Title: CG250 - Guidelines on the use of Oral Anticoagulants and the Role of the Anticoagulant Service

Document Review History

<table>
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<th>Version</th>
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GUIDELINES ON THE USE OF ORAL ANTICOAGULANTS AND THE ROLE OF THE ANTICOAGULANT SERVICE

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CG250 Oral Anticoagulants and the Role of the Anticoagulant Service

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Author: K. Oakley

Next review date: 7/7/13

Controlled document, do NOT print or photocopy.
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Guidelines on the use of Oral Anticoagulants and the Role of the Anticoagulant Service

1 OBJECTIVES

This document provides clinical guidance on the use of oral anticoagulant therapy and the role of the Anticoagulant services within Southend Hospital NHS Trust.

2 REASONS FOR DEVELOPING THESE GUIDELINES

These guidelines incorporate updates of the oral anticoagulation guidelines previously published separately under:
- CG042 Management of bleeding on warfarin
- CG043 Surgery for patients on oral anticoagulation
- CG044 Warfarin reversal for patients not bleeding
- CG004 Anticoagulant referral chart
- 99 Anticoagulant chart proforma

The aim is to provide a consistent and coherent approach towards the use and monitoring of oral anticoagulant therapy within Southend Hospital NHS Trust and aid clinicians by placing all of the available material on the intranet as a single resource.

3 AUDIT

These guidelines will be audited against the following internal and external standards:

- Monitoring of NPSA safety indicators\(^\text{12}\)
- BI-annual DAWN-AC benchmarking report (external report on quality of outpatient dosing / time in range / number of high and low INRS / inter site comparisons)
- 2 day turnaround time of anticoagulant referrals (internal standard)
- Monthly review of dosing intervals (internal standard measured against dosing algorithm in this guideline).
4 RESPONSIBILITY

This document is maintained and reviewed on an annual basis by the Technical lead for the anticoagulant services in conjunction with the Clinical lead for Haematology. All changes are validated in the Haematology management meeting before submitting for publication.

5 REFERENCES

1. 4S DAWN-AC V7 e-book user manual V2, 2007
3. BCSH Guidelines for the management of patients on oral anticoagulants requiring dental surgery 2008
4. The management of Atrial Fibrillation, NICE, 2006
5. CG169 Guideline for the use of Beriplex, Issue 4, 03/2011
6. Guidance from Dr E Watts, Haematology, Basildon Hospital
8. Internal recommendations: Dr H. Eden.
9. Basildon and Thurrock University Hospitals Guidelines on Warfarin Prescribing for inpatients
10. CM-47 Policy for clinical staff uniforms and non clinical staff dress code, Issue 3 05/2008 (Section 7)
12. NPSA patient safety alert: actions that can make Anticoagulants safer 28/03/07
6 DEFINITIONS

OAT  Oral Anticoagulant Therapy
LMWH Low Molecular Weight Heparin
INR  International Normalised Ratio
NPT  Near patient testing
PST  Patient Self Testing
PD   Postal Dosing
OPD  Outpatient Department
DN   District Nurse
BMS  Biomedical Scientist
PPE  Personal Protective Equipment
H&S  Health and Safety

7 RELATED DOCUMENTATION

- Fixed letter formats defined in the DAWN computer system and associated standard operating procedures stored in the Haematology Laboratory document control system.
- CG074 Guideline for IV Heparin
- CG083 Thromboprophylaxis of DVT & PE In Medical Inpatients
8 GUIDELINES

8.1 Overview / care pathway

Indicates transfer of information

Attending team

Diagnosis & assessment of suitability for anticoagulation

Day stay procedures

Clinical review

Cessation of therapy

Admission and discharge

Anticoagulant Outpatient service

External service liaison

District Nursing

Domiciliary Service

GP services
8.2 Initiation and maintenance of anticoagulant therapy

8.2.1 General notes

The attending team are responsible for initiation of anticoagulation. Appropriate clinical assessment must be made before initiating oral anticoagulants. Anticoagulation should be discussed with the patient to ensure they are aware of the risks, benefits and commitments of oral anticoagulant therapy.

Warfarin is the oral anticoagulant of choice; however phenindione or nicoumalone may be substituted in patients who do not tolerate warfarin.

8.2.2 Responsibility for in-patient oral anticoagulant dosing

All in-patient anticoagulant dosing (loading and maintenance dose) is the responsibility of the attending team. All doses are recorded on the “Inpatient anticoagulant treatment and discharge chart” (form 1742).

For patients admitted on oral anticoagulants, recent dosing records are available in documentation kept by the patient or directly from the Anticoagulant services on x5443.

8.2.3 Contraindications

It is important to consider contraindications to oral anticoagulant therapy before initiating therapy: These include:

- Active peptic ulcer, oesophageal varices, aneurysm, proliferative retinopathy
- Confirmed intracranial or intraspinal bleed
- Infective endocarditis
- Potential bleeding lesions
- Recent organ biopsy
- Recent stroke
- Recent trauma or surgery to head, orbit or spine
- Uncontrolled hypertension.

In addition, caution should also be indicated with:

- Alcoholism
- Coagulation disorders
- History of gastrointestinal bleeding
- Co-administration of interacting drugs
- Liver disease
- Mental impairment
• Poor attendance records
• Poor concordance
• Renal failure
• Thrombocytopenia

8.2.4 Recommended intensity and duration of therapy²⁻⁹

This guideline refers to target INRs rather than target ranges, although the target range is generally taken to be within 0.5 of the target, i.e. a target INR 2.5 equates to a target range of 2.0–3.0.

Specifying tighter target ranges for fully anticoagulated patients e.g. 2.0–2.5 or 3.5–4.0 does not achieve tighter anticoagulation control but results in more blood tests and more INR results in ranges associated with increased risk of thrombosis and bleeding.

