Milton Keynes Hospital NHS
NHS Foundation Trust

Oral Anticoagulation Guidelines for Adults

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GENM/GL/ 100	4	11/2008	11/2014	02/2018	Yes	– Consultant Haematologist

Approved By:
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For use in (clinical area)	All clinical areas
For use by (staff groups)	All clinicians involved in the care of patients requiring anticoagulation
For use for (patients/staff/public)	All patient requiring anticoagulation management
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Document History

Version	Date	Author	Reason
1	November 2008		New document
1.1	January 2010		Minor amendment – TED Stockings to AES and link to new AES guideline in Section 4.1
2	April 2010		NICE recommendations
3	November 2010		Addition of Section 4.8, new appendices
3.1	October 2011		Minor amendments in line with NHSLA requirements
4	March 2014		Document review. Major changes links to British Journal of Haematology guidance added

Consultation History

Stakeholders Name	Area of Expertise	Date Sent	Date Received	Comments	Changes Made
	Medical Director	March 2014			
	Associate Medical Director	March 2014			
	Consultant Orthopaedics & Trauma	March 2014			
	Pharmacy Manager	March 2014			
	Haematology	March 2014			
	Consultant Gynaecologist	March 2014			
	Consultant Colorectal Surgeon	March 2014			
	Consultant Gastroenterologist	March 2014			
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	Trust Risk Manager	March 2014			
	Pharmacy Manager	March 2014			
	Consultant Surgeon	March 2014			
	Consultant Surgeon	March 2014			
	Surgery Matron	March 2014			
	VTE Nurse	March 2014			
	Transformation Manager	March 2014			
	General Practitioner	March 2014			
	Consultant Anaesthetist	March 2014			
	ANP Nurse	March 2014			
	Deputy Chief Nurse	March 2014			

	Consultant	March 2014			
	Consultant Gastroenterologist	March 2014			
	Pharmacy	March 2014			
	GP	March 2014			
	Consultant Obstetrician & Gynaecologist	March 2014			
	Consultant Surgeon	March 2014			
VTE committee members		April 2014 November 2014			
Clinical Board Members		December 2014			

1.0 Introduction

1.1 Guidance statement and aim

The overall aim of these guidelines is to provide safe and effective anticoagulation for adults.

The NPSA in collaboration with the British Committee for Standards in Haematology (BCSH) and a broad range of clinical organisations, clinicians, patients and patient groups has made a variety of recommendations, which have been incorporated into the Trust guidelines to ensure compliance and patient safety.

Recommendations from the British Committee for Standards in Haematology and National Patient Safety Agency can be accessed through these links.
http://www.bcshguidelines.com/documents/safety_indicators_oral_anti_coag_bjh_2007.pdf

http://www.nice.org.uk/nicemedia/pdf/CG92FullGuideline.pdf

1.2 Objectives

The objective of this guideline is to ensure that patients who are admitted to Milton Keynes Hospital NHS Foundation Trust (MKHFT) are risk assessed in relation to their current illness, mobility and background risk factors and receive appropriate anticoagulant management through:

- Ensuring all staff caring for patients on anticoagulant therapy have the necessary training and work competencies.
- Appropriate verbal and written information is available for patients.
- Ensuring safe practice through a clear and standardised protocol on all anticoagulant prescribing, monitoring and management.
- Clear lines of accountability are established.

It is vitally important that all clinicians and patients are clearly aware of their responsibilities with oral anticoagulant drugs.

2.0 Scope of document

This guideline applies to all adult patients treated at MKHFT on anticoagulant therapy and the staff who are responsible for their care.

3.0 Roles and responsibilities

Consultants
The Consultants will be responsible for ensuring adherence to the guidelines from a medical perspective.

Matrons
The Matrons will be responsible for ensuring adherence to these guidelines from a nursing perspective.

Pharmacy
Pharmacy will be responsible for ensuring the safe dispensing of anticoagulant therapy.

Anticoagulation Advanced Nurse Practitioner
The ANP will be lead the Anticoagulation service for MKHFT and provide teaching and training whilst acting as a resource for staff and patients.

Learning and Development
Learning and Development are responsible for ensuring that VTE training is provided as per the Trusts Training Needs Analysis (TNA).

