### STEP 1
Determine pretest probability (two level Wells Criteria)

<table>
<thead>
<tr>
<th>Clinical Feature</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active cancer (treatment ongoing or within the previous 6 months or palliative)</td>
<td>1</td>
</tr>
<tr>
<td>Paralysis, paresis or recent plaster immobilization of the lower extremities</td>
<td>1</td>
</tr>
<tr>
<td>Recently bedridden for more than 3 days or major surgery, within the last 12 weeks</td>
<td>1</td>
</tr>
<tr>
<td>Localized tenderness along the distribution of the deep venous system</td>
<td>1</td>
</tr>
<tr>
<td>Entire lower limb swollen</td>
<td>1</td>
</tr>
<tr>
<td>Calf swelling by more than 3cm when compared to the asymptomatic leg (measured 10cm below the tibial tuberosity)</td>
<td>1</td>
</tr>
<tr>
<td>Pitting oedema (greater in the symptomatic leg)</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 diagnosis as likely or more likely than that of DVT</td>
<td>-2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DVT unlikely (1 or less)</th>
<th>DVT likely (2 or more)</th>
</tr>
</thead>
</table>

### STEP 2
Investigations

- **D dimer** (high or moderate sensitivity)
  - Apply age adjusted cut off if:
    - Age > 50
      - Age x 0.01ng/mL

**DVT unlikely**
- Negative

**DVT likely**
- Positive

**Ultrasound**
- Entire lower limb Doppler venous scan
- See note below re timing of scan and limitations of above knee only scans

**DVT excluded**
- Negative
- Consider alternative diagnosis

**DVT confirmed**
- Positive
- Go to Step 3 and DVT Management (next page)

### STEP 3
Additional investigations for proven DVT

#### Massive / Unprovoked or any recurrent DVT
- Assessment of contraindications to treatment
  - Assess bleeding risk
  - FBE / U+E / LFT / Coags

#### Malignancy screen
- History / Examination
- FBE / Ca++ / LFT / U/A / CXR
- Ensure age / sex appropriate cancer screening up to date
  - Mamrogram / PAP / prostate + PSA / FOB
  - If not refer to GP to arrange

#### Thrombophilia screen
- To be determined at DVT clinic follow up

#### Anatomical variants
- Consider investigation (eg. May Thurner)

### STEP 3
Additional investigations for proven DVT

#### Provoked DVT
- Assessment of contraindications to treatment
  - Assess bleeding risk – see note bottom left of page
  - FBE / U+E / LFT / Coags

#### Upper limb DVT with no intravascular device
- Brachial, axillary or subclavian veins
- Assessment of contraindications to treatment
  - Assess bleeding risk – see note bottom left of page
  - FBE / U+E / LFT / Coags
  - Consider CT venogram thoracic inlet (for cervical rib / fibrous band)

### **NOTES - timing of USS**
- If unable to perform ultrasound on the same day
  - DVT likely group - Treat with LMWH overnight and have patient return to ED the next morning (unless high bleeding risk – discuss with senior clinician)
  - DVT unlikely group - Do not treat and have patient return to ED the next morning

### **NOTES - D dimer exclusions**
- Do not do D dimer and proceed direct to ultrasound if:
  - Active cancer (<6/12 since therapy / palliative stage), DIC, obvious infection, inpatient (age >50), recent trauma or surgery <2/52 previously, third trimester of pregnancy, symptoms >7 days.

### **NOTES - timing of USS**
- If below knee component of whole lower limb USS not possible for technical reasons then further assessment / follow up is required:
  - Perform high sensitivity D dimer
  - D dimer negative then no further investigation for DVT required
  - D dimer positive then repeat proximal lower limb USS at one week
SCGH Emergency Department Superficial vein thrombosis (SVT)

Suspected SVT

Compression ultrasound to evaluate for DVT and assess extent of SVT

Confirmed SVT with associated DVT

Confirmed isolated SVT

1. ≤3cm from saphenofemoral junction

2. >3cm from saphenofemoral junction AND >5cm in length

3. >3cm from saphenofemoral junction AND <5cm in length

Treat as DVT
Go to Step 3 (page 1) and DVT Treatment (page 3)

Prophylactic dose
Enoxaparin (40mg od)
Rivaroxaban (10mg od)

Topical NSAIDs
(diclofenac 2-4g tds/QID)
or
Oral NSAIDs (ibuprofen/naproxen) for 7 days

If severe symptoms or risk factors for extension (see # page 3) consider treatment as per 2.

All patients treated with topical or systemic NSAIDs are also to be referred for HASS clinic follow up in one week

0730-2130hrs call - 0424 181 640
After hours eReferral - Haematology (HASS) attention Michaela Walters
In patients with superficial vein thrombosis and a contraindication to anticoagulation, anti-inflammatory medications (with follow up ultrasound scan in one week if there is worsening of symptoms or signs) is an alternative — see above.

## Treatment Options for DVT

Prior to commencing anticoagulation all patients require a full clinical assessment, FBE, U&E, LFTs & coags to assess for any contraindication to therapy.