<table>
<thead>
<tr>
<th>Indication</th>
<th>Target INR (range)</th>
<th>Duration of therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary embolus</td>
<td>2.5 (2-3)</td>
<td>6 months</td>
</tr>
<tr>
<td>Proximal deep vein thrombosis</td>
<td>2.5 (2-3)</td>
<td>6 months</td>
</tr>
<tr>
<td>Calf vein thrombus</td>
<td>2.5 (2-3)</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Recurrence of venous thromboembolism when no longer on warfarin therapy</td>
<td>2.5 (2-3)</td>
<td>Consider long term</td>
</tr>
<tr>
<td>Recurrence of venous thromboembolism whilst on warfarin therapy</td>
<td>3.5 (3-4)</td>
<td>Long term</td>
</tr>
<tr>
<td>Symptomatic inherited thrombophilia</td>
<td>2.5 (2-3)</td>
<td>Discuss with consultant haematologist</td>
</tr>
<tr>
<td>Antiphospholipid syndrome</td>
<td>2.5 (2-3)</td>
<td>Long term</td>
</tr>
<tr>
<td>Non-rheumatic atrial fibrillation</td>
<td>2.5 (2-3)</td>
<td>Long term</td>
</tr>
<tr>
<td>Atrial fibrillation due to rheumatic heart disease, congenital heart disease and thyrotoxicosis</td>
<td>2.5 (2-3)</td>
<td>Long term</td>
</tr>
<tr>
<td>Mural thrombus</td>
<td>2.5 (2-3)</td>
<td>Long term</td>
</tr>
<tr>
<td>Cardiomyopathy</td>
<td>2.5 (2-3)</td>
<td>Long term</td>
</tr>
</tbody>
</table>
Mechanical prosthetic heart valve.

<table>
<thead>
<tr>
<th>PROSTHESIS THROMBOGENICITY*</th>
<th>INR TARGET NO PATIENT RISK FACTORS</th>
<th>INR TARGET PATIENT-RELATED RISK FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Medium</td>
<td>3.0</td>
<td>3.5</td>
</tr>
<tr>
<td>High</td>
<td>3.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

*Prosthesis thrombogenicity: Low: Carbomedics (aortic position), Medtronic Hall, St Jude Medical (without silzone); Medium: Bjork-Shiley, other bileaflet valves; High: Starr-Edwards, Omnicience, Lillehei-Kaster.

Patient-related risk factors for thrombosis: Mitral, tricuspid or pulmonary position; Previous arterial thromboembolism; Atrial fibrillation; Left atrium diameter >50 mm; Mitral stenosis of any degree; Left ventricular ejection fraction <35%; Left atrial dense spontaneous echo contrast.
8.2.5 Induction of warfarin **2.9

Warfarin may take up to 5 days to achieve antithrombotic effects.

If immediate anticoagulation is required then heparin should be used in accordance with local guidelines (E.g.CG083 Thromboprophylaxis of DVT & PE in Medical Inpatients)

There is no standard loading regimen for warfarin that is suitable for all patients and the following table is only intended as guidance. This table cannot be used where the baseline INR is abnormal. In these cases seek advice from a consultant haematologist. Factors that need to be considered when prescribing warfarin include age, weight, concurrent illness (especially liver disease) and interacting drugs.

Slow loading has been assessed in patients with atrial fibrillation e.g. 3mg daily and retest INR in 1 week.

Baseline investigations for FBC, Clotting screen, U&Es and liver function are advisable.

<table>
<thead>
<tr>
<th>Day</th>
<th>INR</th>
<th>Warfarin Dose (mg)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal</td>
<td>5.0</td>
</tr>
<tr>
<td>2</td>
<td>&lt;1.5</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>1.5 - 1.9</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>2.0 - 2.5</td>
<td>2.5 – 1.0</td>
</tr>
<tr>
<td></td>
<td>&gt;2.5</td>
<td>nil</td>
</tr>
<tr>
<td>3</td>
<td>&lt;1.5</td>
<td>10.0 – 5.0</td>
</tr>
<tr>
<td></td>
<td>1.5 - 1.9</td>
<td>5.0 – 2.5</td>
</tr>
<tr>
<td></td>
<td>2.0 - 2.5</td>
<td>2.5 – 0.0</td>
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<tr>
<td></td>
<td>2.5 – 3.0</td>
<td>2.5 – 0.0</td>
</tr>
<tr>
<td></td>
<td>&gt;3.0</td>
<td>0.0</td>
</tr>
<tr>
<td>4</td>
<td>&lt;1.5</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>1.5 – 1.9</td>
<td>7.5 – 5.0</td>
</tr>
<tr>
<td></td>
<td>2.0 – 3.0</td>
<td>5.0 - 0.0</td>
</tr>
<tr>
<td></td>
<td>&gt;3.0</td>
<td>nil</td>
</tr>
<tr>
<td>5</td>
<td>&lt;1.5</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>1.5 - 1.9</td>
<td>10.0 – 7.5</td>
</tr>
<tr>
<td></td>
<td>2.0 – 3.0</td>
<td>5.0 – 0.0</td>
</tr>
<tr>
<td></td>
<td>&gt;3.0</td>
<td>nil</td>
</tr>
<tr>
<td>6</td>
<td>&lt;1.5</td>
<td>12.5 – 7.5</td>
</tr>
<tr>
<td></td>
<td>1.5 - 1.9</td>
<td>10.0 – 5.0</td>
</tr>
<tr>
<td></td>
<td>2.0 – 3.0</td>
<td>7.5 – 0.0</td>
</tr>
<tr>
<td></td>
<td>&gt;3.0</td>
<td>nil</td>
</tr>
<tr>
<td>6+</td>
<td>Monitor INR every 2 days until stable. When stable consider weekly monitoring</td>
<td></td>
</tr>
</tbody>
</table>

** For induction of phenindione or nicoumalone liaise with Consultant Haematologist.
8.3 Transferring care to the Anticoagulant service (Referral)

8.3.1 Requirement for referral

All patients on OATs require referral to the Anticoagulant services upon discharge, including:

- Patients who are to have OATs initiated as an Outpatient (the anticoagulant service will perform warfarin induction).

