Health and Social Care Committee
One-day inquiry into venous thrombo-embolism prevention
VTE 3 – Velindre NHS Trust - Velindre Cancer Centre

Velindre Cancer Centre
Canolfan Ganser Felindre

HAT Velindre Working Group

Velindre NHS Trust - Velindre Cancer Centre

Response to the Welsh Assembly Government Health and Social Care Committee: call for evidence on venous thrombo-embolism prevention

The Velindre Cancer Centre (VCC) 'Hospital Acquired Thrombosis (HAT) Working Group' was formed in June 2010 in response to the 1000 Lives Plus aim to reduce the risk of inpatients developing HAT. The working group is multidisciplinary and meets quarterly to review all aspects of Velindre's commitment to reducing the risk of venous thrombo-embolism (VTE) in patients admitted to VCC.

The VCC HAT Working Group's role is to develop and oversee the implementation of guidelines for both the prevention and treatment of hospital associated venous thromboembolism within the trust.

Key contacts for this group are:

- Usman Malik, Principal Pharmacist
- Carol Jordan, Clinical Change Facilitator
- Dr Rosie Stevens, Consultant Clinical Oncologist

Background

As the largest non surgical cancer centre in Wales, Velindre recognises the particular risks and challenges of VTE that faces patients with cancer. In addition to hospitalisation increasing the risk of VTE, our patient group have an increased risk due to the cancer itself, the use of cancer treatments such as chemotherapy and radiotherapy and complications of the cancer such as spinal cord compression. Also population data demonstrates that the presence of a VTE in cancer patients worsens their prognosis and shortens long time survival. The treatment of VTE in cancer patients is also more complicated (and expensive) than in non cancer patients with an increase rate of

recurrent thrombosis and bleeding complications when compared to the general population. For this reason, the prevention of VTE is of utmost importance.

The nationally agreed Risk Assessment Tool (RAT) risk stratifies all non-ambulant inpatients; if an inpatient is over 60 year then they are considered high risk and would warrant thromboprophylaxis. Those inpatients who are under 60 years are risk assessed to ascertain whether they are classified as high enough risk to warrant thromboprophylaxis. As one of the risk categories for patients under 60 year is either having cancer or being on cancer treatments, effectively all Velindre non-ambulant inpatients would be classed as high risk and would therefore require thromboprophylaxis provided there are no contra-indications to treatment.

The treatment of choice at Velindre Cancer Centre (VCC) is dalteparin as this is the one heparin agent which has good evidence and is licensed for patients with solid tumours.

Implementation of NICE Guidance

NICE clinical guideline 92 'Venous thrombo-embolism: reducing the risk' published in January 2012 forms the basis of the work streams of the VCC HAT Working Group. These include:

- assessing the risks of VTE and bleeding
- reducing the risk of VTE
- outcome measurement
- patient information and planning for discharge

VCC Risk Assessment Tool

In January 2011, Velindre cancer centre adopted the All Wales Risk Assessment Tool (RAT – appendix 1) and implemented the tool onto the three wards. In July 2011, after feedback from the junior medical staff, the RAT was then redesigned to make it more user friendly, the intention being a higher usage uptake. Finally in September 2011, Velindre started to pilot a standard clerking proforma, and incorporated into this was the HAT RAT (appendix 2). The main advantage of this is that the HAT RAT is more visible at the point of clerking.

Nurses on each ward with designated responsibility for patient safety (Patient Safety Champions) routinely assess compliance with the risk assessment tool and results are reported to the HAT working Group and local Quality and Safety Committee.

Prophylaxis guidelines have been produced to compliment the risk assessment tool and are provided in appendix 3 of this document.

Process measurement

As part of our ongoing monthly audit of our practice, the Patient Safety Champions are collecting measurements to ensure that we maintain the high standards we have achieved to date, namely:

- Compliance rates with our RAT
- Percentage of high risk patients being prescribed appropriate prophylaxis

The graphs below show our current compliance with the two measurements:

In figure 1 it is clear that risk assessment compliance dropped in January 2012, the patient safety champions were asked to investigate why this may have happened.

A new rotation of junior medical staff are introduced to the hospital in January. It is their responsibility to complete the risk assessment when the patient is admitted to hospital. The induction programme this year did not include information on the HAT risk assessment process. This has since been addressed. Figure 2 suggests that at risk patients continued to be treated appropriately during this time.

