GIG CYMRU NHS WALES
Bwrdd Iechyd Prifysgol Bae Abertawe
Swansea Bay University Health Board

Thromboprophylaxis Policy and Clinical Guidelines

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Definition of Terms

AES – Anti Embolism Stockings
DVT – Deep Vein Thrombosis
FID – Foot Impulse devices
HAT – Hospital Acquired Thrombosis
IPC – Intermittent Pneumatic compression
LMWH – Low molecular Weight heparin
DOAC – Direct Oral Anticoagulant
PE – Pulmonary Embolism
RA – Risk Assessment
SB/SBUHB – Swansea Bay/ Swansea Bay University Health Board
TP - Thromboprophylaxis
UFH – Unfractionated heparin
VTE – Venous Thromboembolism

Background

A significant number of people die each year because of a Hospital Acquired Thrombosis (HAT), with reports quoting figures of up to 25,000 patients each year. Concern had been raised, however, that the figure may in actuality be higher than this. This was attributed to the potentially clinically silent nature of the condition, and a reduction in the number of post mortems undertaken. In 2009, Sir Liam Donaldson and John Smith (MP) stated in their foreword to the Department of Health published document "Venous Thromboembolism Prevention":

" The emerging picture of death and acute and chronic disability (such as chronic venous insufficiency, venous leg ulcers and pulmonary hypertension) leaves no room for complacency when low-cost effective preventative treatments are available."

VTE is the immediate cause of death in 10% of all patients who die in hospital, and the long-term cost of treating disability caused by VTE is around £640 million a year (Health Select Committee, 2005). Many deaths are preventable if patients are offered risk assessment and, when required, appropriate thromboprophylaxis.

The House of Commons Select Committee Report on the Prevention of Venous Thromboembolism (VTE) in hospitalised patients first addressed the situation in February 2005. In May 2012, the Welsh Assembly Government Health and Social Care committee held a one-day enquiry into in to Venous Thrombo-embolism Prevention in Welsh hospitals.

The following five recommendations were made based upon the one-day enquiry:

Recommendation 1: The Committee recommends that the Welsh Government recognise the importance of reducing the incidence of hospital acquired thrombosis (HAT) in Wales by actively considering whether compliance with the relevant NICE guidance should be included as a tier 1 priority for health boards, against which they will be performance managed. This should be considered alongside revised action through the 1000 Lives campaign. The Committee requests that the Welsh Government report to us the outcome of the consideration it gives to including compliance with the NICE guidance as a tier one priority and explains the reasons for the conclusion it reaches. This consideration should be given as part of the next review of tier 1 priorities.

Recommendation 2: The Committee recommends that a standard procedure be implemented to reduce hospital-acquired thrombosis (HAT) in Wales, mandating clinicians to risk assess and to consider prescribing appropriate thromboprophylaxis – mechanical or chemical –for all hospitalised patients.

Recommendation 3: The Committee recommends that health boards should develop a standardised method to demonstrate a hospital acquire thrombosis rate for each hospital in Wales and at a national, all- Wales level. We recommend that health boards learn from the work already undertaken by Betsi Cadwaladr University Health Board and others so that a standard methodology can be rapidly developed and implemented across Wales.

Recommendation 4: The Committee recommends that a root-cause analysis should be undertaken for each case of Venous Thromboembolism (VTE) at Welsh hospitals, or for patients presenting VTE within 3 months of being discharged from a Welsh hospital, to establish whether they were acquired because of hospital treatment.

Recommendation 5: The Committee recommends that the Welsh Government and health boards work together to raise awareness amongst patients and clinicians of the risks of developing hospital acquired thrombosis (HAT). We recommend that this should take the form of a public education campaign to improve understanding of the risks of HAT and the severity of the problem.

NICE Clinical Guidance 89 – Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism (2018) was released providing clear guidance regarding National Standards.

Nice Clinical guidance 89 (2018) forms the foundation for thromboprophylaxis risk assessment tools for the following patient groups:

- Medical Patients
- Surgical Patients – Elective / Acute
- Orthopaedic Patients – Elective / Acute
- Obstetric Patients

The appropriate use of Thromboprophylaxis will:

- Reduce morbidity due to Venous Thromboembolism
- Reduce mortality rates due to Venous Thromboembolism Parliamentary
- Reduce treatment cost due to Venous Thromboembolism

Section One: The Policy

Scope

The policy covers the following groups of patients

- Medical and surgical patients over the age of 16 who are admitted to hospital or who are formally admitted to a hospital bed
- Obstetric patients who are admitted to hospital
- Any other specialist group who would be at risk of VTE, but does not fall into the above categories

Patients aged 16 to 18

The scope of this policy has changed from covering pateints over the age of 18 to those over the age of 16. This is in response to the most recent update of the NICE guidance (NG89). Prescribers should be aware that at the time of publication of this policy, none of the drugs discussed are licensed for thromboprophylaxis in patients below 18 years of age. Prescribers should be mindful that any prescribing is unlicensed, and hence all prescribing decisions should be discussed with the patient and in line with the health board policy for prescribing and administering unlicensed and off-label medication. For further information, please see the section within this guideline on prescribing in patients aged above 16 years of age, but below 18 years of age.

Policy Statements

- **ALL** patients admitted to any hospital site within the health board, should have their risk of venous thromboembolism (VTE) and bleeding assessed
- This should be undertaken as soon as possible after admission, or by the time of the first consultant review
- The review should be documented using (at least) one of the following methods:
  - The specific section of the All Wales Inpatient Medication Administration Record (IMAR)
  - A relevant health board approved specialty risk assessment tools, of which there are examples available in the appendices of this policy.
  - Electronically where the functionality is available.
- Any reason to not use thromboprophylaxis should be clearly documented in one of the aforementioned areas
- **ALL** patients should have their VTE and bleeding risk re-assessed after 24 hours or as soon as the patients clinical picture dictates

- **ALL** patients who are deemed at risk of developing VTE should be given verbal and written information about VTE and the risk of developing it

Audit and Reporting

Point-prevalence assessment of VTE risk assessment

- Directorates should consider undertaking audits of the uptake of VTE risk assessment in their clinical area
- The All Wales Medication Safety Thermometer audit collects data on thromboprophylaxis prescribing, with data being made available at ward and directorate level

Reporting of Hospital Acquired Thrombosis (HAT)

- A diagnosis of a VTE within 90 days of discharge from an inpatient stay (classed as 24 hours or greater) is classified as HAT
- It is a requirement of Welsh Government that the number of HAT's and potentially avoidable HATs are reported on a quarterly basis
- A group of individual within the health board should be identified to undertake a quarterly audit of all HAT cases, and identify any potentially avoidable HAT's
- A list of HAT's can be generated through the information portal via the following link (N.B. unregistered users will need to register prior to gaining access)
- The notes for each patient should be requested and each case reviewed against the following standards
  - A thromboprophylaxis risk assessment must have been completed on admission as per this health board policy and documented either the inpatient medication administration record (IMAR), risk assessment tools, or electronically via EPMA
  - For patients deemed not suitable for thromboprophylaxis, this should be clearly documented and appropriate
  - For patients deemed suitable for thromboprophylaxis, an appropriate treatment has been offered
  - An appropriate duration of thromboprophylaxis has been offered, in line with the guidance within this policy
  - The patient should have no inappropriate missed or omitted doses of their thromboprophylaxis during their inpatient stay
- A data collection tool (available in appendix 6) can be used for audit purposes

- Once data has been collected, potentially avoidable HAT cases should be discussed with a suitable MDT (containing a range of specialities including nursing, medical, and pharmacy colleagues)
- All agreed avoidable HAT cases should have a Datix incident report submitted, using the HAT reporting functionality
- The completed report should be completed and sent back to Welsh Government using the standardised report template (available from Lisa.Phillips@gov.wales)
- Quarterly reports should be generated and presented
    - Locally at directorate level quality and safety meeting
    - At the HB-wide thrombosis and anticoagulation meeting
    - Nationally at the All-Wales HAT meeting

Duties/Responsibilities

Thrombosis and Anticoagulation (T+A) Committee

The committee comprises of representatives from Medical, Nursing, Midwifery and Pharmacy staff across ABMU Health Board.

The committee:

- Provides a strategic overview for all aspects of the policy
- Have responsibility for the content of the policy, and where necessary, be responsible for updating the policy as new evidence/guidance emerges
- Monitors adherence to the policy (with results reported to the T+A group and at speciality and directorate level – see below)
- Has a quarterly agenda item on HAT rates, including numbers of potentially avoidable HAT's
- Includes HAT data in reports sent to the medicines management board (MMB)

Divisional Directors

Divisional directors are required to ensure that, as appropriate, the requirements of the policy are implemented within their areas of responsibility.

Admitting Doctor / Clinician

The admitting doctor/clinician is responsible for completing and documenting the thromboprophylaxis risk assessment (see appendices). The clinician is responsible prescribing an appropriate form of thromboprophylaxis (pharmacological and/or mechanical), or if not appropriate, documenting the reasons why the patient is not to receive thromboprophylaxis. The clinician should discuss all decisions with the patient.

Ward Based Clinical Team

Clinicians responsible for the ongoing care of admitted patients following admission should ensure that they are conversant with this policy and aware of the role that they play in the ongoing re-assessment of patient's risk of developing VTE and clinical suitability of the method of thromboprophylaxis prescribed

Nurses and Midwives

Registered nurses and midwives should ensure all patients are assessed for their risk of developing VTE within 24 hours of admission. Patients who have not been assessed for their risk of developing a VTE should be brought to the attention of the ward based clinic team. Registered nurses or midwifes are responsible for the accurate administration of prescribed thromboprophylaxis

Pharmacists

Pharmacists should ensure that prescribed thromboprophylaxis is clinically appropriate. Pharmacists should monitor the documentation and administration of prescribed thromboprophylaxis, and highlight any need to review that thromboprophylaxis, in line with change to the patient's clinical status

Section Two: Thromboprophylaxis Guidelines

Summary

Medical				
Type	**1ST Line**	**2nd Line**	**Start**	**Stop**
All	Inhixa	Fondaparinux Mechanical if high bleeding risk	On admission	When VTE risk decreased or discharged
Non-Orthopaedic Surgical				
Type	**1ST Line**	**2nd Line**	**Start (if admission on day of surgery)**	**Stop**
Abdominal Surgery	Mechanical + Inhixa	Mechanical + Fondaparinux	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Pharmacological: 28 days if surgery for cancer NICE recommends continue for 7 days (however clinical judgement of surgeon) Mechanical: Until mobile or discharged
Bariatric	Mechanical + Inhixa	Mechanical + Fondaparinux	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Pharmacological: NICE recommends continue for 7 days (however clinical judgement of surgeon) Mechanical: Until mobile or discharged
Thoracic and Cardiac Surgery	Mechanical + Inhixa	Mechanical + Fondaparinux	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Pharmacological: NICE recommends continue for 7 days (however clinical judgement of surgeon) Mechanical: Until mobile or discharged
ENT, Oral, and Maxillofacial Surgery	Inhixa	Fondaparinux Mechanical if high bleeding risk	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Pharmacological: NICE recommends continue for 7 days (however clinical judgement of surgeon)

