therapeutic INR (2-3) after 11 days using this regimen.

Low dose initiation with warfarin for AF: target INR 2.5 (range 2-3)		
Day	**INR**	**Dose**
1 to 7	< 1.4	2mg
8 to 10	<2	3mg
11 onwards	<2	4mg
Continue to monitor INR at least weekly, preferably on weekdays and increase warfarin by 1mg daily until therapeutic INR achieved.		

Ref: Based on Barrett, J et al Age and Ageing 2000; 29: 457.

Initiation of warfarin in diagnosed DVT patient -Nurse led service Unplanned care

Unplanned Care – DVT service tel no 0151 488 3703 ext 6381
The Unplanned Care -led DVT Diagnostic Treatment Service will initiate warfarin for all patients who have been diagnosed by the team with a DVT and are medically stable, thereby meeting the eligibility criteria for the Nurse led DVT Service. Treatment with warfarin and tinzaparin is administered under a patient group direction. This gives full guidance on warfarin dosages and recommends dosage adjustments following INR results. On the diagnosis of DVT the patient is issued with the yellow Oral anticoagulation booklet.

Patients will be advised either directly during face to face consultation or over the telephone of their warfarin dosage each day and asked to document this in their record book. This verbal information is, where possible confirmed in writing via email or text to the patient. In addition, patients are asked to bring in their record book the following day when they attend for their blood test. Nurses can then confirm that correct details have been recorded by the patient.
Patients will be monitored by the service until their INR is in the range 2-3 for 48 hours. Patients are then referred initially to the Anticoagulant Clinic on Wednesdays at Arrowe Park Hospital. Their future management plan is decided by the service and patients are referred back to their own GP for ongoing care.

Unplanned Care –Stable AF patient's Anticoagulation
The Nurse led DVT service will use the slow induction of anticoagulation in elderly patients for the treatment of Atrial Fibrillation where cardioversion is not suitable. These patients will be referred into the service, via single Point of Access, following diagnosis using the appropriate referral form.
The patients will be monitored as per protocol (warfarin dose as per Algorithm C) until INR in range 2-3. These patients will be referred back to practice if there is a locally enhanced service in situ, for on going monitoring once their INR is stable, otherwise will be referred into anticoagulation clinic and communication with practice is made by this route.

Monitoring Warfarin

The advice below is taken from the Haematology Department at Wirral University Teaching Hospital NHS Foundation Trust. In the out-patient setting and within primary care maintenance dose adjustment should be carried out using a suitable computer programme. An INR outside of range is defined as an INR either greater than or less than 0.5 units outside the target.

NB: It is also recommended to monitor warfarin more closely when interacting medication is started or stopped. See section above.

Warfarin: maximum recall periods during maintenance therapy	
INR	**Action**
One high INR	Recall within 14 days
One low INR	Recall within 14 days
First appointment	Within one week after initiation / transfer of care
One therapeutic INR	Recall within two weeks
Two therapeutic INRs	Recall within two weeks
Three therapeutic INRs	Recall within four weeks
Four therapeutic INRs	Recall within four weeks
Five therapeutic INRs	Recall within six weeks
Six or more therapeutic INRs	Recall within eight weeks
Special circumstances	
Cardioversion	Weekly appointments prior to cardioversion and two weekly after cardioversion
Chemotherapy	Weekly appointments
Amiodarone	Weekly appointments for 4 weeks after commencing or discontinuing amiodarone

Dosage adjustment of established (maintenance) warfarin (i.e. for in-patients who have been taking warfarin for 7 days or longer)

Dose adjustment of established (maintenance) warfarin i.e. in patients who have been taking warfarin for 7 days or longer

NB: Select correct target INR

Target INR 2.5		
INR	**Dose change**	**Next INR**
<1.5	30% Increase	3 days
1.5-2	20% Increase	
2.1-3	No Change	
3.1-4	20% Reduction	
4.1-6	Miss 2 days & 30% reduction	4 days
>6.1	Miss 3 days	Measure INR daily if there is a high concern for bleeding

Target INR 3.5		
INR	**Dose change**	**Next INR**
<2	50% Increase	3 days
2.1-3	20% Increase	
3.1-4	No change	
4.1-6	Miss 2 days & 20% reduction	4 days
>6.1	Miss 3 days	Measure INR daily if there is a high concern for bleeding

Management of bleeding and excess anticoagulation

Major Bleeding: Stop warfarin; give phytomenadione (vitamin K1) 5-10mg by slow intravenous injection*; give Octaplex® (prothrombin complex concentrate: factors II, VII, IX and X): Octaplex® is issued by the Blood Transfusion Laboratory after authorisation by a Haematologist. Guidelines for the administration of Octaplex® are located on Wirral Hospital Intranet (under Umbrella / Clinical Guidance / Transfusion and warfarin reversal / warfarin reversal).

INR >8, no bleeding or minor bleeding: Stop warfarin, restart when INR <5; if there are other risk factors** for bleeding give phytomenadione (vitamin K1) 1mg-5mg by mouth using Konakion® MM Paediatric 2mg/0.2mL ampoules. Repeat dose of phytomenadione if INR is still too high after 24 hours.

INR 6 – 8, no bleeding or minor bleeding: Stop warfarin, restart when INR < 5.

INR < 6 but more than 0.5 units above target value: Reduce dose or stop warfarin, restart when INR < 5.

Unexpected bleeding at therapeutic levels: Always investigate possibility of underlying cause (e.g. unsuspected renal or gastro-intestinal tract pathology).

