Management of DVT in primary care
9 November 2012

Dear Practice

Midlands Health Network Ltd is pleased to release the GP DVT Treatment Pathway that builds on the successful GP DVT Diagnosis Pathway.

Attached is a copy of the GP DVT Diagnosis Pathway and GP DVT Treatment Pathway as a reference for you. I hope that with the support of funding DVT Treatment through Primary Options, more of your patients will receive this treatment in the community and avoid ED. I also hope the notes and algorithms answer all those questions you often have to ask when ED initiates DVT Treatment, and this will result in patients receiving better care.

Key areas to note are:

- The pathway has been activated with your practice earlier than others as you have access to the Primary Options programme – it will be fully rolled out from February 2013.
- The pathway will be at no cost to the patient after the initial consultation.
- Primary Options will fund our GP DVT Pathways in the following ways:
  - Enoxaparin administration - if there is a delay in access to a D-dimer result or scan
  - A single leg diagnostic ultrasound (bilateral ultrasounds if approved by Primary Options)
  - An extended GP consultation (30) when the patient returns to the GP to have the results of the USS explained and treatment initiated including Enoxaparin administration following diagnosis
  - An extended nurse consultation (30) where the patient is shown how to self administer Enoxaparin and/or the treatment pathway is fully explained.
- General practice will need to clearly instruct the patient and formally notify the radiology provider about where the patient goes after their USS. For example, will the patient return to their GP (or colleague), an A&M or ED for who will follow-up management if the USS is positive? This will depend on the time of day and capacity in general practice. We are recommending that A&M will initiate treatment when your practice cannot, and ED will be used only in exceptional circumstances.
- Weekday afterhours diagnostic ultrasounds are not available as there is Enoxaparin cover for a patient until the USS the next day.
- Weekend afterhours diagnostic ultrasounds can be accessed through Hamilton Radiology (if a callout is absolutely necessary), or through the Waikato Hospital Radiology registrar as explained in the DVT pathway clinical notes.
- Follow-up USS as per the Treatment Pathway algorithm should be accessed through the normal referral channels at Waikato Hospital as they are planned and non-urgent.

This is an exciting opportunity for primary care and our patients to have increased access to funded services that support evidence-based clinical management in the community.

If you have any questions, please do not hesitate to contact your practice liaison in the first instance, or Primary Options, 8348289 or email, infopriamryoptions@midlandshn.health.nz for issues regarding funding claims and organising USS.

Yours sincerely

Dr Damian Tomic
Medical Director
Midlands Health Network
1. Calculating pre-test probability

<table>
<thead>
<tr>
<th>Clinical Score from Wells et al NEJM 2003;349:1227</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active cancer (treatment ongoing or within 6 months)</td>
<td>1</td>
</tr>
<tr>
<td>Paralysis, paresis or recent plaster immobilization legs</td>
<td>1</td>
</tr>
<tr>
<td>Bedridden &gt;3 days or major surgery &lt;4 weeks</td>
<td>1</td>
</tr>
<tr>
<td>Localized tenderness in distribution of deep veins</td>
<td>1</td>
</tr>
<tr>
<td>Entire leg swollen</td>
<td>1</td>
</tr>
<tr>
<td>Calf swollen 3 cm &gt; other (10 cm below tibial tuberosity)</td>
<td>1</td>
</tr>
<tr>
<td>Pitting oedema in symptomatic leg only</td>
<td>1</td>
</tr>
<tr>
<td>Collateral superficial veins (non-varicose)</td>
<td>1</td>
</tr>
<tr>
<td>Previously documented DVT</td>
<td>1</td>
</tr>
<tr>
<td>Alternative diagnoses as likely or greater than DVT</td>
<td>-2</td>
</tr>
</tbody>
</table>

2. D-dimer

- D-dimer assay is available via all hospital and community laboratories.
- Office hours collection is available across the Waikato via all laboratories.
- 24 hr service is available via Waikato, Thames, Tokoroa, Te Kuiti and Taumarunui Hospitals and from Pathlab laboratories on an on call basis.
- Laboratory turn around time is <1 hr, but actual turn around is dependent on collection location. The test is stable for 24hrs so samples can be taken and stored overnight in the fridge if no immediate answer is necessary.
- Consideration should be given to providing enoxaparin protection to patients with a pre-test probability of 1 or less where clinical suspicion is high and there may be a delay of > 6 hours in accessing D-dimer.
- When a patient presents with a pre-test probability of two or more, refer straight to ultrasound in the first instance. In this scenario a D-dimer assay is ordered if the ultrasound is negative.

3. Assessment

If the pre-test probability is one or less and the D-dimer is negative, the risk of DVT is very low. If the patient develops progressive symptoms, reassess. All other patients require ultrasound.

Patients in whom DVT is excluded should be reviewed by their GP to consider other diagnoses.