4.0 Assessment and Risks of Patients on Anticoagulation

All patients requiring anticoagulation treatment at MKHFT should be assessed for suitability for anticoagulation by a member of the medical team.

5.0 Guidance - Anticoagulation with Warfarin

Please note – guidelines for the new oral anticoagulants (NOAC's) such as Dabigatran, Rivaroxaban and Apixaban are under development and will be issued in a separate document.

5.1 Assessing patient suitability for oral Anticoagulation with Warfarin

5.1.1 Exceptions/ contraindications

Anticoagulation is contraindicated in any circumstances in which the risk of haemorrhage is greater than the clinical benefits of anticoagulation. Oral anticoagulants are absolutely contraindicated during the first trimester of pregnancy, bacterial endocarditis, active peptic ulceration, uncontrolled hypertension and previous hypersensitivity. Its use at any other stage of pregnancy should only be undertaken after a full risk benefit analysis and discussion with a Consultant Haematologist and Consultant Obstetrician.

Warfarin is relatively safe to use post nataly if monitored carefully and it is safe to breast feed while on Warfarin. Reducing the risk of thrombosis and embolism during pregnancy and the puerperium RCOG green top guideline no 37, November 2009.

Oral anticoagulants should be used with caution if there is a history of recent surgery, haemorrhagic tendencies, alcoholism or significant liver disease, or if there is an inability of the patient to comply with therapy and monitoring.

5.1.2 Potential complications / Risk Management

If a patient has any of the following conditions the consultant responsible for the patients care should state clearly in the patients healthcare records that they wish the patient to have anticoagulant therapy despite contraindications.

- Recent non-embolic cerebrovascular accidents
- Recent surgery or trauma to the central nervous system or the eye
- Inflammatory bowel disease
- Uncompensated cirrhosis
- Pre-existing haemostatic defect e.g. baseline INR above 1.4
- Alcohol abuse
- Tendency to falls

5.1.3 Patient refusal/non compliance

If the patient expresses that they do not wish to receive oral anticoagulant therapy or are non compliant, the ANP will offer further explanation and counselling. If this is not successful, the ANP will contact the referring clinician formally to discuss terminating involvement of the ANP and the anticoagulation service. Advice for an alternative course of treatment can be discussed by the referring clinician and Consultant Haematologist if necessary.

5.2 Initiation of warfarin therapy

5.2.1 Target INR and Duration of Treatment

Before starting oral anticoagulant drugs check a baseline INR/APTT, FBC, U&E and LFTs. All new patients must be asked about a personal or family bleeding history as not all bleeding disorders will show up on standard tests. If the history is positive or the clotting screen is abnormal this must be discussed with a Consultant Haematologist.

Indication	Target INR	Duration of Treatment
Pulmonary embolism	2 - 3	6 months
Above knee DVT	2 - 3	6 months
Below knee DVT	2 - 3	3 months
Recurrent thromboembolism	2 - 3	Long Term
Recurrent thromboembolism on oral anticoagulants	3 - 4	Long Term
Atrial Fibrillation Cardioversion	2 - 3 Consider 2.5 - 3.5	Long Term
Antiphospholipid syndrome	2.5 - 3.5	Long Term
Aortic Valve replacement (mech)	2.5 - 3.5	Long Term
Mitral Valve replacement (mech)	3 - 4	Long Term

For further information please Click here to take you to the BCSH guidance on Oral Anticoagulation with Warfarin

BCSH Guidelines on the investigation and management of venous thrombosis at unusual sites can be found by clicking here **Guidelines on the investigation and management of venous thrombosis at unusual sites**

Do not start warfarin in acute VTE until >24hrs after the first dose of Low Molecular Weight Heparin (LMWH) has been given as this may induce a paradoxical prothrombotic state. However rapidly treatment with warfarin is initiated, coagulation will not usually be inhibited for 72 hours because warfarin only affects the synthesis of new clotting factors. The drug may be initiated by a standard induction regime with a larger loading dose over a 72 hour period or by a low dose approach which is suitable for AF.

5.2.2 For standard induction (e.g. DVT/PE)

Base line blood results must be checked prior to prescribing any anticoagulant.