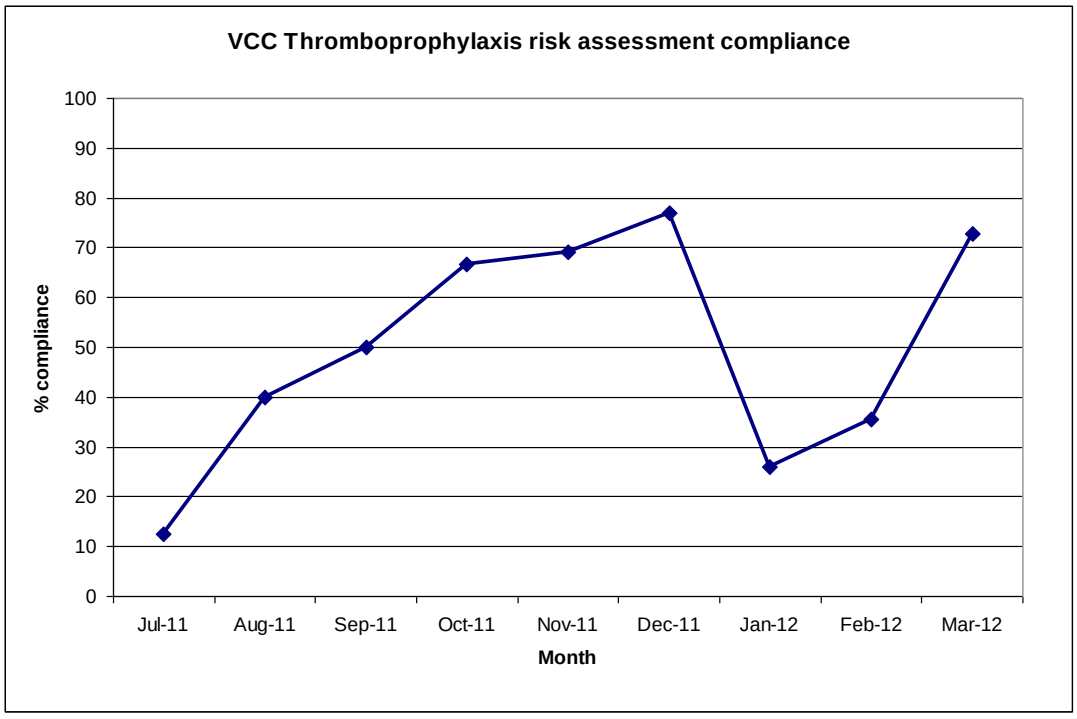


Fig.1

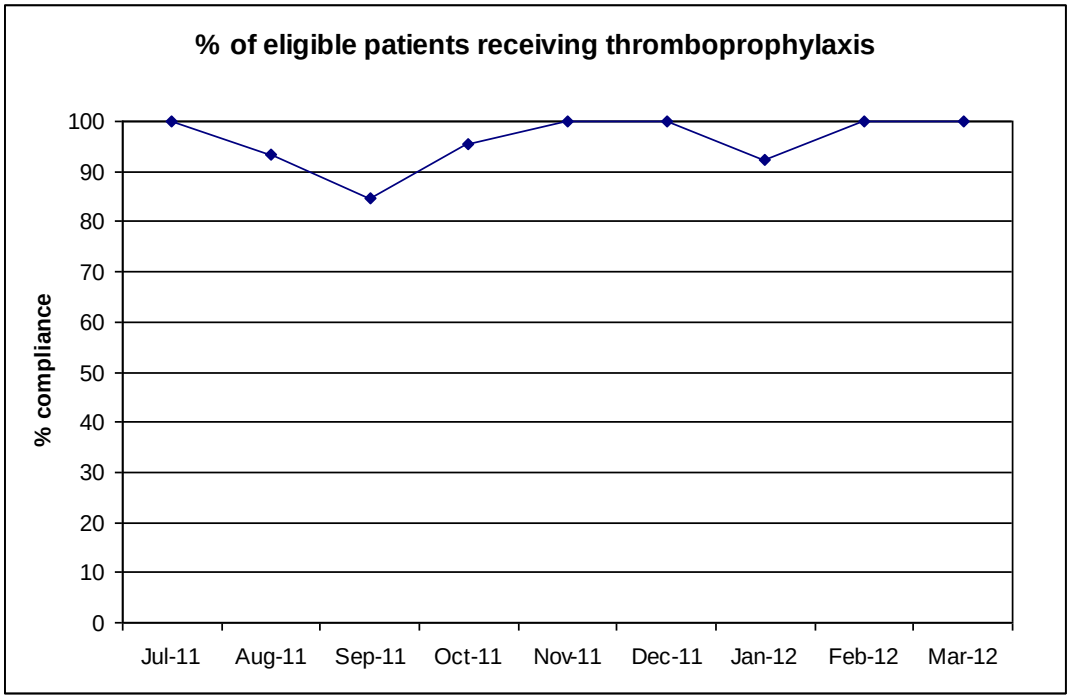


Fig 2

Outcome measurement

A better indicator of how well trusts are preventing HAT is to calculate a 'HAT rate'.

