Emergency Department Deep Venous Thrombosis Management

STEP 1
Determine pretest probability (two level Wells Criteria)

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

DVT unlikely (1 or less) ☐ **DVT likely** (2 or more) ☐

NOTES – Assessment of bleeding risk

Bleeding Risk - HAS-BLED score (Validated for AF)

1 point for each; high risk = 3 or more (3.74% / yr bleed); (2 = 1.88% / yr bleed)

- Uncontrolled hypertension (SBP>160)
- Impaired renal function (Cr>200)
- Impaired liver function (ALT/ALP>3x normal)
- History of stroke
- History of major bleeding
- Labile INRs
- Elderly (>65 years)
- Drugs (NSAIDS or Antiplatelets) 1 point each
- Alcohol consumption (>8 std/week)

Additional high risk factors for bleeding

- Recent surgery / trauma (discuss with surgical team)
- Active GI disease
- Inherited or acquired bleeding disorder

STEP 2
Investigations

DVT unlikely (1 or less) ☐

DVT likely (2 or more) ☐

***D dimer**
(high or moderate sensitivity)

Apply age adjusted cut off if:
Age > 50

Age x 0.01ng/mL

Negative

Positive

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

Negative

Positive

DVT excluded
consider alternative diagnosis

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

*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.

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
  - Mammogram / 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)

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

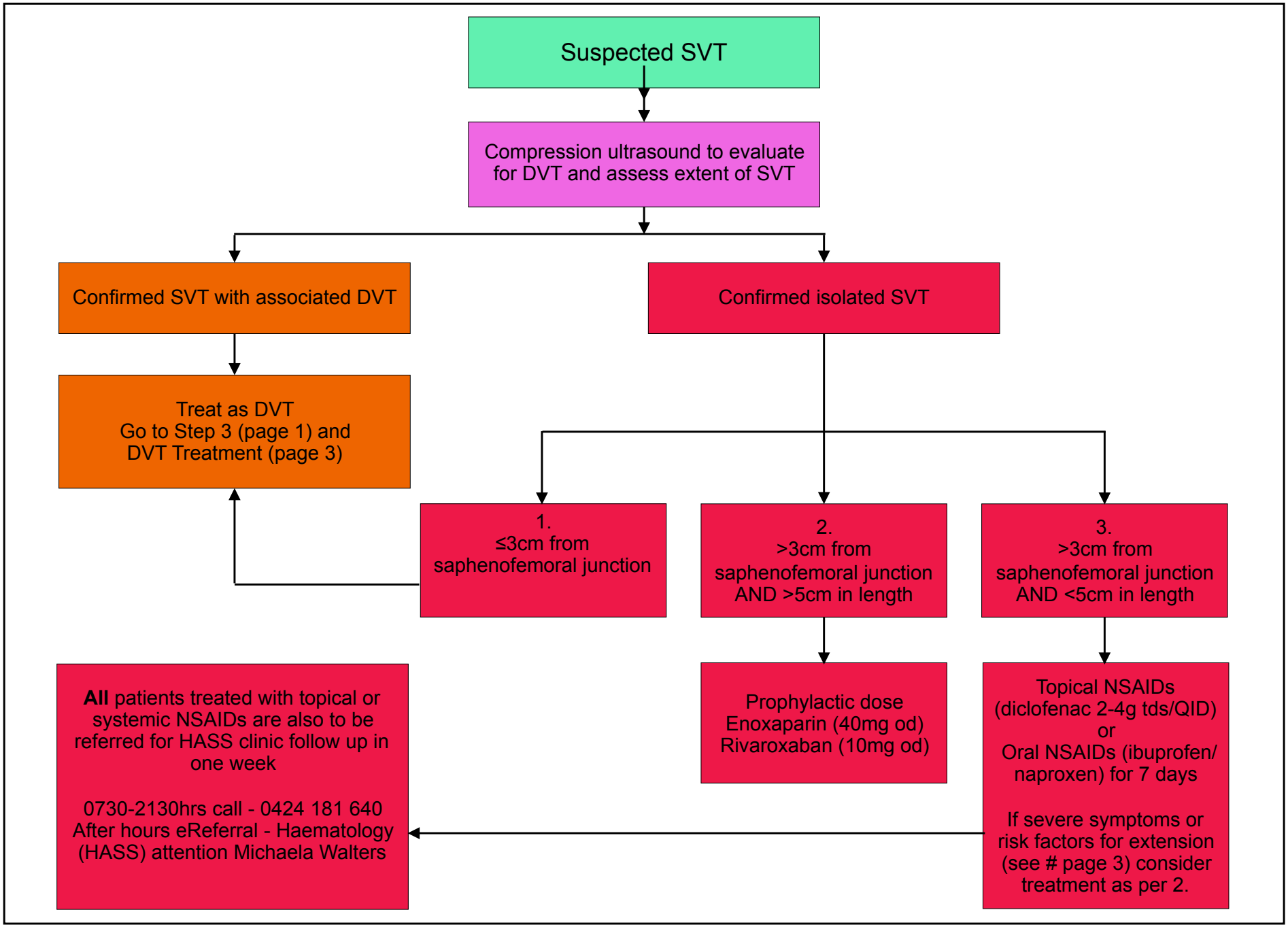
DVT likely group - Treat with LMWH overnight and have patient return to ED the next morning (unless high bleeding risk – discuss with senior clinician)
DVT unlikely group - Do not treat and have patient return to ED the next morning