- All patients discharged on OATs **even if** they were anticoagulated prior to their admission. This ensures that changes to treatment regimes and dosages are communicated to the outpatient dosing staff.

  The referral service is available Monday to Friday 9AM to 5PM.

Where patients have undergone day-stay procedures a full referral is not required but to ensure continuity of care the Anticoagulant services should receive notification of the procedure that has been carried out and the changes that were made to the patient’s anticoagulation (OAT and/or heparin). If the Anticoagulant service is notified of the procedure prior to the event taking place, a brief pro-forma will be provided to the patient to hand in for completion by the attending team.

8.3.2 How to refer a patient for outpatient treatment

All requests for outpatient anticoagulation follow up should be sent to the Anticoagulant services in the Coagulation laboratory, Pathology, 1st floor of the tower block (air tube 100).

2 Referral forms are provided with full instructions shown in the reverse, 1 for inpatients, and 1 for outpatients.

These forms provide clear and simple method of providing the minimum acceptable level of information required to the Anticoagulant services.

See appendices for examples of the proformas in use.

Remember to assess patient mobility and book hospital transport or home visits if required.

The domiciliary service does not form part of the Anticoagulant service. Home visit dates must be arranged directly with the domicillary service by calling 01702 385193 (internal callers ext. 5193)
8.3.2.1 Referring an Inpatient

When any in-patient is prescribed a treatment dose of low molecular weight heparin and/or oral anticoagulant therapy sections 1 to 4 of the form must be fully completed.

At the time of discharge complete ALL of section 5

...including...

The doses that you wish the patient to take until their first appointment

...and...

Sign and complete the medical authorisation section

Just prior to discharge, send both copies of the completed form to the Coagulation laboratory in Pathology (air tube 100) who will maintain the outpatient anticoagulation records. They will return a copy of the form to the referrer along with information sheets for the patient and the patient's medical records prior to discharge, confirming the treatment details and follow up arrangements.

Always assess your patients' mobility prior to discharge to ensure that adequate arrangements are in place to enable them to attend for their Anticoagulant testing.

Remember: incomplete forms cannot be accepted and will be returned to the referrer.

DON'T be the one to cause delay
Complete your form before sending away.

Re-ordering information. The new form is available from the print shop, the form number is 1742 (replacing forms 99 & 2904)
8.3.2.2 Referring an outpatient

To refer any Outpatient for anticoagulation, read and complete sections 1-4 of the form…

And

Sign and complete the medical authorisation section

The form has 2 identical copies

Give the **TOP copy** to the patient and ask them to phone the number shown at the bottom of the form as soon as possible to arrange their first Anticoagulant Appointment. Once the patient contacts the Anticoagulant service we will aim to issue an appointment at the Anticoagulant Outpatient Clinic to start therapy within 2 working days.

Send the **BOTTOM copy** to the Coagulation laboratory in Pathology (air tube 100). Should the patient fail to contact us, we will use this copy to contact them.

This **MUST** be sent as it acts as an important safety check - ensuring that the Anticoagulant service will follow up every referral you make even if the patient forgets to do so.

Remember: incomplete forms cannot be accepted and will not be processed until we confirm the treatment details with the referring clinician.

**DON’T** be the one to cause delay
Complete the form before sending away.

Re-ordering information: the new form is available from the print shop, the **order number is 1192** (replacing form 211)

Note: for outpatient referrals ONLY, a letter may be used in place of the recommended form providing it contains fulfils the acceptance criteria shown below.
8.3.3 Acceptance criteria

It is important to balance the need for referral with the need to ensure patient safety, however, in general:

1. No patient will be accepted for anticoagulation unless adequate clinical and personal information is provided prior to their first appointment.

"Adequate clinical information" is defined as:

- Reason for anticoagulation
- Duration of anticoagulant therapy
- Therapeutic range of INR
- Referring clinician
- Name of anticoagulant
- Start date of anticoagulant therapy

"Adequate personal information" is defined as:

- Southend Unit or District number or NHS number, and patient name
  OR
- Name, date of birth and address

2. All referrals must be signed by the attending physician. By signing, they accept full responsibility for the accuracy of the information provided for the treatment of the patient.

8.4 Surgery on oral anticoagulants (Previously CG043)

8.4.1 General information

Unless there is a very high risk of thromboembolism anticoagulation should be temporarily discontinued in preparation for surgery.

Patients will be advised by the attending team if their oral anticoagulant dose needs reducing pre-op. The Haematology medical staff may be contacted for advice regarding specific procedures.

It is advisable that patients should be tested within 1 week of the procedure to check their INR is in range.

For cataract operations the INR needs to be below 3.0
8.4.2 Peri operative management

8.4.2.1 Low Risk Patients
- For minor surgical procedures (low risk of bleeding) oral anticoagulants should be stopped or adjusted to achieve a target INR of approximately 2 on the day of surgery.
- For major surgery oral anticoagulants should be stopped 3 days prior to surgery and restarted on the same day of surgery if there is no bleeding or other complications with exceptions of patients who are medium or high risk (see below).

8.4.2.2 Medium Risk Patients
- History of DVT and PE (>6 months ago)
- Aortic valve replacement
LMWH once daily starting two days pre-op and daily post-op until INR greater than 2.5

8.4.2.3 High Risk Patients
- Mitral valve replacement
- History of DVT or PE (<6 months ago)
Enoxaparin 1.5mg/kg once daily, starting two days pre-op and daily post-op until INR greater than 2.5.