The standard induction dose is 10mg Warfarin on days 1 and 2 then 5mg Warfarin on day 3 with an INR on day 4. The subsequent dosage is adjusted according to the Fennerty (1988) schedule (Appendix 1: Fennerty)

This guidance is intended to supplement the clinician's own knowledge and does not supersede clinical judgement. When initiating warfarin consider the patient's age, co-morbidities and interacting medicines and use lower loading doses when appropriate (e.g. 5mg instead of 10mg).

5.2.3 Low dose induction

Smaller induction doses (e.g. 5 mg daily for three days or 3mgs daily for 7 days) should be given to elderly, patients with a weight of <50kg and/or those with risk factors for poor anticoagulation control, such as liver disease, CCF or drugs that enhance anticoagulant effect. In these cases the Fennerty schedule is no longer applicable (see Janes Schedule appendix 3)

5.3 Potential Side Effects of Warfarin

Haemorrhage, rash, hypersensitivity, jaundice, hepatic dysfunction, nausea & vomiting, pancreatitis.

N.B. this list is not exhaustive. Please refer to BNF for further information by following this link Coumarins and phenindione : British National Formulary

Special Warnings and Special Precautions for use

The following may **enhance** the effect of warfarin and necessitate a reduction of dosage:

- loss of weight
- elderly patients
- acute illness
- active carcinoma
- CCF
- abnormal liver function
- deficient renal function
- decreased dietary intake of Vitamin K
- administration of some drugs (see below)
- alcohol excess

The following may **reduce** the effect of warfarin and require the dosage to be increased:

- weight gain
- increased dietary intake of Vitamin K, fats and oil
- administration of some drugs (see below)

5.4 Significant Interactions with Warfarin

Many commonly used drugs can have significant interactions with oral anticoagulants – if the patient starts or stops a drug known to have a significant interaction it is essential to arrange for the patient's INR to be checked within 3-4 days and indicate the drug change on the inpatient anticoagulant chart.

Potential enhanced effect		Potential decreased effect
Amiodarone	Metronidazole	Carbamazepine
Ciprofloxacin	Nystatin / Miconazole	Oestrogens
Clarithromycin	Omeprazole	Phenobarbitone
Erythromycin	Paracetamol	Rifampicin
Fibrates	SSRI antidepressants	St John's Wort
Fluconazole	Statins	
Levothyroxine	Tamoxifen	

This is not an exhaustive list so refer to the BNFlink below or BNF Appendix 1 Interactions:under coumarins

http://www.evidence.nhs.uk/formulary/bnf/current/2-cardiovascular-system/28-anticoagulants-and-protamine/282-oral-anticoagulants/coumarins-and-phenindione,

Advice can also be sought from Pharmacy and the Anticoagulation ANP.

There is an increased risk of bleeding with antiplatelet agents and NSAIDs. The Clinician responsible for initiating oral anticoagulation treatment must ensure they document in the patients health care records if the patient needs to continue any of these drugs whilst taking oral anticoagulants.

6.0 After Care

6.1 Monitoring

In the first two weeks of treatment INRs must be checked every 2 - 3 days (or more frequently if required). Once the INR is stable and in therapeutic range, testing intervals can be gradually increased, the maximum time interval being 12 weeks.

If the INR is outside the therapeutic range the dose of oral anticoagulant drug may need to be adjusted either up or down - this requires only small adjustments in dose. The daily maintenance dose is usually taken at 6pm – note there can be large

variance in the daily doses of warfarin taken by individual patients which can range between 1mg and 20mg.

6.2 Management of High INRs

The following guidelines are suggested for reversal of oral anticoagulant overdose - note that the risk of reversal must be balanced against the risk of thrombosis:

Life threatening haemorrhage	Phytomenadione (Vitamin K) 10mg IV Prothrombin Complex Concentrates (needs to be discussed with Consultant Haematologist)
Less severe haemorrhage	Withhold oral anticoagulant for 2-3 days and recheck the INR before recommencing oral anticoagulant Consider vitamin K 0.5mg - 2mg IV / oral
INR >7.0 without haemorrhage	Withhold oral anticoagulant for 2-3 days and recheck the INR before recommencing oral anticoagulant Consider vitamin K 0.5mg - 2mg IV / oral
INR 4.5 - 7.0 without haemorrhage	Withhold oral anticoagulant for 1-2 days and recheck the INR before recommencing oral anticoagulant
Unexpected haemorrhage at therapeutic INR	Investigate cause of bleeding
Any patient on warfarin with haemorrhage	Discuss with Consultant Haematologist Report using Datix Report Form on Trust Intranet

7.0 Emergency Surgery

Stop warfarin and check an FBC & full clotting screen (INR / APTT / Fibrinogen) and seek advice from the on call Consultant Haematologist.