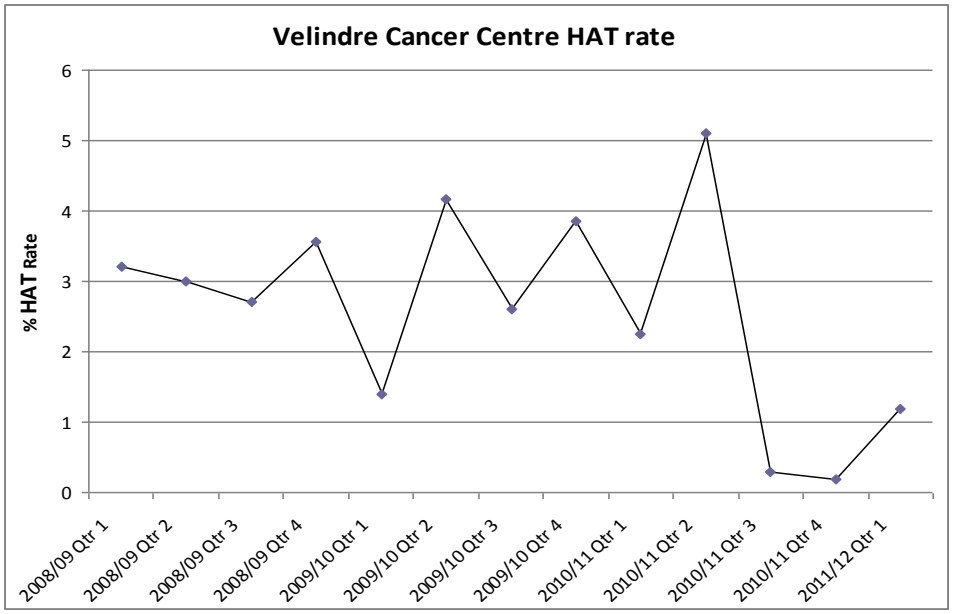
The 'HAT rate' is calculated based on the methodology presented by Mel Baker – Clinical Information Analyst at Betsi Cadwaladr University Health Board (BCUHB) – at a 1000 Lives event on HAT. Results were presented to the Inpatient Team at VCC and published on the 1000Lives extranet.

However our calculated 'HAT rate' is not an accurate reflection of our 'true HAT rate' and therefore should not be used for comparison with local health boards for the following reasons:

- Nature of our patients – there is an increased incidence of venous thromboembolism (VTE) in cancer patients compared to non-cancer patient. Also, the incidence of VTE in cancer patients increases with disease progression and it can be argued that the patients who are admitted to the two supportive wards (Active Support Unit and First Floor wards) may generally be those patients whose disease has progressed and have been admitted for supportive measures.
- As part of routine scanning of our patients, we are identifying and including patients with non-symptomatic VTE's in our HAT rate, whereas other trusts only report back on symptomatic patients.
- Velindre is not a typical District General Hospital (DGH), it is a tertiary treatment centre and as such, many patients who have previously been admitted to VCC may be presenting at the local DGH with thromboembolisms. Similarly, we may

also be picking up thromboembolisms in patients who may have been admitted elsewhere within the previous 3 months.

The graph below represents our calculated 'HAT rate' so far:



Root Cause Analysis

To provide more information about VCC patient identified with a HAT, the working group has commenced undertaking Root Cause Analysis (RCA) on all VCC HAT's using a tool adapted from the Kings Thrombosis Centre. (Appendix 4)

The RCA will be used to identify whether those patients who develop a HAT are being risk assessed and treated appropriately during their previous admissions, along with other areas of good and bad practice if any. This analysis can also be used to identify whether there are any trends of particular cancers or chemotherapy treatments / regimens which are more commonly associated with the development of HAT.

Patient information and planning for discharge

A local Patient Information Leaflet (PIL) has been designed and is now routinely given to all patients admitted to VCC as part of their admission packs. The PIL not only gives background information on the importance of the assessment and treatment of HAT along with the risks and benefits of treatment, but also the typical signs and symptoms of potential VTE's for patients to be aware of post discharge (appendix 5).

Areas of Concern

Obtaining a true HAT rate

A 'true HAT rate' is considered to be the gold standard outcome measurement used to assess the success against preventing HAT, and although it may be argued that you can never completely eliminate HAT, appropriate thromboprophylaxis in every patient admitted into hospital will reduce its incidence. As VCC is a tertiary referral centre which spans across several different health boards, many patients diagnosed with a thrombus at VCC may have had hospital admissions elsewhere within the preceding 3 month period. Similarly, many patients previously admitted to VCC may have had a thrombus diagnosed elsewhere, both scenarios resulting in an inaccurate HAT rate for both VCC and other health boards.