Caution
- For patients with a CrCl less then 30ml/min give 5,000IU heparin as a stat dose followed by 25,000IU heparin over 24 hours. Monitor APTT after 6 hours and daily thereafter.
- For patients undergoing spinal or epidural anaesthesia; liaise with the anaesthetist regarding the acceptable INR and when to restart anticoagulation therapy. No enoxaparin or heparin to be given on the day of operation

8.4.2.4 Monitoring
- Check INR 12-24 hours pre-op
- If INR less than 1.6 and no clinical bleeding problem, proceed to surgery. If INR greater than 1.6 but less than 2.5 give 1mg Vitamin K oral or IV (use Konakion MM Paediatric for oral route) and repeat INR 4 hours Pre-op. If INR greater 2.5 consult a haematologist.
### 8.5 Management of over anticoagulation (Previously CG042, CG044)

<table>
<thead>
<tr>
<th>Clinical condition</th>
<th>INR value</th>
<th>Treatment indicated</th>
</tr>
</thead>
</table>
| Major bleeding           | Any       | • Stop oral anticoagulants  
• 5-10mg Vitamin K₁ (Phytomenadione) slow IV,  
• Beriplex (prothrombin complex concentrate) as d/w Haematologist and administered as per guidelines⁵ |
| No bleeding / minor bleeding | >8        | • Stop oral anticoagulants- restart when INR <5  
• If other risk factors present, give 0.5mg Vitamin K₁ IV or 5mg po  
• Repeat vitamin K dose if INR still high after 24 hours |
|                           | 6-8       | • Stop oral anticoagulants- restart when INR <5                                    |
| No bleeding               | <6        | • Reduce dose or stop warfarin                                                     |
8.6 The Anticoagulant service (Outpatient testing)

8.6.1 Staffing

The Anticoagulant service is based in the Coagulation Laboratory, part of the Haematology Department within Pathology (1st floor of the tower block).

The key personnel are:

Dr P. Cervi, Head Consultant Haematologist  Clinical Lead  
Miss L Latif       Pharmacy Lead  
Mrs J.A.Elliott, Haematology Manager   Managerial Lead  
Mr K. Oakley, Deputy Manager, Haematology  Technical Lead / ITS System Administrator

8.6.2 Service inclusions

- Testing the local outpatient population current being prescribed OAT through the provision of:
  - Anticoagulant Outpatient Clinics providing face to face testing and advice for patients with specific needs.  
  - A Postal Dosing (PD) service on weekdays (excluding bank holidays) providing testing and dosage advice on venous samples received in the Coagulation laboratory.
- A dedicated telephone line 01702 385197, manned 09:00 Monday to 17.30 Friday (excluding bank holidays) for the amendment of appointments and for general queries but excluding medical enquiries.
- The maintenance of a database of anticoagulant patients with complete testing and dosing history, providing the facility for audit.
- A referrals service enabling the transfer of anticoagulant care from inpatient to outpatient (9AM Monday to 5.00PM Friday excluding bank holidays).
- An appointment system with automatic follow up of non-attendance and individual patient safety checks.
• A service providing the physician initiating therapy with a reminder that therapy is due for review.

• Liaison with external services providing dose administration services, E.g. District nurses, practise nurses, nominated 3rd party carers and care agencies.

• Liaison with the Trusts nominated hospital transport supplier, providing details of follow up appointment dates and transport requirements for Outpatient clinics.

• Liaison with providers of phlebotomy services including the Trust Domiciliary service, District Nurses).

• In consultation with the Haematology medical staff and DN service, a service for the prescribing and administering short term LMWH to appropriate patients on OAT

• A system of internal and external review/audit of patient results in line with national guidelines.

8.6.3 Service exclusions

• Clinical advice regarding any aspect of anticoagulant therapy including initiation of treatment, details of treatment regimes and termination of therapy. Clinical advice may be sought from the Haematology medical team.

• The provision of general medical advice or advice service for other medicines concurrently administered to anticoagulated patients. Responsibility for advising on interactions between OAT and newly prescribed medications lies with the prescriber.

• The provision of community phlebotomy or domiciliary visits.

• Clinical review of patients / assessment of candidacy to commence anticoagulant therapy.

• Long term administration and monitoring of patients on LMWH, unfractionated heparin or any other form of anticoagulant or thrombolytic therapy.

• Responsibility for patient’s clinical care (outside of OAT) lies with the referring team and/or General Practitioner.
8.6.4 Dawn-AC Computer Aided Anticoagulant Dosing

The anticoagulant service utilise the DAWN-AC dosing system provide by 4S-Information Systems.

The DAWN-AC system resides on the hospital network under the control of Southend Hospital Network Services and the Pathology IT manager who are responsible for:

- Network integrity and access
- Upgrading policy
- Backup strategy

The system administrator has overall responsibility for:

- DAWN system user security and access levels
- System maintenance
- Training

The use and setup of the DAWN system are covered in the appropriate Haematology Standard Operating Procedure.

8.6.5 How patient referrals are processed.

8.6.5.1 Inadequate referrals

Where no referral is received or an incomplete referral is received the actions taken will depend on which of the following four scenarios are relevant:

1. An incomplete referral is received on an inpatient at Southend Hospital

   Either: The referring doctor will be contacted and asked for the missing details. These may be completed over the phone as long as the doctor involved confirms they agree to this. Any items completed will be clearly marked as such for audit purposes

   Or: If the doctor cannot be contacted the referral will be returned to the relevant ward, indicating the missing information. The ward will also be telephoned to inform them that the referral is unsuitable and is being returned.
2. An incomplete referral is received on an Outpatient,
   OR
   A patient unknown to the clinic telephones for an appointment,
   OR
   A sample arrives & is processed without prior referral of the patient,

   An “Anticoagulant Referral problem” sheet will be completed and the case will be
   followed up daily until adequate referral has been obtained. The patient will be
   kept informed of the current situation. In addition, a new patient record will be
   added to the Anticoagulant database using those details available. A suitable
   comment will be attached and the record to prevent inappropriate dosing activity.

   All referral problem sheets will be referred to a member of the Haematology
   medical team if there is no resolution within 48hrs (for patient's already on
   anticoagulants) or 7 days (for patients who have not yet started anticoagulants).

