

Reference Number: UHB 106 Version Number: 5	Date of Next Review: To be included when document approved Previous Trust/LHB Reference Number: UHB 362
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Policy for the prevention of venous thromboembolism (VTE) in inpatients aged 16 years* and over
(*see scope point (c))

Policy Statement

To ensure the Health Board delivers its aims, objectives, responsibilities and legal requirements transparently and consistently, it is the policy of Cardiff and Vale University Health Board (UHB) to follow the guidance as set out in the NICE NG89:

- All patients aged 16 years* and over admitted to hospital are assessed, using an appropriate UHB VTE risk assessment tool within 14 hours of admission, and appropriate provision of thromboprophylaxis is implemented if indicated.
- All episodes of hospital associated VTE will be reviewed to establish if potentially preventable
- Each clinical board should undertake root cause analysis (RCA) of potentially preventable hospital acquired (HAT) cases and outcomes reviewed for quality and safety assurance.

Policy Commitment

- To maintain adequate processes in all clinical boards for the assessment of the VTE risk for inpatients aged 16 years and older.
- To ensure that all staff and patients are well informed of the risk of HAT; the signs and symptoms of VTE and how to mitigate the risk.
- To ensure that VTE prevention is embedded into practice at each Clinical Board, and that the leading cause of preventable patient morbidity and mortality is at the forefront of patient safety.

Supporting Procedures and Written Control Documents

This Policy is to be used in conjunction with the supporting documents listed below:

Patient Identification Policy
 Medicines Management Policy
 Making Decisions on Individual Requests for Treatment Policy
 Patient Handover Policy
 Single Nurse Administration of Drugs in Hospital Policy
 Writing Prescriptions Policy

Equality Impact Assessment	An Equality Impact Assessment (EqIA) has been completed and this found there to be no impact.
Health Impact Assessment	A Health Impact Assessment is not required for this policy.
Policy Approved by	Quality, Safety and Environment Committee
Group with authority to approve procedures written to explain how this policy will be implemented	C & V UHB Thromboembolism Prevention & Treatment () Group, Clinical Board Quality, Safety and Environment sub-Committees.
Accountable Executive or Clinical Board Director	Executive Medical Director

Disclaimer

If the review date of this document has passed please ensure that the version you are using is the most up to date either by contacting the document author or the [Governance Directorate](#)

Scope

1.1 Groups that will be covered:

- Adults (16 years and older) who are admitted to hospital for 24 hours or more (including through surgical day units).
- Pregnant women admitted to hospital - they have been identified as a group requiring special consideration.
- * Children aged 13 or over or who are post-pubertal, who require an inpatient admission for a surgical procedure
- Any additional groups identified who are at risk of thrombosis due to their personal or family history, or the indication for attending hospital e.g. adult patients requiring immobilisation in a lower limb cast.

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1.2 Groups that will not be covered:

- a) People younger than 16 (except as 1.1 c)
- b) Elderly or immobile people cared for at home, or in external residential accommodation, unless admitted to hospital
- c) Patients admitted to hospital with a diagnosis of, or suspected diagnosis of, deep vein thrombosis or pulmonary embolus that will require specific assessment and treatment.

Summary of reviews/amendments

Version Number	Date Review Approved	Date Published	Summary of Amendments
1	21 February 2012	19 March 2012	Policy supersedes policy of former Trust. <ul style="list-style-type: none"> • Updated Risk Assessment tools under Clinical Policies and Procedures. • Update to Audit Proforma • Update since NICE initial publication
2	23 February 2016	26 Apr 2016	<ul style="list-style-type: none"> • Update on current Welsh Government stance on thromboprophylaxis • Updated risk assessment tools • Use of direct oral anti-coagulants (DOACS)
3	20 August 2020		<ul style="list-style-type: none"> • Update on NICE NG89 • Updated risk assessment tools
4	31 July 2024		<ul style="list-style-type: none"> • Update on Welsh Risk Pool requirements of health board regarding VTE
5	22 July 2025	01 August 2025	<ul style="list-style-type: none"> • Update on Electronic Prescribing and Medicines Administration (ePMA) system • Update on MBRRACE-UK Maternal State of The Nation Report 2024

Note on Governance and Leadership in VTE risk reduction

At Cardiff and Vale University Health Board, a dedicated multidisciplinary team—the **Thromboembolic Prevention and Treatment Group**—leads initiatives aimed at reducing the burden of **venous thromboembolism (VTE)**. The group includes representation from **Haematology, Surgery, Nursing, Pharmacy, Patient Safety, and Medical Physics**.

