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Oral anticoagulation management in primary care

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Aims and intended learning outcomes

In recent years there has been an expansion of clinical indications for oral anticoagulation therapy. This is largely due to its use for stroke prevention in patients with atrial fibrillation (AF).

This article aims to provide guidance on the essentials of setting up an oral anticoagulation clinic in primary care. As this represents a very significant, but potentially beneficial new practice, preparation is extremely important. Practitioners need to reacquaint themselves with blood clotting mechanisms and the indications for anticoagulant use as well as to study the risk factors involved in this treatment. By reading this article and completing the associated Time outs you should be able to:

- constructively explore your current knowledge regarding anticoagulant therapy and oral anti-coagulants
- re examine the underpinning physiology of blood coagulation
- identify the appropriate clinical indications for use of anticoagulants
- with reference to available local resources and readiness of staff, explore the practical steps necessary to set up a nurse-led primary care oral anticoagulant clinic
- identify the risk factors that can attend maintaining patients on anticoagulant treatment in the community.

It is estimated that there are approximately 950,000 patients taking warfarin in the UK and this represents around 1.5 per cent of the general practice population (IMS Health 1999). It has been calculated that to prevent one stroke per annum using warfarin as primary prevention in AF, 32 patients would require to be anticoagulated (Fitzmaurice

and Murray 2005). For patients who have had a previous stroke, 12 patients would require to be treated to prevent one further event. This compares very favourably with anti-hypertensive therapy and secondary prevention with statins where 100 and 150 patients need treatment to prevent one event (Fitzmaurice and Murray 2005).

The National Service Framework for Coronary Heart Disease (DH 2000) recommends warfarin therapy for preventing strokes in people with AF and as a result service requirements for anticoagulation monitoring are predicted to increase by a factor of five. This has already resulted in secondary care anticoagulation management coming under increasing strain (Sudlow *et al* 1995). This increase has heightened concerns over where and how warfarin monitoring should be undertaken (Taylor *et al* 1993), particularly outside laboratory analysis of international normalised ratio (INR) tests using point of care (POC) devices within primary care services. This issue has been particularly problematic for primary care, with lack of resources for monitoring and perceptions of inadequate expertise in anticoagulation care.

What are point of care devices

Point of care (POC) devices are defined as the performance of a diagnostic test outside the laboratory setting (Hobbs 1996). They range from simple urine dipsticks to sophisticated desktop analysers and are used by a large number of non-laboratory personnel including nurses, pharmacists, phlebotomists and more recently patients. They are also referred to as near patient testing (NPT) devices. POC tests for blood glucose and urine have been routine in general practice for many years and other POC tests for

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Summary

The article provides guidance on the essentials of setting up an oral coagulation clinic in primary care in response to the recent expansion of clinical indications for oral coagulation therapy

Key words

- Coronary heart disease
- Stroke
- Primary care

These key words are based on subject headings from the British Nursing Index. This article has been subject to double-blind review.

Online

For related articles visit our online archive at: www.paediatricnursing.co.uk and search using the key words above.

Time out 1

The need for primary care-based management of oral anticoagulant therapy is already here. We can represent the challenge ahead of us as an iceberg that we glimpse only the top of. Take an A3 size blank sheet of paper and sketch out your own iceberg showing the larger portion beneath the water surface. What within your local practice is the 'known' challenge; that which is needed regarding anti coagulation treatment as you understand it today? Add these notes to the visible iceberg on your sheet. What, in your opinion, may be the unknown challenge? Add these notes to the iceberg below the waterline. As you read on through this article, revise your notes appropriately, either adding points to your diagram or ticking those that were correctly anticipated.



Time out 2

Make a flow chart representing what you already understand about the physiology of blood coagulation. In the light of what you read here, what additional revision reading will you undertake now to ensure you have the fullest grasp of physiological factors affecting the use of anticoagulant use?



example pregnancy tests, haemoglobin, cholesterol, helicobacter pylori and INR tests are performed routinely in some practices.