Prothrombin complex concentrates (PCCs eg. Beriplex or Octaplex) provide the most immediate & effective reversal of warfarinisation, however they induce a procoagulant state and therefore the risk / benefit of PCCs should be individually assessed. Fresh frozen plasma (FFP) may alternatively be given after discussion with haematologist on call, however, its effects are short lived and 5mg IV Vitamin K should also be given. Clotting tests should be re-checked after PCCs or FFP have been given and 6 hourly thereafter as further products may be needed. Ensure appropriate anticoagulation is restarted as soon as is safely possible post-operatively (see below for major surgery).

Patients taking anti-platelet agents are at risk of haemorrhagic complications and may need a platelet transfusion even if they have a normal platelet count. See notes below and seek advice from a Consultant Haematologist. Restart antiplatelet agents 24 hours after surgery if there is no ongoing bleeding risk.

8.0 Anti-platelet agents & coronary stents pre surgery

Aspirin should not be stopped in patients with coronary stents except in extreme circumstances (eg. Life threatening bleeding or spinal surgery). Such situations should be discussed with a Consultant Cardiologist. Ideally Clopidogrel and / or Dipyridamole should not be stopped in patients with coronary stents. Where this is essential this should be discussed with a Consultant Cardiologist who may recommend discontinuing Clopidogrel 5 days pre-operatively and restarting at a loading dose of 300mg on Day 1 post surgery.

9.0 Anti-platelet agents for other clinical indications pre surgery

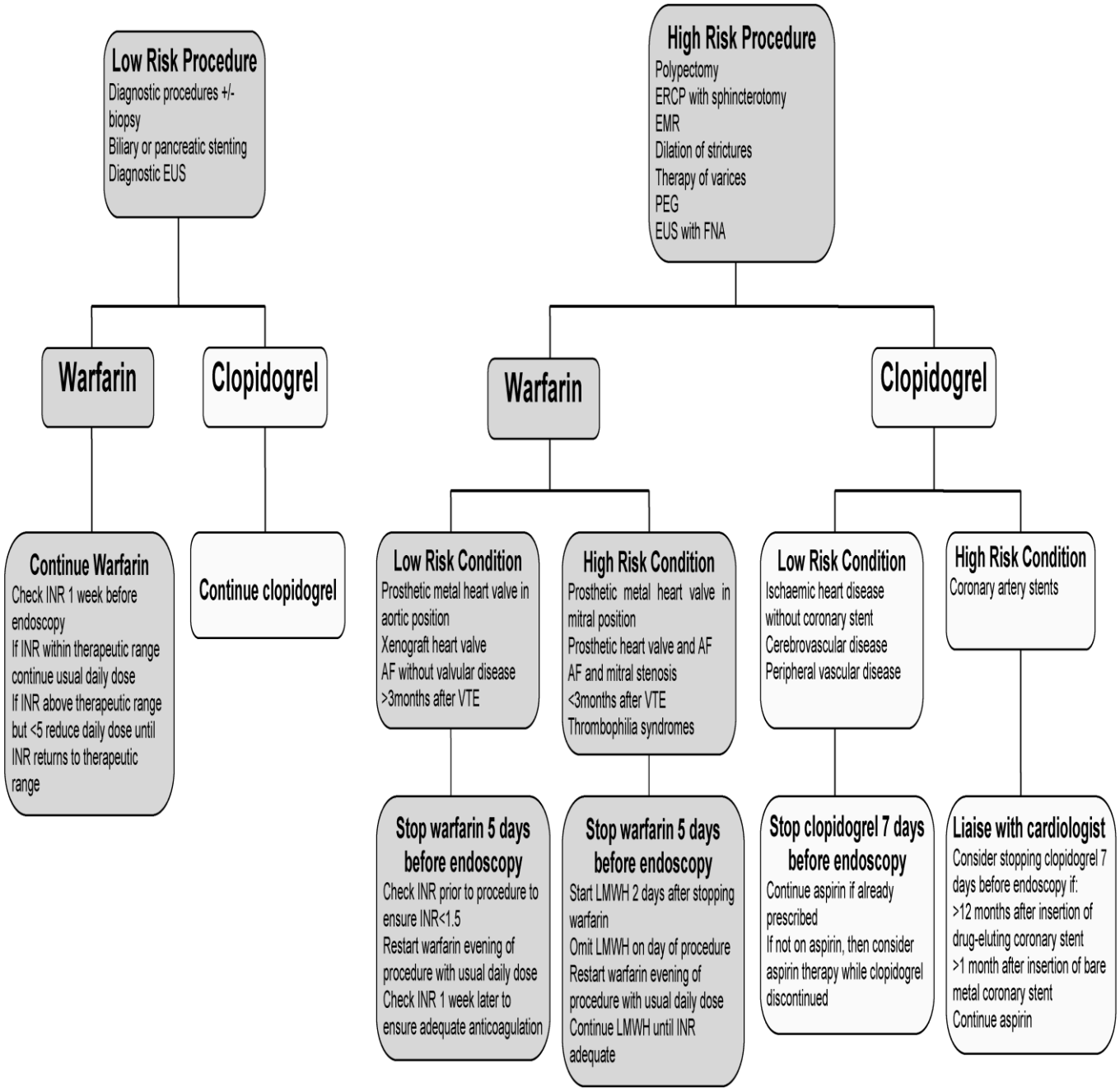
Aspirin should be temporarily discontinued 7 day prior to elective surgery with a significant bleeding risk unless a clinical risk assessment indicates otherwise. Clopidogrel should be stopped 7 days prior to surgery as the risk of haemorrhage is high.