A pivotal role within the team—**Lead Nurse for VTE Prevention and Thromboprophylaxis**—remains vacant as of July 2025. This vacancy highlights an **ongoing gap in clinical governance**, particularly in the investigation of **Hospital-Acquired Thrombosis (HAT)**.

The Group continues to advocate for the appointment of a **Nursing Lead** to champion best practice, standardise HAT investigations, and drive quality improvement across the Health Board. Their leadership would be instrumental in **enhancing patient outcomes** related to VTE.

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1. Introduction and Background

Venous thromboembolism (VTE) contributes to approximately 10% of all hospital-related deaths. Around one third of VTE episodes are associated with hospital admissions, making hospital-acquired thrombosis a major factor in the overall burden of VTE in the UK. The annual cost of managing VTE is estimated at £640 million. Furthermore, an estimated 10% of patients treated for deep vein thrombosis (DVT) go on to develop chronic venous leg ulceration, which incurs an additional £400 million in treatment costs.

VTE has a multifactorial aetiology, with numerous clearly identified risk factors. Hospitalised patients—especially those with stroke, myocardial infarction, severe heart failure, chronic respiratory disease, active cancer, or undergoing cancer therapy—face an elevated risk. Individuals with a personal or family history of venous thrombosis are also at markedly higher risk.

The likelihood of developing VTE increases significantly with age, particularly in individuals over 50. Key acquired risk factors include:

- Surgery, particularly orthopaedic, neurosurgical, or pelvic procedures for cancer
- Pregnancy
- Obesity (BMI >30 kg/m²)
- Use of oestrogen-containing medications (e.g., combined oral contraceptives, hormone replacement therapy)
- Kidney disorders such as nephrotic syndrome
- Other comorbidities, including active inflammatory bowel disease and myeloproliferative conditions

Among VTE presentations, pulmonary embolism (PE) carries the highest mortality risk. If untreated, PE has a mortality rate of approximately 30%; however, with appropriate management, this rate drops to just 2% (House of Commons Committee, 2005).

Without anticoagulant prophylaxis, DVT prevalence ranges from 41–85% following elective knee surgery and 42–57% after elective hip procedures. The prevalence of DVT with PE is reported between 0.9–28% for hip replacement and 1.5–10% for knee replacement (NICE NG89, 2018). It is estimated that up to 5,000 deaths across Europe annually may be attributable to VTE following hip or knee replacement surgeries without thromboprophylaxis.

Historically, approximately one third of surgical patients developed VTE prior to the routine use of prophylactic interventions. The widespread adoption of thromboprophylaxis guidelines—such as those issued by the Royal College of Obstetricians and Gynaecologists for caesarean section—has markedly reduced morbidity and mortality. Nevertheless, VTE remains the leading preventable cause of maternal morbidity and mortality in the UK. 16% of all maternal deaths related to VTE making it the leading cause of maternal death (MBRRACE-UK, 2024). Continuous risk assessment throughout pregnancy and following delivery is therefore essential.

Hospitalisation is clearly linked to an increased incidence of VTE, with hospitalised patients experiencing a risk 135 times greater than individuals in the community. Importantly, 70–80% of hospital-acquired VTEs occur in medical (non-surgical) patients (House of Commons Health Committee, 2005).

National and International Clinical Guidance

Clinical guidelines for thromboprophylaxis have been developed by several specialist bodies in the UK and internationally. Notable examples include:

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- The Royal College of Obstetricians and Gynaecologists' 2015 guideline (CG37a)
- The 9th edition of the American College of Chest Physicians (ACCP) guidelines
- The Scottish Intercollegiate Guidelines Network (SIGN)
- NICE National Guideline (NG89), published in August 2019

NICE NG89 mandates that all patients admitted to hospital must undergo a full assessment for venous thromboembolism (VTE) risk within 14 hours of admission. Additionally, the guideline recommends reassessment at the time of consultant review and whenever there is a significant change in the patient's clinical condition.