<table>
<thead>
<tr>
<th>Pre-test probability</th>
<th>D-dimer</th>
<th>Ultrasound required?</th>
<th>Ultrasound result</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or less</td>
<td>-ve</td>
<td>No</td>
<td>Not applicable</td>
<td>Low risk DVT. Reassess prn</td>
</tr>
<tr>
<td>1 or less</td>
<td>+ve</td>
<td>Yes</td>
<td>Positive</td>
<td>Needs treatment. Refer ED.</td>
</tr>
<tr>
<td>1 or less</td>
<td>+ve</td>
<td>Yes</td>
<td>Negative</td>
<td>Reassess 1 week</td>
</tr>
<tr>
<td>2 or more</td>
<td>-ve</td>
<td>Yes</td>
<td>Negative</td>
<td>Reassess 1 week</td>
</tr>
<tr>
<td>2 or more</td>
<td>+ve</td>
<td>Yes</td>
<td>Negative</td>
<td>Rescan 1 week</td>
</tr>
<tr>
<td>2 or more</td>
<td>+ve</td>
<td>Yes</td>
<td>Positive</td>
<td>Needs treatment. Refer ED.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Week day/normal hours – Refer to any of the following</th>
<th>After 5pm Friday, All day Saturday, Sunday and Public Holidays.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamilton Radiology 07 839 4909/0800 426 723 Medimaging (Cambridge, Huntly, Hamilton) 07 834 0000 Tristram Vascular Ultrasound 07 838 1035 River Radiology 07 839 1800 Thames Hospital 07 868 3807 Waikato Hospital 07 839 8676 ask for on call radiology registrar to arrange appointment. Patient to take completed GP DVT Diagnostic Pathway referral form to Waikato Hospital ED reception who will advise radiology registrar that patient is waiting.</td>
<td></td>
</tr>
</tbody>
</table>

5. Enoxaparin

If ultrasound is indicated but will be delayed for more than 6 hours, or if the result of D-dimer will be delayed more than 6 hours and clinical suspicion is high, the patient should be given an initial dose of enoxaparin provided there are no contraindications.

Dose: 1.5 mg/kg subcutaneous once daily to a maximum of 180mg.

Obese, pregnant, patients with active cancer, the elderly, women less than 45kg, men < 57kg or creatinine clearance of < 30ml/min will need subsequent dosage adjustment should they be proven to have DVT and require treatment.

If in any doubt discuss with the Haematology consultant on call.

Absolute Contraindications to Enoxaparin: Refer Emergency Department

<table>
<thead>
<tr>
<th>Known adverse reaction</th>
<th>Relative contraindications: Contact on call haematologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent heparin induced thrombocytopenia</td>
<td>Angiodyplasia</td>
</tr>
<tr>
<td>Active bleeding</td>
<td>Thrombocytopenia (platelets 60-100)</td>
</tr>
<tr>
<td>Liver disease</td>
<td></td>
</tr>
<tr>
<td>Uncontrolled hypertension (diastolic&gt;110mmHg and/or systolic &gt; 200mmHg)</td>
<td></td>
</tr>
<tr>
<td>Recent eye (except cataract) or CNS surgery (&lt;1 month)</td>
<td></td>
</tr>
<tr>
<td>Recent haemorrhagic stroke (&lt;1month)</td>
<td></td>
</tr>
<tr>
<td>Thrombocytopenia (platelets&lt;60x10^9/l)</td>
<td></td>
</tr>
<tr>
<td>Significant compliance concerns</td>
<td></td>
</tr>
</tbody>
</table>
GP DVT DIAGNOSTIC PATHWAY

Full history & examination

Calculate pre-test probability (note 1)

Score ≤ 1
Score ≥ 2

D-dimer (note 2)
-ve

USS (note 4)

- Phone provider for appointment
- Give patient completed GP DVT Diagnostic Pathway referral form
- If > 6 hr wait give enoxaparin 1.5mg/kg (note 5)

Positive for DVT ? (note 3)

DVT diagnosed
Refer back to primary care
(note 6)
(see GP DVT treatment pathway 1)

- Patient advised re worsening signs/symptoms
- Review by GP
- Repeat USS at 1 week – use GP DVT Diagnostic Pathway referral form

Excluded from GP DVT Diagnostic Pathway
- ACC patients
- Pregnant patients
- Patients ≤4 weeks post partum (note 1)

NO

DVT excluded (note 3)
Review by GP

- Patient advised re worsening signs/symptoms
- Review by GP within 7 days
- Re-score & reapply algorithm

NO

+ve

-ve

+ve

JT 10/12
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USS confirms DVT

Is there evidence of Pulmonary Embolism? (note 7)

Yes → Admit to ED

No → Baseline bloods (FBC, renal, LFT, INR, APTT) (note 8)

Is the patient suitable for community treatment? (note 9)

Yes → Does the patient have active cancer or symptoms and signs suggesting undiagnosed cancer is present? (note 9)

No → FBC on day 6 if still on enoxaparin

1. Prescribe and administer enoxaparin daily until INR 2.0-3.0 on two days) (note 10)
2. Prescribe and start warfarin as per schedule at the same time (note 11)
3. Patient information and education (note 12)

Continue warfarin and INR testing as per protocol

Review patient at 3 months (see GP DVT treatment pathway 2)
Review patient at 3 months

Is a thrombophilia and/or LLAC screen needed? (note 14)

Yes

If positive DW haematologists

Is another USS needed? (note 15)

No

Pre-stop D-dimer

Yes

Second USS at 3 months

DVT resolution

Pre-stop D-dimer

Stop anticoagulation

Post-stop D-dimer at one month

Positive

DW Haematologist

DVT still present

Continue anticoagulation

Third USS in further 3 months

DVT still present or unchanged

Post-stop D-dimer at one month

Positive

DW Haematologist

Stop anticoagulation

Positive

DW Haematologist
Note 6
If you will not be available to see the patient with the result, please ensure the patient/ultrasonographer know who is covering you – ie another doctor at your practice or alternative surgery/A&M clinic after hours.

