Whittington Health NHS

Therapeutic Anticoagulation in Adults:

- Warfarin
- Low molecular weight heparin (tinzaparin)
- Unfractionated heparin
- Rivaroxaban

Subject:	Therapeutic Anticoagulation in Adults:
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Key Words:	Warfarin, heparin, tinzaparin, rivaroxaban, unfractionated heparin

Version Control Sheet

Version	Date	Author	Status	Comment
1.0	Feb 2015	Alison Thomas, Farrukh Shah	Awaiting review	Amalgamation of pre-existing individual guidelines (unfractionated heparin, warfarin in inpatients).. Move to individualised warfarin loading regimen. Introduction of rivaroxaban. Compliance with North Central London Joint Formulary Committee guidance e.g. transfer of care to primary care arrangements

Contents:

Abbreviations:

LMWH: Low molecular weight heparin

SC: Subcutaneous

UFH: Unfractionated heparin

➢ Criteria for use

This guideline covers all NON-PREGNANT inpatients who are receiving therapeutic anticoagulation and all NON-PREGNANT patients commencing therapeutic anticoagulation which is initiated outside the anticoagulation clinic (e.g. inpatient setting). With the exception of:

- Management of acute coronary syndromes

➢ Related guidelines

Please see Whittington Health Guideline:

'Emergency Reversal of Anticoagulants'

"Peri-operative Bridging"

➢ Introduction

Therapeutic anticoagulation is effective in the treatment and prevention of both arterial and venous thromboembolic disease but over-anticoagulation increases risk of bleeding and under-anticoagulation increases risk of thrombosis(1;2).

The period of initiation of anticoagulation and of acute admissions to hospital are particularly high risk and it is vital that meticulous attention is paid to safe prescribing practices and clear communication with patients/carers, primary and secondary care in these circumstances(3;4).

This guideline covers:

1. Initiation of therapeutic anticoagulation
2. Management of patients already admitted on therapeutic anticoagulation
3. Discharge planning for patients on therapeutic anticoagulation
4. Drug-specific prescribing:
    a. Warfarin
    b. Tinzaparin
    c. Unfractionated heparin
    d. Novel oral anticoagulants (NOACS: rivaroxaban, dabigatran, apixaban or similar)

Warfarin is the oral anticoagulant of choice in the Trust. Tinzaparin is the low molecular weight heparin (LMWH) of choice. LMWH is generally preferred over unfractionated heparin (UFH).

Rivaraxoban is the NOAC of choice at the Whittington and may only be initiated by cardiology or haematology for patients with non-valvular atrial fibrillation or venous thromboembolism (VTE) who meet the criteria laid out in section 4D(5).

➢ SECTION 1: INITIATION OF THERAPEUTIC ANTICOAGULATION

1.1: INDICATION & DURATION FOR ANTICOAGULATION

- All patients commenced on therapeutic anticoagulation must have a clear indication for therapeutic anticoagulation explained to them, documented in their medical notes and conveyed to their general practitioner(2;4)
- The planned duration for anticoagulation or a review date regarding duration must be clearly documented in the patient's medical notes, discharge summary/ clinic letter and yellow book (patients commenced on warfarin)

1.2: ASSESSMENT OF BLEEDING RISKS

- Bleeding risk must be assessed and documented in all patients prior to commencement of anticoagulation (Table 1)
- In patients deemed at increased risk of bleeding advice should be sought from a senior member of the patient's team and haematology

Table 1: Bleeding risks

Recent acute stroke (haemorrhagic or ischaemic)
History of GI bleed/ peptic ulcer
Blood pressure >200 mmHg systolic or >120 mmHg diastolic
Severe liver disease (prolonged prothrombin time or known varices)
Severe renal disease (creatinine clearance <30ml/min) with significant uraemia
Recent surgery or major trauma (especially to eye or nervous system)
Spinal intervention (e.g. lumbar puncture, spinal or epidural) planned or performed within 24 hours
Undergoing procedure with high risk of bleeding
Platelet count <100 (discuss with haematology)
Haemophilia or other known bleeding disorder (discuss with haematology)

1.3: BASELINE INVESTIGATIONS

The following must be performed prior to initiation of anticoagulation:

- Urea, creatinine and electrolytes and liver function tests
- Full blood count
- Coagulation screen
- Patient weight (**all patients commencing LMWH must have an actual weight measured)(6)**

1.4: PATIENT COUNSELLING

All patients must be counselled regarding the risks, benefits and appropriate management of anticoagulation. Patients commencing warfarin should be counselled using the checklist in **Appendix 1**. Patients commencing rivaroxaban should be counselled using the checklist in **Appendix 2**. Copies of the form should be given to the patient and sent to the GP. The original should be retained in the patient's medical notes.

1.5 URGENT ANTICOAGULATION (E.g. VTE)

- In patients with suspected VTE and high-probability Wells score parenteral therapy must be initiated immediately (unless contraindications) unless confirmatory imaging available within 4 hours (suspected DVT only).
- As baseline blood results may be delayed, the FIRST dose (but not subsequent doses) of SC LMWH may be given prior to the results being available provided that a clinical assessment of the risk of bleeding has been undertaken (Table 1) and documented.
- Warfarin should not be commenced until imaging has confirmed the presence of a thrombosis

➢ SECTION 2: MANAGEMENT OF INPATIENTS ALREADY RECEIVING THERAPEUTIC ANTICOAGULATION

2.1: ALL PATIENTS ADMITTED ON THERAPEUTIC ANTICOAGULATION:

- The indication for the anticoagulation must be established and documented in the admission clerking
- The following blood tests must be performed:
    - Full blood count
    - Urea, creatinine and electrolytes
    - Liver function tests
    - Coagulation screen (including INR if patient on warfarin)
- An assessment of bleeding risk must be performed (Table 1) and the patient discussed with a senior member of the team if the risk of bleeding is found to be increased.
- The likelihood of the patient requiring emergency surgery or other procedures with an increased risk of bleeding (e.g. lumbar puncture) must be considered. Early cessation of warfarin +/- vitamin K administration can avoid the need for emergency reversal of warfarin with prothrombin complex concentrate with its associated thrombotic risks
- Patients on therapeutic anticoagulation should not be prescribed additional thromboprophylaxis (see **Appendix 4** for indications for LMWH in high risk patients on warfarin with sub-therapeutic INR)
- Bleeding and thrombotic risk must be re-assessed at least every 72 hours or whenever the patient's clinical condition changes

2.2 PATIENTS ADMITTED ON WARFARIN:

- Every effort should be made to establish the patient's normal warfarin dose (e.g. from patient held record (Yellow Book) or their anticoagulation clinic
- The results of the INR must be seen prior to prescription of further doses of warfarin
- Warfarin should be prescribed for **2pm**. Ensure the patient has not already taken a dose of warfarin in the morning on the day of admission
- The potential effect of any changes in medications (either initiation or cessation) on the INR must be considered (see BNF). This is particularly important for patients prescribed antibiotics.
- The INR should be re-checked at least every 72 hours in acutely ill patients. More frequently if INR likely to exit target range (e.g. new interacting drugs)
- Dose adjustments should be made following the algorithm in **APPENDIX 4**

2.3 PATIENTS ADMITTED ON THERAPEUTIC LMWH

- Patients must have a weight measured on admission
- The results of the renal function and weight must be seen prior to prescription of further doses of LMWH
- Establish when last dose of LMWH administered

2.4 PATIENTS ADMITTED ON RIVAROXABAN, DABIGATRAN OR ALTNERATIVE

- The results of the renal function must be seen prior to prescription of further doses of rivaroxaban or other NOAC
- If the patient is likely to require emergency surgery or other invasive procedures, the patient **MUST** be discussed with haematology as soon as possible
- The potential effect of any changes in medication on the anticoagulant effect of rivaroxaban (or other NOAC) must be considered (see BNF).

2.5 PATIENTS WHO SHOULD BE DISCUSSED WITH HAEMATOLOGY

Haematological advice should be sought by a senior member of the patient's team in the following circumstances:

- Patients on therapeutic anticoagulation with bleeding events or at high risk of bleeding
- Patients on therapeutic anticoagulation with new thrombotic events
- Patients on therapeutic anticoagulation in whom emergency surgery or other interventional procedures is required
- Where further advice is required regarding optimal dosing regimens.