*See Medicines Guide Appendix II for administration detail.
** Risk factors include – Age >65 years, hypertension, diabetes mellitus, renal failure, liver failure, previous gastrointestinal bleed, previous cerebral bleed, concomitant antiplatelet therapy.

Phytomenadione:
Higher doses of phytomenadione (above 5mg) will prevent the action of anticoagulants for up to 2 weeks and will make re-anticoagulation difficult.
After administering phytomenadione it is generally considered appropriate to repeat INR after 24 hours (or sooner if clinically indicated).

All patients with major bleeding should be admitted to secondary care. In certain circumstances for patients who have a high INR GPs may deem secondary care referral for clinical evaluation appropriate.

The referral pathway to access the hospital is via the “single point of access” on 0151 488 3703 during office hours and directly through the “on-call for medicine” via switchboard at other times.

Peri-operative Management of Patients Receiving Oral Anticoagulation

In patients undergoing elective surgery, refer to the Protocol for the Peri-operative Management of Patients Receiving Regular Oral Anticoagulation. This is detailed in the Wirral Medicines Guide section 2.6.3. (currently under review)

Patient Education and Counselling

All patients who are prescribed an oral anticoagulant must have been given a copy of the oral anticoagulant therapy pack (O.A.T Pack). This should be documented on the anticoagulant chart. The pack contains a record book, alert card and patient information book. The record book component of the pack is used for recording the INR results and dose of anticoagulant. Both the patient information book and record book must be completed correctly. Ensure that the patient has read and understood this information.

Obtaining an OAT Pack

- **Secondary Care:** Full packs or the record book can be ordered from supplies and are kept on all wards and in the anticoagulant department.
- **Primary Care:** Full packs or the record book can be ordered from Astron.

Secondary Care In-patient Counselling

Pharmacists, doctors and other staff who have been trained in anticoagulant therapy (e.g. ward based pharmacy technicians and nurses) are able to counsel individual patients regarding the safe administration of warfarin.

All counselling should be documented in the patient's medical notes and on the anticoagulation chart.

Patients referred to the anticoagulant clinic at Arrowe Park Hospital are shown a DVD 'Living with warfarin'. This DVD is also available on bedside television screens found on most wards at WUTH and can be viewed free of charge.

Primary Care Patient Counselling

All patients started on an oral anticoagulant in primary care should receive verbal information and an O.A.T pack. This counselling and receipt of an OAT pack must be recorded in the patient's healthcare record.

Walk-in-Centre Patient Counselling

All patients diagnosed with DVT are issued with the O.A.T pack. All patients receive warfarin counselling from the Pharmacist at Lloyds Pharmacy on the Arrowe Park site. All patients are issued with the DVT Service information booklet.

Discharging patients from Wirral University Teaching Hospital NHS Foundation Trust on oral anticoagulants

Prior to a patient being discharged from hospital please ensure that the following points (A, B, C and D) have been actioned. This should be documented and signed for on the discharge planning section of the anticoagulant chart.

It is the responsibility of the prescriber to ensure that A, B, C and D have been completed. It is pharmacist's responsibility to check A, B, C and D when checking the TTH and the discharging nurse's responsibility to check A, B, C and D at the point of discharge.

A: Anticoagulant Clinic Appointment
All patients should be given an **appropriate** appointment to check their INR after discharge. At present the hospital anticoagulant clinic is only available on Wednesdays.

NB: Some patients are discharged from hospital during a loading regimen with warfarin, it is imperative that these patients return to hospital daily for INR checks during this loading phase.
Patient's can be referred into the Unplanned Care Nurse Led DVT service for ongoing monitoring and stabilisation of their INR. Management via this route is done by Single Point of Access on 0151 488 3703 or at Arrowe Park on extension 6381

In addition, patients discharged home while their anticoagulant therapy is unstable may need to return to the hospital before the next scheduled anticoagulant clinic.

B: Anticoagulant Therapy Record Book
Ensure that the patient has received an O.A.T pack. If not, one must be provided and correctly filled in with:

- Patient details
- Warfarin details (e.g. indication, target INR and duration of treatment)
- Latest INR and doses to be taken after discharge until the next anticoagulant clinic appointment
- Date of the next anticoagulant clinic appointment

This information can be entered by a doctor, registered nurse or pharmacist, with the exception of the doses to take post discharge which must be completed and signed for by the prescribing doctor.

C: Counselling
Ensure that the patient has been counselled. See counselling section above.

D: Warfarin Details
At the time of in-patient prescribing, the indication for therapy, target INR and duration of treatment selected will be transferred to the discharge letter. Ensure that this "warfarin detail" information is still correct and that any changes to interacting medication are communicated to the anticoagulant clinic and the GP. The responsibility for this communication and for the information in the discharge letter lies with the practitioner.

Primary Care Annual Review of Patients on Oral Anticoagulants

An annual review should be conducted by the primary care prescriber and include the following:

- That the indication for treatment remains appropriate
- That the patient's INR is being monitored regularly
- That the target INR range and length of treatment is documented and appropriate for the indication
- Discuss treatment with patient to determine if any side effects from anticoagulant therapy and assess concordance
- Establish that the risk/benefit ratio for continuing treatment remains favourable
- Assess if target INR is being achieved

If there is any uncertainty regarding treatment, the patient should be referred to the clinician who recommended initiating anticoagulant therapy.

Discontinuing Oral Anticoagulants

If anticoagulation is no longer required it is safe to stop warfarin abruptly. There is no need to taper the dose.

In secondary care, the prescriber must ensure that the "warfarin detail" on the computerised prescribing system is deleted from the discharge letter to prevent any miscommunication with the GP.