Welsh Risk Pool

The Welsh Risk Pool is a centralised service that enables all trusts and health authorities in Wales to manage and indemnify clinical risk. In April 2022, it published a report aimed at enhancing patient safety in relation to the diagnosis and prevention of venous thromboembolism (VTE). The report sets out five key recommendations:

1. Adoption of Standardised Policy

All health bodies across Wales should adopt the All Wales Thromboprophylaxis Policy. The Cardiff and Vale University Health Board (CAVUHB) policy aligns with this national framework.

2. Mandatory Staff Training

All clinical staff should complete the relevant VTE training modules available via the Electronic Staff Record (ESR). Training must cover both the identification of VTE symptoms and strategies for preventing hospital-acquired thrombosis (HAT).

3. Documented Risk Assessment

Every patient should receive a documented VTE risk assessment on admission, conducted during initial clerking. This should utilise the Department of Health Risk Assessment Tool or an equivalent validated tool.

4. Standardised Investigation Protocol

An All-Wales checklist should be developed to guide the investigation of HAT, ensuring consistency in approach across all NHS Wales organisations.

5. Governance and Data Sharing

VTE risk assessment compliance data and HAT incident data should be routinely shared and reviewed during relevant health body governance meetings.

Cardiff and Vale University Health Board

At Cardiff and Vale University Health Board, a dedicated multidisciplinary team—the Thromboembolic Prevention and Treatment Group—has been established to lead efforts in reducing the burden of venous thromboembolism (VTE). The group includes representation from Haematology, Surgery, Nursing, Pharmacy, Patient Safety, and Medical Physics.

Within the Health Board, clinicians are encouraged to utilise specialty-specific risk assessment tools to appropriately weigh the risks and benefits of thromboprophylaxis based on individual patient profiles. Equally critical is the commitment to education and awareness—both for clinical teams and the wider public. Raising understanding about the risks associated with VTE, how these risks can be mitigated, and most importantly, how to recognise early signs of VTE is fundamental in ensuring timely and effective intervention.

The Electronic Prescribing and Medicines Administration (ePMA) system is currently being implemented across Cardiff and Vale University Health Board (CAVUHB). A key feature of this rollout is the integration of

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VTE risk assessment protocols directly into the prescribing workflow. This is expected to significantly enhance compliance with VTE risk assessments and, consequently, improve patient safety and clinical outcomes.

In addition to supporting preventative measures, the ePMA system will be a valuable asset in the investigation of Hospital-Acquired Thrombosis (HAT), providing timely access to medication records, clinical assessments, and audit trails that facilitate a more accurate and efficient review process.

2. Clinical Procedures and Methods of Prophylaxis Against Venous Thromboembolism (VTE)

All patients admitted to hospital must undergo a documented VTE risk assessment, using tools ratified by each respective clinical board. Where the Electronic Prescribing and Medicines Administration (ePMA) system is in use, this assessment will be embedded electronically within the prescribing workflow, facilitating compliance and traceability.

Specialty-specific thromboprophylaxis guidelines are provided in the appendices to support tailored clinical decision-making.

Pharmacological Prophylaxis

Low Molecular Weight Heparins (LMWH)

LMWHs have demonstrated efficacy across a range of clinical settings—including general surgery, obstetrics, orthopaedic surgery, and general medicine—in reducing the incidence of VTE.

Enoxaparin is the preferred LMWH within Cardiff and Vale University Health Board (CAVUHB) for approved indications.

Contraindications to LMWH

LMWH should be avoided in the following clinical scenarios:

- Active bleeding
- Hypersensitivity to heparin
- Coagulopathy
- Acute or severe renal impairment
- Infective endocarditis
- History of heparin-induced thrombocytopenia (HIT)
- Recent intraocular or intracranial surgery
- Lumbar puncture or neuraxial anaesthesia within the past 12 hours
- Use with caution in patients with uncontrolled hypertension.
- LMWH therapy should be re-evaluated in individuals with chronic kidney disease (CrCl <30 ml/min) or signs of acute renal failure. A specialty-specific assessment remains essential for all patients.

Direct Oral Anticoagulants (DOACs)

The introduction of DOACs has enhanced prophylactic options, particularly in orthopaedic surgery.