➢ SECTION 3: DISCHARGE PLANNING

3.1 PATIENT COUNSELLING

- Anti-coagulation arrangements must be made well in advance of planned discharge
- The patient must have received an appointment date for the anticoagulant clinic (if on warfarin) prior to discharge
- Patient comprehension regarding anti-coagulation must be checked prior to discharge.
- Details regarding the patients anticoagulation (drug, indication, duration, target INR, next anticoagulation clinic appointment) must be documented on the discharge summary.
- For all patients on long term anti-coagulation, the risk-benefit ratio of continued treatment should be reassessed at least annually (NPSA recommendation)

3.2 HIGH RISK DISCHARGES

The following patients are at increased risk of adverse incidents related to anticoagulation following discharge:

- Housebound or frail elderly
- Memory impairment or dementia
- Mental health issues
- Difficult communication: impaired hearing or sight, poor English
- Requires medication reminder box/ Dosset box for other medication
- Transfer to new care setting on discharge (e.g. nursing/residential home, rehabilitation unit)

Meticulous discharge planning is required for these patients. **Verbal and written communication with relevant primary care services must occur before the patient leaves the hospital.**

3.3 PATIENTS ON WARFARIN PRIOR TO ADMISSION

- Ensure patient has an appointment with their own anticoagulation clinic within 5-7 days of discharge. If transferring out of area – the patient must be referred to a new anticoagulant clinic and their existing anticoagulant clinic informed.
- The warfarin dosing up until the patient's next appointment must be documented in the yellow anticoagulant record book and in the discharge summary
- Ensure patient understands the dosing and the date of next anti-coagulant clinic appointment
- If necessary, ensure that transport is arranged for the patient's next anti-coagulant clinic appointment

3.4 PATIENTS NEWLY COMMENCED ON WARFARIN

- Patients must be referred to the Whittington Anticoagulation Clinic (if resident within local area) or local clinic (if outside area) and an appointment obtained
- Patients must be issued with a yellow anticoagulant record book (to be completed before discharge) and be counselled by a doctor or pharmacist using the warfarin counselling record (**APPENDIX 1**)
- If necessary, ensure that hospital transport is arranged for the patient's first anticoagulation clinic appointment
- It is the responsibility of the discharging team to undertake any monitoring that might be required in between the patient's discharge and their first anticoagulation clinic appointment.

3.5 PATIENTS DISCHARGED ON SC LMWH:

- Ensure that the patient/carer has been shown how to self-administer or that a district nurse has been organised
- All patients must be issued with a sharp's bin and advised to return to the team monitoring their treatment or GP surgery when full/ treatment completed
- Arrangements should be made for HIT monitoring as appropriate (**see section 4B**) (usually by GP)
- Ensure that the discharge summary contains:
    - Indication, anticipated duration of therapy and rationale for LMWH as opposed to other anticoagulants (if extended duration LMWH)
- For patients in whom it is anticipated that extended duration LMWH will be required, arrangements for on-going LMWH supply and monitoring (FBC, U&E, LFTs, weight) must be made (See Section 4B)

➢ SECTION 4A: WARFARIN PRESCRIBING

Indications and target INR:

Indication	Target INR	INR range	Duration
PE	2.5	2-3	3-6 months and review
Proximal DVT	2.5	2-3	3 months and review
Calf DVT (if treated)	2.5	2-3	6 weeks – 3 months
Recurrent VTE (not on warfarin)	2.5	2-3	Long term
Recurrent VTE with INR 2-3	3.5	3-4	Long term
Atrial fibrillation	2.5	2-3	Long term (or 6 weeks pre- and 4 weeks post cardioversion
Cardiomyopathy	2.5	2-3	Long term
Mechanical valves (check with cardiology/ patient): depends on valve type and location			Long term

Patients with underlying active malignancy and VTE should be treated with LMWH instead of warfarin.

Initiation of warfarin (patients new to warfarin):

- Patients with low-risk chronic atrial fibrillation should be referred to the anticoagulation clinic for low dose initiation of anti-coagulation
- Where immediate therapeutic anticoagulation is required, treatment with both LMWH and warfarin is required with a period of overlap between the two agents. LWMH should be continued **for at least 5 days** and until **the INR has been in the therapeutic range for at least 2 consecutive days**.
- Warfarin dosing is affected by various factors including: patient age and weight, liver dysfunction, concurrent medication (i.e. drug interactions) & diet (see Table 2). The initial and maintenance dosing needs to take these factors into account.
- The initial loading doses of warfarin should be individualised to each patient, taking into account the factors in Table 2 using the algorithm in **APPENDIX 3**.
- The INR should be repeated on the morning of day 3 (after 2 doses) and the next dose determined according to the algorithm
- The INR should be repeated again on the morning of day 4 and the next dose determined according to the algorithm

Table 2: Factors with increase bleeding risk or decrease effect of warfarin

Factors which increase risk of bleeding	Factors which alter effect of warfarin
Age >70 years	Significant malabsorption
Weight <50 kg	Uncontrolled hypothyroidism
Concurrent drug administration which increases effect of warfarin (e.g. metronidazole, clarithromycin) (see BNF Appendix 1/ ward pharmacist)	Concurrent drug administration which decrease effect of warfarin (see BNF Appendix 1/ ward pharmacist)
Significant hepatic impairment	
Significant cardiac failure	
Renal impairment with significant uraemia	
Uncontrolled hyperthyroidism	

Maintenance dosing of warfarin:

- Warfarin must be prescribed for **2pm**
- The INR should be measured at least every 3 days in inpatients
- If the INR is out of the target range (either too low or too high) then dose adjustments should be made following the algorithm in **APPENDIX 4** which includes:
    - Need for dose omissions/ additional loading doses
    - Adjustments to maintenance dose
    - Potential reasons for out of range INR

➢ SECTION 4B: TINZAPARIN PRESCRIBING

Cautions and contra-indications to LMWH or UFH:

Contra-indications	Cautions
History of heparin-induced thrombocytopenia	On oral vitamin K antagonist with therapeutic INR
Hypersensitivity to UFH or any LMWH	On treatment dose oral direct thrombin or Xa inhibitor (eg. rivaroxaban or dabigatran)
Major or uncontrolled active bleeding	Increased bleeding risk (see Table 1)
eGFR or creatinine clearance <20ml/min (use unfractionated heparin)	eGFR or creatinine clearance 20-30ml/min (anti-Xa monitoring required)

Dosing:

The standard therapeutic dose is 175 IU/kg once daily subcutaneously, rounded to the nearest 1000 units. The following chart should be used to select the correct dose and syringe size:

VTE Treatment: 175 IU/kg once daily SC (20 000 IU/ml formulation)			
	Weight (kg)	**Prescribed dose**	**Injection volume (ml)**
0.5ml syringe	37-42	7000	0.35
	43-48	8000	0.40
	49-53	9000	0.45
	54-59	10 000	0.50
0.7ml syringe	60-65	11 000	0.55
	66-70	12 000	0.60
	71-76	13 000	0.65
	77-82	14 000	0.70
0.9ml syringe	83-88	15 000	0.75
	89-93	16 000	0.80
	94-99	17 000	0.85
	100-105	18 000	0.90
Multi-dose vial *Discuss with haematology*	106-110	19 000	0.95
	111-116	20 000	1.00
	117-122	21 000	1.05
	123-128	22 000	1.10
	129-133	23 000	1.15
	134-139	24 000	1.20
	140-145	25 000	1.25

Monitoring of anti-coagulant activity:

- Most patients receiving LMWH do not require monitoring.
- The following groups of patients may benefit from anti-Xa monitoring. **These patients must be discussed with haematology**:
    - Renal failure (creatinine clearance or eGFR <30ml/min).
    - Pregnancy
    - Obesity (weight >105kg)

Renal failure:

Intravenous UFH infusion is the preferred heparin for patients with eGFR<20ml/min (Cockcroft Gault creatinine clearance must be calculated for patients at extremes of body weight: http://www.icid.salisbury.nhs.uk/ICID_Applications/creatininecalculator.aspx). Where it is felt that UFH cannot be safely administered to the patient and therapeutic anticoagulation with tinzaparin is essential, then discuss with haematology for consideration of reduced dose tinzaparin with anti-Xa monitoring.