Non-Orthopaedic Surgical (Continued)				
Type	**1ST Line**	**2nd Line**	**Start (if admission on day of surgery)**	**Stop**
Open Vascular Surgery or Endovascular Aneurysm Repair	Inhixa (Consider)	Fondaparinux Mechanical if high bleeding risk	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Pharmacological: NICE recommends continue for 7 days (however clinical judgement of surgeon)
Lower Limb Amputation	Inhixa (Consider)	Fondaparinux Mechanical if high bleeding risk (IPC of contralateral leg)	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Pharmacological: NICE recommends continue for 7 days (however clinical judgement of surgeon)
Varicose Vein Surgery	Not generally required, unless surgery >90 minutes. In which case offer Inhixa	If required Fondaparinux Mechanical if high bleeding risk (IPC of contralateral leg)	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Pharmacological: NICE recommends continue for 7 days (however clinical judgement of surgeon)
Cardiac Surgery	Mechanical + Inhixa (if not receiving therapeutic anticoagulation)	Mechanical + Fondaparinux	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Pharmacological: NICE recommends continue for 7 days (however clinical judgement of surgeon) Mechanical: Until mobile or discharged
Elective Spinal Surgery	Mechanical + Inhixa (if deemed appropriate by specialist input)	Mechanical + Fondaparinux	24-48 hours post-surgery.	Pharmacological: 30 days or discharge Mechanical: Until mobile or discharged

Non-Orthopaedic Surgical (Continued)				
Type	**1ST Line**	**2nd Line**	**Start (if admission on day of surgery)**	**Stop**
Cranial Surgery	Mechanical + Inhixa (but subject to bleeding risks)	Mechanical + Fondaparinux	24-48 hours post-surgery.	Pharmacological: NICE recommends continue for 7 days (however clinical judgement of surgeon) Mechanical: Until mobile or discharged
Orthopaedic Surgical				
Type	**1ST Line**	**2nd Line**	**Start (if admission on day of surgery)**	**Stop**
Elective Hip Replacement Surgery	Inhixa (10/7) then aspirin (28/7) Inhixa (28/7) + mechanical (until discharge) Rivaroxaban (35/7)	Apixaban (32-38/7) Dabigatran (28-35/7)	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Subject to therapy (see previous columns)
Elective Knee Replacement Surgery	then aspirin (14/7) Inhixa (14/7) + mechanical (until discharge) Rivaroxaban (14/7)	Apixaban (10-14/7) Dabigatran (28-10/7)	6-12 hours post-surgery. (Unless regional anaesthesia- see table 1)	Subject to therapy (see previous columns)

Other orthopaedic	*See individual monographs*			
Specialist Groups				
Type	**1ST Line**	**2nd Line**	**Start (if admission on day of surgery)**	**Stop**
See individual monographs				

Primary Groups

Medical Patients

- All medical patients should have their risk of VTE assessed as soon as possible after admission, or by the time of the first consultant review.
- The review should be documented using either
    - The All Wales Medication Administration Record (IMAR)
    - A standardised health board **Medical Patient VTE Risk-Assessment Tool (such as the example in appendix 1), or**
    - In clinical areas where electronic prescribing is available, using the JAC electronic VTE risk assessment tool
- If the patient is to receive thromboprophylaxis, then this should be started as soon as possible, and within 14 hours of admission.
- **All patients should be re-assessed at the point of the next consultant review or if their clinical condition changes**

Duration of thromboprophylaxis

- The most recent NICE guidance (NG89) recommended that all medical patients receive at least 7 days of pharmacological thromboprophylaxis
    - The health board T+A committee have recommended against the use of routine extended (i.e. beyond discharge) pharmacological thromboprophylaxis in medical patients. Reasons for this decision include concerns around Cost vs Benefit ratio, validity of the key studies in modern practice, safety of home LMWH administration.
    - These concerns are in line with the British Society of Haematology's recent rebuttal to the NICE guidance
    - Extended thromboprophylaxis in medical patients is currently not recommended within the ACCP guidelines
    - The 2018 ASH guidelines contain strong recommendations in favour of using in-patient only thromboprophylaxis for both acute unwell and critically unwell patients.
- As such, the HB recommendation is that extended pharmacological thromboprophylaxis in medical patients is not routinely offered; unless the prescribing clinician feels that the patient is sufficiently at risk of thrombosis for it to be considered.
- Pharmacological thromboprophylaxis should instead be regularly reviewed, and stopped when the patients risk of developing VTE has reduced, or the patient discharged
- This statement is in line with the advice offered in the All Wales Thromboprophylaxis policy

Reducing the risk of thrombosis in medical patients

- Ensure patients are adequately hydrated during their inpatient stay (unless there is a clinical reason not to)
- Ensure early mobilisation where clinically appropriate

Therapeutic Guidelines

- Acutely ill medical patients who are deemed to have a risk of VTE that outweighs their bleeding risk, should receive pharmacological thromboprophylaxis with:
    - Inhixa (Enoxaparin)
    - Fondaparinux (if Inhixa contraindicated)
- For prescribing guidance, please see below
- Acute stroke patients should not be offered anti-embolism stockings. In their place, intermittent pneumatic compression stockings should be used for those patients who are immobile

Prescribing guidance

- For guidance on prescribing, see the section of the document titled Thromboprophylaxis Prescribing.

Surgical Patients (Non-Orthopaedic)

- All surgical patients should have their risk of VTE assessed as soon as possible after admission, or by the time of the first consultant review.
- The review should be documented using either
    - A standardised health board **Surgical Patient VTE Risk-Assessment Tool (such as the example in appendix 2).**
    - In clinical areas where electronic prescribing is available, using the JAC electronic VTE risk assessment tool
- If the patient is to receive thromboprophylaxis, then this should be started as soon as possible, and within 14 hours of admission.
- **All patients should be re-assessed at the point of the next consultant review or if their clinical condition changes**

Reducing the risk of thrombosis in elective surgical patients

- NICE recommends, where possible, the use of regional anaesthesia (as opposed to general), due to its lower risk of VTE (however see below, reducing the bleeding risk)
- NICE recommends that patients taking oestrogen containing oral contraceptives or hormone replacement therapy should stop these medications 4 weeks before surgery and advised to use other methods of contraception.
- Ensure patients are adequately hydrated during their inpatient stay (unless there is a clinical reason not to)
- Ensure early mobilisation where clinically appropriate

Reducing the risk of bleeding in elective surgical patients

- When using regional anaesthesia, careful consideration should be given towards the timing of both the anaesthesia, catheter removal, and administration of anticoagulant.
- This is due to the risk of developing epidural or spinal haematoma with neuraxial anaesthesia (spinal/epidural anaesthesia) or spinal/epidural puncture
- Guidance on timing of anaesthesia and thromboprophylaxis is available below in table 1.

Duration of thromboprophylaxis

- The most recent NICE guidance (NG89) recommended that all surgical patients receive at least 7 days of pharmacological thromboprophylaxis
    - There are concerns around this approach from a cost, efficacy, and safety (in terms of patient self-administration) perspective.
    - These concerns are in line with the British Society of Haematology's recent rebuttal to the NICE guidance
    - Routine extended thromboprophylaxis in surgical patients is currently not recommended within the ACCP guidelines
    - Specific society guidelines e.g. the European Association of Urology 2020 guidelines recommend continuing anticoagulation until ambulation only
- As such, the NICE recommendations are stated below as guidance only. It is under the discretion of the surgeon as to whether extended or in-patient only thromboprophylaxis is used, based upon an assessment of the patients bleeding and thrombotic risk

Therapeutic Guidelines

Timing of Thromboprophylaxis

- If given the day before surgery
    - Administer **no later than 18:00**
- If given after surgery
    - Administer **6-12 hours post-surgery**
- For patients requiring neuraxial anaesthesia (spinal/epidural anaesthesia) or spinal/epidural puncture, see table 1 below

- ***Table 1-*** *Thromboprophylaxis and neuraxial anaesthesia (spinal/epidural anaesthesia) or spinal/epidural puncture*

Pharmacological Thromboprophylactic Regime	*If a patient requires thromboprophylaxis prior to surgery, how long following administration of pharmacological thromboprophylaxis can the patient receive neuraxial/spinal anaesthesia?*	*How long following administration of pharmacological thromboprophylaxis, should we wait until catheter removal?*	*How long following removal of an epidural/catheter should we wait until the first dose of pharmacological thromboprophylaxis*
Inhixa (Prophylactic doses only)[1]	At least 12 hours* Consider doubling if CrCl 15-30ml/min	At least 12 hours* Consider doubling if CrCl 15-30ml/min	4 hours
Fondaparinux (Arixtra)[2,3]	No recommendation available in SmPC	No recommendation available in SmPC Studies adopted a strategy of 36-42 hours[3]	No recommendation available in SmPC Studies adopted a strategy of 12 hours[3]

References:

1- SmPC. Inhixa 4,000 IU (40 mg)/0.4 mL solution for injection. Summary of Product Characteristics. Techdow Pharmaceuticals. 15th of September 2016 (Updated 26th of September 2017). Accessed 26th of June 2019 via https://www.medicines.org.uk/emc/product/784/smpc

2- SmPC. Arixtra 1.5 mg/0.3 ml solution for injection, pre-filled syringe. Summary of Product Characteristics. Aspen Pharmaceuticals. 21st of March 2002 (Updated 10th of September 2018). Accessed 26th of June 2019 via https://www.medicines.org.uk/emc/product/3359/smpc#

3- Gogarten, Wiebke; Vandermeulen, Erik; Van Aken, Hugo; Kozek, Sibylle; Llau, Juan V; Samama, Charles M. Regional anaesthesia and antithrombotic agents: recommendations of the European Society of Anaesthesiology European Journal of Anaesthesiology: December 2010 - Volume 27 - Issue 12 - p 999–1015. doi: 10.1097/EJA.0b013e32833f6f6f. Accessed 26/6/19. Available via https://journals.lww.com/ejanaesthesiology/fulltext/2010/12000/.Regional_anaesthesia_and_antithrombotic_agents_.1.aspx

Prescribing guidance

- For guidance on prescribing, see the section of the document titled Thromboprophylaxis Prescribing.