It is important to recognise that any laboratory-based tests, whether POC or bench top analysers, are subject to some degree of error, pre analytical, analytical and post analytical. The quality of results obtained is influenced by many factors: appropriate sample collection and handling; selection of a suitable technique; maintenance of up-to-date standard operational procedures; adequate records and reporting system for results. For that reason quality control procedures should be in place when undertaking a laboratory procedure. Internal quality control (IQC) identifies the degree of precision of a particular technique and highlight any analytical error, precision being the degree of agreement amongst repeat measurements on one blood sample. A precise technique is not necessarily accurate however; accuracy being a measure of the closeness of an estimated value to the true value, and that is detected through an external quality assessment (EQA).

Now do Time out 1

Coagulation and anticoagulation

Plato thought that blood contained fibres that caused it to congeal when it left the warmth of

the body and became cooled (Jewett 1892). Two thousand years later an anatomist washed clotted blood to dislodge red particles and white fibrous strands that were later described by William Hewson as the liquid part of the blood we now call plasma (Gulliver 1846). In the 1930s Vitamin K was found to be an important component to the production of prothrombin (Factor II) (Quick 1943). It was discovered that there were at least five other coagulation factors also dependent on Vitamin K for their production (Davie and Ratnoff 1964). These were Factors VII, IX, X, Protein C and Protein S. Coagulation initiation has been described as occurring in two ways: the 'extrinsic' pathway with clotting dependent upon thromboplastin, and the 'intrinsic' pathway where exposure of blood to a negatively charged surface plasma protein activates factor XII rather than thromboplastin (Davie and Ratnoff 1964).

Now do Time out 2

The extrinsic or 'Tissue Factor' pathway is the primary pathway for the initiation of blood coagulation. The pathway is a series of reactions – serine protease (enzymes) and glycoproteins are activated in a cascading and amplifying fashion, cleaving other proteins at specific sites to ultimately result in a thrombin. Thrombin has a variety of functions but its primary role is the conversion of fibrinogen to fibrin, the building block of a haemostatic plug. There are regulatory mechanisms within the coagulation cascade that, first limit the amount of fibrin clot formed to avoid ischaemia of tissues, and second, localise clot formation to the site of tissue or vessel injury, thereby preventing widespread thrombosis, namely Protein C and S.

The extrinsic pathway along with the intrinsic pathway lead to a final common pathway and this is a convenient model for the understanding of clot formation and the use of laboratory investigations to monitor different aspects of coagulation. Recently it has become clear that this established model does not accurately represent what happens *in vivo*. The revised hypothesis of coagulation differs from the traditional waterfall theory in that it integrates all coagulation factors into a single pathway (Hirsh 1995) (Figure 1).

The activated partial thromboplastin time (APTT) measures the activity of the intrinsic system while the prothrombin time (PT) measures the activity of the extrinsic system. The modification of the PT to the INR is the familiar test for the purpose of monitoring oral anticoagulant therapy.

Haemostasis is essentially the fine balance between activators and inhibitors which control the production of the fibrin thrombus. One way

Figure 1. Final common pathway

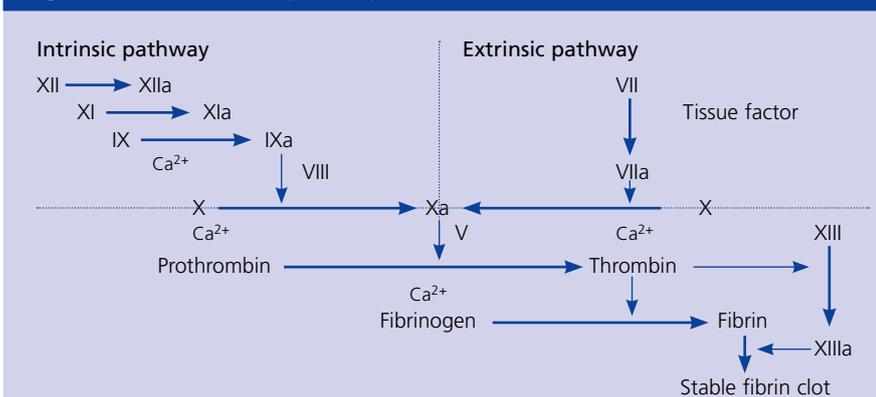


Table 1. Half-lives of the vitamin K dependent clotting factors

Factor	Half-life (9 hours)
II (prothrombin)	48-72
VII	2-6
IX	18-30
X	32-60
Protein C	6
Protein S	42

of interfering with this fine balance is by the use of warfarin therapy.

How do oral anticoagulants work?