Monitoring of LMWH:

- FBC, U&E and LFTs every 4-6 weeks initially; maximum interval every 3 months
- Weight: every 4-6 weeks initially; maximum interval every 3 months

Monitoring for heparin induced thrombocytopenia (HIT):

Most patients do not require monitoring for HIT(7;8). The platelet monitoring required for patients receiving LMWH or UFH is shown in Table 3.

- Suspect HIT if the platelet count falls by 50% or more from baseline (even if the platelet count remains within the normal range)
- Consider the possibility of HIT if patient develop venous/arterial thrombosis on heparin or skin lesions at heparin injection site
- If HIT suspected **stop LMWH/UFH immediately and contact haematology urgently for advice**

Table 3: Platelet monitoring for heparin-induced thrombocytopenia

Patient type	Platelet monitoring for HIT
LMWH and post cardiothoracic surgery OR cancer patients undergoing surgery	• Baseline platelet count • Once between days 4-7 post starting LMWH • Once again between days 10-14 if still on LMWH
UFH during in-patient episode, now on LMWH	• Baseline platelet count • Once between days 4-7 post starting UFH • Once again between days 10-14 if still on LMWH
ANY type of heparin within previous 100 days	• Baseline platelet count • Check at 24 hours • Thereafter as per other categories as appropriate
UFH infusion	• Baseline platelet count • Check at 24 hours if UFH/LMWH in previous 100 days • Every 2-3 days from days 4-14 or until UFH stopped (whichever is earlier)
LMWH and patient does not fall into any category above	• Baseline platelet count • Subsequent monitoring not required

On-going prescribing and monitoring of LMWH – primary or secondary care?

Responsibility for on-going prescribing and monitoring should follow the North Central London Joint Formulary Committee Guidelines (NCL-JFC). If transfer to primary care for on-going management is appropriate – the Transfer of Care form (**APPENDIX 5**) must be completed and faxed to the GP surgery or the appropriate "Action for GP" selected on the electronic discharge letter.

Secondary care should usually prescribe, monitor and follow up:

- Warfarin patient requiring "peri-operative bridging" (may be prescribed by GP on advice of pre-operative assessment team or anticoagulant clinic)
- Patient being newly warfarinised and LMWH used as interim anticoagulant
- Patients requiring therapeutic LMWH undergoing chemotherapy
- Patients with a recent history of bleeding or bleeding disorder undergoing anticoagulation

Initial management by secondary care before considering transfer to primary care:

- Renal impairment (creatinine clearance or eGFR <20ml/min)
- Significant hepatic impairment
- Weight >105kg or <40kg
- Cancer patients once chemotherapy completed if ongoing LMWH required

Primary care may take over supply and monitoring of LMWH. (NB Initial supply usually from secondary care):

- Patient unsuitable for warfarin or alternatives e.g.:
    - Poor compliance (e.g. IVDU, homeless)
    - Unable to attend anticoagulant clinic and with poor peripheral veins
    - Poor INR control or intolerance or contraindications to warfarin
    - Excess alcohol, binge drinking
- Defined course of anticoagulation (e.g. provoked DVT) when anticoagulation with warfarin not suitable for clinical reasons
- Cancer patients who do not require or have completed chemotherapy and who are no longer under the direct care of the oncologist but who require ongoing LMWH

➢ SECTION 4C: UNFRACTIONATED HEPARIN INFUSION

Indications:

Unfractionated heparin should **ONLY** be used for VTE treatment where:

- Patients being treated for massive PE who have received thrombolysis
- Anticoagulation may need to be discontinued suddenly (e.g. in patients likely to require thrombolysis)
- Patients with severe renal failure (creatinine clearance or eGFR <20ml/min)

Clinical areas where IV UFH may be administered:

UFH requires very close monitoring to achieve therapeutic anticoagulation and the risks of both bleeding and under-anticoagulation are much greater than with LMWH. Due to the close monitoring required, intravenous unfractionated heparin infusions should only be administered in the following clinical areas:

- Intensive Care Unit
- Mary Seacole North, Mary Seacole South or Montouschi wards
- Emergency Department (resuscitation area – whilst awaiting transfer to ICU or MSS)

Initiation of treatment and dosing (see Appendix 6):

- *Initial bolus dose:* bolus of 5000 units
- *1st check APTR:* take sample 6 hours post
- *Dose adjustment:* use normogram
- *Subsequent APTR:* take every x hr post sample
- *Documentation of infusion rate:* nursing staff must record the hourly heparin rate on the "UFH administration record" in addition to documenting any dose adjustments or temporary cessations.

Laboratory monitoring of UFH:

- Laboratory monitoring of UFH is with the APTR ratio
- Samples must be taken at the time indicated and send to the laboratory urgently
- **The therapeutic range at Whittington Health for the APTR is: 1.5-2.5**

Monitoring for heparin induced thrombocytopenia:

See Section 4B Tinzaparin prescribing and Table 3 for platelet monitoring requirements and when to suspect HIT.

➢ SECTION 4D: RIVAROXABAN PRESCRIBING

Indications (based on NCL NOAC criteria)(5):

Warfarin is the current standard of treatment across NCL. Rivaroxaban, the preferred NCL NOAC, may be considered by cardiology (for non-valvular atrial fibrillation) or haematology (for VTE) in the following circumstance:

1. Documented warfarin/ vitamin K antagonist allergy or specific intolerance (e.g. alopecia or rash with no other cause)
2. Unable to comply with warfarin specific monitoring requirements e.g:
    - Significant technical difficulties with INR monitoring or accessing anticoagulant clinic

    - Housebound patients where INR monitoring/ clinic attendance would adversely affect quality of life or raise safety concerns
3. Unable to achieve satisfactory INR control:
    - Time in range <65% once anticoagulation established (not due to wilful non-compliance)
    - INR ≥ 8.0 on 1 occasion with a high likelihood of recurrence
    - INR ≥ 5.0 on 2 occasions over a 6 month period (once anticoagulation established) with a high likelihood of recurrence
4. Specific indication as advised by designated haemostasis or cardiology consultant

Contraindications:

Rivaroxaban should not be prescribed in the following circumstances(9):

- Risk of major bleeding:
    - Current/ recent upper or lower GI ulceration; oesophageal varices (known or suspected); malignant neoplasms at high risk of bleeding
    - Surgery/ trauma or bleed affecting head/brain, eyes or spine within last 4 weeks
    - AV malformations, vascular aneurysms or major intraspinal/ intracerebral vascular abnormalities
    - Stroke in last 14 days/ severe stroke in last 6 months (unless advised by designated stroke consultant)
    - Uncontrolled hypertension (systolic BP >180 mmHg and/or diastolic >100mmHg), vascular retinopathy
    - Hepatic disease associated with coagulopathy and clinically relevant bleeding risk including cirrhotic patients with Child Pugh B and C
    - Creatinine clearance <15ml/min (calculated as per Cockcroft & Galt formula)
- Pregnancy and lactation (crosses placenta and into breast milk)
- Indications not covered by licence e.g. prosthetic heart valves; INR range higher than 2.0-3.0 required
- Concomitant medications: systemic ketoconazole, intraconazole, posaxonazole, HIV protease inhibitors

Cautions to use:

Caution should be exercised in prescribing rivaroxaban in the following circumstances:

- History of previous major bleed on anticoagulation/ antiplatelet therapy
- Thrombocytopenia (e.g. platelets <75)
- Abnormal baseline coagulation screen (repeat and investigate prior to initiation)
- Weight <50kg or >120kg
- Abnormal liver function tests (2x upper limit of normal)
- Myeloproliferative disease, sickle cell disease
- Congenital or acquired bleeding disorders
- Antiplatelets, NSAIDs
- Age >75 years, particularly if additional risk factors for bleeding
- Excessive alcohol intake
- High risk of recurrent falls resulting in significant injury
- Patients <18 years (unlicensed)
- Concomitant medications: antiplatelets, NSAIDs, rifampicin, phenytoin, phenobarbitone, carbamazepine, St John's Wort

Dosing (10):

Atrial fibrillation: 20mg OD

VTE: 15mg BD for 3 weeks then 20mg OD

Reduce dose to 15mg od if:

- Creatinine clearance 15-49 ml/min
- Consider if increased risk of bleeding where anticoagulation is appropriate (e.g. HAS-BLED score ≥3)

Administration:

Rivaroxaban must be taken with food to maximise bioavailability

Missed doses: if a dose is missed it should be taken as soon as it is remembered (if within 8 hours). Continue with the next dose the following day as usual. The dose should not be doubled within the same day to make up for a missed dose.