For DVT Likely group

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)



SCGH Emergency Department - Adult Deep Venous Thrombosis Treatment

Thrombus location / type	Massive DVT • Iliofemoral • +/- IVC	Proximal DVT • Unprovoked or recurrent * Below knee DVT • Unprovoked and recurrent	Proximal DVT • Provoked +	Below knee DVT# • Provoked or first unprovoked	Calf muscle vein thrombus#	Superficial vein thrombus • not associated with IV infusions or co-existent DVT)	Upper limb DVT • No intravascular device • Basilic, brachial, axillary or subclavian	Upper limb DVT Intravascular device present • Basilic, brachial, axillary or subclavian • See CCRVT Guideline form
Disposition	Admit	Discharge if good social support	Discharge if good social support	Discharge	Discharge	Discharge	Discharge	Discharge
Referral **•ALL TREATED PTS TO HASS$**	Vascular review if phlegmasia eReferral to DVT clinic (refer oncology pts to own team) **HASS**	eReferral to DVT clinic (refer oncology pts to own team) **HASS**	GP **HASS**	GP **HASS**	GP **HASS - both treated and untreated**	GP Discuss with Vascular if post varicose vein surgery **HASS - both treated and untreated**	Vascular **HASS**	Own team **HASS**
Anti-coagulation	3 months minimum (ongoing Rx to be determined at DVT clinic follow up)	3 months minimum (ongoing Rx to be determined at DVT clinic follow up)	3 months	3 months #	45 days NOAC or LMWH (unless contraindication) #	**See SVT Guideline algorithm above** 45 days prophylactic dose LMWH or Rivaroxaban (unless contraindication) ^	3 months	Until device is removed and then for 3 months (If device required, patent, correct position and not infected leave and use)
Below knee stockings	Offer HASS will arrange	Offer HASS will arrange	Offer HASS will arrange	Offer if symptomatic HASS will arrange	No	No (if anticoagulated)	No	No

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

NOACs	LMWH	Warfarin	Catheter directed lysis	IVC filter
Choice of either •Apixaban •Rivaroxaban •Dabigatran (not PBS listed as yet) **•Refer to HASS for follow up** •See WATAG 'Prescribing a NOAC' quick reference below •For more detailed information see Clinical Excellence Commission NOAC Guideline http://www.cec.health.nsw.gov.au/patient-safety-programs/medication-safety/high-risk-medicines/anticoagulants	• In pregnant/breast feeding patients • 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 / Dabigatran • 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 (eg. 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**

WATAG 'Prescribing a NOAC' quick reference

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

Prior to NOAC initiation:
Record: FBC, renal and liver function

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

Take detailed history:
Ensure patient doesn't have any exclusion criteria

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

Assess bleeding risk

Consider concomitant medications

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

If the patient is on warfarin:
Discontinue warfarin and start NOAC when INR is 2.0 or less

Dabigatran (Pradaxa)

Treatment or prevention of recurrent DVT/PE

•CrCl ≥ 50ml/min – 150mg bd
•CrCl 30-49ml/min or ≥ 75yrs – 110mg bd

Apixaban (Eliquis)

Treatment of recurrent DVT/PE

•CrCL > 25ml/min – 10mg bd for first 7 days then 5mg bd thereafter

Rivaroxaban (Xarelto)

Treatment or prevention of recurrent DVT/PE

•CrCl ≥ 30ml/min 15mg bd for 3 weeks then 20mg od thereafter

Adapted from WATAG 'Prescribing a NOAC' quick reference – www.watag.org.au

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Department of **Health**
North Metropolitan Area Health Service

Sir Charles Gairdner Hospital
DEPARTMENT OF EMERGENCY MEDICINE
"SUPPORTING THE COMMUNITY IN A TIME OF NEED"

PATIENT LABEL

Home Anticoagulation Support Service (HASS)
Sir Charles Gairdner Hospital
Nedlands, WA 6009
Tel: 0424181640
Fax: (08) 64574731

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

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OR

☐ **Enoxaparin** injection dose of: _____ once a day / twice a day (circle)

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

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

☐ **Enoxaparin** (preferred option) injection dose of: _____ once a day

Patient Weight _____ kg

OR

☐ **Rivaroxaban** dose of: _____ once a day **(as non PBS script)**

It is important that your medication is taken as prescribed for a minimum of _____ (see DVT/SVT management page) unless directed by your GP or another hospital physician.

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

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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

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