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Apixaban is recommended for VTE prevention following elective hip or knee replacement surgery, as per NICE TA245. It is the preferred agent within the Orthopaedic Directorate at CAVUHB and this strategy has been group ratified.

Dosage: 2.5 mg orally twice daily

Initiation: First dose 12–24 hours post-surgery

Duration:

Hip replacement: 32–38 days

Knee replacement: 10–14 days

Rivaroxaban is also recommended for this indication (NICE TA170), as is Dabigatran (NICE TA157).

Aspirin is endorsed in NICE NG89 as an option for thromboprophylaxis in total hip and knee replacement patients. However, aspirin does not currently hold UK marketing authorisation for VTE prophylaxis, and it is not ratified by the Group for use within CAVUHB.

2.2 Mechanical Methods of Prophylaxis

2.2.1 Intermittent Pneumatic Compression (IPC) Devices

- Indication: Use when VTE risk is high and where pharmacological prophylaxis is contraindicated.
- Preferred Method: IPCs (or mechanical impulse devices) have the strongest evidence base.
- Availability: IPCs are limited in the UHB (except obstetrics/maternity); AES are more widely available but less effective.
- Prescription Guidance:
 - Only one mechanical device should be used at a time.
 - Do not combine IPC with other mechanical methods.
- Cautions:
 - Skin issues (e.g., ulcers, grafts)
 - Congestive cardiac failure
 - Peripheral vascular disease

2.2.2 Anti-Embolism Stockings (AES)

- Use:
 - As an adjunct or alternative to pharmacological prophylaxis.
 - In surgical patients: Use both pharmacological and AES unless contraindicated.
 - In medical patients (except stroke patients): Use AES only if pharmacological options are contraindicated.
- Cautions:
 - Peripheral vascular disease
 - Longstanding diabetes
 - Skin ulcers, trauma, infection
 - Recent skin grafts
 - Massive or pulmonary oedema
 - Pressure damage to heels
 - Severe leg deformities
- Assessment:
 - Pulse palpation and Doppler are not reliable for skin perfusion.
 - Regular inspection is essential if vascular compromise is suspected.

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- Nursing Responsibilities:
 - Ensure proper fitting and ongoing reassessment.
 - Complete the AES documentation sheet for all patients prescribed AES.

3. Patient Education/ Awareness

Patients should be made aware of the increased risk of VTE associated with hospital admission. In specialties where extended thromboprophylaxis is required, involving the administration of subcutaneous low molecular weight heparin, the patient should be advised, in advance of the procedure that they will be trained to self-administer the medication at home.

The UHB has designed “in-house” patient information leaflets. These should be given to patients in the pre-operative assessment area and on admission to all adult wards. (See appendix for copy of Reducing the Risk Patient Leaflet)

Plasma screens are used to increase patient awareness; thrombosis prevention campaign material is regularly updated and displayed. Thrombosis UK’s app–Let’s talk Clots provides a very useful resource for patient reference.

4, PROCESS

- a. On admission **all** adults over 16yrs and children >13yrs old /post puberty who are admitted to hospital will be assessed for their risk of VTE. The outcome of this assessment should be documented as appropriate for the particular Clinical board.
- b. Completion of the Venous Thromboembolism Risk Assessment Section of the All-Wales In-patient Medication Administration Chart is advised **as a minimum** standard. Each speciality will incorporate a risk assessment tool as appropriate to that area. When electronic prescribing (ePMA) is implemented at CAVUHB in **early 2025**, there will be a mandated VTE risk assessment process to allocate thromboprophylaxis prescriptions, which should translate into improved patient safety.

Risk Assessment Tools for the clinical boards are included in the appendices. Any modification by individual directorates should be approved at Clinical Board Level, with oversight by the Leads for Thromboprophylaxis and ratified by the Clinical Board Quality and Safety Committee

5. Roles and Responsibilities

5.1 Thromboembolism Prevention and Treatment (TEPT) Group

It is the responsibility of the group to guide the UHB on the content of this Policy and monitor compliance. It will receive reports regarding the development of hospital acquired thrombosis from all the clinical board leads to establish any UHB-wide trends that need addressing.

5.2 Clinical Board Directors

It is the responsibility of the Clinical Board Directors (or equivalent) to ensure, where appropriate, that the Policy is implemented within clinical areas for which they hold responsibility.