Dipyridamole and short acting NSAIDS should be stopped 24 hours prior to surgery unless a clinical risk assessment indicates otherwise.

Ticlopidine & Tirofiban have anti-platelet effects and are used in specific high-risk coronary disease. Cessation should be discussed with a Consultant Cardiologist.

Please refer to the guidance at this link for specific indication recommendations at end of bridging chapter (Chapter 9 or 10)
http://www.bcshguidelines.com/documents/WarfarinandentalSurgery_bjh_264_2007.pdf

10.0 Guidelines for the management of patients on warfarin or clopidogrel undergoing endoscopic procedures



Follow this link for further guidance: **British Society of Gastroenterology Guidance**

11.0 Discharge guidance

Inpatients on warfarin should not be discharged without patient information, a yellow book (see link below) or dosage leaflet with dose instructions stated in mg and advice on when and where to have a repeat INR blood test.

NOTE: Patient information 'Oral Anticoagulant Therapy' is available via the NPSA website at http://www.nrls.npsa.nhs.uk/resources/?EntryId45=61777

11.1 Patient Information

All patients (and their carers) should be counselled about anticoagulation therapy. Patients newly commenced on oral anticoagulant therapy should be given a Yellow Oral Anticoagulant Therapy pack, which contains an information booklet and an alert card which should be carried with them at all times.

In an emergency they must be advised to contact their GP or attend the Emergency Department.

12.0 Stopping Warfarin

When a patient reaches the end of the specified duration of anticoagulation, Warfarin can be discontinued. Tailing off the Warfarin is not necessary.

12.1 Anticoagulation Clinic

Milton Keynes Hospital provides an Out-patients anticoagulation service to patients referred internally (post discharge), referred by other hospitals or via General Practitioners (GPs). The clinic is managed by the Advanced Nurse Practitioner (ANP) who is responsible for maintaining patients International Normalised Ratios (INRs) within their target range depending on their indication as recommended by the British Committee for Guidelines in Haematology (BCSH). The ANP will work under Consultant Haematologist advice.

Most patients in Milton Keynes on Warfarin for over 2 weeks have their monitoring and dosing supervised by their GP. If the patient's GP is phoned and unwilling to take over Warfarin dosing the patient should be referred to the hospital Anticoagulation Clinic.

Please note the anticoagulation clinic only runs once per week, so patients must be stable before they can be accepted.