Starting rivaroxaban (patients already on LMWH or warfarin) (10):

Warfarin to rivaroxaban:
- Stop warfarin
- Start rivaroxaban when INR ≤3.0 (if indication = AF) or ≤2.5 (if indication = VTE)

LMWH to rivaroxaban:
- Stop LMWH
- Start rivaroxaban 0 to 2 hours before the time of the next scheduled administration of SC LMWH

Stopping rivaroxaban (patients switching to warfarin or LMWH)

Rivaroxaban to warfarin:

Note rivaroxaban can contribute to a raised INR and there is a potential for inadequate anticoagulation during transition.

- Give rivaroxaban and warfarin concurrently until INR ≥2.0
- Whilst patients are on both warfarin and rivaroxaban, the INR should be measured just prior to the dose of rivaroxaban
- Load warfarin as per standard initiation protocol (**see Appendix 3)**

Rivaroxaban to LMWH:

- Give first dose of LMWH at the time the next rivaroxaban dose would have been taken

Adverse effects:

- Common: dyspepsia, diarrhoea, nausea, vomiting, hypotension, oedema, dizziness
- In phase 3 studies, mucosal bleeding (e.g. epistaxis, gastrointestinal and genitourinary) and anaemia were seen more frequently with rivaroxaban compared to warfarin
- ***All suspected adverse drug reactions must be reported to the MHRA via yellow card scheme***

Initiation of rivaroxaban and transfer to primary care for on-going prescribing:

- Rivaroxaban is only to be initiated by cardiology or haematology
- The patient must be counselled regarding rivaroxaban and the counselling checklist completed (**APPENDIX 2)**
- FBC, U&E, LFTs and blood pressure much be checked prior to initiation
- Patients should initially be prescribed 4 weeks of rivaroxaban
- At time of initiation – send NOAC GP notification form (**Appendix 7)**
- Review in outpatients after 4 weeks. Re-check U&E. Review compliance and potential side effects.
- Prescribe further 4 weeks supply. Complete NOAC GP transfer of care form (**Appendix 8).**
- Patient should receive all further supplies of rivaroxaban and monitoring from their GP

➢ Contacts (inside and outside the Trust including out-of-hours contacts)

Haematology SpRs: bleep 3060 or 3037

Haematology consultant: via switchboard or secretaries (x 5437 or 5144)

Haematology out-of-hours: via switchboard

Anticoagulation pharmacist: bleep 2624

Anticoagulation clinic: bleep 5390 or 3516

➢ References (evidence upon which the guideline is based)

Consult pharmacy or the electronic medicines compendium (SPCs) for most recent drug information. This can be found at: http://www.medicines.org.uk/emc/default.aspx.

Warfarin prescribing algorithms adapted from Guys and St. Thomas's NHS Foundation Trust and University College London Hospitals NHS Foundation Trust.

Additional information on prescribing of rivaroxaban and low molecular weight heparins, including transfer to primary care and monitoring guidance, can be found on the North Central London Joint Formulary Committee website: http://ncl-jfc.org.uk

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(10) Electronic Medicines Compenidum. Rivaroxaban (SPC). 2014. Accessed: 15-11-2014.

➢ Compliance with this guideline (how and when the guideline will be monitored e.g. audit and which committee the results will be reported to) Please use the tool provided at the end of this template

See end table

Whittington Health NHS

Hospital Number:……
Patient Name:……
DOB:……
Date of Birth:……..

APPENDIX 1: WARFARIN COUNSELLING RECORD

This patient has been counselled on the following areas of warfarin therapy, by a doctor, pharmacist or clinical nurse specialist.

	Counselling point	Signature	Comments
1.	Use of the Anticoagulant Therapy Record (Yellow Book) and alert card		
2.	Standard dispensing labels (*i.e. take strictly as directed by the anticoagulant clinic)*		
3.	Basic mode of action of warfarin		
4.	Indication for therapy		
5.	Expected duration of therapy		Specify if know:
6.	Tablet identification - colour of different strength tablets		
7.	Dose: • Varied dosing and need for individualisation • Aim to take at the same time of day • How to use the different strength tablets to make up intended dose • Action to take if dose missed: NOT to take extra doses		
8.	Compliance and ways of remembering to take the tablets e.g. using a calendar		
9.	Monitoring: Target INR Where to go for monitoring (and importance of attendance)		
10.	Potential for drug interactions: aspirin, ibuprofen (paracetamol is preferred analgesic), antibiotics, herbal remedies, etc.		
11.	Side effects of warfarin (and what to do if experienced) • Signs/symptoms of excess anticoagulation: bleeding or bruising		
	• Recurrence of thromboembolism (if relevant)		
12.	Diet (vitamin K containing foods, importance of avoiding major fluctuations in dietary intake; cranberry juice interaction)		
13.	Alcohol intake		
14.	Contraception, pregnancy, and hormone replacement therapy (if relevant)		
15.	Surgical procedures (inc. day surgery /dental treatment & hospital admission)		
16.	Hobbies and leisure activities (including flying)		
17.	Injections (including immunisation) – inform nurse that pt is anticoagulated		
18.	How to obtain further supplies of warfarin and need to present Yellow book with prescription to a pharmacy		
19.	Who to contact for advice/ further information		
20.	**Patients receiving tinzaparin whilst warfarin loading:** Indication for LMWH in addition to warfarin Expected duration (until INR>2) Who will tell patient to stop LMWH Self-administration or other arrangements for administration Injection site rotation Safe disposal of sharps and return of sharps bin when no longer required Potential side effects Need for monitoring (if indicated)		

The patient must receive the Yellow Patient Anticoagulant Record Book and patient information booklet.
The yellow book MUST be fully completed

Counselled by: (Sign & print name): ..... Bleep / Extn:……Date: ……..

Patient's signature: ……..…… Date:……..

Warfarin Counselling Advice

1&2: Use of the Anticoagulant Therapy Record (yellow book) and alert card. Show the patient the yellow book and go through it – filling in pages 1 &2. Explain that the anticoagulant therapy record is the only record of dosing information available for the patient since the dispensing labels on the warfarin boxes will be labelled at "*Take strictly as directed by your doctor or anticoagulant clinic"* It is important to keep the record book up to date at all times and that the patient understands the dosing instructions.

Go through the booklet with the patient, highlighting the information it contains and ensuring the points below are covered:

3. Basic mode of action of warfarin: to reduce blood clots

4. Indication for therapy: explain why the patient is taking warfarin

5. Explain expected duration of therapy (if known): if unsure, check with medical team. If duration has not yet been determined (e.g. unprovoked PE) explain when decision on duration will be reviewed

6. Tablet identification: explain that the colour of different strength tablets will always be the same colour for each strength even if the supplier is different: White- 500µg; Brown- 1mg; Blue – 3mg; Pink – 5mg. It is unusual for the patient to have all 4 strength tablets.

7. Dose:

- Varied dose according to blood result (INR)
- Warfarin should be taken at the same time of day, every day
- How to use the different tablet strengths to make up the dose intended
- If a dose is missed, OK to take on the same day within 6 hours of when dose was due. NEVER double up on a dose by carry on as normal on next day if dose is missed. Make a note of the date the dose was missed in the yellow book and let the anticoagulant clinic/ doctor know.