5.3 Medical Staff

Ensuring quality and safety standards which are defined by the UHB are the responsibility of all medical staff. It is their responsibility to ensure that they are conversant with this policy and their role in minimising the risk of HAT.

5.4 Admitting Clinician

It is the responsibility of the admitting clinician to assess each patient using the risk assessment appropriate to the speciality and to document the outcome of that assessment in the medical notes.

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Adherence to the speciality-specific guidelines will enable the clinician to prescribe the correct thromboprophylaxis.

An explanation for any deviation from these recommendations should be documented in the clinical notes.

5.5 Registered Nurses and Midwives

Registered nurses and midwives should ensure that patients under their care have been assessed for their risk of thrombosis within 14 hours of admission. Prior to administration of thromboprophylaxis - pharmacological/LMWH or mechanical/IPC the nurse or midwife should check whether a risk assessment has been documented, and if not, bring this to the attention of a member of the medical team for completion.

The prescriber and the registered nurse or midwife are responsible for the accurate administration/implementation of the thromboprophylaxis

5.6 Pharmacists

Pharmacists for each speciality have a responsibility for ensuring that prescribing of pharmacological thromboprophylaxis is appropriate. Pharmacists are responsible for monitoring the documentation of administration of the prescribed thromboprophylaxis and should highlight the need for review / reassessment as the patient's clinical condition alters.

The pharmacist is responsible for liaising with the medical and nursing team ensuring appropriate, accurate and timely thromboprophylaxis is provided.

6. RESOURCES AND TRAINING

6.1 Printed risk assessment tools and patient information leaflets are available for each specialty. When ePMA is rolled out across the health board, VTE risk assessments will be integrated into the electronic prescription system and will also generate alerts to prompt completion of the assessment. A patient information leaflet is included in the appendices.

6.2. Ongoing training of all Doctors and Nursing staff is essential to ensure success and to ensure evidence-based practice. This should be incorporated into the Clinical Board Quality, Safety and Experience Meetings, Grand Rounds and Registered Nurses Educational Programmes and Induction Programmes. It is recommended that all clinical staff (patient facing – both qualified and unqualified) undertake the designated learning module available on ESR aimed at improving education in relation to the recognition of patients presenting with symptoms of a VTE and in the prevention of hospital acquired thrombosis (HAT).

6.3 This policy will be published on the Intranet, Clinical Portal and Internet

6.4 It is the responsibility of the Clinical Board Directors to ensure that members of the Clinical Boards and Directorates are conversant with the policy and implement the relevant risk assessments.

7. HOSPITAL ACQUIRED THROMBOSIS (HAT) REVIEW PROCESSES

It is the responsibility of each Clinical Board to review the clinical notes of all patients who develop a VTE during their current inpatient admission (length of stay to be greater than 24 hours of being admitted) or following a hospital inpatient admission (of >24 hours) within the previous 90 days to establish whether:

- A thromboprophylaxis risk assessment was completed on admission as per health board policy
- Appropriate thromboprophylaxis was prescribed
- Appropriate dose adjustments for the patient's renal function and weight was applied to the pharmacological thromboprophylaxis

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- The prescribed thromboprophylaxis was administered with no missed doses
- If thromboprophylaxis deemed contraindicated at admission, there is clear documentation with regular re-assessment of the risk benefit of thromboprophylaxis and initiation when possible
- Documentation of re-assessment during the inpatient stay and/or when the patients clinical condition changes

Where the answer to either of these questions is 'No' a root cause analysis (RCA) must be undertaken to establish if the HAT was potentially preventable.

The result of the RCA should then be discussed at the clinical board Q & S meeting to improve processes and ensure learning from adverse events takes place.

8. FURTHER INFORMATION AND REFERENCES

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Speciality Specific Guidelines

Acute spinal injury (T&O): Patients should receive mechanical prophylaxis in the form of AES. Please discuss with the consultant spinal surgeon if enoxaparin should be prescribed as they may require surgical intervention.