<table>
<thead>
<tr>
<th>NOACs</th>
<th>LMWH</th>
<th>Warfarin</th>
<th>Catheter directed lysis</th>
<th>IVC filter</th>
</tr>
</thead>
</table>
| Choice of either: *Apixaban*  
*Rivaroxaban*  
*Dalteparin (not PBS listed as yet)*  
*Refer to HASS for follow up*  
*See WATAG 'Prescribing a NOAC' quick reference below*  
In oncology patients  
In patients with failed oral therapy  
Whilst starting warfarin  
Enoxaparin 1.5mg/kg daily or 1mg/kg bd (modify in renal impairment — see MR401/805.2)  
Dalteparin preferred in oncology patients (only commence with specialist advice)  
Caution: Renal impairment, high bleeding risk  
Contraindications: HITTs  
Refer to HASS for follow up* | *Consider as first line in patients with lupus anticoagulant  
CI to Rivaroxaban / Apixaban / Dalteparan  
Initiate whilst on LMWH  
See MR401/805.2 for commencement regimen  
Target INR 2-3 (if VTE whilst on warfarin aim 2.5-3.5)  
Caution: multiple, high bleeding risk  
Contraindications: Pregnancy, allergy  
Refer to HASS for follow up* | *Consider when iliofemoral DVT  
Symptomatic with symptoms less than 2 weeks  
Good functional status  
Life expectancy > 1 year  
Low bleeding risk  
Discuss with vascular surgery / interventional radiology* | *May be considered in those with:  
Acute DVT or PE who have a contraindication to anticoagulation. In this setting a conventional course of anticoagulation should be given if the risk of bleeding resolves  
Recurrent proximal DVT or PE despite adequate anticoagulation (alternate options such as LMWH or high intensity oral anticoagulant therapy should be explored prior to considering IVC filter)  
Remove filter when able to anticoagulate* |

### Notes

* Provoked DVT — occurring in a patient with an antecedent (within 3 months) and transient major clinical risk factor for VTE (e.g. Surgery / trauma / significant immobility (travel > 8 hours) / pregnancy or puerperium / HRT or OCP (transient if able to be stopped).

* In patients already on blood thinners a decision needs to be made whether symptoms are due to clot extension or post-thrombotic changes. If thought due to clot extension, intensification of Rx is required e.g. LMWH cover for 5 days and increase target INR.

* In patients with acute isolated distal DVT or calf muscle vein thrombosis without severe symptoms or risk factors for extension serial imaging over two weeks is an alternative to anticoagulant therapy. Anticoagulation should be initiated if there is evidence of thrombus extension, even if it remains confined to the distal veins.

* Risk factors for extension = positive D-dimer, clot >5cm in length, involves multiple veins, unprovoked, cancer, known thrombophilic disorder, history of VTE, HRT, pregnancy, recent surgery or trauma, inpatient admission, ongoing immobilisation.

* In patients with superficial vein thrombosis and a contraindication to anticoagulation, anti-inflammatory medications and compression stockings (with follow up ultrasound scan in one week if there is worsening of symptoms or signs) is an alternative - see above SVT Guideline.

$ HASS – Home anticoagulation support service. Contact on 0424 181 640 between 0730-2130 or after hours send eReferral (Haematology (HASS)) attention Michaela Walters
**Adapted from WATAG ‘Prescribing a NOAC’ quick reference – www.watag.org.au**

**Dabigatran (Pradaxa)**
- Treatment or prevention of recurrent DVT/PE
  - $\text{CrCl} \geq 50\text{ml/min}$ – 150mg bd
  - $\text{CrCl} 30\text{-}49\text{ml/min}$ or $\geq 75\text{yrs}$ – 110mg bd

**Apixaban (Eliquis)**
- Treatment of recurrent DVT/PE
  - $\text{CrCL} > 25\text{ml/min}$ – 10mg bd for first 7 days then 5mg bd thereafter

**Rivaroxaban (Xarelto)**
- Treatment or prevention of recurrent DVT/PE
  - $\text{CrCL} \geq 30\text{ml/min}$ 15mg bd for 3 weeks then 20mg od thereafter

**EXCLUSION Criteria:**
- Known hypersensitivity to NOAC preparation
- Active significant bleeding
- Pregnant or breastfeeding
- Atrial Fibrillation: prosthetic heart valve, valve repair or stenosis
- Recent stroke

**Bleeding Risk CONTRAINDICATIONS:**
- Disorder of haemostasis e.g. Von Willebrand disease or coagulation factor deficiency
- Recent surgery ≤ 1 month ago (except VTE prophylaxis following elective hip or knee surgery)
- GI bleed ≤ 12 months, ulcer ≤ 30 days
- Skin ulcer ≤ 30 days ago
- Fibrinolytic treatment last 10 days
- Dual antiplatelet therapy

**Lab CONTRAINDICATIONS:**
- Poor renal function (dabigatran, rivaroxaban $\text{CrCl} < 30\text{ mL/min}$, apixaban: $<25\text{ mL/min}$)
- Liver disease (e.g. ALT > 2x upper limit of normal)