   ** Note 1: In cases of AF ONLY: Qualified BMS staff may review an incomplete
   referral and where the case appears to be one of anticoagulation for
   AF with no complicating factors an INR range of 2.0-3.0 and indefinite
   therapy may be assumed if not stated. The letter sent to the referrer
   should also be marked to indicate this action was taken.

3. A patient attends the Outpatient's Clinic without a prior referral.

   An INR will be performed and the Pharmacist in clinic will assess whether
   immediate action is required over the INR result. The patient will then either be
   forwarded to the prospective referrer or, in cases requiring urgent resolution, to
   the Haematology medical staff for follow up.

4. Exceptional cases.

   Exceptional cases may be accepted into the clinic by the Haematology medical
   team without full referral. In these cases the haematology team will provide
   written treatment details that will be entered onto Dawn-AC before the patients’
   first appointment, to enable dosing to be performed.

   ** 8.6.5.2 Fully completed referrals

   All referrals received before 5PM on a routine working day will be processed on the day
   of receipt.

   Although the clinic will attempt to book every patient for the visit date indicated on the
   referral this cannot be guaranteed, particularly during busy periods (such as around
   bank holidays). If the desired date is not available, the closest available alternative will
   be issued and the referrer will be telephoned to indicate the change.
The anticoagulant service aim to test all patients within 2 days except where indicated otherwise on the referral.

Once the referral is processed, the following documents will be dispatched:

- A national yellow anticoagulant information booklet and local services leaflet for all patients new to OAT.
- A letter of introduction for the patient, confirming the details of their appointment.
- A letter to the referring doctor/team confirming the treatment details provided and the appointment that has been made along with a copy of the original referral. This notification should be checked carefully before being filed in the patient's notes. Any errors or omissions should be communicated to the Anticoagulant service without delay.
- A letter for the patient’s GP (if identified in the referral or on the hospital PAS system) confirming the treatment details provided to the clinic.

8.6.5.3 Temporary residents

Patients resident in the UK who are temporarily resident in the Southend catchment area will be treated as follows.

a) Patients will be invited to attend the phlebotomy clinic for an INR. This will be telephoned to the patient who will be asked to contact their local centre for dosing advice or, where requested to do so, the Anticoagulant service will directly contact the patient's local testing service.

b) If the patient is to be resident locally for a prolonged period, their local test centre will be requested to provide a written copy of their OAT records and the patient will be dosed locally until they leave the area.

In either case, if the patient is not a UK resident they will be issued with a copy of the Trust guidelines on possible fees that may apply and the patient's details will be passed to the Trust liaison in these matters.

8.6.5.4 Patients temporarily out of area

Patients who are temporarily out of area and who are due an anticoagulant blood test will be asked to source a test in their area.
The anticoagulant will accept telephoned confirmation of the blood test and dose the patients OAT accordingly.

**Disclaimer**

The Anticoagulant clinic is a monitoring service only and accepts no responsibility for the accuracy of information provided to it. Patients will be treated strictly according to the information provided to the Anticoagulant clinic and all referrers should be aware that this information is *not routinely reviewed by medical staff* within the clinic prior to the initiation or continuation of anticoagulant therapy.

8.6.6 **Counselling of newly referred patients at their first Clinic Appointment**

Before counselling begins, a check will be made to see if the patient has been on warfarin before (even if they have, it might be necessary to cover some points again). The following points will then be covered, remembering to use *simple lay language*. Where necessary an interpreter will be contacted.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Information to impart</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic details of the tablets to be taken</td>
<td>Name of tablet – warfarin / nicoumalone / phenindione. Explanation of colours and strengths of tablets that may be issued.</td>
</tr>
<tr>
<td>2. What does it do?</td>
<td>It &quot;Thins down the blood&quot; and so stops clots from forming or getting bigger.</td>
</tr>
<tr>
<td>3. How long is it required for?</td>
<td>Discuss length of treatment (explain that this decision rests with the referring consultant).</td>
</tr>
<tr>
<td>4. What dose is required?</td>
<td>State that the dose depends on the result of the blood test and can vary. The dose is always written in the Yellow book and not on the tablet boxes received from Pharmacy.</td>
</tr>
<tr>
<td>5. When should the dose be taken?</td>
<td>Ask the patient to take the tablets at the same time of day; ideally about 6pm. Explain that warfarin can be taken with, before or after food.</td>
</tr>
<tr>
<td>6. How often to come into clinic?</td>
<td>Initial results can be quite unstable so a patient may be seen twice weekly, then once a week, then every 2 weeks etc. up to a possible (case dependant) maximum of every 12 weeks depending on stability. Once patients achieve a therapeutic INR they will be transferred to the Postal Dosing service provided. Patients using this service are required to have a venous sample of blood taken at specified clinics, or at GP surgeries. They are</td>
</tr>
</tbody>
</table>
7. What does the blood test tell us?

   asked to be contactable on the day of the blood test in case any alterations are necessary
   
   The INR is a measure of how thin blood is compared to normal. If normal is about 1 and a patient result is 2 that means the patients’ blood is effectively 2 times thinner than normal. If a dose is missed the patient should make a note of the date and tell the clinic when they next have a blood test. If more than one dose is missed the patient should ask their GP for advice or phone the clinic to make an earlier appointment. If they are unsure whether they have taken their tablets then do not take an extra dose.

8. Missed doses

9. Precautions

   Refer to the anticoagulant booklet for signs of over or under dosage. The patient should inform the clinic of any changes in medication including herbal remedies and OTC but ask the prescribing doctor to check of their affect on anticoagulants WHEN THEY ARE PRESCRIBED in case the anticoagulant dose or appointment needs adjusting - we cannot offer this advice over the telephone.

10. Inform the patient that many factors affect warfarin:

   Diet:
   Large changes in diet generally but specifically, large changes in the amount of green vegetables eaten (also liver, dairy produce).