Abdominal Surgery (Gastrointestinal, gynaecological, urological)

- Abdominal surgery patients at risk of VTE are defined as those who have one or more risk factor for VTE or where duration of anaesthesia and surgery ≥ 60 minutes (pelvic or lower limb surgery) or ≥90 minutes (other surgery):
- Offer these at risk patients
    - A mechanical method of thromboprophylaxis with either:
        - Anti-embolism stockings **or**
        - Intermittent pneumatic compression
    - A pharmacological method of thromboprophylaxis provided that their bleeding risk does not outweigh their VTE risk
        - Inhixa
        - Fondaparinux (if Inhixa contraindicated)
        - For drug related information see below
- Durations for interventions
    - Pharmacological and/or mechanical methods of thromboprophylaxis should be continued until the patients no longer has significantly reduced mobility relative to their normal or anticipated mobility.
    - NICE recommends that thromboprophylaxis should be continued for a minimum of 7 days, however duration decisions will be under the discretion of the patients surgeon (balancing thrombotic and bleeding risks)
    - Pharmacological thromboprophylaxis should be extended to 28 days for patients who have had major surgery of the abdomen for cancer

Bariatric Surgery

- Offer VTE prophylaxis to all patients undergoing bariatric surgery
    - A mechanical method of thromboprophylaxis with either:
        - Anti-embolism stockings **or**
        - Intermittent pneumatic compression
    - A pharmacological method of thromboprophylaxis provided that their bleeding risk does not outweigh their VTE risk

        - Inhixa
        - Fondaparinux (if Inhixa contraindicated)
        - For drug related information see below
- Durations for interventions
    - Mechanical methods of thromboprophylaxis should be continued until the patients no longer has significantly reduced mobility relative to their normal or anticipated mobility
    - NICE recommends that thromboprophylaxis should be continued for a minimum of 7 days, however duration decisions will be under the discretion of the patients surgeon (balancing thrombotic and bleeding risks)
- For information on dosing of low molecular heparins in bariatric patients, please refer to the health board policy.

Thoracic and Cardiac Surgery

- Offer VTE prophylaxis to all patients who are at increased risk of VTE
    - A mechanical method of thromboprophylaxis with either:
        - Anti-embolism stockings **or**
        - Intermittent pneumatic compression
    - A pharmacological method of thromboprophylaxis provided that their bleeding risk does not outweigh their VTE risk
        - Inhixa
        - Fondaparinux (if Inhixa contraindicated)
        - For drug related information see below
- Durations for interventions
    - Mechanical methods of thromboprophylaxis should be continued until the patients no longer has significantly reduced mobility relative to their normal or anticipated mobility
    - NICE recommends that thromboprophylaxis should be continued for a minimum of 7 days, however duration decisions will be under the discretion of the patients surgeon (balancing thrombotic and bleeding risks)

ENT, Oral, and Maxillofacial Surgery

- For patients whose risk of VTE outweighs their bleeding risk offer:
    - Inhixa
    - Fondaparinux (if Inhixa contraindicated)

- NICE recommends that thromboprophylaxis should be continued for a minimum of 7 days, however duration decisions will be under the discretion of the patients surgeon (balancing thrombotic and bleeding risks)
- For patients whose risk of VTE and bleeding are high offer
    - Anti-embolism stockings
    - Intermittent pneumatic compression
    - These should be continued until the patients no longer has significantly reduced mobility relative to their normal or anticipated mobility

Open Vascular Surgery or Endovascular Aneurysm Repair

- Consider the use of pharmacological VTE prophylaxis for all patients whose VTE risk outweighs their bleeding risk, with:
    - Inhixa
    - Fondaparinux (if Inhixa contraindicated)
- NICE recommends that thromboprophylaxis should be continued for a minimum of 7 days, however duration decisions will be under the discretion of the patients surgeon (balancing thrombotic and bleeding risks)
- For patients whose risk of VTE is high, but are contraindicated from pharmacological thromboprophylaxis, consider mechanical methods, provided that the patient has no contraindications to these either (e.g. lower limb ischaemia)
    - Anti-embolism stockings
    - Intermittent pneumatic compression
    - These should be continued until the patients no longer has significantly reduced mobility relative to their normal or anticipated mobility

Lower Limb Amputation

- Consider the use of pharmacological VTE prophylaxis for all patients whose VTE risk outweighs their bleeding risk, with:
    - Inhixa
    - Fondaparinux (if Inhixa contraindicated)
- NICE recommends that thromboprophylaxis should be continued for a minimum of 7 days, however duration decisions will be under the discretion of the patients surgeon (balancing thrombotic and bleeding risks)

- For patients whose risk of VTE is high, but are contraindicated from pharmacological thromboprophylaxis, consider mechanical methods, provided that the patient has no contraindications to these either (e.g. lower limb ischaemia)
    - Intermittent pneumatic compression on the contralateral leg
    - These should be continued until the patients no longer has significantly reduced mobility relative to their anticipated mobility

Varicose Vein Surgery

- Thromboprophylaxis is generally not indicated in this patient group, especially when total anaesthesia time is less than 90 minutes, or the patient is at low risk of VTE
- If however total anaesthesia time is more than 90 minutes of the patients VTE risk outweighs their bleeding risk then consider 7 days of pharmacological thromboprophylaxis with:
    - Inhixa
    - Fondaparinux (if Inhixa contraindicated)
- For patients whose risk of VTE is high, but are contraindicated from pharmacological thromboprophylaxis, consider
    - Intermittent pneumatic compression on the contralateral leg
    - These should be continued until the patients no longer has significantly reduced mobility relative to their normal or anticipated mobility

Cardiac Surgery

- For patients at risk of VTE who are undergoing cardiac surgery, mechanical methods of thromboprophylaxis should be prescribed at the point of admission with **either:**
    - Anti-embolism stockings **or**
    - Intermittent pneumatic compression
    - These should be continued until the patients no longer has significantly reduced mobility relative to their normal or anticipated mobility
- For patient not being prescribed therapeutic anticoagulation, then the addition of pharmacological VTE prophylaxis should be considered with **either:**
    - Inhixa
    - Fondaparinux (if Inhixa contraindicated)

Elective Spinal Surgery

- For patients at risk of VTE who are undergoing elective spinal surgery, mechanical methods of thromboprophylaxis should be prescribed at the point of admission with **either:**

  - Anti-embolism stockings **or**
  - Intermittent pneumatic compression
  - These should be continued until for 30 days, or until the patient is mobile or discharge (whichever is sooner)
- The decision to use pharmacological thromboprophylaxis should be undertaken on a case by case basis, by assessing the patients bleeding and thrombotic risk factors
  - NICE recommends that if pharmacological thromboprophylaxis is indicated, LMWH (Inhixa) should be used
  - NICE recommends that in most cases, pharmacological thromboprophylaxis is not started until 24-48 hours post-surgery
  - Inhixa should be continued for 30 days, or until the patient is mobile or discharged (whichever is sooner)

Cranial Surgery

- For patients at risk of VTE who are undergoing elective spinal surgery, mechanical methods of thromboprophylaxis should be prescribed at the point of admission with **either:**
  - Anti-embolism stockings **or**
  - Intermittent pneumatic compression
  - These should be continued until for 30 days, or until the patient is mobile or discharge (whichever is sooner)
- In patients whose thrombotic risk outweighs their bleeding risk, consider pharmacological thromboprophylaxis with Inhixa
  - If to be used pre-operatively, give the last dose no earlier than 24 hours before surgery
  - If to be used post-operatively, start 24-48 hours post-surgery
  - Continue for a minimum, of 7 days
- NICE recommends against the use of pharmacological thromboprophylaxis in patients at high risk of bleeding (e.g. patients with ruptured cranial vascular malformations or intracranial haemorrhage)
  - Pharmacological thromboprophylaxis may be considered once the lesion has been secured or condition improved

Surgical Patients (Orthopaedic)

- All surgical orthopaedic patients should have their risk of VTE assessed as soon as possible after admission, or by the time of the first consultant review.
- The review should be documented using either
    - A standardised health board **Orthopaedic Patient VTE Risk-Assessment Tool (such as the example in appendix 3).**
    - In clinical areas where electronic prescribing is available, using the JAC electronic VTE risk assessment tool
- If the patient is to receive thromboprophylaxis, then this should be started as soon as possible, and within 14 hours of admission, unless otherwise recommended in the specific patient populations below:
- **All patients should be re-assessed at the point of the next consultant review or if their clinical condition changes**

Reducing the risk of thrombosis in elective surgical patients

- NICE recommends, where possible, the use of regional anaesthesia (as opposed to general), due to its lower risk of VTE (however see below, reducing the bleeding risk)
- NICE recommends that patients taking oestrogen containing oral contraceptives or hormone replacement therapy should stop these medications 4 weeks before surgery and advised to use other methods of contraception.
- Ensure patients are adequately hydrated during their inpatient stay (unless there is a clinical reason not to)
- Ensure early mobilisation where clinically appropriate

Reducing the risk of bleeding in elective surgical patients

- When using regional anaesthesia, careful consideration should be given towards the timing of both the anaesthesia, catheter removal, and administration of anticoagulant.
- This is due to the risk of developing epidural or spinal haematoma with neuraxial anaesthesia (spinal/epidural anaesthesia) or spinal/epidural puncture
- Guidance on timing of anaesthesia and thromboprophylaxis is available below in table 1.

Therapeutic Guidelines

Timing of Thromboprophylaxis

- If given the day before surgery
    - Administer **no later than 18:00**
- If given after surgery
    - Administer **6-12 hours post-surgery**
- For patients requiring neuraxial anaesthesia (spinal/epidural anaesthesia) or spinal/epidural puncture, see table 2 below

- ***Table 1-*** *Thromboprophylaxis and neuraxial anaesthesia (spinal/epidural anaesthesia) or spinal/epidural puncture*

Pharmacological Thromboprophylactic Regime	*How long following administration of pharmacological thromboprophylaxis can the patient receive neuraxial/spinal anaesthesia*	*How long following administration of pharmacological thromboprophylaxis, should we wait until catheter removal?*	*How long following removal of an epidural/catheter should we wait until the first dose of pharmacological thromboprophylaxis*
Apixaban [1] ***(Prophylactic doses only***	Not recommended pre-surgery	Not recommended pre-surgery	At least 5 Hours
Aspirin [2]	Not recommended pre-surgery	Not recommended pre-surgery	No information from SmPC European Society of Anaesthesiology suggest no evidence of risk, therefore no time restriction
Dabigatran[3] ***(Prophylactic doses only***	Not recommended pre-surgery	Not recommended pre-surgery	At least 2 hours
Rivaroxaban[4] ***(Prophylactic doses only***	Not recommended pre-surgery	Not recommended pre-surgery	At least 6 hours
Inhixa[5] ***(Prophylactic doses only)***	At least 12 hours* Consider doubling if CrCl 15-30ml/min	At least 12 hours* Consider doubling if CrCl 15-30ml/min	4 hours
Fondaparinux (Arixtra) [2, 6]	No recommendation available in SmPC	No recommendation available in SmPC Studies adopted a strategy of 36-42 hours[6]	No recommendation available in SmPC Studies adopted a strategy of 12 hours[6]

References:

1- SmPC. Eliquis 5 mg film-coated tablets. Summary of Product Characteristics. BMS Pfizer. 18th of May 2011 (Updated 12th of June 2019). Accessed 26th of June 2019 via https://www.medicines.org.uk/emc/product/2878/smpc