Therefore, for accurate measurements to be obtained and to assess how much of an impact thromboprophylaxis is achieving, a 'national HAT rate' needs to be a priority for Wales to achieve. It is also ideal for the different health boards and VCC to have the ability to ascertain their own HAT rates from the national rate.

Sustainability

The work of the original 1000 Lives Campaign and the 1000 Lives Plus has been a key driving factor for all the excellent work done not only in VCC but across Wales. In today's environment where our workload demands are high and resources are scarce, it is important that all available resources are used appropriately.

Summary

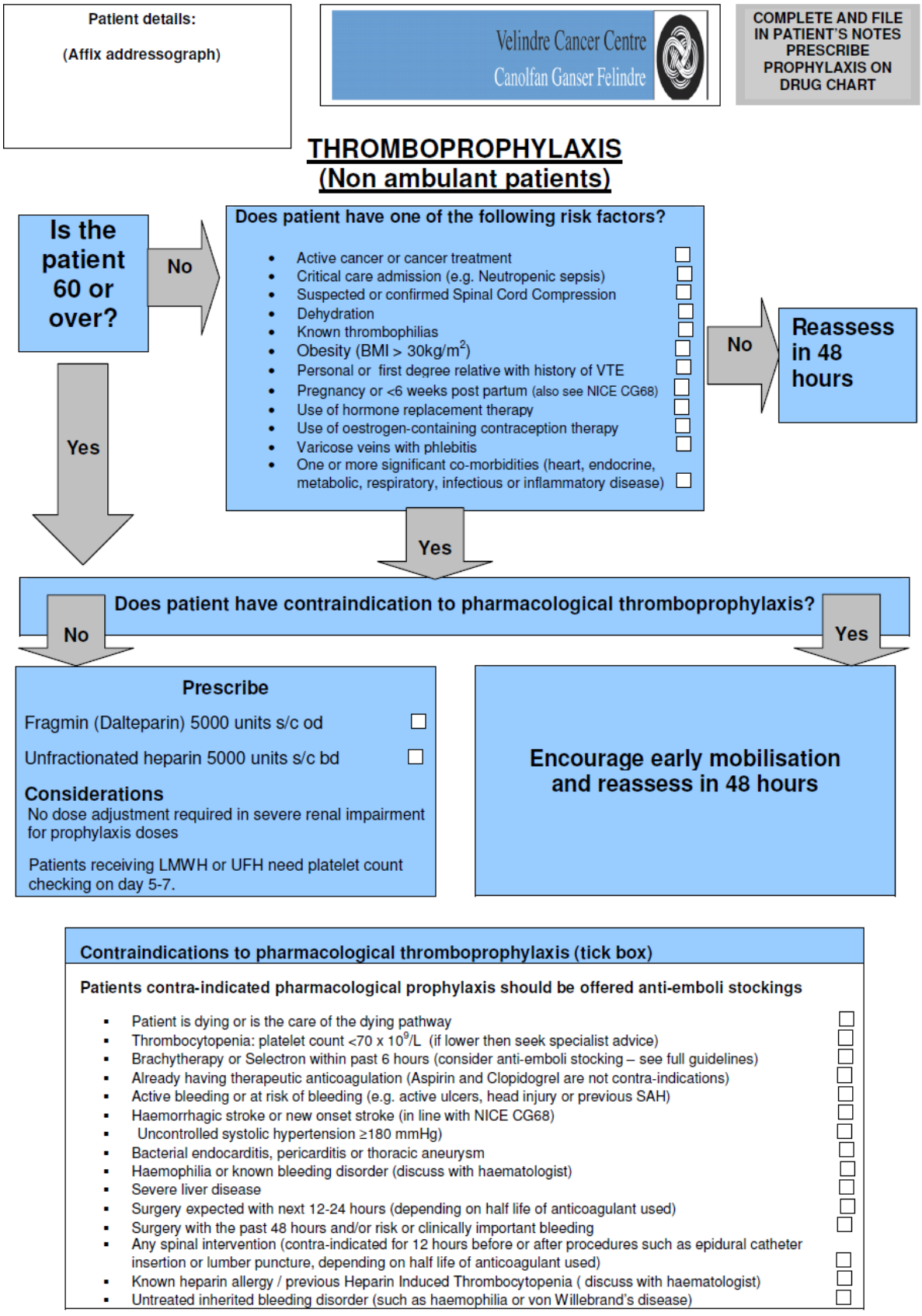
Velindre Cancer Centre has taken giant strides forward in the battle against Hospital Acquired Thrombosis. Unlike other trusts, we are diagnosing non-symptomatic thromboembolisms along with undertaking Root Cause Analysis on all HATs to identify areas of both good and bad practice.

However, to accurately assess our success, we need to ascertain a 'true HAT rate', which will only be achieved if the different Health Boards and Velindre pool our data to achieve a national 'HAT rate'.