Note 7
Is there evidence of Pulmonary Embolism?
E.g. breathlessness and/or tachypnoeic > 20/min are major signs of PE; other symptoms can be pleuritic chest pain, dry cough, haemoptysis.

Note 8
Baseline bloods must be done before second dose of enoxaparin. FBC, renal, LFT, INR, APTT (EDTA, serum and citrate required).
Any abnormalities in these blood results should be discussed with a haematologist.

Note 9
Community DVT Treatment Exclusion Criteria: (admit ED)
- Children < 16 yrs of age.
- Pregnant women
- Patients with co-existent serious medical pathology (such as active cancer/see note below)
- Severe acute venous obstruction (phlegmasia cerulea dolens)
- Patients with uncontrolled pain
- Significant renal impairment (creatinine in excess of 200 micromol/L)
- Suspected problems with adherence to treatment (poor communication, age, mobility, distance from medical care, social circumstances, no telephone)
- Patients with active bleeding
- Patients at significant risk of bleeding e.g.
  - Previous significant bleed on warfarin.
  - Active peptic ulceration
  - Liver disease (INR > 2 sec beyond normal range)
  - Uncontrolled hypertension (diastolic > 110 mm Hg, systolic > 200 mm)
  - Angiodysplasia
  - Recent eye or CNS surgery (within one month)
  - Recent haemorrhagic stroke (within one month)
  - Thrombocytopenia (platelet count below 60 x 109/L)
  - Known heparin allergy or heparin-associated thrombocytopenia

If active cancer is present at time of DVT diagnosis please refer to hospital immediately for longterm LMWH, and do not give warfarin.

It is important to remember that DVT may be secondary to a serious medical cause such as cancer, especially in older patients presenting with DVT. If there is any clinical suspicion that this may be the case always carry out appropriate investigations, referring to secondary services should this be confirmed.

If in any doubt discuss with the haematology consultant on call.
Phlegmasia cerulea dolens presents as a large, swollen and painful leg which appears blue because of incipient venous infarction. It results from extensive thrombotic occlusion of the ilio-femoral veins. It may lead to tissue death (gangrene) and the need for amputation.

**Note 10**

Enoxaparin is given as a sc injection once a day. All patients can safely have an initial dose of enoxaparin of 1.5mg/kg to a maximum of 180mg. Check the platelet count, renal function, LFT, INR and APTT are normal before administering the subsequent doses of enoxaparin. Subsequent doses can also be given at 1.5mg/kg unless the creatinine clearance <30ml/minute. For these patients use 1mg/kg. If the patient is clinically obese (BMI>30) these patients should receive 1mg/kg bd.

Patients with active cancer should still receive their initial dose at 1.5mg/kg, and be referred to appropriate inpatient specialist team immediately after administration.

The elderly, women less than 45kg and men < 57kg will also require dose adjustment and you should discuss this with the haematologist on call

Enoxaparin is continued until the INR 2.0-3.0 on two consecutive days and has been given for at least 5 days (in practice this means one further dose of enoxaparin once the INR is 2.0-3.0)

It is not considered good medical practice for the patient to be treated with enoxaparin on a presumptive bases for more than 24 hours, as for many patients this would involve unnecessary treatment and an unacceptable degree of risk.

Remember to order a FBC on day 6 if still on enoxaparin.

**NB When administering enoxaparin initially before a diagnosis has been made, you must use the supply from Waikato Hospital Pharmacy and re-order using the form provided. This supply should not be used when treating a diagnosed DVT. For these patients a community prescription can be written after applying electronically for a special authority number.**

Your practice must be able to apply electronically for special authority numbers if you need to use the DVT Treatment Pathway.

When treating a DVT (treatment pathway 1) please note that the patient and clinician will decide where subsequent enoxaparin doses are administered; at the practice, by the patient, or through district nursing services (see Primary Options business rules).

**Note 11**

Prescribe total of 100 x 1mg tablets. Baseline INR will have been carried out. Initiate warfarin according to your practice policy or the inclosed protocol. The therapeutic range is 2-3. Beware of possible interactions especially amiodarone, tamoxifen, macrolide antibiotics and NSAIDS. A lower initial dose will usually be required (5mg) in the following circumstances; >70yrs, liver disease, frail, alcohol abuse, body weight<50kg, congestive heart failure, renal dysfunction, interacting medication known to potentiate warfarin.

Pregnant women should never take warfarin as it is teratogenic.

Please remember that there is no contraindication to breast feeding in women who are on warfarin. Warfarin is excreted into breast milk, but in negligible quantities, and does not increase the INR in the baby.

Please refer to warfarin initiation template

We have included a warfarin induction regime for your use.

**Note 12**

We have included patient resources covering an overview of DVT, warfarin, and enoxaparin self-administration.
Note 13

General Measures and Graduated Class 2 Compression Stockings

Rest may be helpful in the early stages of treatment and elevation of the leg (supported at the heel) when at rest may help reduce swelling.

☐ Simple analgesia may be indicated for discomfort and should be offered
☐ Early mobilisation is advised
☐ Encourage good hydration
☐ Avoid venous obstruction wherever possible and the patient is advised to avoid harm from constricted clothing

Class 2 below knee compression hosiery should be fitted as soon as possible after a DVT has been diagnosed if the patient can tolerate them. This is to reduce the incidence of post thrombotic syndrome. These can be accessed by sending a referral to the Waikato Hospital Orthotic Dept (see below).