13.0 Perioperative Bridging Anticoagulation for Warfarin Patients According to Risk of Thrombosis

13.1 Patients at high risk of thrombosis include

i. Those with valvular atrial fibrillation (AF), ie, mechanical valvular prosthesis or mitral valve repair, or mitral valve prosthesis, or any caged-ball or tilting disc aortic valve prosthesis or multiple mechanical heart valves. Also include patients with a mechanical heart valve

who have had a stroke, TIA or cardioembolic event in last 6 months.

ii. Those with a history of VTE if VTE is within last 3 months **or** severe thrombophilia* **or** unprovoked VTE, or active cancer (cancer diagnosed < or = 6 months ago) or patient undergoing cancer therapy.

iii. Those with non valvular AF if CHADS2 score of 5 or 6 or stroke or TIA within previous 3 months, or rheumatic valvular heart disease.

Caution: In patients with decreased renal function, if creatinine clearance level <30ml/min, use unfractionated heparin infusion (therapeutic) instead of low molecular weight heparin (LMWH). Use APTR to monitor anticoagulation. Stop heparin infusion 6 hours pre procedure.

Protocol for high risk patients

a) Stop warfarin 5 days pre surgery and start therapeutic LMWH when INR falls below therapeutic range (check daily INR).

b) In mechanical heart valve or AF patients, give LMWH; Dalteparin 100u/kg sub cut **every 12 hours**. In patients with history of VTE give Dalteparin 200iu/kg subcut **once** per day

c) The last dose of LMWH should be given 24 hours before the procedure at **50%** of the **total** daily dose (ie Dalteparin 100u/kg subcut). If less than 24 hrs pre-op, bleeding risk is increased.

d) Check the INR within 24 hours of procedure and give vitamin K if needed (approximately 2mg oral). Avoid vitamin K if mechanical heart valve. Check the INR on the morning of the procedure. Go ahead if INR <1.2 for procedures with a high risk of bleeding. If >1.2 discuss with surgeon and if there is a need for FFP, with haematologist on call.

e) Post operatively, do not give therapeutic dose of LMWH until at least 48 hours after procedure, once good haemostasis is achieved. (Can be earlier if at low risk of bleeding). The exception is patients undergoing endoscopic sphincterotomy when therapeutic LMWH should not be started until 72 hours post operatively. NB: If using unfractionated heparin do not give a bolus when restarting.

f) Restart warfarin the evening of the procedure unless there is a substantial risk of delayed bleeding. Stop LMWH once there are 2 x INR, consecutive, in therapeutic range (daily INR's).

13.2 Patients at low or moderate risk of thrombosis

The intensity of the bridging (therapeutic/ prophylactic) needs to be **individualised**.

Patients can be defined as **moderate risk** if they have AF with a CHADS2 score 3 or 4. They can also be defined as moderate risk if AF and having a bileaflet aortic valve prosthesis. They are at moderate risk if they have had a VTE within previous 3 - 12 months or if they have non-severe thrombophilia† or if they have recurrent VTE.

For **low risk** patients prophylactic doses of LMWH can be used e.g. in patients with a history of VTE > 12 months ago.

Addendum:

- ***** Severe thrombophilia is defined if patient has: protein C or protein S or ATIII deficiency, or has antiphospholipid syndrome, or is homozygous for Factor V Leiden,

or is homozygous for PT G-20210A, or has compound heterozygosity mutations for both these two genes.

- \+ Non severe thrombophilia is defined as the patient having heterozygosity for Factor V Leiden or heterozygosity for PT G-20210A.

Reference

1. Todd H. Baron, M.D., Patrick S. Kamath, M.D. and Robert D. McBane, M.D. Management of Antithrombotic Therapy in Patients Undergoing Invasive Procedures. The New England Journal of Medicine, May 2013 Volume 368, Page 2113 to 2122
2. Patel J. Arya R. The Current Status of Bridging Anticoagulation. British Journal of Haematology, 2014, Volume 164, Pages 619-629

Invasive procedures where bleeding risk is low and oral anticoagulation can often be continued.

Procedure	Comments
Minor dental e.g. tooth extractions and endodontic (root canal)	Current UK guidance states that vitamin K antagonist therapy can safely be continued (National Patient Safety Agency, 2007; Perry et al, 2007). A pro-haemostatic agent (eg tranexamic acid (5-10% 5ml – 3-4 times a day), starting 1 d before the procedure and for 1-2 d after the procedure, was found to be associated with a low (<5%) risk of clinically relevant non-major bleeding (Douketis et al, 2012).
Dermatological, e.g. excision of basal and squamous cell skin cancers, actinic keratosis and premalignant or cancerous skin nevi	The reported incidence of bleeding complications appears to be low (<5%) when oral anticoagulation is continued.
Cataract	Prospective cohort studies report an incidence of clinically relevant bleeding of <3% when oral anticoagulation therapy is continued (Robinson & Nylander, 1989, Roberts et al, 1991; Katz et al, 2003).