8. Compliance: and ways of remembering to take the tablets

9. Monitoring:

- INR monitored regularly initially (daily/ every few days) and gradually less often once dose and INR stabilises (e.g. monthly or up to 12 weekly)
- Outpatient monitoring clinics/ GP practice (and importance of attendance/ District Nurse)

10. Side effect of warfarin and poor control of anticoagulation: and what to do if experienced:

- Recurrence of thromboembolism
- Signs/symptoms of excess dosing: severe bleeding or multiple bruising with or without high INR is the most common side effect: contact doctor immediately if unusual or severe
- Contact GP if: bloody stools or urine, nose bleeds (if lasting >5min or patient does not usually suffer from nose bleeds), bloodshot eye, coughing or vomiting blood, excessive vaginal bleeding, cuts that take longer than 5 mins to stop bleeding
- Bleeding from gums (use soft toothbrush)

11. Potential for drug interactions: may be affected by many medicines, therefore:

- Patients should always let doctor/dentist/pharmacist know they are on warfarin
- Do not take aspirin unless prescribed by a doctor. Care with ibuprofen. Paracetamol if preferred
- Caution with antibiotics and always check with anticoagulant clinic before taking herbal remedies
- Inform GP/ anticoagulant clinic of any drugs stopped/started or if doses are changed

12. Diet: some foods contain high levels of vitamin K which may interfere with warfarin action (e.g. broccoli, Brussel sprouts, cauliflower, cabbage, chickpeas, kale, spinach, turnip, greens, beef liver, pork products). Can have these in moderation but important to avoid major changes in regular diet or crash diets. Cranberry juice may raise INR.

13. Alcohol intake: if patient a heavy drinker discuss with medical team re: plan for alcohol reduction and warfarin suitability. Small-moderate alcohol should not affect warfarin control. Avoid binge drinking.

14. Contraception, pregnancy and hormone replacement therapy: (if relevant) if patient on HRT/OCP discuss with clinician re: stopping/ appropriate choice (generally avoid oestrogen-containing preparations – progesterone only preferred). Check pregnancy test. Ensure understand importance of effective contraception. Pregnancy should be planned following discussion with anticoagulation clinic/GP. **Urgently refer women who may be pregnant and are on warfarin to obstetric medicine team**.

15. Surgical procedures (including dental treatment): patient must inform doctor they are on warfarin.

16. Inform treating Doctor (e.g. GP) of acute illness as more regular INR check may become necessary

17. Hobbies and leisure activities: avoid contact sports and other higher risk sports (e.g. skiing and horse riding) as increased risk of bruising/bleeding

18. Injections: patient must inform nurse that they are on warfarin

19. Obtain further supplies: from your GP. Make sure never run out of warfarin

21: LMWH: ensure patient understands need for LMWH whilst waiting for warfarin to take effect and INR to be therapeutic. Check need for monitoring (e.g. for heparin induced thrombocytopenia).

Whittington Health NHS

Hospital Number:……
Patient Name:……
DOB:……
Date of Birth:……

APPENDIX 2: RIVAROXABAN COUNSELLING RECORD

This patient has been counselled on the following areas of rivaroxaban therapy, by a doctor, pharmacist or Anticoagulant clinical nurse specialist in accordance with the guidance overleaf

	Counselling point	Signature	Comments
1.	Indication for rivaroxaban		
2.	Alternative anticoagulation options		
3.	Benefits and disadvantages of rivaroxaban compared to warfarin		
4.	Expected duration of therapy *(specify if known)*		
5.	Basic mode of action		
6.	Dose		
7.	How to take: • Must be taken with food to improve amount absorbed • Aim to take at the same time of day		
8.	What to do if a dose is missed: • If taking 20mg (or 15mg) OD: Take one tablet as soon as it is remembered and then take the next tablet the following day (and continue). Do not take two tablets in one day to make up for the missed dose • If taking 15mg BD (e.g. acute VTE): take one tablet as soon as remembered. Do not take more than two 15mg tabs in a single day (but can take 2 tablets at the same time to make a total of 30mg on one day). Continue with one 15mg tablet BD on the next day Extra dose taken accidentally? Contact doctor or healthcare team		
9.	Importance of compliance: • Fairly rapid fall in drug levels (and therefore loss of efficacy) if poorly compliant • Ways of remembering to take the tablets e.g. calendar		
10.	Monitoring (e.g. renal function) and how often		
11.	Side effects of rivaroxaban (and what to do if experienced) • Signs/symptoms of excess anticoagulation: bleeding or bruising		
	• Recurrence of thromboembolism (if relevant)		
12.	Potential for drug interactions: paracetamol is the preferred analgesic		
13.	Alcohol intake		
14.	Contraception, pregnancy, and hormone replacement therapy (if relevant)		
15.	Surgical procedures (inc. day surgery /dental treatment & hospital admission)		
16.	Hobbies and leisure activities (including flying)		
17.	Injections (including immunisation) – inform nurse that pt is anticoagulated		
18.	How to obtain further supplies of rivaroxaban		
19.	Who to contact for advice/ further information		

The patient must receive a rivaroxaban patient information booklet and patient alert card.
The alert card MUST be fully completed and the patient advised to keep it with him/her at all times

Counselled by: (Sign & print name): ..... Bleep / Extn:……Date: ……..

Patient's signature: ……..…… Date:……..

Rivaroxaban Counselling Guidelines

Provide patient with the Xarelto® patient information booklet and go through it with him/her, ensuring that the points below are covered. **Complete the patient alert card** -if unsure of any sections, check with the doctor. The patient alert card should be kept with the patient at all times.

1. Indication: licensed for: (a) Prevention of stroke and systemic embolism in adult patients with non-valvular AF with additional risk factors (b) Treatment of DVT/PE (c) prevention of recurrent DVT/PE in adults.

2. **Alternative anticoagulants**: warfarin (and other oral vitamin K antagonists), low molecular weight heparin (e.g. tinzaparin), other newer oral anticoagulants (e.g. dabigatran, apixaban).

- For AF, rivaroxaban was shown to be as effective as warfarin for the prevention of stroke and systemic embolism, with a similar rate of major bleeding, but with a lower risk of intracranial haemorrhage. There was a higher rate of GI bleeding, epistaxis and haematuria with rivaroxaban compared to warfarin.
- For the treatment of acute DVT /PE: rivaroxaban was shown to be as effective as warfarin (plus initial SC enoxaparin) in preventing symptomatic recurrent VTE, with a similar (DVT trial) or lower (PE trial) rate of major bleeding.

3. Advantages (vs. warfarin): fixed dose, no routine coagulation monitoring, more stable anticoagulation control, lower risk of intracranial haemorrhage (AF pts); **Disadvantages (vs. warfarin):** unable to routinely monitor coagulation, not as easy to reverse compared to warfarin (no formal drug antidote), limited long-term data

4. Expected duration of therapy – if unsure, check with Doctor.

5. Basic mode of action: belongs to a group of medicines called antithrombotic agents; blocks a blood clotting factor (factor Xa) and thus reduces the tendency of the blood to form clots.

6. Dose: Non-valvular AF: 20mg OD*; Acute VTE: 15mg BD for 3 wks, then 20mg OD*; **review dose if CrCL 15 - 49mL/min see SPC*

7. How to take: For rivaroxaban doses ≥ 15mg, the dose **must be taken with food** to improve absorption; aim to take at the same time each day.

9. Compliance: Rivaroxaban has a shorter half-life than warfarin and efficacy more likely to be affected if poorly compliant.