In many patients as the blood clot is reabsorbed by the body the valves lining the deep veins are damaged. This can lead to abnormal reverse flow (reflux) in the deep veins. Over many years this can lead to high pressures in the veins around the ankle and lower calf. In some people this may lead to the development of leg ulcers and chronic venous insufficiency. This is called the post-thrombotic syndrome or post-phlebitic limb. This syndrome develops in about one third of patients with a first time proximal (in the larger veins, above the lower leg) DVT even with standard treatment. The post-thrombotic syndrome is likely to be much worse if blockages remain in the veins. The incidence of post-thrombotic syndrome can be reduced by wearing below knee graduated compression stockings (Kyrle and Eichinger, 2005).

Orthotic Department

Please fax the referral letter included with these documents to the Waikato Hospital Orthotic Dept as soon as possible after a diagnosis of DVT has been made. Their opening hours are Mon-Fri 8:30am -5pm. Their fax number is 07 834 1282. At present patients will need to travel to Waikato Hospital to access stockings. The orthotic dept will take appropriate measurements of the affected limb and ensure the compression stockings are well fitted. Patients should be advised to wear them during the day but to remove them at night. They should continue to wear them for a period of 2 years. The patient will be advised that the compression stockings will, under normal conditions, need to be replaced every 6 months in order to maintain the compression functionality.

Note 14

Consider thrombophilia and LLAC screen (lupus like anticoagulant) at the three month review. Thrombophilia screen-unprovoked DVT under 50 years of age, previous unprovoked DVT, or strong family history DVT (first degree relative. LLAC- No FH, previous thrombosis, other associated immune disorders, recurrent miscarriage

If a thrombophilia screen was taken on everyone, it would be expensive and have a very low pick up rate. There is the argument that the samples could just be frozen away for later analysis. This is also an expensive exercise and nearly always ends up in lots of testing being done early.

It is best to ensure patients are clinically assessed at 3 months.

If the Protein C and Protein S levels are < 20% on warfarin at three months then discuss with a haematologist the need to temporarily switching them to enoxaparin before retesting. Conversely if the levels are > 20% on warfarin you can assume there is no deficiency.

Note 15

Before stopping anticoagulation ALL above knee DVTs will need a further ultrasound at three months to check resolution especially if the above knee DVT was unprovoked.

NB this should be referred to Waikato Hospital Radiology on a normal referral form as funding only exists for private radiology providers to perform the initial diagnostic scan (this could mean two scans, please see diagnostic pathway).
DVT Patient Information Sheet

What is a Deep Vein Thrombosis (DVT)?
Deep Vein Thrombosis (DVT) is a blood clot that forms in a vein deep in the body. Most deep vein clots occur in the lower leg or thigh. It is important for GPs to diagnose a DVT, because if a piece of the clot breaks away it can travel through your blood stream to the lungs. This is called a pulmonary embolism (PE) and can cause serious health complications, even death.

Symptoms of DVT may include:
• Leg pain
• Leg swelling
• Redness or warmth in the leg

Investigation of DVT
If a DVT is suspected, your GPs may send you for a Doppler ultrasound of your leg. This is a painless procedure that examines the blood flow in the major veins of the leg by ultrasound. You may be given an injection of a blood thinner (Clexane) if they cannot get an ultrasound the same day. It is very important that you still attend your appointment the following day, even if you feel better.

Occasionally the ultrasound may need to be repeated 7-10 days later to be certain a clot hasn’t formed since the initial test.

What is the treatment for DVT?
If the ultrasound shows you have a DVT, you will need to be started on medication to thin your blood. This stops the clot enlarging and reduces the chance of having a clot go to your lungs (PE). Your GP will arrange for you to start on warfarin, which is a tablet that thins your blood. It is very important to take it every day and have regular monitoring. Your GP will give you further information about this. You will need to take the warfarin for at least three months, at which time your GP will review you and may arrange some further tests.

As it takes several days for warfarin to get to the right levels in your blood, your GP and practice nurse will arrange for you to have injections of a blood thinner called enoxaparin (clexane) until the levels are right.

What to look out for
• Increased pain or swelling in the affected leg
• Chest pain
• Shortness of breath
• Light headedness

If you experience any of the symptoms mentioned above or feel you are getting worse you MUST contact your GP immediately or go to the hospital if it is outside your GP’s opening hours.

GP name and phone:

Appointments:
What is warfarin?
Warfarin is a prescription medicine that helps stop the blood from clotting.
There are two brands of warfarin in New Zealand – Marevan® and Coumadin®. Both brands come in three different strengths.
Marevan® and Coumadin® are slightly different from each other so they are not inter-changeable. Therefore it is important that you always stick to the same brand.

Check with your pharmacist if:
- your tablets are different from usual (eg, a different colour, strength or brand)
- you are unsure about when to take your warfarin or what dose to take.

Why do you need warfarin?
You need warfarin because you either have, or may get, a blood clot. Clots can be harmful if they block the blood flow in an artery or vein.
A deep vein clot (often in the leg) is called a deep vein thrombosis or DVT. A clot in the lung is known as a pulmonary embolism or PE.
If your heart beats irregularly (atrial fibrillation or AF), the blood flow can be slowed and a clot can develop causing a stroke. Blood clots in the heart can cause a heart attack.
It is important that you tell your doctor if you have any heart, liver, stomach or bleeding problems before you start treatment with warfarin.