   Alcohol:
   Moderate drinking usually OK (e.g. 1-2 glasses of wine per day—depends on patient's normal habits). Bingeing increases the INR. Continuous heavy drinking decreases the INR by stimulating hepatic enzymes to speed up warfarin metabolism. Once liver damage is present considerable fluctuation is possible but generally the INR is greatly increased.

   Stress:
   Either increased or decreased INRs, Mechanism unknown.

   Illnesses:
   Bouts of diarrhoea / sickness / nausea / vomiting longer than 2 days are likely to affect the warfarin.

11. Side Effects

   Warfarin
   Is generally very well tolerated. Patients will probably bruise more easily and bleed for longer when cut. There should be no bleeding problems if they are kept under control by the clinic. Nausea, vomiting, diarrhoea. Rarely alopecia, rash, skin
ulceration, pancreatitis, jaundice, liver dysfunction reported.

If patients notice spontaneous bruising or bleeding from gums, nose, PR or PU then the patients should go straight to A&E.

**Nicoumalone**
Similar to warfarin.

**Phenindione**
May cause blood dyscrasias, liver and kidney damage. *Patients should be referred to a Consultant Haematologist or SPR before switching to Phenindione to discuss the risk / benefit.*

| 12. Pregnancy and breast feeding | If patients are of Child Bearing age discuss the current guidelines regarding pregnancy and breast feeding while on warfarin. |

### 8.6.7 INR testing methods

INR testing is performed according to the Standard Operating Procedures (SOP) and policies in place in the Haematology Laboratory:

Routine laboratory INR testing will be taken as the gold standard test for the Trust. This will be supplemented by NPT and Anticoagulant Clinic finger prick testing. All methods will be subjected to appropriate internal and external QC procedures.

While the INR is an international standard measure of anticoagulant therapy it should be noted that INR standardisation is imperfect. For this reason there is bias between the various methods in use across the UK and patient care may benefit by limiting their transfer from one testing method to another.

### 8.6.8 The OPD Anticoagulant clinic

The anticoagulant clinic is held to allow the rapid assessment of oral anticoagulant therapy in patients unsuitable for testing under the Postal Dosing service. This includes patients who:

- are new to anticoagulant therapy
- have not yet achieved a therapeutic INR
- require additional help or advice to ensure their compliance
- have poor venous access
- do not have access to a telephone or e-mail service for communication of postal dosing results.
Testing is via a sample of capillary blood, collected from the finger tip or other suitable site (such as the ear lobe), which is tested immediately. The result is then assessed by BMS staff and, if required, passed to an Anticoagulant Pharmacist, who will advise the patient on their anticoagulant dosage. The dosage will be provided in writing for the patient to take away with them.

Counselling of newly anticoagulated patients also takes place.

All staff working in the clinic undertake to be smartly and safely attired according to Trust policy and conduct themselves in a friendly but professional manner.

Daily protocols for the running of the Anticoagulant clinic is covered in the relevant Haematology SOP.

8.6.9 The Postal Dosing Scheme

8.6.9.1 Overview

Under the Postal Dosing Scheme (PD) blood tests are taken by venepuncture at any of the sites run by the Hospital Phlebotomy service, at GP surgeries or (in special circumstances) in the patients’ home.

The postal dosing scheme also accept telephoned INR results from patients on home testing or tested while on holiday.

All tests, however collected, are sent to the Coagulation laboratory in Pathology for processing.

Once processed and dosed in the laboratory, the test information is sent to the patient by first class mail or e-mail.

Dosing information is also telephoned if the anticoagulant dosage is to change before the test information could reasonably be expected to arrive by post.

Detailed running of the Postal Dosing Scheme is covered in the relevant Haematology SOP.

8.6.9.2 Transfer of patients from OPD clinics to Postal Dosing

Patients who are new to the Anticoagulant Clinic are usually seen in the OPD clinic but may immediately be placed on the postal dosing scheme if they comply with the PD regulations (shown below) and any of the following apply:
• They have previously been tested under another clinic and their medication is at a therapeutic level.

• They are unable to travel.

• They have specific work/life complications which make clinic attendance difficult (such cases must be cleared by the Haematology medical staff).

Once patients achieve a therapeutic INR they are automatically transferred to the Postal Dosing service provided that they:

• Have demonstrated the ability to interpret and administer their dosages by achieving a therapeutic INR.

• They are available by telephone on the day of their test.

• They are able to attend a community phlebotomy site.

Patients may request a transfer to Postal Dosing at any stage by telephoning the enquiry line.

### 8.6.10 Dosing guidelines for maintenance dosing of outpatients

#### 8.6.10.1 General advice

In general DO NOT make large dose adjustments in the OAT dosage. As a rough guide there should be no change greater than 15%\(^9\). This equates to a maximum dose change of approximately 1mg of warfarin per day for a patient on 7mg daily, 2mg per day for a patient on 14mg per day etc.

A dosing flow diagram is provided in the appendices.

#### 8.6.10.2 Appointment intervals

**New cases**

At an initial visit patient will be counselled and issued a prescription for warfarin. Patients will be seen twice weekly initially. As the patient stabilises appointment intervals can extend to weekly, two weekly, four weekly, up to a maximum of 12 weeks.

In cases where a cardioversion is to be performed, once the cardioversion date is confirmed, the appointment intervals will be shortened to 1 week for at least the 4 weeks prior to the procedure taking place.

**Ongoing cases**
Refer to previous patient record on dosage and appointment time and recent inpatient records and treat as for new cases

### 8.6.10.3 Issuing Prescriptions

Haematology medical staff pre sign prescriptions printed exclusively for the use in the Outpatient clinic.

The pharmacist must countersign anticoagulant prescriptions when they are issued.

The pre-printed prescriptions allow for the prescribing of:

- 3mg, 1mg, and 0.5mg warfarin tablets
- 50mg, 25mg and 10mg phenindione tablets
- 1mg nicoumalone tablets

When a prescription has been issued, the yellow anticoagulation booklet must be stamped with "prescription issued" (using the stamp provided).