Normal haemostasis involves interaction between blood vessels, platelets and coagulation factors and there is a fine balance between procoagulant and anticoagulant factors. Oral anticoagulants (also known as vitamin K antagonists) interfere with cyclical conversion of vitamin K to reduce the biological activity of clotting factors II, VII, IX and X and the anticoagulant proteins C and S. Because of this mechanism of action, the anticoagulant effects of warfarin can be overcome by small doses of vitamin K (Hirsh 1995).

Most patients on oral anticoagulation therapy receive warfarin in the UK and they are aware that the treatment 'thins the blood'. Other, less commonly prescribed, oral anticoagulants include phenindione and acenocoumarol.

The mean plasma half-life of warfarin is approximately 40 hours, and the duration of effect is two to five days. The antithrombotic effect of warfarin, or the inability to expand or form clots, depends on the clearance of functional factor II (prothrombin), which has a half-life of approximately 50 hours in patients with normal hepatic function. Thus, when warfarin treatment is started, or the dose is increased, up to five days pass before the full effects are present. However, the factor with the shortest half-life, factor VII, will be cleared first, but only when the levels of all the vitamin K dependent clotting factors have fallen to the new steady state level will the antithrombotic effect be fully developed. Table 1 shows the half-lives of the clotting factors.

With increasing numbers of patients receiving warfarin therapy the similar balance between the beneficial effects of preventing thromboembolism and the hazardous effects of excessive thinning of the blood needs to be borne in mind. Warfarin treatment requires careful monitoring and dose adjustment to avoid over- or under-anticoagulation.

Now do Time out 3

Table 2. BCSH guidelines

Target INR	Clinical indication
2.5	Pulmonary embolus
2.5	Proximal deep vein thrombosis
2.5	Calf vein thrombus
2.5	Recurrence of venous thromboembolism when no longer on warfarin therapy
3.5	Recurrence of venous thromboembolism while on warfarin therapy
2.5	Symptomatic inherited thrombophilia
3.5	Antiphospholipid syndrome
2.5	Non-rheumatic atrial fibrillation
2.5	Atrial fibrillation (AF) due to rheumatic heart disease, congenital heart disease, thyrotoxicosis
2.5	Cardioversion
2.5	Mural thrombus
3.5	Mechanical prosthetic heart valve

BCSH recommendations and therapeutic target INR

Guidelines for oral anticoagulation management have been formulated by the British Committee for Standards in Haematology (BCSH) of the British Society for Haematology (Baglin *et al* 2005). Table 2 summarises the conditions recommended for anticoagulation therapy and the therapeutic target INR.

Some of the evidence for the BCSH recommendations for anticoagulant therapy is covered here.

Non rheumatic atrial fibrillation

Atrial fibrillation as a risk factor for stroke was demonstrated in the Framingham Heart Study (Wolf *et al* 1991). A five-fold increase in stroke rate was identified in patients with atrial fibrillation (AF), which increases with age, such that 25 per cent of all strokes in those aged 80 to 89 were associated with AF. Furthermore, the rate of death was significantly raised and chronic disability higher in patients with AF having strokes than in those with sinus rhythm.

The BCSH recommendations for oral anticoagulation for patients with non-rheumatic AF are:

- Patients with no risk factors under the age of 65 to receive aspirin 300mgs daily, although currently 75mg is considered an adequate dose
- Patients with risk factors to receive warfarin to achieve a target INR of 2.5.
- Patients over 65 with additional risk factors should receive warfarin if there are no serious adverse risk factors (Baglin *et al* 2005).

Time out 3

To successfully support patients, we must encourage greater 'health literacy'. That is, patients need to understand anticoagulant treatment, how they can contribute to safe practice and why their co-operation is vital. But how far have you got with your explanations of anticoagulants and the importance of monitoring medication requirements? Discuss your summary of progress here with colleagues as part of preliminary thoughts about what clinic work will involve.



Time out 4

Think back to recent oral anticoagulant therapy that you have played a part in managing and identify the extent to which patients successfully achieved INR target values as recommended by BCSH. Where targets were not achieved, what influenced matters here? Some of these factors represent 'risks' to the patient, so add these to your iceberg diagram, either in the part where challenges are well understood or where more work has yet to be completed.