What makes clots more likely to happen?
- surgery
- sitting or lying in one position for a long time (eg, long flights or car journeys)
- major injuries or paralysis
- hormone replacement therapy (HRT)
- oral contraceptives (the Pill)
- smoking
- some inherited conditions
- cancer and its treatments
- pregnancy
- being overweight.

When should I take my tablets?
Take your tablets as one dose, once a day, at the same time every day.
Taking your tablets in the evening is best. This means when your blood test is due you can get the test done in the morning. (The test is usually done about 12 hours after taking a tablet.)
Some people find it hard to remember whether they have taken their tablet for the day. To help you keep track, mark each day on the calendar as you take your dose, or use a medication organiser.

Warfarin can be taken with or without food.

What if I forget a dose?
Take the missed dose as soon as you remember if it is on the same day. However if you do not remember until the following day, only take the dose you would take on that day, as you should never take more than one dose a day.

Tell your doctor about the missed dose
It is important to tell your doctor about a missed dose. Your doctor will need to take the missed dose into account when looking at your blood test results.

Having blood tests
You need to have regular blood tests while you are on warfarin. The blood test measures the speed of blood clotting or INR (International Normalised Ratio). Your INR should be between 2 and 4, depending on why you take warfarin.

Your doctor will tell you:
- what INR you should be aiming for
- what warfarin dose you need
- how often you need an INR blood test.
If you are in hospital, your blood will be tested there. When you are at home, your doctor will give you a blood testing form to take with you to the laboratory.
On the day of your blood test...

In the morning: have your blood test.
In the afternoon: ring your doctor or nurse for the result. They will tell you what dose to take until your next blood test. They will also tell you when your next blood test will be.
In the evening: take the dose and mark it off on the calendar.

How long will I need to take warfarin?
It depends on your condition. Your doctor will tell you how long you need to be on warfarin.

Tell your doctor and pharmacist if you are taking other medicines or alternative treatments
Other medicines, ‘over-the-counter’ medications or alternative treatments can change the way warfarin works. For example, some antibiotics and arthritis medications can increase the risk of bleeding.
A number of over-the-counter medicines sold in pharmacies and supermarkets can also interfere with the way warfarin works. This includes some types of pain relief. It is, however, safe to use paracetamol.
Be careful about alternative treatments. Even St John’s wort, gingko, ginseng, dong quai, cranberry juice and ginger can affect the way warfarin works.

It is very important to let your health professional know if you are taking any other medicines or alternative therapies.

When to seek medical advice
Call a doctor if you have:
• unusual bruising or bleeding
• fever, infection
• vomiting, diarrhoea
• unexplained pain
• loss of appetite for 2-3 days
• blood in urine or faeces (black bowel motions)
• changes to your skin (eg, a rash or itching)

Eat a balanced diet
Enjoy a variety of healthy foods. You don’t need to change your eating habits very much as large changes can interfere with warfarin treatment.
Try to avoid large changes in the amount of food you eat containing vitamin K. This vitamin can stop warfarin from working. Food containing vitamin K includes spinach, broccoli, lettuce, soya beans, cabbage, beef, liver, alfalfa, wheat bran and green tea. Before making any changes to your diet talk to your health professional.

Take care with alcohol
Have no more than two standard drinks a day.
A standard drink is:
• 300ml (one can) ordinary strength beer, or
• 60ml (2 singles) sherry or port, or
• 100ml (half a glass) table wine, or
• 30ml (single) of spirits.

More than 2 standard drinks per day can increase the risk of bleeding.

Pregnancy
Talk to your doctor if you take warfarin and think you might be pregnant, or if you want to have a baby.
Warfarin can cause birth defects if taken in pregnancy. Heparin, another medicine, may be used instead of warfarin.

Breastfeeding
Warfarin is considered safe to use when breastfeeding.

What do I need to know?
• Always tell your health practitioner (eg, your doctor, pharmacist, nurse, physiotherapist and dentist) that you take warfarin.
• Always tell your doctor and pharmacist about any medicines or alternative treatments that you are taking.
• Use a soft toothbrush if your gums bleed easily.
• Avoid activities where you might get hurt easily and bleed too much, eg, contact sports.
• Do not get new tattoos or piercings.

You can get more information from:
Your pharmacist and doctor, or the website:
www.medsafe.govt.nz

Checklist on discharge from hospital
- Warfarin book
- Discharge prescription
- Laboratory form for blood test
- You know what dose of warfarin to take
## Warfarin induction protocol for Waikato GP DVT pathway