**NB It is Southend Hospitals' policy not to issue 5mg tablets to outpatients.**

### 8.6.10.4 Dealing with INRs above the therapeutic range

Refer to section “management of over anticoagulation” and “Anticoagulant Pharmacist Appointment/DOSE Assessment chart”

Try to establish the reason for the high INR (illness, diet, alcohol consumption, change of medication, stress). In many cases this may not be established.

Assess how the patient has previously reacted to dose adjustments.

If the patient requires referral for medical assessment, the Staff Grade on the Medical Assessment Unit should be contacted if the patient is 60 years old or above, otherwise bleep the Medical SHO 1st on-call.

When referring a patient always complete a copy of the DAU referral form

### 8.6.10.5 Unexpected bleeding in a patient whose INR is therapeutic

If a patient presents with bleeding but has an INR result within their specified range, reduce the dose of warfarin and attempt to achieve an INR result at the lower end of their specified range e.g. Range 2-3 aim for INR of 2.0.
Patients should be advised to seek urgent advice from their General Practitioner, as the underlying cause needs to be investigated.

If the patient is suffering from serious bleeding then **SEEK IMMEDIATE MEDICAL ATTENTION**

Record all actions taken in the Comments section on DAWN-AC.

### 8.6.10.6 Dealing with INRS below the therapeutic range

Refer to section “Anticoagulant Pharmacist Appointment/DOSE Assessment chart”.

Try and establish the reason for the low INR (Compliance problems, missed doses, changes in medication, changes in diet etc.). In many cases this may not be possible.

**N.B. Patients who have been otherwise very stable and have presented with a single sudden change in control should be assessed and if no reason for this variation can be found, the same dose should be considered with more frequent monitoring.**

If patients have recently had a PE / DVT and their INR is < 2.0 (within the first six weeks of the thrombosis)
- reload them with warfarin according to the induction protocol
- start enoxaparin at treatment dose and monitor frequently
- continue enoxaparin until INR > 2.0

If enoxaparin is required and the patient is unable to self administer ensure an enoxaparin administration form (locked format on the DAWN system) is faxed to the District nurse office, the clinic nurse will do this for you.

### 8.6.10.7 Dental extractions

The risk of significant bleeding in patients on oral anticoagulants and with a stable INR in the therapeutic range 2-4, is low. The risk of thrombosis if anticoagulants are discontinued may be increased. Oral anticoagulants should not be discontinued in the majority of patients requiring out-patient dental treatment. An appreciation of the surgical skills of primary care dentists and the difficulty of surgery, particularly when INR levels approach 4, is also important when assessing the risk of bleeding. Individuals, in whom the INR is unstable, should be discussed with their anticoagulant management team.

Warfarin dose should not be changed if patient requires a single dose of antibiotic for endocarditis prophylaxis.
Risk of bleeding may be minimised by:
- Use of oxidised cellulose (surgical) or collagen sponges and sutures.
- 5% tranexamic acid mouthwash 5-10mls qds x 2 days

Patients taking warfarin should not be prescribed non-selective NSAIDS and COX-2 inhibitors as analgesia following dental surgery (grade B, level III).

8.6.10.8 Drug interactions

Refer to BNF Appendix 1 for further information

8.6.10.9 Co-administration of Warfarin and Aspirin

Some patients will require co-administration of both Aspirin and Warfarin. The patients should be told if they are to remain on both drugs and counselled about the increased risk of bleeding.

If patients are to remain on both Aspirin and Warfarin this will be recorded on the referral chart or in personal communication to the clinic.

8.6.10.10 Dosing for Trips abroad

Trips abroad are not usually a problem unless a patient is newly started on warfarin and very difficult to stabilise. If the patient is going away for a long period of time it is possible to have their INR checked in most countries if necessary and also on cruise ships.

To cope with significant time differences adjust warfarin dose gradually by an hour each day to enable patient to take warfarin at 6 p.m. local time. The same procedure should be followed on return home.

Check with the Consultant Haematologist before requesting any patient to cancel a holiday.

To enable patients to have INR checks without paying for them abroad (certain countries only) they can obtain an E121 form. The patient needs to apply for a form at least 5 weeks before going on holiday and will require a letter from a doctor. E121 forms can be supplied via the Post Office.

8.6.10.11 Pregnancy and breast feeding

If a woman becomes pregnant whilst taking warfarin she must be referred to the consultant Haematologist or Haematology SPR immediately.
It is safe to breast feed whilst on warfarin & heparin but **NOT** on aspirin or phenindione

### 8.6.10.12 Patients unable to tolerate warfarin

Contact Haematology medical staff if a patient is suspected to be unable to tolerate warfarin. The patient should be seen by the doctor before a change is initiated

Dose conversion: Warfarin 12mg is approximately equivalent to Phenindione 100mg

### 8.6.10.13 Compression stockings

Duration of compression stockings should be approximately two years. They are worn to stop thrombophlebitic syndrome. Refer patients to their GP or the originating referrer for further advice.

### 8.6.10.14 Clinical complications (other than overt bleeding)

Any patient with symptoms suggesting a repeat thrombosis must be referred to the Medical SHO 1st On-call for urgent clinical review.

If patients present with any signs of bruising and have an INR within their therapeutic range then refer them to their GP, as the cause should be investigated.

Some patients tend to bleed when their INR is at the upper end of their range. It may help to temporarily reduce the patients Warfarin dose so that their INR is at the lower end of their range. **However, remember that DAWN-AC will not make such changes automatically. Permanent changes to target range must be confirmed in writing by a clinician.**

The Haematology medical team is also available if Clinical advice is required.

### 8.6.11 Cardioversions

Procedures are in place to ensure patients are adequately anticoagulated for cardioversions and to ensure rapid anticoagulation following referral to the Rapid AF service.