For endoscopic procedures please see Chapter 10

14.0 Audit and monitoring Criteria

Audit Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee	How changes will be implemented
BCSH	BCSH tool	ANP	Annually	Trust VTE	Via the VTE committee

15.0 Statement of evidence/references

Guidelines on oral anticoagulation with warfarin – fourth Edition
http://www.bcshguidelines.com/documents/warfarin_4th_ed.pdf

Fennerty et al. BMJ 1988; 297: 1285-8

Tait RC & Sefcick A. A warfarin regime for outpatient anticoagulation in patients with atrial fibrillation. *British Journal of Haematology* 1998; 101: 450-454

Janes S, Challis R & Fisher F (2004) Safe introduction of warfarin for thrombotic prophylaxis in atrial fibrillation requiring only a weekly INR. *Clinical Laboratory Haematology,* 26, 43-47

NPSA Patient Safety Alert "Actions on making anticoagulation therapy safer" March 2007

British Medical Association & Royal Pharmaceutical Society of Great Britain. British National Formulary February 2014.

British Society of Gastroenterology http://www.bsg.org.uk/clinical-guidelines/endoscopy/anticoagulant-antiplatelet-therapy.html

16.0 Equality Impact Assessment

Impact	**Age**	**Disability**	**Race**	**Gender**	**Religion or Belief**	**Sexual Orientation**
Do different groups have different needs, experiences, issues and priorities in relation to the proposed policy?	No	No	No	No	No	No
Is there potential for or evidence that the proposed policy will not promote equality of opportunity for all and promote good relations between different groups?	No	No	No	No	No	No
Is there potential for or evidence that the proposed policy will affect different population groups differently (including possibly discriminating against certain groups)?	No	No	No	No	No	No
Is there public concern (including media, academic, voluntary or sector specific interest) in potential discrimination against a particular population group or groups?	No	No	No	No	No	No

17.0 Implementation and dissemination of document

This policy will be implemented in clinical areas treating patients with oral anticoagulations. The policy is available on the Trust intranet under clinical policies. The policy will be disseminated to local GP's.

18.0 Overall responsibility for the document

Consultant Haematologist, Associate Medical Director and Anticoagulation ANP.

19.0 Appendices

Appendix 1: Fennerty

INITIATING WARFARIN – DOSE GUIDE NB. Day 1 is the first day of Warfarin Treatment							
Day 1		**Day 2**		**Day 3**		**Day 4**	
INR	**DOSE**	**INR**	**DOSE**	**INR**	**DOSE**	**INR**	**DOSE**
< 1.2	10mg	< 1.8	10mg	< 2.0	10mg	< 1.4	*
> 1.2	*	1.8	1mg	2.0 – 2.1	5mg	1.4	8mg
		> 1.8	0.5mg	2.2 – 2.3	4.5mg	1.5	7.5mg
				2.4 – 2.5	4mg	1.6 – 1.7	7mg
				2.6 – 2.7	3.5mg	1.8	6.5mg
				2.8 – 2.9	3mg	1.9	6mg
				3.0 – 3.1	2.5mg	2.0 – 2.1	5.5mg
				3.2 – 3.3	2mg	2.2 – 2.3	5mg
				3.4	1.5mg	2.4 – 2.6	4.5mg
				3.5	1mg	2.7 – 3.0	4mg
				3.6 – 4.0	0.5mg	3.1 – 3.5	3.5mg
				> 4.0	0	3.6 – 4.0	3mg
						4.1 – 4.5	Omit 1 day, then 2mg
						> 4.5	Omit 2 days, then 1mg

*Discuss with consultant/registrar on call for Haematology before starting.