### Induction protocol only

<table>
<thead>
<tr>
<th>Day</th>
<th>INR</th>
<th>Warfarin Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>* &lt; 1.2 (&gt;1.2)</td>
<td>5 mg (3 mg)</td>
</tr>
<tr>
<td>Day 2</td>
<td></td>
<td>5 mg (3 mg)</td>
</tr>
<tr>
<td>Day 3</td>
<td></td>
<td>5 mg (3 mg)</td>
</tr>
<tr>
<td>Day 4</td>
<td></td>
<td>5 mg (3 mg)</td>
</tr>
<tr>
<td>Day 5, if:</td>
<td>1.0-1.2</td>
<td>7 mg</td>
</tr>
<tr>
<td></td>
<td>1.3-1.5</td>
<td>5 mg</td>
</tr>
<tr>
<td></td>
<td>1.6-2.0</td>
<td>4 mg</td>
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<td></td>
<td>2.1-2.5</td>
<td>3 mg</td>
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<td></td>
<td>2.6-3.0</td>
<td>2.5 mg</td>
</tr>
<tr>
<td></td>
<td>3.1-3.5</td>
<td>2 mg</td>
</tr>
<tr>
<td></td>
<td>3.6-4.0</td>
<td>Miss one day, then 1.5 mg</td>
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<tr>
<td></td>
<td>&gt;4.0</td>
<td>Miss two days, then 1 mg</td>
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* If the baseline INR >1.2, abnormal LFT’s are present or a concurrent interacting drug prescribed, please use the 3 mg dose for the first 4 days.

### Monitoring

After day 5, repeat the INR frequently (every 1-2 days) until a stable INR is achieved (two consecutive INR’s within therapeutic range, with variation of < 0.3 INR).

Once the suggested stable warfarin dose is obtained, the warfarin dose should not be increased or decreased by > 20 % in the absence of abnormal LFT’s, interacting drugs, hypersensitivity to warfarin or presence of severe cardiac failure.

NB: To prevent the ‘ping pong’ effect of frequent dose alteration, it is recommended that trends be followed.

**Alteration of the warfarin dose is generally reflected by a change in INR result within 2-3 days.**
Administration of Clexane

For subcutaneous use: do not mix CLEXANE with other injections or solutions

**Subcutaneous injection technique**
Injection should be made preferably when the patient is reclining. CLEXANE is administered by deep subcutaneous injection. Injection of CLEXANE should be alternated between the left and right anterolateral abdominal wall using a different site for each injection. Do not expel the air bubble from the syringe before the injection to avoid the loss of drug. CLEXANE contains no antimicrobial agent and should be used only once and then discarded.

The needles on the pre-filled syringes of CLEXANE are covered in a silicon coating, to enable ease of penetration. Do not wipe the needle or allow CLEXANE solution to crystallise on the needle prior to use, as this will damage the silicon coating. A "dart" injection technique should be used to administer CLEXANE. Do not rub the injection site after administration.

**Pre-filled syringes**
The pre-filled disposable syringe is ready for immediate use. The whole length of the needle should be introduced vertically (at a 90° angle to the skin) into a skin fold gently held between the thumb and forefinger. The skin fold should be held throughout the duration of the injection.

**Graduated pre-filled syringes**
When using the 60 mg, 80 mg, 100 mg, 120 mg and 150 mg graduated prefilled syringes, the volume to be injected should be measured precisely according to the dosage recommended, without expelling the air bubble while adjusting dosage. If the dose required is exactly 60, 80, 100, 120 or 150 mg inject the full contents of the syringe. The whole length of the needle should be introduced vertically (at a 90° angle to the skin) into a skin fold gently held between the thumb and forefinger. The skin fold should be held throughout the duration of the injection.


Sponsor: Sanofi-Aventis New Zealand Limited
56 Cawley Street
Ellerslie, Auckland, New Zealand
Freecall No: 0800 280384
Waikato GP DVT Pathway

Enoxaparin (Clexane®) re-order form

Please fax this form to the Hospital Pharmacy 07 839 8769 to re-order more Clexane

Clexane strength:

<table>
<thead>
<tr>
<th>Date</th>
<th>Patient</th>
<th>Doctor</th>
<th>Dose</th>
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Patients receiving enoxaparin (Clexane®):

This supply is only to be used for doses given while waiting for diagnostic tests to be completed. Once a diagnosis has been made a special authority application should be made and a prescription written for both enoxaparin of the appropriate strength and warfarin 1mg tabs.
Initial Consultation Date/Time:

Patient Details
NHI:
Given name: Surname:
DOB: Sex: Ethnicity:
Address:
Day Ph: Alternate Ph: Mobile:

Referrer Details
GP Name: NZMC No:
Address:
Ph: Fax:
Patient's usual GP:

Referring GP signature:

For full GP DVT Diagnostic Pathway protocol details online refer to www.waikatodhb.govt.nz/GP.
DO NOT use this form if patient ACC, pregnant or up to 4 weeks post-partum. Follow normal referral process in these cases.

Modified Wells Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
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<tbody>
<tr>
<td>Active cancer (treatment in past 6/12 or palliative)</td>
<td>+1</td>
</tr>
<tr>
<td>Paralysis, paresis or recent plaster immobilisation of lower leg</td>
<td>+1</td>
</tr>
<tr>
<td>Recent immobilisation &gt; 3 days, or major surgery &lt; 12 weeks</td>
<td>+1</td>
</tr>
<tr>
<td>Localised tenderness along the distribution of the deep veins</td>
<td>+1</td>
</tr>
<tr>
<td>Calf swelling &gt; 3cm difference from asymptomatic side (Measure at 10cm below the tibial tuberosity)</td>
<td>+1</td>
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Total Score: Note: If score is 1 or less, order D-dimer (low risk); If score is 2 or more, refer for ultrasound (high risk).