**Mechanical and bioprosthetic valves**

Patients with bioprosthetic valves in the aortic position need a maximum of three months anti-coagulation to achieve an INR of 2.5 as the value of subsequent oral anticoagulation is minimal (Peterseim *et al* 1999). However, for any patients with bioprosthetic valves who have AF, lifelong oral anticoagulation will be needed. Furthermore, patients who have had a history of systemic emboli or cardiac thrombus should also receive lifelong anticoagulation (Peterseim *et al* 1999).

For mechanical valves higher levels of anticoagulation have been routinely used. It has been suggested that the position of valve and the nature of the mechanical valve may have some bearing on the level of anticoagulant prophylaxis needed (Cannegieter *et al* 1995). The thrombotic risk is higher with mitral valve replacements, although more recent mechanical valves are likely to be of less risk than some of the more traditional older valves. Recommendations are for a target INR of 3.5 with lifelong duration for mechanical valves. This is based on results published in 1995 by Cannegieter demonstrating increased embolic events occurring with INR values less than 2.5, and increased haemorrhagic events occurring with INR values greater than 5. There is, however, a current trend for lower levels of anticoagulation in an attempt to reduce bleeding complications while maintaining the benefits of warfarin therapy (Baglin *et al* 2005).

Idiopathic venous thrombosis

Patients with deep vein thrombosis require anticoagulation to prevent extension and embolisation of clot, although the duration of therapy is debatable. The recommended duration of oral anticoagulation for proximal vein thrombosis is based on two studies. One study reported a recurrent rate of 0.6 per cent after four weeks oral anticoagulation compared to 0.9 per cent with three months oral anticoagulation (Levine *et al* 1995). The other study reported recurrence rates for DVT to be 18.1 per cent with six weeks anticoagulation compared to 9.5 per cent with six months anticoagulation (Schulman *et al* 1995).

Current recommendations are that an INR target value of 2.5 is indicated and oral anticoagulation should be continued for six months for patients with a proximal vein thrombosis. A further study compared the recurrence rate of patients with a first idiopathic venous thrombosis given three months oral anticoagulation followed by placebo compared to those receiving continuous warfarin. The recurrence rate was 27.4 per cent per patient year in those receiving three months' oral antico-

agulation compared to 1.3 per cent per patient year with continuous warfarin (Kearon *et al* 1999).

For patients with an obvious precipitating factor such as post-surgery, a shorter period of anticoagulation of three months is recommended. For patients in whom the post-surgical DVT is confined to the calf, six weeks treatment has been shown to be effective (Walker *et al* in press).

Now do Time out 4**Maintaining patients on anticoagulants – why it is important**

There is no 'standard' dose for warfarin; the dose for an individual is affected by age, co-existing diseases, diet, alcohol consumption, interacting drugs and concordance. There is also genetic variation in the ability to metabolise warfarin, but the effect of this is usually small in comparison to the other factors. Poor understanding of these factors or inadequate systems for monitoring the response to treatment can put patients at risk (NPSA 2006).

There were 600 patient safety incidents of harm or near harm reportedly associated with the use of anticoagulants in the UK between 1990 and 2002. Of these cases, 20 per cent (120) resulted in the death of the patient. During this period the Medical Defence Union (MDU) logged 79 reports of deaths due to warfarin, 60 of which occurred in primary care (NPSA 2006).

The most common causes for these incidents were inadequate laboratory monitoring and drug interactions involving non-steroidal anti-inflammatory drugs.

Monitoring anticoagulants – PT and INR

Monitoring anticoagulant therapy to maintain the therapeutic target for a specific condition requires regular blood analysis. The prothrombin time (PT) was the original test used to measure clotting times and uses a thromboplastin, an extract of tissue factor (TF), to accelerate the clotting time of recalcified plasma. A variety of sources of TF have been used to prepare thromboplastin including human, bovine and rabbit brain, human placenta and more recently recombinant human and rabbit preparations (Fitzmaurice and Murray 2005).