2- Gogarten, Wiebke; Vandermeulen, Erik; Van Aken, Hugo; Kozek, Sibylle; Llau, Juan V; Samama, Charles M. Regional anaesthesia and antithrombotic agents: recommendations of the European Society of Anaesthesiology European Journal of Anaesthesiology: December 2010 - Volume 27 - Issue 12 - p 999–1015. doi: 10.1097/EJA.0b013e32833f6f6f. Accessed 26/6/19. Available via https://journals.lww.com/ejanaesthesiology/fulltext/2010/12000/.Regional_anaesthesia_and_antithrombotic_agents_.1.aspx

3- SmPC. Pradaxa 110 mg hard capsules. Summary of Product Characteristics. Bayer. 18th of March 2008 (Updated 20th of May 2019). Accessed 26th of June 2019 via https://www.medicines.org.uk/emc/product/6229/smpc

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5- SmPC. Inhixa 4,000 IU (40 mg)/0.4 mL solution for injection. Summary of Product Characteristics. Techdow Pharmaceuticals. 15th of September 2016 (Updated 26th of September 2017). Accessed 26th of June 2019 via https://www.medicines.org.uk/emc/product/784/smpc

6- SmPC. Arixtra 1.5 mg/0.3 ml solution for injection, pre-filled syringe. Summary of Product Characteristics. Aspen Pharmaceuticals. 21st of March 2002 (Updated 10th of September 2018). Accessed 26th of June 2019 via https://www.medicines.org.uk/emc/product/3359/smpc#

Elective Hip Replacement Surgery

- Provided bleeding risk does not outweigh VTE risk, offer patients either:
    - Inhixa (enoxaparin) for 10 days followed by aspirin (75mg or 150mg) for a further 28 days
    - Inhixa (enoxaparin) for 28 days with anti-embolism stocking used until discharge
    - Rivaroxaban 10mg OD for 35 days
- If the patient is contraindicated from any of the above, offer:
    - Apixaban 2.5mg BD (starting 12-24 hours after surgery) for 32 to 38 days
    - Dabigatran 110mg as a single dose (taken 1-4 hours post-surgery) followed by 220mg once daily for 28-35 days
- If the patient is contraindicated from pharmacological thromboprophylaxis, consider anti-embolism stockings (to be used until discharge)

Elective Knee Replacement Surgery

- Provided bleeding risk does not outweigh VTE risk, offer patients either:
    - Aspirin (75mg or 150mg) for 14 days
    - Inhixa (enoxaparin) for 14 days with anti-embolism stocking used until discharge

  - Rivaroxaban 10mg OD for 14 days
- If the patient is contraindicated from any of the above, offer:
  - Apixaban 2.5mg BD (starting 12-24 hours after surgery) for 10 to 14 days
  - Dabigatran 110mg as a single dose (taken 1-4 hours post-surgery) followed by 220mg once daily for 10 days
- If the patient is contraindicated from pharmacological thromboprophylaxis, consider intermittent pneumatic compression (to be used until mobile)

Non-Arthroplasty Orthopaedic Knee Surgery

- VTE prophylaxis is generally not indicated in this patient group unless
  - Total anaesthesia time is more than 90 minutes **or**
  - The patients risk of VTE outweighs their risk of bleeding

Foot and Ankle Orthopaedic Knee Surgery

- VTE prophylaxis is generally not indicated in this patient group unless
  - The surgery requires immobilisation (however stopping should be considered if the immobilisation lasts longer than 42 days)
  - Total anaesthesia time is more than 90 minutes **or**
  - The patients risk of VTE outweighs their risk of bleeding

Upper Limb Orthopaedic Surgery

- VTE prophylaxis is generally not indicated in this patient group when using local or regional anaesthesia
- VTE prophylaxis may be considered if:
  - The patients total time under general anaesthetic is over 90 minutes **or**
  - The patients operation is likely to make it difficult for them to mobilise

Fragility fractures of the pelvis, hip and proximal femur

- If VTE risks outweighs bleeding risk, offer patients either:
  - Inhixa (enoxaparin) starting 6-12 hours post-surgery or
  - Fondaparinux starting 6 hours post-surgery (provided that there is a low risk of bleeding)
- If surgery is delayed beyond the day of admission, then pre-operative VTE prophylaxis may be considered, provided that the last dose of LMWH is given no less than 12 hours before surgery (24 hours for fondaparinux)

- For patients who are contraindicated from pharmacological thromboprophylaxis, consider intermittent pneumatic compression. This should be continued until the patient no longer has significantly reduced mobility relative to their normal or anticipated mobility.

Specialist Groups

Major Trauma Patients

Background

- Trauma patients are known to be at a high risk of developing DVT, and this section discusses patient admitted to hospital following major trauma who are not having surgery
- No validated risk assessment tool is available for non-surgical patients admitted to hospital
- In terms of thromboprophylaxis strategies, a Cochrane Review found a significant reduction in the rate of DVT when thromboprophylaxis (any type) was offered to patients. The greatest risk reduction was observed for pharmacological thromboprophylaxis (1).
- However, no impact on reduction of PE's or overall mortality was observed from the studies

General Guidance

- NICE recommends that all patients admitted following serious or major trauma should be offered intermittent pneumatic compression on admission.
    - This should be continued until the patient no longer has significantly reduced mobility relative to their normal or anticipated mobility
- The patients VTE and bleeding risk should be assessed whenever their clinical condition changes, and at least daily
    - The risk assessment should be undertaken using the health board wide medical, surgical, or orthopaedic risk assessment tools (depending on what intervention is to be undertaken)
        - N.B. This is with the exception of lower limb immobilisation (see below)
- Pharmacological VTE prophylaxis may be considered once the risk assessment has identified that the patients risk of VTE outweighs their bleeding risk
- Pharmacological thromboprophylaxis should be offered in the form of 7 days of:
    - Inhixa (Enoxaparin)
    - Fondaparinux (if Inhixa contraindicated)

Lower Limb Immobilisation

- The Royal College of Emergency medicine guidelines on the management of ambulatory trauma patients requiring temporary limb immobilisation advise that there is reasonable evidence to suggest a significant risk of VTE in ambulatory patients with isolated injury and subsequent temporary lower limb immobilisation (2)
- For patients who have lower limb immobilisation and any temporary risk factor (including rigid immobilisation, non-weight bearing status, acute sever injury), risk assessment for VTE should be undertaken
    - No validated clinical prediction score exists for this group of patients
- In patients whose VTE risk outweighs their bleeding risk, pharmacological thromboprophylaxis should be considered using LMWH or fondaparinux
- This should be continued for the duration of the plaster immobilisation period
- However, there should be a consideration towards stopping therapy if lower limb immobility is to continue beyond 42 days

Upper Limb Immobilisation

- The College of Emergency Medicine Guidelines on the use of thromboprophylaxis in ambulatory trauma patients requiring limb immobilisation do not consider there to be sufficient risk of VTE to consider the routine use of thromboprophylaxis. (2)

Spinal Injury (Patients not for surgery)

- For patients at risk of VTE who are admitted with a spinal injury, mechanical methods of thromboprophylaxis should be prescribed at the point of admission with **either:**
    - Anti-embolism stockings **or**
    - Intermittent pneumatic compression
    - The patients risk of bleeding should be re-assessed after 24 hours
- After 24 hours, for patients who are not going to have surgery in the next 24-48 hours, then pharmacological thromboprophylaxis with Inhixa may be considered in patients whose risk of VTE outweighs their bleeding risks.
    - Inhixa should be continued for 30 days, or until the patient is mobile or discharged (whichever is sooner)

References

1- Barrera LM, Perel P, Ker K, Cirocchi R, Farinella E, Morales Uribe CH. Thromboprophylaxis for trauma patients. Cochrane Database of Systematic Reviews 2013, Issue 3. Art. No.: CD008303. DOI: 10.1002/14651858.CD008303.pub2. Accessed 25/6/19

2- Guidelines in Emergency Medicine Network. Guideline for the use of thromboprophylaxis in ambulatory trauma patients requiring temporary limb immobilisation. October 2012. Accessed 25/6/19 via https://www.rcem.ac.uk/docs/College%20Guidelines/5z26.%20Thromboprophylaxis%20in%20ambulatory%20trauma%20patients%20requiring%20temporary%20limb%20immobilisation%20-%20(Flowchart)%20(Oct%202012).pdf

Cancer Patients

- Admitted cancer patients should be managed as general medical or surgical patients (see above), depending on the clinical area that they are an inpatient
- Ambulatory cancer patients who are receiving cancer modifying therapies (including radiotherapy) do not routinely require VTE prophylaxis
- The exceptions to this rule are:
    - Patients who are receiving thalidomide, lenalidomide or pomalidomide (with steroids) for the treatment of myeloma
        - Thromboprophylaxis should be with either
            - Aspirin 75-150mg
            - Inhixa (enoxaparin)
    - Thromboprophylaxis should be considered in patients with pancreatic cancer who are receiving ambulatory chemotherapy
        - Thromboprophylaxis should be with Inhixa (enoxaparin), apixaban 2.5mg BD, or rivaroxaban 10mg OD
    - ASCO recommends considering the use of thromboprophylaxis in cancer patients receiving ambulatory chemotherapy, with a Khorana Score of 2 or greater
        - Thromboprophylaxis should be with Inhixa (enoxaparin), apixaban 2.5mg BD, or rivaroxaban 10mg OD
- For further information and guidance please consult the health board guidelines on Cancer Associated Thrombosis (CAT)

Palliative Care Patients/Patients in the Last Days of Life

- Inpatients receiving palliative care should be considered for thromboprophylaxis where it is felt in the best interests of the patient (taking into account bleeding risk, thrombotic risk, life expectancy and patient/carer wishes).

- Thromboprophylaxis may be prescribed in the form of:
    - Inhixa (Enoxaparin)
    - Fondaparinux (if Inhixa contraindicated)
- NICE recommends against the use of thromboprophylaxis in the last days of life
- Thromboprophylaxis should be assessed daily

Critical Care Patients

- Assess all people admitted to the critical care unit for risk of VTE and bleeding.
- Provide pharmacological thromboprophylaxis to people admitted to the critical care unit if it is not contraindicated, with:
    - Inhixa (Enoxaparin)
    - Fondaparinux (if Inhixa contraindicated)
- Consider mechanical VTE prophylaxis for people admitted to the critical care unit if pharmacological prophylaxis is contraindicated based on their condition or procedure.
- Re-assessment of thrombosis/bleeding risks should be undertaken at least daily, but may need to be undertaken more frequently if the patients clinical condition is changing rapidly

Patients with Psychiatric Illness

- The evidence available to guide VTE risk assessment and thromboprophylaxis in patients admitted to hospitals with acute psychiatric illnesses are limited
- However, NICE recommends that these patients be managed in the same way as a patient presenting with acute medical illness
- Therefore, all patients admitted with an acute psychiatric illness should have their risk of VTE assessed as soon as possible after admission, or by the time of the first consultant review.
- The review should be documented using either
    - The standardised health board **Medical Patient VTE Risk-Assessment Tool, or**
    - In clinical areas where electronic prescribing is available, using the JAC electronic VTE risk assessment tool
- However, additional risk factors should also be considered in the risk assessment process, which are not included on the HB risk assessment tool, e.g.
    - Increased risk of thrombosis from antipsychotic medication,
    - Increased thrombosis risk from immobility due to sedation.