Enoxaparin administered: Y / N (circle one)
Date administered: Dose: Time:

D-dimer Result
Date: Positive: Negative (Circle one)

Ultrasound Referral
Appt Date: Time: Place:

Please ultrasound right/left (Circle one) lower limb as per GP DVT Diagnostic Pathway protocol
First referral/Follow-up referral (Circle one) Note: Follow up USS at 1 week if Wells >=2 with USS neg and pos D-dimer

Ultrasound Result: Positive: Negative (Circle one)
Note: Please attach preliminary report if positive and refer to ED as per GP DVT Diagnostic Pathway protocol

Anglesea Clinical Exceptional Circumstances Referral refer for Enoxaparin administration if DVT suspected and > 6 hr wait for D-dimer or USS)
Note: Only to be used if GP unable to administer this themselves. i.e. under exceptional circumstances.
Please administer this patient Enoxaparin as per the GP DVT Diagnostic Pathway protocol provided there are no contraindications.
Date administered: Dose: Time:

ED Referral for confirmed DVT
This patient has a right / left (Circle one) deep vein thrombosis confirmed on ultrasound examination.
Thank you for further management as appropriate. Relevant additional clinical details overleaf.

Signed: (ULTRASOUND PROVIDER)
## Patient Details

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<th>Field</th>
<th>Details</th>
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<tr>
<td>NHI:</td>
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<tr>
<td>Given name:</td>
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<td>Day Ph:</td>
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<td>Alternate Ph:</td>
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## Referrer Details

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<td>GP Name:</td>
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<td>NZMC No:</td>
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<td>Address:</td>
<td></td>
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<td>Ph:</td>
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<td>Fax:</td>
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## Current Medications:

- [ ]
- [ ]
- [ ]

## Medication Alerts:

- [ ]
- [ ]
- [ ]

## Relevant Medical History:

*Particularly any contraindications to anticoagulant therapy*
Frequently Asked Questions (FAQs):

- Why this programme?
- Can I refer anyone I suspect of having a DVT through this programme?
- What will be funded under the programme?
- Will this community-based treatment cost more for my patient?
- How do I refer patients for this service?
- Do all patients need a D-dimer?
- How quickly can I get a D-dimer result?
- What if there is a delay in either getting the D-dimer or ultrasound result but I am clinically suspicious?
- What if the D-dimer result will be available, but only after I have finished for the day?
- Is the ultrasound free?
- Are ultrasounds available 7 days/week?
- What happens if the patient has a positive ultrasound?
- What if the patient has to have the ultrasound repeated in 1 week - i.e. Wells score 2 or more, ultrasound negative and D-dimer positive, or on review the clinical situation changes and they would now fulfil the access criteria?
- What if I have clinical concerns but the patient doesn’t fit the access criteria?
- If the ultrasound result is positive can I get enoxaparin or refer to Anglesea for enoxaparin for treatment?
- If I have questions, who do I speak to?
- In exceptional circumstances can I refer a patient with a suspected DVT to Anglesea clinic for enoxaparin administration?
- Where do I get enoxaparin from?
Answers:

**Why this programme?**
Patients with possible DVT who need an ultrasound as part of diagnosis, and who cannot afford to access this privately, need to go to Hospital Emergency Departments (ED). As well as being inconvenient for the patient in terms of travel and time, these patients are relatively low priority so often have lengthy waits simply to be assessed and then again for ultrasound. Some may have to return the next day for an ultrasound. This pilot will give direct access to funded ultrasounds via the radiology providers for all patients. Only patients with proven DVTs will need to attend ED. GP practices will also have supplies of enoxaparin (Clexane) provided by Waikato Hospital Pharmacy for patients who have a delay of more than 6 hours for ultrasound or D-dimer result.

The big difference between now and the pilot is patients no longer need to go to Anglesea Clinic if they require enoxaparin, as all GP practices in the Waikato DHB region will carry stock.

You remain responsible for the patient through the process. If you have any clinical concerns (irrespective of the Wells score) or are unsure about any aspect of management you must consult with the Emergency Department consultant (not registrar) on duty or refer the patient to ED.

**Can I refer anyone I suspect of having a DVT through this programme?**
ACC covered conditions are not included because they are covered by ACC funding.

Pregnant patients or those 4 or less weeks post partum are excluded. They require special management and should follow normal referral processes via specialist services.

All other patients can be included as long as they fit the criteria of the GP DVT Diagnostic Pathway.

If your patient does not fulfil criteria for ultrasound access but clinical suspicion remains high you must discuss the patient with the Emergency Department consultant (not registrar) on duty or refer the patient to ED.

**What will be funded under the pilot?**
Funding will cover the cost of ultrasound delivered by the radiology providers. Therefore the ultrasound is free for your patients. Funding does not cover general practice consultation fees or fees for patients presenting to Anglesea Clinic Accident and Medical as their first point of contact.

**Will this community-based treatment cost more for my patient?**
Patients included in this programme would previously have presented to their GP before referral to hospital, so would have been paying the cost of the first visit in any case. Ultrasound will be free to the patient.