Elective spinal surgery (T&O): Prescribe foot impulse device to be applied in theatre. Do not prescribe LMWH (enoxaparin) or AES pre-operatively. Discuss with consultant spinal surgeon before starting enoxaparin post-operatively. Patients with ruptured cranial/spinal vascular malformations or acute traumatic/non traumatic haemorrhage must not be offered enoxaparin prophylaxis until the lesion is secured or the patient's condition stabilised.

Trauma: There is an increased **initial** risk of haemorrhage in patients following poly- trauma, multi part or unstable pelvic fractures and potentially unstable spinal pathology pending MRI scan. Discuss with consultant

Suspected fracture of hip/femur:

All admissions with hip or femoral fracture should receive enoxaparin – unless specifically contraindicated

Mechanical thromboprophylaxis need only be considered in the rare cases where it is not possible to use any form of anticoagulant

Cardiac surgery: 'Patients should be prescribed enoxaparin pre-operatively *unless contraindicated*, but enoxaparin should be omitted for at least 24 hours prior to surgery. Patients should be prescribed mechanical prophylaxis. Prescribe prophylactic enoxaparin post-operatively until discharge, unless patient is receiving therapeutic anticoagulation (either IV heparin or therapeutic enoxaparin) or acquires a contraindication.

Head and Neck surgery: Thromboprophylaxis is determined according to patient risk and surgery planned – please see local directorate guidance

Haematology: For patients with significant thrombocytopenia or bleeding disorders, discuss with Haematology

Ophthalmology: Day case / SSSU patients do not require VTE prophylaxis if (1) LA (2) GA less than 90mins. Patients with GA > 90mins should receive AES prophylaxis. This does not apply to paediatric cases.

Nephrology and transplant: For this patient group refer to **appropriate** risk assessment form

Urology specific guidelines:

Ambulatory care surgery (e.g circumcision, hydrocoelectomy, vasectomy):
No pharmacological or mechanical prophylaxis necessary.

Inpatient urological procedures including Robotic procedures (whether day case or inpatient):

Pharmacological prophylaxis with Enoxaparin 40 mg od (40 mg bd for patients >100Kg and 20 mg od for patients <50kg)

Mechanical prophylaxis with AES alone.

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Exercises to improve circulation

You can do these in bed or when sitting in a chair and continue them after you have been discharged.

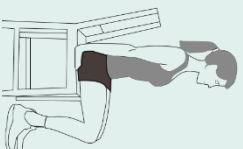
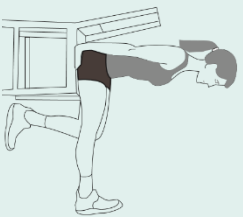
In Bed

- Paddle your foot up and down, pointing your toes to the floor and then the ceiling
- Make circles with your feet
- Raise one leg, pull gently towards you, slowly bring back down and repeat with other leg



Sitting in the chair

- Sit with knee bent, straighten knee and lower, repeat with other leg

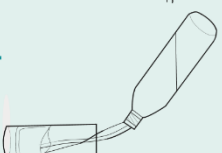


Deep Breathing Exercises

- Breathing exercises are important. Every 5 - 10 minutes, take deep breaths, filling your lungs as much as possible.

Keep well hydrated

Drink plenty of fluids, unless advised otherwise by medical staff



When you leave hospital

You may need to continue to take precautions against a DVT.

The risk of a DVT continues for some weeks after your hospital stay, so it may be necessary to keep wearing the stockings, or taking injections or tablets to reduce the risks. The length of the risk period is variable - we will advise you on what you need to do when you go home.

Watch out for signs of DVT or PE

A DVT usually causes a leg to swell and hurt. A PE causes shortness of breath, chest pain or rarely sudden collapse.

Watch out for signs of bleeding if you are still taking anticoagulant injections or tablets.

These include bruising, nosebleeds, blood in the urine or stools, heavy periods, or excessive tiredness or pallor.

If you are worried, phone your GP or NHS Direct on **0845 4647** straightaway.

This an information leaflet following advice from NICE Clinical Guidelines

Deep Vein Thrombosis and Pulmonary Embolism

Reducing your risk

Being admitted to hospital can increase the risk of you developing a blood clot in your veins. This leaflet explains how we can work with you to reduce the chances of this happening



GIG Cymru NHS Wales
Bwrdd Iechyd Prifysgol
Caerdydd a'r Fro
Cardiff and Vale
University Health Board