  - Increased bleeding risk in patients who are likely to attempt to self-harm
  - Increased bleeding risk from patients taking medications that may produce a pharmacodynamic interaction, e.g. SSRI's.
- Evidence for pharmacological thromboprophylaxis is limited to observational studies, however NICE once more recommends that this group of patients are managed in the same way as medical patients
- Patients whose risk of thrombosis outweighs their risk of bleeding should be offered pharmacological thromboprophylaxis in the form of:
  - Inhixa (Enoxaparin)
  - Fondaparinux (if Inhixa contraindicated)
- Pharmacological thromboprophylaxis for patients presenting to an acute medical/psychiatric ward should be continued until the patient is no longer at increased risk of thrombosis
- NICE did not feel that there was sufficient evidence to extend these recommendations to psychiatric patients who were not admitted to an acute medical/psychiatric ward.

Pregnant women and women who gave birth or had a miscarriage or termination of pregnancy in the past 6 weeks

- For advice on strategies for reducing the risk of VTE in pregnant individuals or who have given birth , please refer to the health board policy on the assessment, prophylaxis and treatment venous thrombo-embolism (VTE) in pregnancy and puerperium
- For women who had a miscarriage or termination , consider pharmacological thromboprophylaxis if the patients VTE risk outweighs their bleeding risk
  - Use enoxaparin (Inhixa) as the first line thromboprophylaxis
  - Start 4-8 hours after the event and continue for at least 7 days

Admitted patients with COVID 19 infection

- A separate guideline (CID3926) is available to guide decisions regarding thromborpohylaxis in this patient group

All Patients

Patient Information

- All patients and their families should have their risk of developing a VTE as a result of their admission explained to them.
- In order to support this, patients should also be given a copy of written information on the risk of developing a VTE, how to reduce those risks, and the symptoms to be vigilant for.
    - Swansea Bay University Health Boards suggests using the current Thrombosis UK patient information, however departments may choose to develop their own versions
- Patients should be advised on who to contact in the event of them developing any signs or symptoms suggestive of VTE
- For patients requiring extended thromboprophylaxis, patients should be counselled by a health care professional on the correct use of their medication/device

Equality

The following document has been screened for any possible or actual impact that this policy may have on any groups in respect of gender, maternity and pregnancy, carer status, marriage or civil partnership issues, race, disability, sexual orientation, Welsh language, religion or belief, transgender, age or other protected characteristics. A concern has been noted about the use of low molecular weight heparin (LMWH) based produces in patients of certain religious beliefs or dietary statuses. Almost all low molecular weight heparin produced in the UK are porcine in nature and therefore may be unsuitable for patients of Jewish or Muslim faiths, or those who are vegetarian or vegan. The implications of the use of LMWH should be discussed with the patient. Given that each clinical scenario is likely to be different there are no universal alternative therapies available. However, in general the following alternative therapies can be used:

- **Medical and surgical prophylaxis of DVT/PE** – Fondaparinux (at prophylactic dose). DOAC's or aspirin may be used in elective TKR/THR
- **Prophylaxis of DVT or PE in pregnancy** – no medicine is licensed in pregnancy but there are case reports for the use of fondaparinux (using the same dosing as non-pregnant patients). This is supported by RCOG as an alternative to LMWH, but should only be used after detailed discussion between the patient and the obstetrician. Fondaparinux is contra-indicated in breast-feeding. Fondaparinux is renally excreted therefore care must be taken in renal impairment.

Thromboprophylaxis Prescribing

Pharmacological Thromboprophylaxis

The following pharmacological therapies are approved for use as thromboprophylaxis for the following indications. Please consult the relevant SmPC for more in-depth prescribing information

Treatment	Thromboprophylactic Indication	Dose	Formulary Status	Contraindications
Inhixa[1] (Enoxaparin)	1) Prophylaxis of venous thromboembolic disease in moderate and high risk surgical patients 2) Prophylaxis of venous thromboembolism in medical patients	- ***Surgical:*** *In patients at moderate risk of thromboembolism, the recommended dose of enoxaparin sodium is 2,000 IU (20 mg) once daily by subcutaneous (SC) injection* - ***Surgical:*** *In patients at high risk of thromboembolism, the recommended dose of enoxaparin sodium is 4,000 IU (40 mg) once daily given by SC injection* - ***Medical:*** *The recommended dose of enoxaparin sodium is 4,000 IU (40 mg) once daily by SC injection.* - ***For patients weighing <50Kg or >100Kg consult HB policy CID2436 Guidance on the dosing of prophylactic doses of LMWH in Obese and Low Body Weight patients.*** ***Renal Impairment*** - *30ml/min – 15ml/min: Reduce dose to 20mg OD* - *<15ml/min. Inhixa is not recommended in the product licence for patients with a CrCl of less than 15ml/min. However, other sources (e.g. renal drug handbook) support using a 20mg dose. Decisions should be based upon clinical assessment of patients' bleeding and thrombotic risk factors [2]*	First line pharmacological prophylactic option for all types of surgery	Enoxaparin sodium is contraindicated in patients with: • Hypersensitivity to enoxaparin sodium, heparin or its derivatives, including other low molecular weight heparins (LMWH) or to any of the excipients. • History of immune mediated heparin-induced thrombocytopenia (HIT) within the past 100 days or in the presence of circulating antibodies • Active clinically significant bleeding and conditions with a high risk of haemorrhage, including recent haemorrhagic stroke, gastrointestinal ulcer, presence of malignant neoplasm at high risk of bleeding, recent brain, spinal or ophthalmic surgery, known or suspected oesophageal varices, arteriovenous malformations, vascular aneurysms or major intra-spinal or intracerebral vascular abnormalities; • Spinal or epidural anaesthesia or loco-regional anaesthesia when enoxaparin sodium is used for treatment in the previous 24 hours

Fondaparinux[3]	1) Prevention of Venous Thromboembolic Events (VTE) in adults undergoing major orthopaedic surgery of the lower limbs such as hip fracture, major knee surgery or hip replacement surgery. 2) Prevention of Venous Thromboembolic Events (VTE) in adults undergoing abdominal surgery who are judged to be at high risk of thromboembolic complications, such as patients undergoing abdominal cancer surgery 3) Prevention of Venous Thromboembolic Events (VTE) in adult medical patients who are judged to be at high risk for VTE and who are immobilised due to acute illness such as cardiac insufficiency and/or acute respiratory disorders, and/or acute infectious or inflammatory disease.	- ***Medical and Surgical:*** *The recommended dose of fondaparinux is 2.5 mg* ***Renal Impairment*** ***CrCl <20ml/min:*** *Contraindicated* ***CrCl 20-50ml/min:*** *Reduce dose to 1.5mg S/C OD*	On formulary-reserved for patients who are contraindicated from receiving Inhixa	• Hypersensitivity to the active substance or to any of the excipients • Active clinically significant bleeding • Acute bacterial endocarditis • Severe renal impairment defined by creatinine clearance < 20 ml/min.
Rivaroxaban[4] (Xarelto)	1) Prevention of VTE in adult patients undergoing elective hip or knee replacement surgery	- ***Treatment initiation 6-10 hours after completed surgery****: single tablet of 10mg rivaroxaban taken once a day* - ***Duration:*** *14 days for knee replacement, 35 days following elective hip replacement* ***Renal Impairment*** ***CrCl <15ml/min:*** *Contraindicated* ***CrCl 15-49ml/min:*** *Use with caution with 10mg OD*	First Line option for patients undergoing elective TKR/THR	• Hypersensitivity to the active substance or to any of the excipients listed in section • Active clinically significant bleeding. • Lesion or condition, if considered a significant risk for major bleeding. This may include current or recent gastrointestinal ulceration, presence of malignant neoplasms at high risk of bleeding, recent brain or spinal injury, recent brain, spinal or ophthalmic surgery, recent intracranial haemorrhage, known or suspected oesophageal varices, arteriovenous malformations, vascular aneurysms or major intraspinal or intracerebral vascular abnormalities. • Concomitant treatment with any other anticoagulants, e.g. unfractionated heparin (UFH), low molecular weight

				heparins (enoxaparin, dalteparin, etc.), heparin derivatives (fondaparinux, etc.), oral anticoagulants (warfarin, dabigatran etexilate, apixaban, etc.) except under specific circumstances of switching anticoagulant therapy or when UFH is given at doses necessary to maintain an open central venous or arterial catheter • Hepatic disease associated with coagulopathy and clinically relevant bleeding risk including cirrhotic patients with Child Pugh B and C • Pregnancy and breast-feeding
Aspirin[5]	1) Primary prevention of venous thromboembolic events in adult patients who have undergone elective total hip replacement surgery or total knee replacement surgery [Unlicensed Indication]	- ***Treatment initiation 4-6 hours post-surgery**: 75-150mg of aspirin once each day*	First Line option for patients undergoing elective TKR/THR	• Hypersensitivity to salicylic acid compounds or prostaglandin synthetase inhibitors (e.g. certain asthma patients who may suffer an attack or faint) or to any of the excipients listed in section • Active, or history of recurrent peptic ulcer and/or gastric/intestinal haemorrhage, or other kinds of bleeding such as cerebrovascular haemorrhages; • Haemorrhagic diathesis; coagulation disorders such as haemophilia and thrombocytopenia; • Severe hepatic impairment; • Severe renal impairment; • Gout; • Doses >100 mg/day during the third trimester of pregnancy • Methotrexate used at doses >15mg/week
Dabigatran [6](Pradaxa)	1) Primary prevention of venous thromboembolic events in adult patients who have undergone elective total hip replacement surgery or total knee replacement surgery.	- ***Treatment initiation on the day of surgery 1-4 hours after completed surgery**: single capsule of 110 mg dabigatran* - ***Maintenance dose starting on the first day after surgery**: 220 mg dabigatran once daily taken as 2 capsules of 110 mg* - ***Duration:** 10 days for knee*	Second Line option for patients undergoing elective TKR/THR	• Hypersensitivity to the active substance or to any of the excipients • Patients with severe renal impairment (CrCL < 30 mL/min) • Active clinically significant bleeding • Lesion or condition, if considered a significant risk factor for major bleeding. This may include current or recent gastrointestinal ulceration, presence of malignant