We recognise the importance of risk assessment and thromboprophylaxis in our hospitalised patients and would support initiatives to standardise practice across the principality.

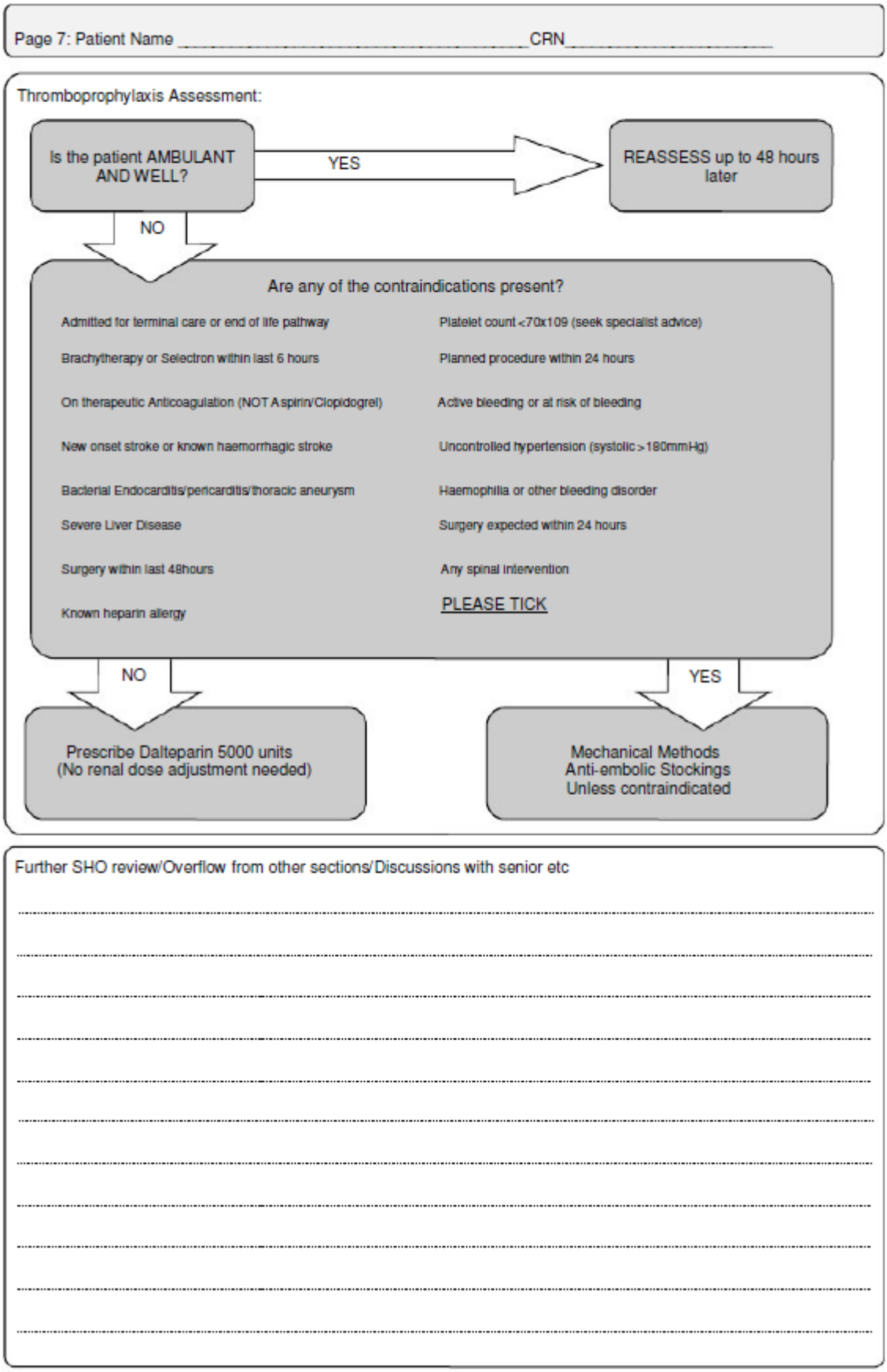
Appendix 1

HAT risk assessment version 1 attached to prescription charts



Appendix 2

HAT risk assessment version 3 included in the standard medical clerking proforma



Appendix 3

Guidelines for venous thromboembolism prevention

Velindre Cancer Centre
Canolfan Ganser Felindre

Department Of Pharmacy

Guidelines for venous thromboembolism PROPHYLAXIS for inpatients – Issue 2, July 2009 Review July 2012

This information is issued by the Drugs Committee on the understanding that it is the best available from the resources at our disposal at the time of preparation.

These guidelines are intended to support clinical judgement. The clinician must use his discretion when following them.