10. Monitoring: the dose will need to be reduced / stopped if renal function deteriorates. Frequency of monitoring depends on the level of renal function and may vary from minimum 3monthly to 6-12monthly. Also, FBC and LFTs, minimum annually

11. Side effects of rivaroxaban (and what to do if experienced)

- For VTE patients: recurrence of thromboembolism: contact doctor if original symptoms recur
- Bloody stools or urine, nose bleeds (lasting for > 5-10mins or if pt does not usually suffer from nose bleeds), blood shot eye, coughing or vomiting blood, severe or spontaneous bruising, unusual headaches, excessive vaginal bleeding, cuts that take longer than 5 minutes to stop bleeding. Seek medical attention.
- If involved in major trauma, suffer a significant blow to the head or are unable to stop bleeding – seek immediate medical attention
- Any other side-effects: discuss with GP or anticoagulant clinic

12. Potential for drug interactions: may be affected by some medicines / herbal preparations (see SPC for Xarelto®). Therefore:

- Patient should always let doctor/dentist/pharmacist know that s/he is on rivaroxaban
- Not to take aspirin unless prescribed by doctor, as increased risk of bleeding (- combination to be reviewed; will need GI protection). Avoid OTC painkillers such as ibuprofen, aspirin, diclofenac etc (paracetamol is preferred)
- If admitted to hospital, to inform staff that s/he is taking a new oral anticoagulant (to avoid duplication of therapy with standard VTE thromboprophylaxis).

13. Alcohol intake: alcohol is not expected to affect rivaroxaban levels per se. However, excess alcohol consumption and binge drinking are generally not advised for anticoagulated patients, due to the risks of alcohol associated acute injuries (e.g. head injuries) and chronic liver disease (which may affect coagulation).

14. Contraception, pregnancy, and hormone replacement therapy (if relevant): Women should not become pregnant nor breast feed whilst taking rivaroxaban. Reliable contraception is required. If patient is currently taking HRT/OCP then discussions are required regarding stopping or appropriate choice (generally avoid oestrogen-containing preparations; progesterone only ones are preferred). For women taking rivaroxaban who may be pregnant, discussion haematology is required ASAP so that pt can be seen by a haematologist / obstetrician for discussion re potential implications. If planning to become pregnant, then pt should discuss with GP for onward referral to a haematologist.

15. Surgical procedures (including dental treatment) and **hospital admission**: patient must inform healthcare professional that s/he is taking rivaroxaban especially as (1) patient will need management of anticoagulation around procedures and (2) VTE thromboprophylaxis (e.g. LMWH) is often prescribed on admission to hospital.

16. Hobbies and leisure activities: avoid contact sports (e.g. boxing) and other higher risk sports (e.g. skiing and horse riding), as increased risk of bruising/bleeding. Inform Dr/anticoagulant clinic if flying in the near future.

18. Obtain further supplies of rivaroxaban from the hospital (or GP once care transferred). Not to run out of supplies, especially when on holiday.

19. Further advice/info from local A/C clinic, GP, Hospital pharmacy medicines info dept or in an emergency, A&E dept

APPENDIX 3: PATIENTS NEW TO WARFARIN – LOADING (ADULT GUIDELINE)

BOX A: Factors that increase bleeding risk

- Age >70 years
- Weight <50kg
- Concurrent drug administration which increases effect of warfarin (see BNF)
- Significant hepatic impairment
- Renal failure with significant uraemia
- Severe anaemia and/ or thrombocytopenia
- Significant cardiac failure
- Uncontrolled hyperthyroidism

BOX B: Factors that decrease warfarin effect

- Concurrent drug treatment which decreases effect of warfarin (see BNF)
- Significant malabsorption
- Uncontrolled hypothyroidism

BOX C: Maintenance dose calculation table

Day 3 or 4 INR	Total loading dose received (mg)							
	9	12	15	18	21	24	27	30
1.0-1.5	**Contact Haematology for advice**							
1.6-2.0	2	3	3.5	4	5	5.5	6	6.5
2.1-2.5	2	2.5	3.5	3.5	4	4.5	4.5	5
2.6-3.0	1.5	2.5	3	3	3.5	4	4	4.5
3.1-3.5	1.5	2	2.5	2.5	3	3	3.5	3.5
See Box D for need for dose omission before maintenance								
3.6-4.0	1	2	2	2.5	2.5	3	3	3
4.1-4.5	1	1.5	2	2	2.5	2.5	3	3
4.6-5.0	1	1.5	1.5	2	2	2.5	2.5	3
5.1-5.5	1	1.5	1.5	2	2	2	2.5	2.5
5.6-6.0	1	1	1.5	1.5	1.5	2	2	2.5
6.1-6.5	0.5	1	1	1.5	1.5	1.5	2	2
6.6-7.0	0.5	1	1	1.5	1.5	1.5	2	2

BOX D: Number of days warfarin omission

	Target INR		
INR	2-3	2.5-3.5	3-4
3.4 – 3.7	1		
3.8	2		
3.9-4.2	2	1	
4.3	2	2	
4.4-4.7	2	2	1
4.8-5.9	2	2	2
6.0-6.9	2	2	2
≥7.0	Contact haematology for advice		

Is baseline INR <1.4?

Yes → Contact haematology for advice

No

Individualise a standard loading dose of 8mg OD for 2 days as follows:

- *Factors that increase bleeding risk (Box A):* subtract 1mg from daily loading dose for each factor (2mg if age >80 years)
- *Factors that decrease warfarin effect (Box B):* add 1mg to daily dose for each factor

If >10mg is required, contact haematology for dose confirmation.

(e.g. if patient weight <50kg (-1mg) and >70 years (-1mg) then a loading regimen of 6mg OD should be used)

ALL WARFARIN SHOULD BE GIVEN AT 2PM

HAEMATOLOGY CONTACTS:
Mon-Fri 9am-5pm:
SpR on bleep 3060

Out of hours:
Via switchboard

Prescribe loading regimen (2 doses) on drug chart (in section on oral anticoagulant) and additionally on JAC

Measure INR on morning of day 3 (after 2 doses given)

INR below target range

INR already within target range

INR above target → Contact haematology for advice

Repeat same loading dose and measure INR on morning of day 4

Day 4 INR above target range:

- Use **Box D** to estimate number of days to omit warfarin for
- If patient bleeding OR INR≥7.0 contact haematology

Day 4 INR below target range:

- Consider giving another loading dose ***OR***
- Continue with maintenance dose and LMWH cover until INR in range

INR in range:

- Calculate maintenance dose required using **Box C**:
- add up total loading dose patient has received
- use this and INR to calculated likely maintenance dose
- Re-check INR in 3 days

Once INR in range:

- Use Day 4 INR and total loading dose to calculate maintenance dose (**Box C)**

If treatment dose LMWH/ IV UFH infusion prescribed, stop this once two consecutive INRs in range and at least 5 days heparin received

APPENDIX 4: PATIENTS ALREADY ON WARFARIN – RESTARTING OR ADJUSTING DOSES

BOX A: Number of days warfarin omission

	Target INR		
INR	2-3	2.5-3.5	3-4
3.4 – 3.7	1		
3.8	2		
3.9-4.2	2	1	
4.3	2	2	
4.4-4.7	2	2	1
4.8-5.9	2	2	2
6.0-6.9	2	2	2
≥7.0	Contact haematology for advice		

BOX B: Number of days warfarin loading

	Target INR		
INR	2-3	2.5-3.5	3-4
2.8-2.9			
2.3-2.7			1
1.9-2.2		1	2
1.8	1	2	2
1.5-1.7	2	2	2
<1.5	3	3	3

BOX C: High Risk Patients:

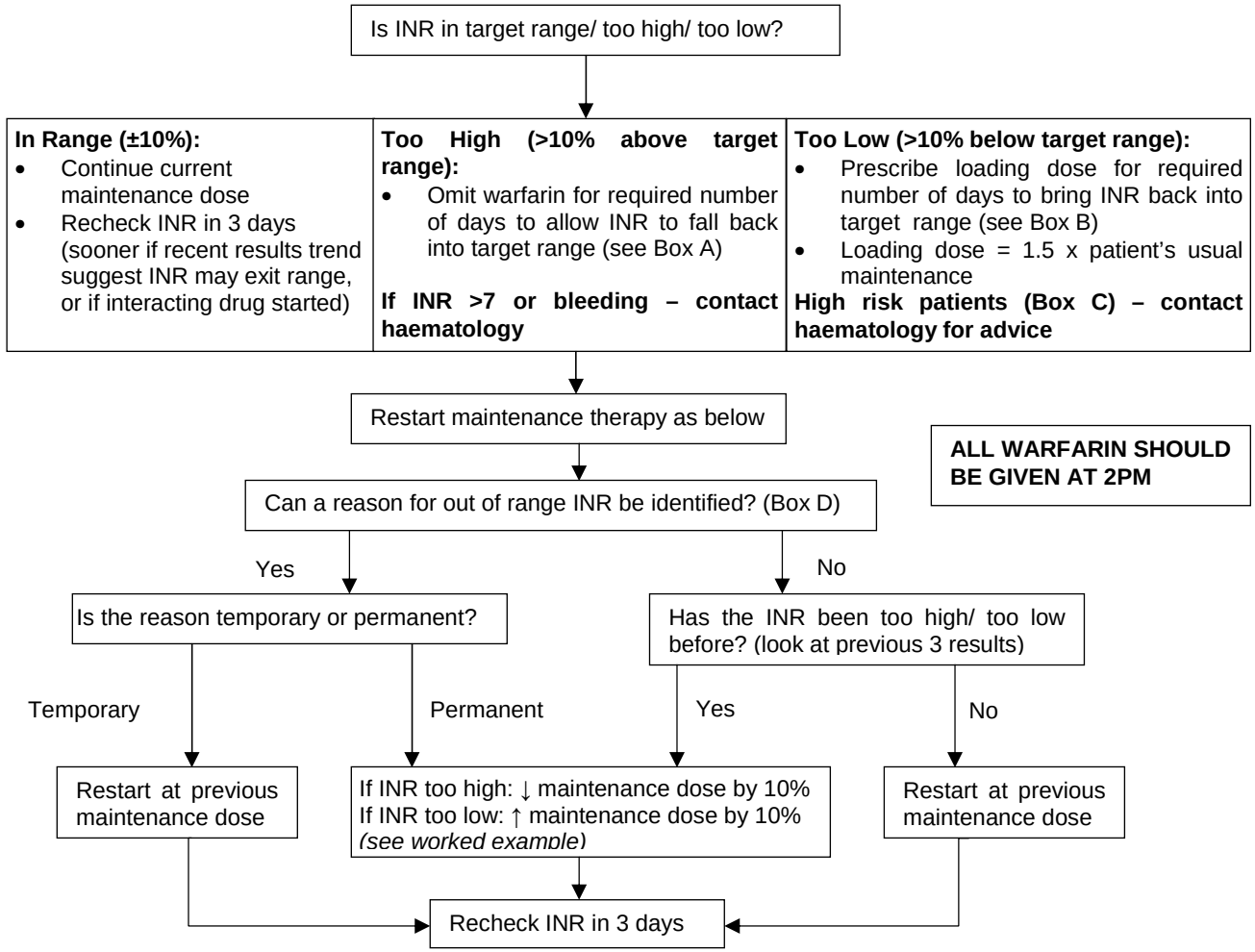
- Mechanical valve: INR <2.0
- Recurrent VTE (target INR 3-4): INR<2.0
- VTE in previous 3 months: INR <1.5
- APLS (target INR 2-3): INR <1.5
- APLS (target INR 2.5-3.5 or 3-4): INR <2.0

Discuss with haematology for consideration of additional anticoagulation with LMWH

BOX D: Reasons for out of range INR:

- Non-compliance (missed doses/ extra doses/ incorrect doses)
- Initiation of an interacting drug/ herbal remedy/ vitamin supplement (see BNF)
- Change in diet/ alcohol intake
- Change in health

Consider if reason permanent or temporary. A temporary reason may require dose adjustment if the reason continues acutely.



Worked example:

- Normal dose 4mg od. Current INR 1.3 due to new medication which has to be continued. Load with 6mg (1.5x4) for 3 days (Box B)
- Increase maintenance dose by 10%: 4.5mg daily (31.5mg/wk) or 4.5mg/4mg alt days (30mg/wk) or 4mg Mon-Fri, 5mg Sat/Sun (30mg/wk)

HAEMATOLOGY CONTACTS:

Mon-Fri 9am-5pm: SpR on bleep 3060
Out of hours: Via switchboard

APPENDIX 5: LMWH TRANSFER TO PRIMARY CARE WITHIN NORTH CENTRAL LONDON

Consultant:……. Speciality:……. Clinic Date:…….	**Whittington Health** **Magdala Avenue** **London N19 5NF**
Patient Name:…….. DOB:…… Hospital Number:…… NHS Number:……..	Patient's address: GP address:

Dear Dr ……..

Transfer of Low Molecular Weight Heparin Prescribing & Monitoring to Primary Care

The above patient requires ongoing treatment with tinzaparin injection

Indication:	Start date:
Proposed duration:	Review date:
Responsibility for reviewing anticoagulation:	
Dose & frequency:	Weight & date:
Administered by:	

Baseline blood results:

Hb (date):…….

Platelets (date):…….

Creatinine (date)…….

eGFR (date)……..

Standard Monitoring:

- FBC, U&E, LFTs every 4-6 initially (max interval 3 months). Discuss with haematology if eGFR <20ml/min
- Weight every 4-6 weeks initially (max interval 3 months). Review dose if weight change >5kg

We have supplied …….. days of therapy on ……. and would be grateful if you could please continue to supply and monitor thereafter.

Any additional specific monitoring:

Thank you for continuing their care. If you wish to discuss further please contact using the details below.

Print Name:…… Signature:……

Grade:…… Contact details:…… Date:……

APPENDIX 6a: UNFRACTIONATED HEPARIN INTRAVENOUS INFUSION PRESCRIPTION:

To be used in conjunction with the "Pump rate record chart for unfractionated heparin infusion".
Rate must be checked hourly by nursing staff

Infusions only to be given in:
- **Intensive Care Unit**
- **Mary Seacole South**
- **Emergency Department**

Patient Name:……
Hospital Number:……
DOB: ……
Ward: ……
Use addressograph label if available

Check baseline APTR prior to starting infusion:
≤1.5 give 5000 units IV bolus loading dose (over 5 minutes)
1.6-1.9 omit loading dose

Baseline APTR:	Bolus Dose:	Prescriber sign:	Name & bleep:	Date:
Heparin sodium 5000 IU in 5ml ampoule		Given by:	Checked by:	Date/time:

- Draw up ready diluted 20 000 units in 20ml of heparin sodium for infusion via a syringe driver
- Heparin strength is 1000 units/ml.
- *This is ready diluted, there is no need to dilute further*

IV infusion of heparin sodium 20 000 units/ 20ml
Start infusion at 1000 units/hr (1ml/hr). Check APTR after 6 hours

Prescriber sign:	Name & bleep:	Date:
Given by:	Checked by:	Date/time:

DOSE ADJUSTMENT INSTRUCTIONS:
Check APTR 6 hours following each dose change and every 24 hours once stable.

TARGET APTR: 1.5-2.5

APTR	Action
≥5.1	Stop for 60 minutes and contact haematology. Reduce rate by 500 units/hr (0.5ml/hr).
4.1-5.0	Stop for 60 minutes. Reduce rate by 300 units/hr (0.3ml/hr)
3.1-4.0	Stop for 30 minutes. Reduce rate by 200 units/hr (0.2ml/hr)
2.6-3.0	Reduce rate by 100 units/hr (0.1ml/hr)
1.5-2.5	NO CHANGE
1.2-1.4	Increase rate by 200 units/hr (0.2ml/hr)
<1.2	Increase rate by 400 units/hr (0.4ml/hr)

HAEMATOLOGY CONTACTS:
Mon-Fri 9am-5pm: SpR on bleep 3060
Out of hours: Via switchboard

DOSE ADJUSTMENT RECORD:

Date	Time	APTR	New rate (ml/hr)	Dr Sign	Actioned by:	Checked by:	Time actioned:

APPENDIX 6b: PUMP RATE RECORD CHART FOR UNFRACTIONATED HEPARIN

Patient Name:……………………………… **Hospital Number:…………………………** **DOB: ………………………………………** **Ward: ………………………………………** *Use addressograph label if available*	**Risk of bacteraemia from contaminated infusions** • Maintain a closed system at all times • Change syringe and giving set at least every 24 house or if line disconnected

Check APTR against prescription chart to determine action to be taken.
If in doubt ask the doctor, pharmacist or site practitioner

Record of pump checks (Hourly) and planning for next APTR							**Record of syringe & giving set changes (24 hourly)**			
Date	Time	Infusion rate	Expected volume left in syringe (ml)	Actual volume left in syringe (ml)	Signature of nurse	Date & time next APTR	Date & time of syringe change	Date & time of giving set change	Signature for new syringe/ giving set	
									1st check	2nd check

APPENDIX 7: GP NOTIFICATION

Whittington Health NHS

GP notification form of NOAC initiation (1st visit to AC/ haematology clinic)

1. Patient details (or attach pt sticker)		**2. GP practice details**
Surname		Name Address Tel no: Fax no:
First name		
DOB:	Hosp. No	
Address: Postcode:		
Tel no:		

Dear Dr ……

1. Your patient has been referred to Haematology/ Cardiology by …… to be initiated on NOAC. The patient fulfils the following NCL criteria for NOAC use.