Each laboratory establishes a normal reference range for each reagent and technique employed, using samples from at least 20 healthy adults. From this, the geometric mean normal PT (MNPT) is calculated so that the prothrombin ratio (PR) may be calculated, thus $PR = \text{test PT} / \text{MNPT}$. It has long been recognised that there can be variability in PRs calculated in different laboratories using the same sample mostly due to which type of thromboplastin is used. This inconsistency could easily lead to the

incorrect dosing of patients with potentially life-threatening consequences and the INR was developed in the 1980s, in an attempt to standardise the PT for use in the control of long term oral anticoagulation. Each thromboplastin is assigned an International Sensitivity Index (ISI) by the manufacturers, which reflects the reagents' sensitivity to the reduced levels of factors II, VII. The INR is therefore calculated as $INR = (\text{patient PT}/\text{MNPT})^{ISI}$. When selecting your point of care device ensure that it offers the following parameters, excellent accuracy (low ISI) and precision (low CV), EQA scheme and positive MHRA/CEP evaluation.

Anticoagulation services in primary care

Due to the inherent risks of anticoagulation, its management is multifaceted in that as well as INR testing it also requires interpretation of the INR result by a clinician (whether it is within the target range set for the condition requiring anticoagulation), advice on the warfarin dosage (whether to increase or decrease the anticoagulant therapy) and finally management of the complications of therapy (bleeding or thrombotic events). Historically in the UK anticoagulation management has been undertaken mostly within hospital outpatient clinics under the care of haematology laboratories and consultant haematologists. However, in recent years there has been a degree of movement to models of care outside hospital services including management by the patient.

There is increasing evidence that specialised clinics within primary care, using POC devices to measure the INR and computerised decision support software (CDSS) for dosage and review advice, are able to achieve high standards of complete anticoagulation management with little input from the service laboratory (Fitzmaurice *et al* 2000). Specialised clinics have since been developed in the USA (Ansell 1998) and have endorsed findings of minimised risks when anticoagulation is monitored within specialised clinics (Rosendaal 1996).

CDSS utilisation

The traditional model of anticoagulant dosing has involved hospital clinicians altering the anticoagulant dose based upon the patient's INR result using no formal algorithm or mathematical equation.

A variety of simple algorithms have been developed to guide dosing, and some computer systems have simply incorporated these algorithms, while others are based upon mathematical equations.

Most computer programmes are rule-based; derived rules for adjusting the dose of warfarin are based upon questionnaires sent to hospital doctors. An equation was derived from the replies

received and the performance achieved using the computer-based equation compared with that achieved under the previous manual system. The algorithm used by any system forms the heart of CDSS for oral anticoagulation and enables dosing. Other facilities are often provided by the currently available systems:

- Consultation - the programmed algorithm is used to determine a new warfarin dose for the patient and to generate a suggested recall date based upon consensus opinion published in the British Haematological Society guidelines
- Audit – statistics that anticoagulation systems need to generate include: point prevalence, percentage time spent within range, percentage of visits in range and review frequency
- Other facilities – the ability to back-up and restore database files, add data for previous visits, allow amendment to target INR, importing data from practice systems and the management of clinics.

A variety of anticoagulation systems are in current use and each system has its advantages and disadvantages.

Planning a primary care service

With the introduction of practice-based commissioning (DH 2004) the government aimed to devolve appropriate services to a primary care setting in order to develop more locally-provided services and to reduce the number of outpatient referrals into secondary care. The delivery of primary care anticoagulation monitoring would provide seamless care between the primary/secondary care interface in that appropriate patients would receive continuing primary care with access to secondary care as necessary.

Anticoagulation monitoring is a national enhanced service (NES) that can be offered by GP practices that have adequate experience, training and competence in this field. The terms for delivery of this type of service have been set out by the British Medical Association and can be found at www.bma.org.uk/ap.nsf/Content/NESanticoagulation

Now do Time out 5

The 2006 Quality Framework indicators for AF (BMA 2006) include points for producing a register of AF patients, the number with confirmed diagnosis and the number treated with anticoagulant therapy. The success of implementing primary care anticoagulation services can be evaluated by evidence of reduction in secondary care activity, patient waiting times, improved access to services and improved patient choice.



Point of care device

Time out 5

Visit the BMA website to conduct a preliminary comparison of local practice and the requirements set out there for an enhanced service. What clinic opportunities appear possible as a result of this review? Does this help you to move some of the challenges from the unknown to the known part of your iceberg diagram?