Perform a FBC, baseline INR, clotting screen, renal and liver profile and clinical investigations as indicated.

Patients with active cancer are at high risk of developing Venous Thromboembolism (VTE).

The risk is further increased by surgery, chemotherapy, acute medical illness (including sepsis) and immobility.

Almost all patients admitted to Velindre will be prothrombotic and should be considered for thromboprophylaxis with Low Molecular Weight Heparin (LMWH).

LMWH involves a daily subcutaneous injection and its benefits must be weighed against medical risks and the impact of the injection on patient's quality of life.

The guidelines overleaf identify those patients most at risk of VTE within the oncology inpatient setting

This list is neither exhaustive nor exclusive.

Patients considered at risk of developing VTE should receive thromboprophylaxis at the discretion of the senior clinician

Prophylaxis of venous thromboembolism dose = 5,000 units of dalteparin once a day[1]

Patients should remain on treatment for duration of in-patient stay unless co-existing medical factors contra-indicate

For additional prescribing notes see overleaf.

VTE risk assessment[2]

Regard patients as being at increased risk of VTE if they:

- Is the patient over 60

or

- Are expected to have ongoing reduced mobility relative to their normal state and have one or more of the following risk factors:
  - Active cancer or cancer treatment
  - Suspected or confirmed Spinal Cord Compression
  - Critical care admission (including patients admitted with Neutropenic Sepsis)
  - Dehydration
  - Known thrombophilias
  - Obesity (BMI > 30kg/m^2)
  - Personal history or first-degree relative with a history of VTE
  - Pregnancy or < 6 weeks post partum (see NICE CG 92 for further advice)
  - Use of hormone replacement therapy
  - Use of oestrogen-containing contraception therapy
  - Varicose veins with phlebitis
  - One or more significant medical co-morbidities (such as heart disease, metabolic, endocrine or respiratory pathologies, acute infectious diseases, inflammatory conditions)

Risk assessment – bleeding[2]

Do not offer pharmacological VTE prophylaxis to patients with any of the following unless the clinical benefits outweigh the potential risks

Regard patients as being at risk of bleeding if they have any of the following risk factors:

- Patient is dying and /or is on the care of the dying pathway
- Platelet count < 70 (if platelet count lower seek specialist advice)
- Surgery within the past 6 hours (including brachytherapy and selectrons). See anti-embolism stocking section overleaf.
- Already having therapeutic anticoagulation (aspirin and clopidogrel are not contra-indications)
- Actively bleeding or a risk of bleeding (e.g. active ulcers, head injury or previous sub arachnoid haemorrhage)
- Haemorrhagic stroke or new onset stroke in line with NICE Stroke guidelines (NICE CG 68)
- Uncontrolled systolic hypertension (BP ≥230/120 mmHg)
- Bacterial endocarditis, pericarditis or thoracic aneurysm
- Haemophilia or known bleeding disorder
- Severe liver disease
- Surgery expected within the next 12-24 hours
- Any spinal intervention (contra-indicated for 12 hours before or after procedures such as epidural catheter insertion or lumber puncture)
- Known heparin allergy/ Previous heparin induced thrombocytopenia – seek specialist advice
- Untreated inherited bleeding disorder (such as haemophilia or von Willebrand's disease)

Prescribing Notes

Usual dose = 5,000 units subcutaneously once day for duration of in-patient stay

Renal impairment;
Dose as in normal renal function for prophylactic doses (5000 units once a day)[3]

Liver impairment;
Care in severe liver insufficiency

Monitoring

Heparin Induced Thrombocytopenia;
All patients on LMWH thromboprophylaxis should have their platelet count checked at baseline, day 4 and then every 7 days.
If the count has dropped by 30 – 50% from baseline, discontinue LMWH and seek senior medical advice.

Serum potassium;
Increased risk of hyperkalaemia, especially with the following co-morbidities:

- diabetes mellitus,
- chronic renal failure,
- pre-existing metabolic acidosis,
- raised plasma potassium,
- taking potassium sparing drugs.

Monitor regularly especially if treatment > 7 days.

Anti-Xa
Routine monitoring of APTT and anti-Xa levels is not required.
It may be considered in those who have an increased risk of bleeding, eg renal impairment, low body weight or who are elderly.
If haemorrhage or heparin-induced thrombocytopenia occurs stop treatment immediately and seek specialist advice.

Mechanical VTE Prophylaxis – Anti-embolism stockings

Patients receiving brachytherapy should be offered anti-embolism stockings[2]

Do not offer Dalteparin to patients receiving brachytherapy, unless specifically requested by the consultant oncologist.

Antiembolism stockings have traditionally been used in the prevention of VTE of medical and surgical inpatients, usually in combination with pharmacological agents such as LMWH. However, the evidence supporting the use of stockings lies solely within surgical studies and more recently the use in medical patients has been limited to those with contraindications to pharmacological agents.