**CONTRAINDICATED concomitant medications:**
- Dabigatran:
  - Systemic azole antifungals (except fluconazole)
  - dronedarone
  - cyclosporin and tacrolimus
  - HIV-protease inhibitors e.g. ritonavir
- Rivaroxaban / apixaban:
  - Systemic azole antifungals (except fluconazole)
  - HIV-protease inhibitors e.g. ritonavir

Prior to NOAC initiation:
- Record: FBC, renal and liver function
- Take detailed history:
  - Ensure patient doesn’t have any exclusion criteria
- Assess bleeding risk
- Consider concomitant medications
- If the patient is on warfarin:
  - Discontinue warfarin and start NOAC when INR is 2.0 or less
THROMBOSIS EMERGENCY DEPARTMENT DISCHARGE LETTER

Date: ______________

Dear Doctor / patient

This patient was seen in the Emergency Department at Sir Charles Gairdner Hospital and has been diagnosed with a (circle):

- Deep Venous Thrombosis (DVT)
- Superficial Vein Thrombosis (SVT)

Our emergency department has diagnosed the event as a (circle):

- Provoked
- Unprovoked

DVT involving the following veins of the _____________________________________________

- Iliac
- Femoral
- Popliteal
- Posterior tibial
- Fibula
- Other ______________________________________________________________________

**DVT MANAGEMENT**

SCGH ED HAS COMMENCED (authority code is required on the discharge script):

- **Apixaban** 10mg (2x5mg) twice a day for 7 days (Streamline authority code 4098 (initial treatment) / Quantity 28 x 5mg tablets) - *Script provided by SCGH ED*
  - From day 8 the dose must be reduced to Apixaban 5mg twice a day - *Script to be obtained from GP*

OR

- **Rivaroxaban** 15mg twice a day for 21 days (Streamline authority code 4098 (initial treatment) / Quantity 42 x 15mg tablets) - *Script provided by SCGH ED*
  - From day 22 the dose must be changed to Rivaroxaban 20mg once a day - *Script to be obtained from GP*  
  - **NOTE - This medication must be taken with food**

OR

- **Warfarin** dose titrated to target INR 2.5 (2.0-3.0) with therapeutic **Enoxaparin** (Clexane) bridging until INR >2.0 - *This will be supervised by HASS*
  - Therapeutic **Enoxaparin** bridging dose of: _____________ once a day / twice a day (circle)
  - Patient Weight ________ kg
It is important that your medication is taken as prescribed for a minimum of ____________ (see DVT management page) unless directed by your GP or another hospital physician.

**SVT MANAGEMENT**

OR

□ **Enoxaparin** (preferred option) injection dose of: ________________ once a day
  
  Patient Weight ________ kg

OR

□ With Specialist advice
  **Dalteparin** injection dose of: ________________ for 30 days loading
  
  From day 31 the dose must be changed to a step down dose to be arranged by the patient’s specialty team
  
  (stock must be obtained from SCGH hospital pharmacy)
  
  Patient Weight ________ kg

Baseline blood results included the following levels:

- Creatinine: ______
- Platelet count: ______
- Haemoglobin: ______
- ALT: ______
- Bilirubin: ______
- Albumin: ______

We would ask that your GP please repeat these levels in 3 months
Additional Information

☐ A referral has been made to the Home Anticoagulation Support Service (HASS) here at SCGH who will contact you in the upcoming days. They can also be contacted on the phone number provided above should you have any queries.

☐ A referral has been made for a Specialist Haematology Outpatient Clinic at SCGH (for unprovoked or recurrent proximal DVT or unprovoked AND recurrent below knee DVT). You should receive a notification for this appointment by mail. If so please attend the clinic as directed or call the provided number (on the appointment notification) to reschedule the time.

☐ A referral has been made for your treating Specialist Oncology service (known oncology patients referred to own team). You should receive notification for this appointment by either phone or mail. If so please attend the clinic as directed or call the provided number (on the appointment notification) to reschedule the time.

☐ You will need to follow up with your General Practitioner for ongoing management and further prescriptions as above.

Kind regards

Treating Physician: ________________________
Sir Charles Gairdner Hospital
Emergency Department
References

• National Institute for Health and Care Excellence. NICE Pathways. www.nice.org.uk/pathways/venous-thromboembolism
• Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: Chest Evidence Based Clinical Practice Guidelines
• Baglin et al. Duration of anticoagulation therapy after a first episode of an unprovoked pulmonary embolus or deep venous thrombosis: Guidance from the SSC of the ISTH. Journal of Thrombosis and Haemostasis; 10:698-702
• Thrombosis Canada 2017. Superficial Thrombophlebitis, Superficial Vein Thrombosis.

Guideline designed by:
• Dr Richard Hay and Dr James Rippey (Emergency Physicians SCGH) in collaboration with;
• Dr Carolyn Grove (Haematologist SCGH)
• Michaela Walters (Anticoagulation Nurse Practitioner SCGH)
• Mr Stefan Ponosh (Vascular Surgeon SCGH)