1. The date of the cardioversion is to be supplied to the anticoagulation laboratory *in writing* prior to cardioversion

2. The date of the cardioversion will be transferred to the anticoagulation...
computer system and in addition, if the patient is not due for a test within the next fortnight their appointment will be brought forward.

3. Each patient due for a cardioversion will be seen weekly before the cardioversion takes place to achieve a stable therapeutic INR (aiming for 2.5-3.5), for 4 weeks before the procedure is to take place.

4. Following cardioversion, the patients’ records will be returned to their initial values and anticoagulation continued according to their primary diagnosis unless the clinic is informed in writing.

8.6.12 Review of short term therapy

Decisions regarding the duration of Anticoagulant therapy are under the remit of the referring medical staff not the Anticoagulant clinic.

8.6.12.1 Laboratory actions

Where a referral states that anticoagulation is to be maintained for a set period of time, as opposed to indefinitely, the laboratory staff will:

a) Approximately 1 month prior to the expected termination date of the therapy an “anticoagulation review” letter (termed a Duration letter) will be sent to the referring clinician and the patients registered G.P. informing them that the patients anticoagulation therapy is due to cease and that they should inform the clinic within 1 month if they desire the therapy to be continued beyond the original cessation date.

b) Approximately 1 month later (and never less than 1 month from the date on which the “anticoagulation review” letters were sent). The patients’ anticoagulant therapy will be terminated unless advice to the contrary has been received. If the clinic is requested to extend the period of anticoagulation then a further review letter will be sent 1 month prior to the newly stated expected termination date.

8.6.12.2 Anticoagulant Pharmacist / Doctor Actions

The letters file is checked for recent communication. If the patient is to stop, they can stop immediately, there is no requirement to tail off the doses.

Tell the patient to keep the book at home somewhere safe and not to throw it away.

If there is a clinical reason to doubt as to whether the patient should be discontinued, the
Pharmacist will maintain the patient on warfarin and write to the referring consultant for advice, documenting their decision on DAWN-AC.

**8.6.13 Anticoagulant Pharmacist Appointment/Dose Assessment chart**

A multi-centre randomised trial to compare the effectiveness of computerised dosage (using Dawn AC) with traditional (manual) dosage by medical staff in achieving target INR range concluded that the computer program gave better INR control than experienced medical staff.11

Therefore, any dose suggested by DAWN-AC should be considered to be the best option provided that there are no complications that cannot be factored into the automatic dose (E.g. clinical complications, medication changes).

Where other factors require consideration, the following algorithm may be applied but should not be regarded as over-riding clinical concerns.

Before assessing any dose, establish patient diagnosis and treatment range.
Maintain dose/appointment suggested by DAWN-AC unless external factors identified (E.g. surgery, admission to hospital, changes in medication, clinical indicators).

** See also Guidelines section 6.4 Management of over anticoagulation.
8.6.13.1 Patient Compliance Aid

### Anticoagulation Compliance Aid

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Hospital Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Dose</th>
<th>Tablets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The date of your next appointment is

Completed By: (Name)

Signature

Date
9 APPENDICES

9.1 Inpatient referral chart

<table>
<thead>
<tr>
<th>Date</th>
<th>Date</th>
<th>Discharged on</th>
<th>Name</th>
<th>Referral Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INSTRUCTIONS FOR USE**

Do not leave the form when completed and do not photocopy.

Use this form to document the anticoagulant advised to the patient during their inpatient stay. If this period is more than 28 days, please refer to the Anticoagulant Service.

Before discharge, this sheet must be completed and signed for the patient to be continued post-discharge. Do not use this form to document advice given during an outpatient appointment.

INSTRUCTIONS FOR USE

Do not leave the form when completed and do not photocopy.

Use this form to document the anticoagulant advised to the patient during their inpatient stay. If this period is more than 28 days, please refer to the Anticoagulant Service.

Before discharge, this sheet must be completed and signed for the patient to be continued post-discharge. Do not use this form to document advice given during an outpatient appointment.

FAILURE TO COMPLETE ALL SECTIONS OF THIS FORM MAY DELAY YOUR PATIENTS' DISCHARGE AS INCOMPLETE FORMS WILL BE RETURNED TO THE REFERRER.

**POLETS YOU SHOULD COVER BEFORE THE PATIENT IS REFERRED**

1. Patient must be advised of the need for anticoagulant therapy.
2. Patient must be advised of the need for anticoagulant therapy as prescribed.
3. Blood should be tested for the following:
   - INR (INR = 2-3)
   - Platelet count
   - Fibrinogen level
4. Patient should be advised of the need for anticoagulant therapy as prescribed.
5. Patient should be advised of the need for anticoagulant therapy as prescribed.
6. Patient should be advised of the need for anticoagulant therapy as prescribed.
7. Patient should be advised of the need for anticoagulant therapy as prescribed.
8. Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT INFORMATION**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**MEDICATION**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT HISTORY**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT TESTING**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT FOLLOW-UP**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT EDUCATION**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT OUTCOME**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT COMMUNICATION**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT FUNDING**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT SUPPORT**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT DOCUMENTATION**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT CONSULTATION**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT MANAGEMENT**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT SAFETY**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT OUTCOME**

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**PATIENT MANAGEMENT**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT SAFETY**

Patient should be advised of the need for anticoagulant therapy as prescribed.

**PATIENT OUTCOME**

Patient should be advised of the need for anticoagulant therapy as prescribed.
9.2 Outpatient referral chart

This form is for referrals for outpatient appointments to the Anticoagulant Service.

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INSTRUCTIONS FOR USE

Use this form for referrals to the outpatient clinics for initiation and monitoring of oral anticoagulant therapy.

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Please phone the Anticoagulant Clinic on 01702 385197 (5AM to 5PM Mon-Fri) to arrange your first appointment.

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CG250 Oral Anticoagulants and the Role of the Anticoagulant Service

Date of Issue: 7/7/11

Author: K. Oakley

Next review date: 7/7/13

Controlled document, do NOT print or photocopy.