Table 3: The seven pillars of governance

Consultation and patient involvement	Medical colleagues and patients are key stakeholders in any new clinic
Clinical risk assessment	Anticoagulant treatment involves inherent risks for patients and can threaten the reputation of nurse and GP practice
Clinical audit	Standards and parameters of practice, consultation and referral will have to be clearly set out
Research and effectiveness	Treatment and consulting practice will need to be research evidence-based
Staffing and staff management	Staffing will need to be equal to demand and demonstrate staffed by suitably prepared and qualified nurses
Education, training and development	Clinic practice will need to develop in line with best practice and agreed protocols
Use of information	Data will have to be secured and safely maintained

Time out 6

Working with primary care colleagues to prepare a robust protocol is an important undertaking and one requiring significant investment of time and inter-professional working. As you contemplate this work, what do you think may be the benefits of working on this project together? Why will this mutual understanding of need, risk and practice parameters be so important for any future nurse-led oral anticoagulant clinic?



Setting up the primary care service

While primary care protocols and operating procedures must address local circumstances, all should adhere to the seven pillars of governance (Table 3). In planning a clinic it is important to consider whether the objectives are:

- 1 Specific – Objectives should specify what they want to achieve.
- 2 Measurable – You should be able to measure whether you are meeting the objectives or not.
- 3 Achievable – Are the objectives you set achievable and attainable?
- 4 Realistic – Can you realistically achieve the objectives with the resources you have?
- 5 Time – When do you want to achieve the set objectives?

Establishing a clinic is necessarily a cautious and stepwise process. The incidence of risk associated with anticoagulant treatment, the vulnerable status of patients and the need to consider the resources and the reputation of GP practice where it is located, as well as the professional registration of the nurse, all highlight the need for careful consultation and judgement.

Step 1. Identify key personnel

It is important to identify key personnel who are stakeholders in the development of a successful and ethical new service. This includes health literate patient representatives, a named haematologist, specialist nurse, lead GP, lead practice nurse, laboratory representative, pharmacist and administrator. These stakeholders then contribute to:

Step 2. Production of a protocol for the clinic

The protocol will include the following:

- Aim of the clinic – who will benefit and to what extent?
- Objectives – measurable, with targets for success. These will cover such matters as: Identification of special needs, patient guid-

ance in specific circumstances such as dental treatment, patient education, arrangements for achieving and monitoring compliance with INR targets, means of monitoring patient access and satisfaction.

- Capacity – How many patients in target population, how many patients per clinic?
- Agreed scope of practice – The competence of the nurse will have to be assessed and some complex patient situations might not be referred to the nurse led clinic, for example:
 - Patients under 18 years of age
 - Patients with complex pathologies such as atypical systemic emboli, anything not listed under routine indications for warfarin
 - Domiciliary patients (practices will need to make a decision regarding patients requiring home visiting)
 - Patients choosing to continue with hospital/primary care
 - High risk patients referred back to secondary care after consultation with haematologist
 - Patients with warfarin intolerance.
- Indications for warfarin use and target INR – The indications and targets are taken from BCSH guidelines (Baglin *et al* 2005). Other targets may be requested from the British Society of Cardiology or British Thoracic Society and these may be acceptable for named patients after discussion with a designated clinician.
- Training for designated clinic staff – The clinic nurse(s) will require training in oral anticoagulation therapy and the associated tests and calculations relating to INR (such as the University of Birmingham courses www.anticoagulation.org.uk). They will need to demonstrate competence in the use of the selected POC device. Clinic nurses will need to demonstrate competence in the interpretation of test results, as measured against target INR and relating to the patient's diagnosis. Given the importance of such tests, and the correct administration of the right dosage of anticoagulant, precise record keeping and audit practices will have to be part of training as well. If clinic work extends to the prescribing of anticoagulants, then the appropriate training and recording of supplementary prescribing practice competence will also be required.
- Identification and referral of patients – It will be necessary to identify the means by which patients are selected for this clinic, and how referrals are made to or from the clinic to GP or other agencies. Because patients may be expected to move between primary and hospital care, there is real risk of clinic treatment

records becoming out of date, with potentially dangerous consequences. This aspect of preparation therefore mandates the most careful consideration and may benefit from the tracking of example or hypothetical patients through different pathways of care to identify what might become lost or confused en route.

Now do Time out 6

Step 3. Clinic preparation

The third step concerns practical measures designed to enable the clinic to work efficiently.