The recently published CLOTS study: a randomised controlled trial of 2518 immobile, acute stroke patients suggests that thigh length antiembolism stockings do not reduce the incidence of DVT. However the use of stockings was associated with a five-fold increase in skin breaks, ulcers, blisters, and skin necrosis[5].

In the absence of evidence of benefit from using antiembolism stockings in medical patients and evidence of harm in a selected medical population it would seem counterintuitive to recommend their use in medical patients (even if they have contraindications to pharmacological agents).

However, brachytherapy is ostensibly a surgical procedure and the mode of thromboprophylaxis should reflect this. In view of the perceived theoretical bleeding risk associated with brachytherapy, LMWH is not recommended.

Do not offer anti-embolism stockings to patients who have:

- Peripheral arterial disease
- Peripheral neuropathy
- Leg/foot ulcers
- Fragile 'tissue paper' skin
- Known allergy to material of manufacture
- Cardiac failure
- Massive leg oedema
- Unusual leg size or shape
- Major limb deformity preventing correct fit

Prescribing Notes for anti-embolism stockings[2]

Ensure that patients who need anti-embolism stockings have their legs measured and that the correct size of stocking is provided. Stockings should be fitted and patients should be used how to use them by staff trained in their use
Ensure that patients who develop oedema or post-operative swelling have their leg re-measured and stockings refitted
Pedal pulses should be detected by healthcare professionals trained in the technique before anti-embolism stockings are fitted
Encourage patients to wear their anti-embolism stocking day and night from admission until they are discharged and are no longer significantly immobile. Anti-embolism stockings should be removed daily for hygiene purposes and to inspect skin conditions
Discontinue the use of anti-embolism stockings if there is marking, blistering or discolouration of the skin, particularly over the heals and bony prominences
Show patients how to use anti-embolism stockings correctly and ensure they understand that this will reduce their risk of developing VTE
Monitor the use of anti-embolism stockings and offer assistance if they are not being worn correctly
Ensure that patients who are discharged with anti-embolism stockings are able to remove and replace them, or have someone available who will be able to do this for them

Acknowledgments

This policy has been written with the advice of Dr Simon Noble, Clinical Senior Lecturer, Palliative Medicine

References

1. Pharmacia (2009) Summary of Product Characteristics – Fragmin (Dalteparin) Accessed 14/07/09. http://emc.medicines.org.uk/document.aspx?documentId=9150

2. NICE – Venous Thromboembolism: reducing the risk of venous thromboembolisms (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital. Draft for consultation – 1st version (March 2009)

3. The Renal Drug Handbook, 3rd Edition, 2009.

4. Noble S Hudson E. Recommendations for thromboprophylaxis guidelines within Velindre NHS Trust, Cardiff. Sept 2004, and Oct 2005

5. CLOTS Trials Collaboration, Dennis M, Sandercock PA, Reid J, Graham C, Murray G, Venables G, Rudd A, Bowler G. Effectiveness of thigh-length graduated compression

stockings to reduce the risk of deep vein thrombosis after stroke (CLOTS trial 1): a multicentre, randomised controlled trial. Lancet. 2009 Jun 6;373(9679):1958-65.

Appendix 4

Hospital Acquired Thrombosis - Route Cause Analysis Form

Patient details	
Patient details	Patient Label
Date first diagnosed with thrombus /embolus (date of scan)	
Asymptomatic or symptomatic	

Hospital admission details (prior to diagnostic scan within 85 days)			
	Admission 1	***Admission 2***	***Admission 3***
Hospital			
Ward			
Consultant			
Primary diagnosis			
Admission date			
Discharge date			
Reason for admission	Elective Emergency	Elective Emergency	Elective Emergency
Treatment regime			

Thromboprophylaxis			
Was a HAT Risk Assessment Tool (RAT) completed?	YES / NO	YES / NO	YES / NO
Was the patient ambulant and well? (at the time of risk assessment)			
Risk factors present (See table below)			

Contra-indications (see Table below)			
Was chemical prophylaxis prescribed?	YES / NO	YES / NO	YES / NO
Which drug / dose prescribed??			
Date treatment commenced			
Date treatment stopped			
Any missed doses? (If YES explain why)			
Evidence of 48 hour re-assessment performed	YES / NO	YES / NO	YES / NO