Appendix 2: Tate

For patients needing non-immediate anticoagulation with a target INR of 2.5 (INR Range 2 – 3) (e.g. Atrial fibrillation) the Tate method of induction has been shown to be safe, and convenient for both General Practitioners and patients.
This is a guideline and should be used in conjunction with the clinician's clinical judgement according to individual patient history. E.g. previous sensitivity to warfarin, interacting drugs.

Day 5 INR	Dose (for day 5-7)	Day 8 INR	Dose (from day 8)
		≤ 1.7	6mg
≤ 1.7	5mg	1.8-2.4	5mg
		2.5-3.0	4mg
		>3.0	3mg for 4 days
		≤1.7	5mg
		1.8-2.4	4mg
1.8-2.2	4mg	2.5-3.0	3.5mg
		3.1-3.5	3mg for 4 days
		>3.5	2.5mg for 4 days
		≤1.7	4mg
		1.8-2.4	3.5mg
2.3-2.7	3mg	2.5-3.0	3mg
		3.1-3.5	2.5mg for 4 days
		>3.5	2mg for 4 days
		≤1.7	3mg
		1.8-2.4	2.5mg
2.8-3.2	2mg	2.5-3.0	2mg
		3.1-3.5	1.5mg for 4 days
		>3.5	1mg for 4 days
		≤1.7	2mg
		1.8-2.4	1.5mg
3.3-3.7	1mg	2.5-3.0	1mg
		3.1-3.5	0.5mg for 4 days
		>3.5	Omit for 4 days
		<2.0	1.5mg for 4 days

>3.7	0mg	2.0-2.9	1mg for 4 days
		3.0-3.5	0.5mg for 4 days

Appendix 3: Janes

A low dose protocol for warfarin initiation (Janes, 2004)			
	INR	**Warfarin Daily Dose**	**Notes**
Day 1	Obtain Baseline INR	3 mg	
Day 2 - 7		3 mg	
Day 8	< 1.4	6 mg *	*** follow guide below for 2nd week**
	1.4 - 1.5	5 mg	
	1.6 - 1.8	4 mg	
	1.9 - 2.1	3 mg	
	2.2 - 2.5	2.5 mg	
	2.6 - 2.7	2 mg	
	2.8 - 3.0	Omit 1-2 days, reduce to 1 mg	
	> 3.0	Stop Warfarin. Check causes, high INR protocol and need for warfarin. Repeat INR in 3-5 days. Restart at 1 mg if indicated.	
Day 15	Most patients will have received stable doses on day 8 and others will only need minor dose adjustments		When INR is stable extend dosing interval and transfer to maintenance guide.

Guide for patients on 6 mg on days 8 to 14			
Day 15	**< 1.4**		**Unusual, check adherence, medication etc. Increase to 10 mg**
	1.4 - 1.6	**8 mg**	
	1.7 - 1.8	**7 mg**	
	1.9 - 2.4	**6 mg**	

	2.5 - 2.9	**5 mg**	
	3.0 - 4.0	**4 mg**	**Consider omitting 1-2 days**
	4.1 - 5.0	**reduce dose by 1-2 mg**	**Omit 2 days, check doses taken**
	> 5.0		**Check high INR protocol. Check doses taken. Omit 3 days and check INR**

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Appendix 4: Referral form for Anticoagulant Clinic

Patient Addressograph
Surname
Forename
DOB
Hospital Number

Referring team remain responsible for patient's INR monitoring until Anticoagulation appointment

- Please complete this form **at least 48 hours** before discharge.
- Contact G.P. to formally refer patient.
- If G.P. unable to accept referral then post to Dr White, Haematology Department internal mail.
- Exception of CDU: Referral from CDU to GP must follow the ICP for Outpatient Treatment of DVT.

All sections to be completed by referring doctor. *Doctor name/ bleep mandatory*

Referring Consultant_____

G.P.Name and Practice _____

Yellow Book given and patient counseled Yes/ No (Please Circle)

Indication for anticoagulation_____

Target INR_____

Duration_____

Do you wish G.P. / Anticoagulation Clinic to stop warfarin at end of treatment? Yes/ No (Please Circle)
Is patient on anti-platelet therapy? Please specify_____
Do you wish these to be continued with Warfarin? Yes/ No (Please circle)

Additional requirements:

- TRANSPORT Chair/ Walker (Please circle)
- INTERPRETER Specify language _____

Referring Doctor Print name & Sign_____

Bleep No._____Date_____