		replacement, 28-35 following elective hip replacement ***Dose reductions*** ➢ *Patients with moderate renal impairment (creatinine clearance (CrCL 30-50 mL/min)* ***and/or*** ➢ *Patients who receive concomitant verapamil*, amiodarone, quinidine* ***and/or*** ➢ *Patients aged 75 or above:* - *Use initial single dose of 75mg followed by maintenance dose of 150mg once daily* ***Dabigatran is contraindicated in patients with a CrCl of less than 30ml/min***		neoplasms at high risk of bleeding, recent brain or spinal injury, recent brain, spinal or ophthalmic surgery, recent intracranial haemorrhage, known or suspected oesophageal varices, arteriovenous malformations, vascular aneurysms or major intraspinal or intracerebral vascular abnormalities • Concomitant treatment with any other anticoagulants e.g. unfractionated heparin (UFH), low molecular weight heparins (enoxaparin, dalteparin etc), heparin derivatives (fondaparinux etc), oral anticoagulants (warfarin, rivaroxaban, apixaban etc) except under specific circumstances. • Hepatic impairment or liver disease expected to have any impact on survival • Concomitant treatment with the following strong P-gp inhibitors: systemic ketoconazole, cyclosporine, itraconazole and dronedarone
Apixaban [7](Eliquis)	1) Prevention of venous thromboembolic events (VTE) in adult patients who have undergone elective hip or knee replacement surgery	- ***Treatment initiation 12-14 hours after completed surgery****: single tablet of 2.5mg Apixaban taken twice a day* - ***Duration:*** *10-14 days for knee replacement, 32-38 following elective hip replacement* ***Renal Impairment*** ***CrCl <15ml/min:*** *Contraindicated* ***CrCl 15-29ml/min:*** *Use with caution. Renal drug handbook recommends 2.5mg BD*[2]	Second Line option for patients undergoing elective TKR/THR	• Hypersensitivity to the active substance or to any of the excipients • Active clinically significant bleeding. • Hepatic disease associated with coagulopathy and clinically relevant bleeding risk • Lesion or condition if considered a significant risk factor for major bleeding. This may include current or recent gastrointestinal ulceration, presence of malignant neoplasms at high risk of bleeding, recent brain or spinal injury, recent brain, spinal or ophthalmic surgery, recent intracranial haemorrhage, known or suspected oesophageal varices, arteriovenous malformations, vascular aneurysms or major intraspinal or intracerebral vascular abnormalities. • Concomitant treatment with any other anticoagulant agent e.g., unfractionated heparin (UFH), low molecular weight heparins (enoxaparin, dalteparin, etc.), heparin derivatives (fondaparinux, etc.), oral anticoagulants (warfarin, rivaroxaban, dabigatran, etc.) except under specific circumstances of switching anticoagulant therapy or when UFH is given at doses necessary to maintain an open central venous or arterial catheter.

Aspirin Prescribing

It should be noted that prescribing of aspirin for primary prophylaxis of thrombosis post hip and knee surgery is outside of the product license. Prescribers are reminded of their responsibility in line with the health board policy on prescribing off-license medication

References

1- SmPC. Inhixa 4,000 IU (40 mg)/0.4 mL solution for injection. Summary of Product Characteristics. Techdow Pharmaceuticals. 15th of September 2016 (Updated 26th of September 2017). Accessed 26th of June 2019 via https://www.medicines.org.uk/emc/product/784/smpc
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Patient aged above 16 years of age, but below 18 years of age

- As previously discussed the lower age cut off for the scope of the policy/guideline has changed to 16 years of age
- At the time of writing, none of the above mentioned medicines are licensed for thromboprophylaxis in patients under the age of 18 with the exception(s) of
    - Aspirin is licensed in patients above 16 years of age, however has no license for thromboprophylaxis in any age group
    - Fondaparinux is licensed in patients aged 17 or above
- The following recommendations (unlicensed) are recommended within this health-board

Medical Patients

- Patients within this age category should be assessed for their risk of thrombosis and bleeding on the same way as all other patients
- Patients should be offered pharmacological thromboprophylaxis with either
    - Enoxaparin (Inhixa)- first line
    - Fondaparinux (where Inhixa is contraindicated)

Surgical Patients

- Patients within this age category should be assessed for their risk of thrombosis and bleeding on the same way as all other patients
- All patients with major trauma, or undergoing cranial, abdominal, bariatric, thoracic, maxillofacial, ear, nose, throat, cardiac, or elective spinal surgery
    - Offer mechanical thromboprophylaxis
- All patients whose thrombosis risk outweighs their bleeding risk should be offered pharmacological thromboprophylaxis with either
    - Enoxaparin (Inhixa)- first line general surgery and orthopaedic
    - Aspirin (+/- Inhixa) – an alternative for elective TKR/THR
    - Fondaparinux is patients over 17 – where LMWH is not appropriate

Dosing

Drug	Indications(s)	Recommended dose
Enoxaparin (Inhixa)	Prophylaxis of thrombotic episodes (Medical and Surgical)	500mcg/Kg BD (Maximum 40mg daily)
Fondaparinux	Prophylaxis of thrombotic episodes (Medical and Surgical)	See relevant section of policy
Aspirin	Prophylaxis of thrombotic episodes post TKR/THR	See relevant section of policy
DOAC's (Rivaroxaban, Apixaban, Edoxaban, Dabigatran)	Not Recommended	Not Recommended

Mechanical Prophylaxis

- The assessment of the appropriateness of mechanical thromboprophylaxis should be undertaken by the admitting clinician as part of the VTE risk assessment.
    - This should be documented on the relevant risk assessment tool
- Mechanical thromboprophylaxis should not be offered to the following patients
    - Suspected or proven arterial insufficiency
    - Peripheral arterial bypass grafting
    - Recent Skin Graft
    - New onset stroke (**discuss with stroke specialist)**
    - Peripheral neuropathy/sensory impairment
    - Cardiac Failure
    - Cutaneous infection
    - Known allergy to stockings materials

Anti-Embolism Stockings

- The following is a summary of the All-Wales Guidelines on The Nursing Care of Patients Wearing Anti-Embolic Stockings,
- The full guidance is available from : https://www.wwic.wales/uploads/files/documents/Professionals/All-Wales-Guidlines-for-Best-Practice.pdf
- Stockings should only be fitted by members of staff (registered nurses) who are trained in their application
- All patients should have their legs measured prior to fitting of stockings, as to ensure that the correct size is used
    - This should be as per the manufacturer's instructions which are provided with the stockings
    - This should be documented within the patients care plan, with the ankle measurement and stocking size documented
    - For certain groups of patients (e.g. patients with post-operative swelling) staff should re-measure the leg and re-fit the stocking as appropriate
- Anti-embolism stocking should provide graduated pressure and produce a calf pressure of 14-18mmHg, reducing to 11-14mmHg at the knee
    - The type of stockings used in the he
- All patients should be given written information on the use of stockings
    - There is a readily available information sheet available within the appendices of the All-Wales Guideline, as listed above

- Following application of the stocking, the registered nurse should check the limb(s) after 30 minutes for tissue redness/damage and tissue perfusion
- Nursing staff should check stockings at the begging of each shift to ensure the correct fitting of the stockings, and to ensure the patient is experiencing no adverse events
    - This should be documented in a visible location, e.g. in the patient notes, nursing notes, on the drug chart
- Stockings may be removed for a maximum of 30 minutes in a 24 hour period to allow for washing of stockings and assessment circulation and sensation
    - Clean stockings should generally be applied every 3 days
    - Patients with topical infections or those undergoing decolonisation, e.g. for MRSA, should have these changed every day
- Patients should generally NOT be discharged with stockings unless it is clinically indicated as per the guidance above

Intermittent Pneumatic Compression (IPC) Devices

- These are only to be used in line with the guidance above
- Use of IPC devices should be undertaken by staff trained in their use and as per any local policies within that clinical area

Resources and Training

- Printed risk assessment tools and patient information leaflets are required for each specialty. The cost for printing will be carried by individual directorates.
- Ongoing training of all Doctors and Nursing staff is essential to ensure success and to ensure evidence based practice. This is incorporated into Divisional Quality and Safety Meetings, Grand Rounds and Registered Nurses Educational Programmes and Induction Programmes.

Section 3: Appendices

1- Medical Admission VTE Risk- Assessment Tool

2- Surgical (Non-Orthopaedic) Admission VTE Risk- Assessment Tool

3- Surgical (Orthopaedic) Admission VTE Risk- Assessment Tool

4- Electronic Prescribing VTE Risk Assessment Tool

5- Hospital Acquired Thrombosis RCA

Appendix 1: Medical Admission VTE Risk- Assessment Tool

Medical Admission VTE Risk- Assessment Tool

GIG CYMRU NHS WALES | Bwrdd Iechyd Prifysgol Abertawe Bro Morgannwg University Health Board

Patient details
(Affix addressograph)

***Section One*: Does the patient have risk factors for venous thromboembolism?**

Medical patient NOT expected to have significantly reduced mobility relative to normal state	1	2	**Risk assessment complete. Re-assess in 24 hours OR as the patient's condition dictates**		
Medical patient expected to have ongoing reduced mobility relative to normal state			**If 1 or more of factors below apply, consider thromboprophylaxis**		
Patient Related					
Dehydration	1	2	One or more significant medical co-morbidity (i.e. heart disease, metabolic/respiratory pathologies, inflammatory disease)	1	2
Active cancer or cancer treatment					
Patient aged 60 or over			Use of oestrogen-containing contraceptive therapy		
Known Thrombophilia			Varicose veins with active phlebitis		
Obesity (BMI >30kg/m^2)			Pregnancy or ≤ 6 weeks post-partum		
Personal or family history of VTE			Use of hormone replacement therapy		
Admission Related					
Significantly reduced mobility for 3 days or more	1	2	Hip or knee replacement	1	2
Critical care admission			Hip fracture		
Acute infection (including pneumonia)			Acute exacerbation of heart failure		

***Section Two*: Does the patient have any contraindications to pharmacological thromboprophylaxis?**

Patient Related					
Active bleeding or at risk of bleeding	1	2	Acquired bleeding disorder, such as acute liver failure	1	2
Thrombocytopenia (Platelet count <75x10^{-9}/l)			Uncontrolled systolic hypertension ≥ (230/120mmHg or higher)		
Concurrent use of anticoagulants known to increase the risk of bleeding, e.g. NOAC, warfarin INR >2			Acute stroke or risk of central nervous system bleed, e.g. SAH		
			Untreated inherited bleeding disorder (such as haemophilia and von Willebrand's disease)		
Bacterial endocarditis, pericarditis, thoracic aneurysm			Known heparin allergy (use fondaparinux)		
Previous heparin induced thrombocytopenia (use fondaparinux)			Admitted for terminal care/end of life pathway		
Admission Related					
Neurosurgery, spinal surgery or eye surgery	1	2	Other procedure with high bleeding risk	1	2
Lumbar puncture/epidural/spinal anaesthesia expected within the next 12 hours			Lumbar puncture/epidural/spinal anaesthesia within the previous 4 hours		

If patient deemed at risk of admission related VTE, and has no contraindications to pharmacological thromboprophylaxis, please proceed to Section Four

Please see next page

***Section Three*: Consider patients with contraindications to pharmacological thromboprophylaxis for mechanical forms. Contraindications to mechanical thromboprophylaxis includes:**					
Suspected or proven arterial insufficiency	1	2	Peripheral neuropathy/sensory impairment	1	2
Peripheral arterial bypass grafting			Cardiac Failure		
Recent Skin Graft			Cutaneous infection		
Severe peripheral or pulmonary oedema			Known allergy to stockings materials		
New onset stroke (**discuss with stroke specialist)**					