Summary of NCL criteria for NOAC	**Tick**
Known allergy / intolerance to warfarin or other VKAs	
VKA ideally avoided from a safety angle (e.g. significant technical difficulties or safety concerns)	
Poor INR control	
Phenindione supply issues	
Awaiting DC-cardioversion	
Other (specify)	

2. The patient was seen in our clinic on …… and was initiated on …… (***add drug name, dose and frequency***) for the above indication. An initial 28 day supply has been provided by the hospital.

3. He/she has been counselled and has been made aware of the benefits and risks of NOAC therapy, including the fact that there is currently no pharmacological reversal agent available. A patient information booklet and a 'patient-alert' card have been provided. Please reinforce the importance of this card and the need to carry it at all times.

4. As supplies are currently being issued by secondary care, please ensure that the patient's records in primary care are updated to reflect the fact that the patient is being anticoagulated with a NOAC.

5. The patient is due to return for a second visit on …… where tolerability and adherence issues will be discussed and a second month's treatment supplied as appropriate.

6. After the second visit, we will send a ***Transfer of Care document*** requesting that you take over prescribing responsibility starting from the beginning of month 3 (date: ……)

7. Additional comments: ……

……

……

Please contact if there are any questions or clinical concerns- Thank-you

Signed		Print name		Designation		Date	

NCL NOAC documents can be found at the following link: http://ncl-jfc.org.uk/noac-prescribing-guides.html

APPENDIX 8: TRANSFER TO PRIMARY CARE

Whittington Health NHS

Transfer to primary care: NOAC for prevention of stroke and systemic embolism in adult patients with non-valvular AF or VTE

Section A: To be completed by the Anticoagulation Clinic/ Cardiology/ Haematology		
Patient's surname		GP details:
First name		
DOB:	Hosp. No	Address
Address: Postcode:		Tel no:
Tel no:		Fax no:

Dear Dr ……..

The above patient was seen in the clinic on …….. / …….. / …….. and received a second month's prescription for …… ***(drug, dose and frequency)***.

Your agreement is requested re the transfer of care of this patient from …….. / …….. / …….. in accordance with the NCL position statement for the use of NOACs.

The following investigations were performed on …….. / …….. / …….. and are considered acceptable for transfer of care.

- Please **monitor renal function as outlined in the NOAC NCL guidance** (at least annually, or more frequently if appropriate). The **appropriateness of AC** should also be incorporated within the **annual GP check**
- *Please reinforce the importance of taking NOAC and advise the patient to carry the 'patent-alert' card at all times along with up-to-date information regarding their medication*

Test	**Result**	**Test**	**Result**
Serum Creatinine			
eGFR			
est CrCL (C&G method)			

Other relevant information ……

……

Signed		Print		Designation		Date	

Section B: GP to please complete and fax to the AC clinic/ Cardiology/ Haematolgy (within 14 days of receiving the request) on ……

Please tick as applicable:

☐ **I accept the transfer of care.** *Primary care physicians should refer to NCL NOAC guidance for the use of these drugs to support prescribing in primary care.*

☐ **I am not willing to accept the transfer of care for this patient for the following reason(s)**:

……

……

GP signature		GP name		Date	

If there are any questions or clinical concerns, please feel free to contact the AC team on the above number and/or refer back to the clinic as appropriate and as per normal practice.

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval

		Yes/No	Comments
1.	**Does the procedural document affect one group less or more favourably than another on the basis of:**		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Culture	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
	• Disability - learning disabilities, physical disability, sensory impairment and mental health problems	No	
2.	**Is there any evidence that some groups are affected differently?**	No	
3.	**If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?**	No	
4.	**Is the impact of the procedural document likely to be negative?**	No	
5.	**If so can the impact be avoided?**	N/A	
6.	**What alternatives are there to achieving the procedural document without the impact?**	N/A	
7.	**Can we reduce the impact by taking different action?**	N/A	

If you have identified a potential discriminatory impact of this procedural document, please refer it to the Director of Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact the Director of Human Resources.

Checklist for the Review and Approval of Procedural Document

To be completed and attached to any procedural document when submitted to the relevant committee for consideration and approval.

	Title of document being reviewed:	Yes/No	Comments
1.	**Title**		
	Is the title clear and unambiguous?	Yes	
	Is it clear whether the document is a guideline, policy, protocol or standard?	Yes	
2.	**Rationale**		
	Are reasons for development of the document stated?	Yes	
3.	**Development Process**		
	Is it clear that the relevant people/groups have been involved in the development of the document?	Yes	
	Are people involved in the development?	Yes	
	Is there evidence of consultation with stakeholders and users?	Yes	
4.	**Content**		
	Is the objective of the document clear?	Yes	
	Is the target population clear and unambiguous?	Yes	
	Are the intended outcomes described?	Yes	
5.	**Evidence Base**		
	Are key references cited in full?	N/A	
	Are supporting documents referenced?	N/A	
6.	**Approval**		
	Does the document identify which committee/ group will approve it?	Yes	
7.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	Yes	
8.	**Document Control**		
	Does the document identify where it will be held?	Yes	
9.	**Process to Monitor Compliance and Effectiveness**		
	Are there measurable standards or KPIs to support the monitoring of compliance with and	Yes	

	Title of document being reviewed:	Yes/No	Comments
	effectiveness of the document?		
	Is there a plan to review or audit compliance with the document?	Yes	
10.	**Review Date**		
	Is the review date identified?	Yes	
	Is the frequency of review identified? If so is it acceptable?	Yes	
11.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for co-ordinating the dissemination, implementation and review of the document?	Yes	

Executive Sponsor Approval			
If you approve the document, please sign and date it and forward to the author. Procedural documents will not be forwarded for ratification without Executive Sponsor Approval			
Name		Date	
Signature			
Relevant Committee Approval			
The Director of Nursing and Patient Experience's signature below confirms that this procedural document was ratified by the appropriate Governance Committee.			
Name		Date	
Signature			
Responsible Committee Approval – only applies to reviewed procedural documents with minor changes			
The Committee Chair's signature below confirms that this procedural document was ratified by the responsible Committee			
Name		Date	
Name of Committee		Name & role of Committee Chair	
Signature			

Tool to Develop Monitoring Arrangements for Policies and guidelines

What key element(s) need(s) monitoring as per local approved policy or guidance?	Who will lead on this aspect of monitoring? Name the lead and what is the role of the multidisciplinary team or others if any.	What tool will be used to monitor/check/observe/Assess/inspect/ authenticate that everything is working according to this key element from the approved policy?	How often is the need to monitor each element? How often is the need complete a report ? How often is the need to share the report?	What committee will the completed report go to?
Element to be monitored	**Lead**	**Tool**	**Frequency**	**Reporting arrangements**
• Warfarin loading: time to target INR, % patients with INR >5.0	**Haematology & ambulatory care**		**6 monthly initially**	**Thrombosis committee**
Warfarin inpatient prescribing o % out of range INRs o Out of hours prescribing o Discharge arrangements	**Thrombosis lead**		**Annually**	**Thrombosis committee**
Rivaroxaban prescribing: o Compliance with NCL NOAC indications	**Thrombosis lead & anticoagulant pharmacist**		**Annually**	**Drugs and therapeutics committee**