The nurse will need to allocate protected time each week for the clinic and inform stakeholder agencies of what is now in place. The selected nurse or nurses will undertake their required training, and all relevant testing equipment will be identified, reviewed, selected and established in the chosen location. Preparation for the clinic will include the following:

- A point of care (POC) device to estimate the INR
- Internal quality control procedures at the start of each clinic and after every 20 INR tests using material supplied by the manufacturer
- External quality control procedures every three months using samples from an external quality assessment scheme www.ukneqas.org.uk
- Computerised decision support software (CDSS) for dosage advice, documentation of patient details, review dates and audit procedures
- Adherence to health and safety procedures

recommended by laboratory staff to protect both the patient and clinical staff at all times

- Patient education material
- A template for counselling the patients regarding relevant medication changes and clinical events
- Patient handheld record cards.

In addition, the protocol should have agreed clinical guidelines for over anticoagulation, dental and pre-operative care and for managing new patients or initiating warfarin.

Conclusion

Oral anticoagulant therapy can play a major part in the management of a number of circulatory system difficulties, particularly in the prevention of stroke. Such treatment carries with it some significant risks, so if therapy is to be managed in the community, it is imperative that careful plans are laid. Key to this is the understanding when and how to adjust the dosage of anticoagulants so that the target INR is met and when to make timely referrals to other colleagues when clinical risks are apparent.

Nurses can and do play a lead part in this work. By liaising with medical colleagues, health literate patients and laboratory scientists it is possible to arrange clinics that make best use of nurses' talents and effective use of facilities within GP practices. Honest and diligent investigation of competence, confidence and capacity are important starting points ■

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- Write 'Practice Profile' at the top of your entry followed by your name, the title of the article, which is: 'Oral anticoagulation management in primary care ', and the article number, which is PHC792.
- Complete all of the requirements of the cut-out form provided and attach it securely to your practice profile. Failure to do so will mean that your practice profile cannot be considered for a certificate.
- You are entitled to unlimited free entries. Using an A4 envelope, send for your free assessment to: Practice Profile, RCN Publishing Company, Freepost PAM 10155, Harrow, Middlesex HA1 3BR by March 2008. Please do not staple your practice profile and cut-out slip – paper-clips are recommended. You can also email practice profiles to practiceprofile@rcnpublishing.co.uk. You must also provide the same information that is requested on the cut-out form. Type 'Practice Profile' in the email subject field to ensure you are sent a response confirming receipt.
- You will be informed in writing of your result. A certificate is awarded for successful completion of the practice profile.
- Feedback is not provided: a certificate indicates that you have been successful.
- Keep a copy of your practice profile and add this to your professional profile – copies are not returned to you.

1. Framework for reflection

- Study the checklist (section 3).
- What have I learnt from this article?
- To what extent were the intended learning outcomes met?
- What do I know, or can I do, now, that I did not/could not before reading the article?
- What can I apply immediately to my practice or client/patient care?
- Is there anything that I did not understand, need to explore or read about further, to clarify my understanding?

- What else do I need to do/know to extend my professional development in this area?
- What other needs have I identified in relation to my professional development?
- How might I achieve the above needs? (It might be helpful to convert these to short/medium/long-term goals and draw up an action plan.)

2. Examples of practice profile entries

Example 1 After reading a CPD article on 'Communication skills', Jenny, a practice nurse, reflects on her own communication skills and re-arranges her clinic room so that she will sit next to her patients when talking to them. She makes a conscious decision to pay attention to her own body language, posture and eye contact, and notices that communication with patients improves. This forms the basis of her practice profile.

Example 2 After reading a CPD article on 'Wound care', Amajit, a senior staff nurse on a surgical ward, approached the nurse manager about her concerns about wound infections on the ward. Following an audit which Amajit undertook, a protocol for dressing wounds was established which led to a reduction in wound infections in her ward and across the directorate. Amajit used this experience for her practice profile and is now taking part in a region-wide research project.

3. Portfolio submission

Checklist for submitting your practice profile

- ✓ Have you related your practice profile to the article?
- ✓ Have you headed your entry with: the title 'Practice Profile'; your name; the title of the article; and the article number?
- ✓ Have you written between 750 and 1,000 words?
- ✓ Have you kept a copy of the practice profile for your own portfolio?
- ✓ Have you completed the cut-out form and attached it to your entry?
- ✓ Have you indicated whether you would like your practice profile to be considered for publication?