***Section Four*: Prescribe thromboprophylaxis on the relevant section of the drug chart**			
Pharmacological *For prescribing guidance, please see SmPC and thromboprophylaxis policy*			
Inhixa (Enoxaparin)	40mg s/c OD	1	2
	Consider 20mg if <50Kg		
	20mg if CrCl <30ml/min		
	For patients >100Kg consult health board policy for dosing information		
Arixtra (Fondaparinux Sodium)	2.5mg s/c OD		
	1.5mg if CrCl 20-50 ml/min		
Mechanical (If pharmacological contraindicated)			
Anti-embolism stockings		1	2
No Thromboprophylaxis	Please justify rationale in columns to the right		

****** Re-assess patient in 24 hours and/or if clinical situation changes ******

1- Initial Assessment	**Signature**		**Consultant**		**Date**	
2- Re-Assessment	**Signature**		**Consultant**		**Date**	

Appendix 2: Surgical (Non-Orthopaedic) Admission VTE Risk- Assessment Tool

Surgical (Non-Orthopaedic) Admission VTE Risk- Assessment Tool

GIG CYMRU NHS WALES | Bwrdd Iechyd Prifysgol Abertawe Bro Morgannwg University Health Board

Patient details
(Affix addressograph)

***Section One*: Does the patient have risk factors for venous thromboembolism?**

Non-Ambulant patient with an acute surgical illness and has ≥ 1 risk factor for VTE	1	2	**Prescribe a combination of mechanical and pharmacological thromboprophylaxis (unless contraindicated)**
Surgical patient who has ≥ 1 risk factor for VTE			
Surgical patient where duration of anaesthesia and surgery ≥ 60 minutes (pelvic or lower limb surgery) or ≥90 minutes (other surgery)			

Patient Related					
Dehydration	1	2	One or more significant medical co-morbidity (i.e. heart disease, metabolic/respiratory pathologies, inflammatory disease)	1	2
Active cancer or cancer treatment					
Patient aged 60 or over			Use of oestrogen-containing contraceptive therapy		
Known Thrombophilia			Varicose veins with active phlebitis		
Obesity (BMI >30kg/m^2)			Pregnancy or ≤ 6 weeks post-partum		
Personal or family history of VTE			Use of hormone replacement therapy		
Admission Related					
Significantly reduced mobility for 3 days or more	1	2	Hip or knee replacement	1	2
Critical care admission			Hip fracture		
Acute infection (including pneumonia)			Acute exacerbation of heart failure		

***Section Two*: Does the patient have any contraindications to pharmacological thromboprophylaxis?**

Patient Related					
Active bleeding or at risk of bleeding	1	2	Acquired bleeding disorder, such as acute liver failure	1	2
Thrombocytopenia (Platelet count <75x10^{-9}/l)			Uncontrolled systolic hypertension ≥ (230/120mmHg or higher)		
Concurrent use of anticoagulants known to increase the risk of bleeding, e.g. NOAC, warfarin INR >2			Acute stroke or risk of central nervous system bleed, e.g SAH		
			Untreated inherited bleeding disorder (such as haemophilia and von Willebrand's disease)		
Bacterial endocarditis, pericarditis, thoracic aneurysm			Known heparin allergy (use fondaparinux)		
Previous heparin induced thrombocytopenia (use fondaparinux)			Admitted for terminal care/end of life pathway		
Admission Related					
Neurosurgery, spinal surgery or eye surgery	1	2	Other procedure with high bleeding risk	1	2
Lumbar puncture/epidural/spinal anaesthesia expected within the next 12 hours			Lumbar puncture/epidural/spinal anaesthesia within the previous 4 hours		

Please see next page

***Section Three*: Consider patients with contraindications to pharmacological thromboprophylaxis for mechanical forms. Contraindications to mechanical thromboprophylaxis includes:**					
Suspected or proven arterial insufficiency	1	2	Peripheral neuropathy/sensory impairment	1	2
Peripheral arterial bypass grafting			Cardiac Failure		
Recent Skin Graft			Cutaneous infection		
Severe peripheral or pulmonary oedema			Known allergy to stockings materials		
New onset stroke (**discuss with stroke specialist)**					

***Section Four*: Prescribe thromboprophylaxis (both forms) on the relevant section of the drug chart**			
Prescribe one pharmacological method (unless contraindicated) *For prescribing guidance, please see SmPC and thromboprophylaxis policy*			
Inhixa (Enoxaparin)	High risk of VTE use 40mg dose	1	2
	Moderate risk of VTE use 20mg dose		
	Consider 20mg if <50Kg		
	20mg if CrCl <30ml/min		
	For patients >100Kg consult health board policy for dosing information		
Arixtra (Fondaparinux Sodium)	2.5mg s/c OD		
	1.5mg if CrCl 20-50 ml/min		
No pharmacological thromboprophylaxis	Please justify rationale in columns to the right		
And prescribe one mechanical (unless contraindicated)			
Anti-embolism stockings or intermittent pneumatic compression		1	2
No mechanical thromboprophylaxis	Please justify rationale in columns to the right		

****** Re-assess patient in 24 hours and/or if clinical situation changes ******

For surgery under spinal/epidural analgesia
- Stop thromboprophylaxis at least 12 hours prior to neuraxial blockade
- Do not remove epidural catheter within 12 hours of giving Inhixa

For all other surgical patients
- Start thromboprophylaxis 6-12 hours after surgery

For patients having abdominal/pelvic surgery for malignancy: Consider extended thromboprophylaxis for 28 days

1- Initial Assessment	**Signature**		**Consultant**		**Date**	
2- Re-Assessment	**Signature**		**Consultant**		**Date**	

Appendix 3: Surgical (Orthopaedic) Admission VTE Risk- Assessment Tool

Surgical (Orthopaedic) Admission VTE Risk-Assessment Tool GIG CYMRU NHS WALES | Bwrdd Iechyd Prifysgol Abertawe Bro Morgannwg University Health Board	Patient details (Affix addressograph)

Assess patient at admission (1) and in 24 hours and/or if clinical situation changes (2)

***Section One**: Does the patient have risk factors for venous thromboembolism?*

Patients admitted for elective arthroplasty surgery	1	2	**Prescribe thromboprophylaxis (unless contraindicated)** ***Proceed to section TWO***		
Patient admitted for other orthopaedic surgery			**Do not routinely offer VTE prophylaxis unless VTE risk outweighs bleeding risk** ***Complete below***		
Patient Related					
Dehydration	1	2	One or more significant medical co-morbidity (i.e. heart disease, metabolic/respiratory pathologies, inflammatory disease)	1	2
Active cancer or cancer treatment					
Patient aged 60 or over			Use of oestrogen-containing contraceptive therapy		
Known Thrombophilia			Varicose veins with active phlebitis		
Obesity (BMI >30kg/m^2)			Pregnancy or ≤ 6 weeks post-partum		
Personal or family history of VTE			Use of hormone replacement therapy		
Admission Related					
Significantly reduced mobility for 3 days or more	1	2	Hip or knee replacement	1	2
Critical care admission			Hip fracture		
Acute infection (including pneumonia)			Acute exacerbation of heart failure		
Total anaesthetic time + surgical time >60 mins (pelvic and lower limb surgery)			Total anaesthetic time + surgical time >90 mins (other surgery)		

***Section Two**: Does the patient have any contraindications to pharmacological thromboprophylaxis?*

Patient Related					
Active bleeding or at risk of bleeding	1	2	Acquired bleeding disorder, such as acute liver failure	1	2
Thrombocytopenia (Platelet count <75x10^{-9}/l)			Uncontrolled systolic hypertension ≥ (230/120mmHg or higher)		
Concurrent use of anticoagulants known to increase the risk of bleeding, e.g. NOAC, warfarin INR >2			Acute stroke or risk of central nervous system bleed, e.g SAH		
			Untreated inherited bleeding disorder (such as haemophilia and von Willebrand's disease)		
Bacterial endocarditis, pericarditis, thoracic aneurysm			Known heparin allergy (do not use Inhixa)		
Previous heparin induced thrombocytopenia (do not use Inhixa)			Admitted for terminal care/end of life pathway		
Admission Related					
Neurosurgery, spinal surgery or eye surgery	1	2	Other procedure with high bleeding risk	1	2
Lumbar puncture/epidural/spinal anaesthesia expected within the next 12 hours			Lumbar puncture/epidural/spinal anaesthesia within the previous 4 hrs		

Section Three: *Consider patients with contraindications to pharmacological thromboprophylaxis for mechanical forms. Contraindications to mechanical thromboprophylaxis include:*					
Suspected or proven arterial insufficiency	1	2	Peripheral neuropathy/sensory impairment	1	2
Peripheral arterial bypass grafting			Cardiac Failure		
Recent Skin Graft			Cutaneous infection		
Severe peripheral or pulmonary oedema			Known allergy to stockings materials		
New onset stroke (**discuss with stroke specialist)**					

Section Four: *Prescribe thromboprophylaxis on the relevant section of the drug chart*

Pharmacological *For prescribing guidance, please see SmPC and thromboprophylaxis policy*		***1***	***2***
Inhixa (Enoxaparin) *with anti-embolism stocking as inpatient* ***THR:*** *28 to 35 days* ***TKR:*** *10 days*	High risk of VTE use 40mg dose 6-12 hours post-surgery		
	Moderate risk of VTE use 20mg dose 6-12 hours post-surgery		
	Consider 20mg if <50Kg started 6-12 hours post-surgery		
	20mg if CrCl <30ml/min started 6-12 hours post-surgery		
	For patients >100Kg consult health board policy for dosing information		
Rivaroxaban (THR and TKR) ***THR:*** *35 days* ***TKR:*** *14 days*	10mg OD started 6 -10 hours post surgery		
	Not recommended in patients with a CrCl of <15ml/min		
Aspirin	**THR:** Inhixa (see dosing above) for 10 days followed by aspirin 75-150mg for a further 28 days		
	TKR: Aspirin 75-150mg OD for 14 days		
Second Line Therapies			
Dabigatran (THR and TKR only) ***THR:*** *28 to 35 days* ***TKR:*** *10 days*	110mg OD 1-4 hours after completion of surgery then 220mg OD		
	If CrCl 30-50ml/min: 75mg OD 1-4 hours after completion of surgery then 150mg OD		
	Patients who receive concomitant verapamil, amiodarone, quinidine: 75mg OD 1-4 hours after completion of surgery then 150mg OD		
	Patients aged 75 or above: 75mg OD 1-4 hours after completion of surgery then 150mg OD		
Apixaban (THR and TKR only) *32 to 38 days for THR* *10 to 14 days for TKR*	2.5mg BD taken 12 to 24 hours after surgery		
	Not recommended in patients with a CrCl of <15ml/min		