**How do I refer patients for this service?**
You must use and complete the relevant sections of the specific GP DVT Diagnostic Pathway referral form, available in hardcopy with this pack, on Medtech as an electronic document, and printable from the WDHB website: [www.waikatodhb.govt.nz/GP](http://www.waikatodhb.govt.nz/GP) and Pinnacle Website: [www.pinnacle.org.nz/clinical/pmwiki.php?n=Main.Clprojects](http://www.pinnacle.org.nz/clinical/pmwiki.php?n=Main.Clprojects) under primary care management guidelines - DVT. Give the form to the patient to take to the next provider e.g. radiology or Anglesea Clinic Accident and Medical. As patients with a positive ultrasound result will be referred directly to ED from the ultrasound provider it is important that any relevant medications or past medical history are included in the appropriate portion of the referral form. Alternatively you can attach a copy of your consultation notes to the referral form.
Do all patients need a D-dimer?
Only those who score 1 or less on the Wells score at presentation need D-dimer as a first step. If the Wells score is 1 or less and the D-dimer is negative, the risk of DVT is very low and ultrasound is not indicated. Those who score 2 or more are high risk and should have an ultrasound. Those with a Wells score of 2 or more, who subsequently have a normal ultrasound, should have D-dimer after the ultrasound. If their D-dimer is positive they need a repeat ultrasound in 1 week to exclude the possibility of a developing DVT.

How quickly can I get a D-dimer result?
The test is available on an on-call basis 24 hours/day via all hospital and community laboratories. Pathlab. Laboratory turn around time is <1 hr, but actual turn around is dependent on collection location. The test is stable for 24hrs so samples can be taken and stored overnight in the fridge if no immediate answer is necessary.

What if there is a delay in getting either the D-dimer or ultrasound result but I am clinically suspicious?
When a patient has a pre-test probability of 1 or less and there may be a delay of more than 6 hours in receiving a D-dimer or ultrasound result, but clinical suspicion is high, you should give them the first dose of enoxaparin. Medtech has an electronic advanced form to record the giving of enoxaparin when using this pathway. Please look under Module-Advanced forms-New Forms. Form will write back all clinical details into consultation notes so no need for double entry.

What if the D-dimer result will be available, but only after I have finished for the day?
It is your responsibility to arrange for follow up of the result. It may be possible to enlist the assistance of Anglesea Clinic Accident and Medical in consultation with staff there.

Is the ultrasound free?
Yes - as long as patients fulfil the criteria and are referred using the specific GP DVT Diagnostic Pathway referral form.

Are ultrasounds available 7 days/week?
Ultrasounds are available during normal working hours 7 days/week. Please see document entitled “Access to Ultrasound” to look specifically at your area. At the weekend they are provided by Waikato Hospital radiology department, via the radiology on call registrar. See contact details on the GP DVT Diagnostic Pathway notes provided to you with this pack and also available on www.walkatodhb.govt.nz/GP under primary care management guidelines - DVT or on the Pinnacle website: (http://www.pinnacle.org.nz/clinical/pmwiki.php?n=Main.Clprojects) for Pinnacle members. Remember to give a single dose of Enoxaparin if there is going to be a delay of more than six hours in receiving an ultrasound result.
What happens if the patient has a positive ultrasound?
The private ultrasound providers will contact you while the patient is with them to inform you of the result. They will refer patients with positive ultrasounds directly to Waikato Hospital ED for treatment. You may like to inform your patient of this process before referral to ensure they understand what will happen if the ultrasound is positive for a DVT. Patients with normal ultrasounds will be asked to see you for review on the next working day, unless you advise differently.

Because contact with the referring GP may be practically difficult at the weekend, the Waikato Hospital radiology on call registrar will arrange for those with positive ultrasounds to go straight to ED for treatment and advise those with negative ultrasounds to see you for review the next working day. A formal report of the ultrasounds will come to you via the usual route.

What if patient has to have the ultrasound repeated in 1 week – i.e. Wells score 2 or more, ultrasound negative and D-dimer positive, or on review the clinical situation changes and they would now fulfil the access criteria?
The ultrasound will be funded as long as the patient is referred with an appropriately completed GP DVT Diagnostic Pathway referral form. If the initial Wells score is 2 or more with a negative ultrasound but positive D-dimer simply circle “follow up referral” in the ultrasounds referral section of the GP DVT Diagnostic Pathway referral form. All others need a repeat of the full assessment.

What if I have clinical concerns but the patient doesn’t fit the access criteria?
If the patient does not fulfil the criteria for ultrasound access but clinical suspicion remains high you must discuss with the Emergency Department consultant (not registrar) on duty or refer the patient to ED.

If the ultrasound result is positive, can I get enoxaparin or refer to Anglesea for enoxaparin for treatment?
No. Enoxaparin is only available through this pathway to cover those who will have a delay of more than 6 hrs for ultrasound or D-dimer result. **Any patient with a positive ultrasound must go directly to ED to commence treatment.**

If I have questions, who do I speak to?
Consult the Haematology consultant (not registrar) on call if the question is about enoxaparin, or ED consultant (not registrar) on duty if you have other clinical questions about a particular patient.

In exceptional circumstances can I refer a patient with a suspected DVT to Anglesea Clinic for enoxaparin administration?
Yes, but only under exceptional circumstances. **Patients must be referred using the GP DVT Pathway Referral Form if you decide to do this.** The intention is for general practices to administer the first dose of enoxaparin where there will be more than a six hour delay in either receiving an ultrasound result or d-dimer result in a patient where there is high clinical suspicion of DVT. All practices will be supplied with an enoxaparin administration kit and education around it’s administration.

Where do I get enoxaparin from?
All practices in the Waikato area will receive an enoxaparin administration kit from Waikato Hospital with a re-order form. This is because enoxaparin is only available on the community schedule for the treatment of established diagnosed DVT not whilst waiting for diagnosis.