Risk Factors	**Contra-indications**
• Active cancer or cancer treatment • Critical care admission (e.g. Neutropenic sepsis) • Suspected or confirmed Spinal Cord Compression • Dehydration • Known thrombophilias • Obesity (BMI > 30kg/m^2) • Personal or first degree relative with history of VTE • Pregnancy or <6 weeks post partum (also see NICE CG68) • Use of hormone replacement therapy • Use of oestrogen-containing contraception therapy • Varicose veins with phlebitis • One or more significant co-morbidities (heart, endocrine, metabolic, respiratory, infectious or inflammatory disease)	• Admitted for terminal care • Platelet count <70x109 • Bradytherapy or Selectron within last 6 hours • Planned procedure within 24 hours • On therapeutic Anticoagulation (NOT Aspirin/Clopidogrel) • Active bleeding or at risk of bleeding • New onset stroke or known haemorrhagic stroke • Uncontrolled hypertension (systolic >180mmHg) • Bacterial Endocarditis/pericarditis/thoracic aneurysm • Haemophilia or other bleeding disorder • Severe Liver Disease • Surgery expected within 24 hours • Surgery within last 48hours • Any spinal intervention • Known heparin allergy

General comments / areas of good or bad practice not commented upon above

Summary
☐ **Failure to Recognize** Comments: ☐ **Failure to Plan** Comments: ☐ **Failure to Communicate** Comments:

Appendix 5

Patient Information Leaflet

Velindre Cancer Centre
Canolfan Ganser Felindre

Hospital Acquired Thrombosis

H.A.T

Preventing a Deep Vein Thrombosis (DVT) in Hospital

Introduction

Any patient admitted to hospital is potentially at risk of developing a Deep Vein Thrombosis (DVT). This leaflet will explain what a DVT is, who is most at risk of getting one and what you can do to help reduce your risk. It will also tell you what symptoms might suggest the presence of a DVT and what you should do if you experience any of them.

A contact telephone number and details of how to obtain further information are given at the end of the leaflet.

What is a DVT?

A DVT is a blood clot which forms in a deep vein, usually in the leg. Deep veins are large veins which transport blood to the heart. When a blood clot occurs, it forms a plug that can interrupt this blood flow.

Is a DVT serious?

A DVT may cause pain and swelling in the leg, which usually resolves with treatment. However, in some cases problems may develop as a result of poor blood flow through the legs such as pain, swelling and ulcers of the lower leg.

In many cases, the initial DVT is ‘silent’ and does not cause any symptoms in the leg, causing problems only when a portion of the blood clot breaks off and travels through the blood stream and becomes lodged in the lungs. This is known as a Pulmonary Embolism (PE).

A PE usually causes chest pain, shortness of breath and coughing, sometimes with bloody phlegm, and sudden collapse.

In rare cases, a PE is fatal, and if you develop any of the above symptoms you should seek immediate medical attention.

Are you at risk of DVT?

Many people think that going on a long aeroplane flight is a big risk factor for DVT development. Unfortunately the risk of developing a DVT following admission to hospital is far greater.

Can a DVT be prevented?

The good news is that the development of a DVT following as admission to hospital can be prevented in the majority of cases with safe and effective treatments. If any of the following risk factors apply to you, you should discuss DVT prevention with your doctor. You will then be assessed as to whether any treatments should be given in your particular case.

Risk factors for developing a DVT

- You are immobile
- You are over 60 years of age
- You have cancer or are receiving treatment for cancer
- You are taking hormone replacement therapy or a contraceptive that contains oestrogen
- You are pregnant or have had a baby in the past 6 weeks
- You are obese
- You are going on a long-distance flight (more than 6 hours) following discharge from hospital
- You have had a previous DVT or PE
- You have a family history of DVT or PE
- You have had surgery in the past 3 months

Your right to a DVT risk assessment

The Department of Health recommends that all adults who are admitted to hospital should be assessed for their risk of developing a DVT. If it is felt that the risk is increased then appropriate treatments should be prescribed.

At Velindre, the treatment most commonly prescribed is one called dalteparin.

What is Dalteparin?

Dalteparin is a blood thinning injection which helps prevent the formation of a DVT. It is a single, once daily, subcutaneous injection (which means it is injected beneath the skin). It is usually injected into a skin fold in your abdomen (stomach), or the upper part of your thigh.

Its main side effect is bruising at the site of injection.

Discharge from hospital

The risk of developing a blood clot may persist for several months following discharge form hospital. It is important that you follow advice given to you upon discharge from hospital to reduce the risk of DVT occurring at a later stage.

If you develop any symptoms that suggest you might have a DVT or PE, please seek immediate medical attention.

Contact telephone numbers

If you would like any more information about dalteparin please speak to your doctor or pharmacist.

Pharmacy department 029 2061 5888 ext 6223

Monday – Friday 9am – 5pm for queries about your medicines

Additional information can be obtained from Lifeblood the Thrombosis charity at www.thrombosis-charity.org.uk

This leaflet was written by health professionals. The information contained in this leaflet is evidence based. It has been approved by doctors, nurses and patients. It is reviewed and updated annually.

Prepared March 2011