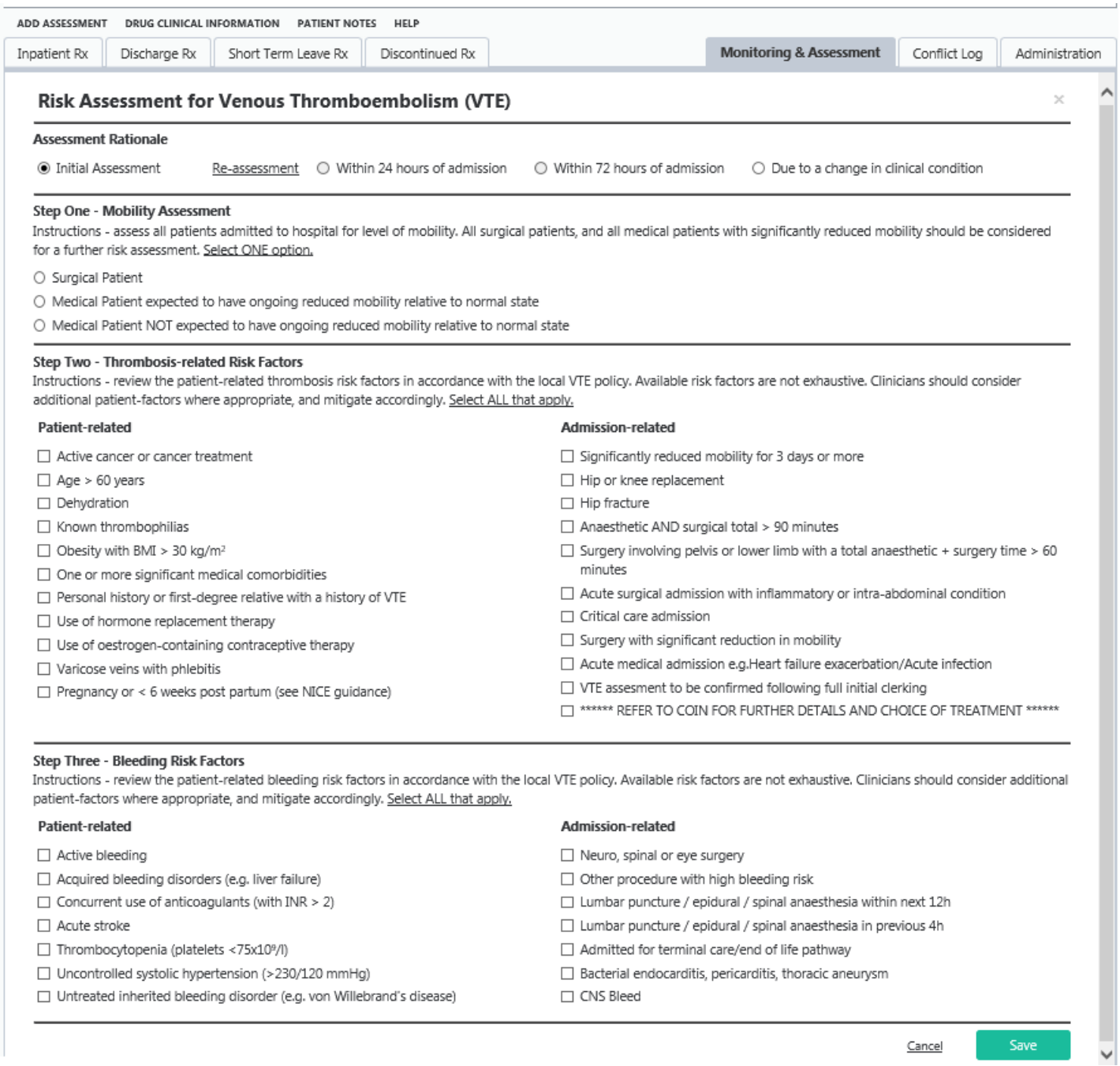
Mechanical (If pharmacological contraindicated or THR/TKR patient prescribed Inhixa)			
Anti-embolism stockings or intermittent pneumatic compression		1	2
No Thromboprophylaxis	Please justify rationale in columns to the right		

For surgery under spinal/epidural analgesia
- Stop thromboprophylaxis at least 12 hours prior to neuraxial blockade
- Do not remove epidural catheter within 12 hours of giving Inhixa

1- Initial Assessment	**Signature**		**Consultant**		**Date**	
2- Re-Assessment	**Signature**		**Consultant**		**Date**	

Appendix 5: Electronic Prescribing VTE Risk Assessment Tool

Screenshot of JAC Risk-Assessment Tool – For Reference Only



ADD ASSESSMENT DRUG CLINICAL INFORMATION PATIENT NOTES HELP

Inpatient Rx | Discharge Rx | Short Term Leave Rx | Discontinued Rx | Monitoring & Assessment | Conflict Log | Administration

Risk Assessment for Venous Thromboembolism (VTE)

Assessment Rationale

◉ Initial Assessment Re-assessment ○ Within 24 hours of admission ○ Within 72 hours of admission ○ Due to a change in clinical condition

Step One - Mobility Assessment

Instructions - assess all patients admitted to hospital for level of mobility. All surgical patients, and all medical patients with significantly reduced mobility should be considered for a further risk assessment. Select ONE option.

○ Surgical Patient
○ Medical Patient expected to have ongoing reduced mobility relative to normal state
○ Medical Patient NOT expected to have ongoing reduced mobility relative to normal state

Step Two - Thrombosis-related Risk Factors

Instructions - review the patient-related thrombosis risk factors in accordance with the local VTE policy. Available risk factors are not exhaustive. Clinicians should consider additional patient-factors where appropriate, and mitigate accordingly. Select ALL that apply.

Patient-related

☐ Active cancer or cancer treatment
☐ Age > 60 years
☐ Dehydration
☐ Known thrombophilias
☐ Obesity with BMI > 30 kg/m²
☐ One or more significant medical comorbidities
☐ Personal history or first-degree relative with a history of VTE
☐ Use of hormone replacement therapy
☐ Use of oestrogen-containing contraceptive therapy
☐ Varicose veins with phlebitis
☐ Pregnancy or < 6 weeks post partum (see NICE guidance)

Admission-related

☐ Significantly reduced mobility for 3 days or more
☐ Hip or knee replacement
☐ Hip fracture
☐ Anaesthetic AND surgical total > 90 minutes
☐ Surgery involving pelvis or lower limb with a total anaesthetic + surgery time > 60 minutes
☐ Acute surgical admission with inflammatory or intra-abdominal condition
☐ Critical care admission
☐ Surgery with significant reduction in mobility
☐ Acute medical admission e.g.Heart failure exacerbation/Acute infection
☐ VTE assesment to be confirmed following full initial clerking
☐ ****** REFER TO COIN FOR FURTHER DETAILS AND CHOICE OF TREATMENT ******

Step Three - Bleeding Risk Factors

Instructions - review the patient-related bleeding risk factors in accordance with the local VTE policy. Available risk factors are not exhaustive. Clinicians should consider additional patient-factors where appropriate, and mitigate accordingly. Select ALL that apply.

Patient-related

☐ Active bleeding
☐ Acquired bleeding disorders (e.g. liver failure)
☐ Concurrent use of anticoagulants (with INR > 2)
☐ Acute stroke
☐ Thrombocytopenia (platelets <75x10⁹/l)
☐ Uncontrolled systolic hypertension (>230/120 mmHg)
☐ Untreated inherited bleeding disorder (e.g. von Willebrand's disease)

Admission-related

☐ Neuro, spinal or eye surgery
☐ Other procedure with high bleeding risk
☐ Lumbar puncture / epidural / spinal anaesthesia within next 12h
☐ Lumbar puncture / epidural / spinal anaesthesia in previous 4h
☐ Admitted for terminal care/end of life pathway
☐ Bacterial endocarditis, pericarditis, thoracic aneurysm
☐ CNS Bleed

Cancel Save

Appendix 6: Hospital Acquired Thrombosis Route Cause Analysis

Hospital Acquired Thrombosis RCA GIG CYMRU NHS WALES | Bwrdd Iechyd Prifysgol Abertawe Bro Morgannwg University Health Board	Patient details (Affix addressograph)

***Section One**: Admission Details*

Admission dates (Exclude if <24hrs)		**Admission type** (Please circle)	***Elective***	***Emergency***
Consultant		**Speciality** (Please circle)	***Surgical/T+O***	***Medical***
Ward			***Oncological/ Haematology***	***Obs/Gynae***
VTE diagnosis date		**VTE Type** (Please circle)	***DVT***	***PE***
			UEDVT	***Other***

***Section Two**: VTE risk assessment*

Did the patient have a VTE risk assessment on admission?	***Yes***	***No***	**Where was this documented?**	***Chart/IMAR*** / ***Notes*** / ***Electronic*** / ***Other***
Was thromboprohylaxis deemed necessary in this patient?				***Yes*** / ***No***
If the patient was not, what was the rationale for this?				
Was this decision appropriate?				***Yes*** / ***No***

***Section Three**: Thromboprophylaxis prescribing*

What method of thromboprophylaxis was prescribed?	***Mechanical***	***Pharmacological***	***Mechanical/ Pharmacological***
What agent was prescribed (if pharmacological thromborophylaxis used)?	***Enoxaparin***	***Tinzaparin***	***Aspirin***
	Apixaban	***Rivaroxaban***	***Fondaparinx***
	Other (specify)		
Was the agent used as per HB guidelines?	**Yes**		**No**
If no, please provide details			
Was the dose used an appropriate dose?	**Yes**		**No**
If no, please provide details			
Was the duration of thromboprophylaxis appropriate?	**Yes**		**No**
If no, please provide details			
Did the patient have any missed doses of their thromborphylaxis?	**Yes**		**No**
Any other details?			

Section Four: *MDT discussion*	
Details:	
Unavoidable HAT	**Avoidable HAT**
RCA undertaken by	
Date	
For avoidable HAT please submit a DATIX report using the "HAT" functionality	
Date submitted	
Section Five: *Follow up*	
Please attach DATIX response to RCA	

COIN clinical online information network

GIG CYMRU NHS WALES | Bwrdd Iechyd Prifysgol Bae Abertawe Swansea Bay University Health Board

Swansea Bay University Health Board

Authorisation form for items to be published onto COIN

Title of Guideline	SWANSEA BAY UNIVERSITY HEALTH BOARD THROMBOPROPHYLAXIS POLICY
Name & Signature of Author / Chair of Group or Committee *	Thrombosis and Anticoagulation Committee
Coin ID:	1884
Library on which you wish the guideline to be launched	Anticoagulation
Document: Is the Document New, Modified, Reviewed, Supersedes another Document. List Version	Supersedes
Effective Practice Approval Committee (EPAC) All Policy Documents or if • The document relates to primary care or both primary, secondary care and specialist care • Multiple directorates/ teams within secondary care are highlighted in the document • The document relates to a new service or a new way of working There are cost or safety implications associated with adopting the document	Not applicable
Equality Statement on all Policies:*	Within document
Is this document relevant to the GP portal?	No
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Keywords to assist with searching *	Heparin, Thromboprophylaxis, VTE, TP, LMWH, Inhixa, enoxaparin
Last Review:	November 2020
Next Review / Guideline Expiry:	November 2022
Name of Group or Committee *	Medicines Management Board
Name & Signature of Lead Pharmacist*	[redacted]