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Guidelines for VTE Thromboprophylaxis in Orthopaedics

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This clinical guideline/protocol supersedes all previous issues.

Guidelines for VTE Thromboprophylaxis in Orthopaedic Surgery

In August 2019 NICE updated their guidance on VTE prevention in hospital, Venous Thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism (NG89).

This guideline has been developed for managing the risk of venous thromboembolism (VTE) in patients admitted under the care of the orthopaedic team at Gateshead Health NHS Trust in keeping with the NICE guideline. Treatment should be patient centered and take into account individual patient need and preference, good communication is essential, supported by evidence-based information to allow patients to reach informed decisions about their care.

Assessing Risk of VTE and Bleeding

All orthopaedic patients admitted to hospital should have a VTE risk assessment completed on JAC at admission to identify VTE and bleeding risks. The outcome of which should be used to prescribe appropriate management. All patients should be reassessed after 24 hours and whenever the clinical situation changes, using the Department of Health assessment tool.

Balance the person's individual risk of VTE against their risk of bleeding when deciding whether to offer pharmacological thromboprophylaxis and if necessary discuss with on-call haematologist.

If using pharmacological VTE prophylaxis for surgical and trauma patients, start as soon as possible and within 14 hours of admission, unless otherwise contra-indicated.

Patients who are at risk of VTE

Medical patients

- If mobility significantly reduced for ≥ 3 days **or**
- If expected to have ongoing reduced mobility relative to normal state plus any VTE risk factor.

Surgical patients and patients with trauma

- If total anaesthetic + surgical time > 90 minutes **or**
- If surgery involves pelvis or lower limb and total anaesthetic + surgical time > 60 minutes **or**
- If acute surgical admission with inflammatory or intra-abdominal condition **or**
- If expected to have significant reduction in mobility **or**
- If any VTE risk factor present.

VTE risk factors[1]

- Active cancer or cancer treatment
- Age > 60 years
- Critical care admission
- Dehydration
- Known thrombophilias
- Obesity (BMI > 30 kg/m^2)
- One or more significant medical comorbidities (for example: heart disease; metabolic, endocrine or respiratory pathologies; acute infectious diseases; inflammatory conditions)
- Personal history or first-degree relative with a history of VTE
- Use of HRT
- Use of oestrogen-containing contraceptive therapy
- Varicose veins with phlebitis

[1] For women who are pregnant or have given birth within the previous 6 weeks see page 23.

Patients who are at risk of bleeding

All patients who have any of the following.

- Active bleeding
- Acquired bleeding disorders (such as acute liver failure)
- Concurrent use of anticoagulants known to increase the risk of bleeding (such as warfarin with INR > 2)
- Lumbar puncture/epidural/spinal anaesthesia within the previous 4 hours or expected within the next 12 hours
- Acute stroke
- Thrombocytopenia (platelets < 75 x 10^9/l)
- Uncontrolled systolic hypertension (≥ 230/120 mmHg)
- Untreated inherited bleeding disorders (such as haemophilia or von Willebrand's disease)

Giving information and Planning Discharge

- On admission ensure people understand the reason for having a risk assessment for VTE and bleeding.
- Verbal and written information should be given on:
    - Risks and possible consequences of VTE
    - Importance of VTE prophylaxis and possible side effects
    - Correct use of VTE prophylaxis
    - Advice on how patients can reduce their risks of VTE.

For patients discharged with VTE prophylaxis verbal and written information (leaflet: Preventing Venous Thromboembolism on Discharge from Hospital) should be given to the patient or carer.

Anti-embolism stockings

Do not offer anti-embolism stockings to patients with:

- Suspected or proven peripheral arterial disease
- Peripheral arterial bypass grafting
- Peripheral neuropathy or other causes of sensory impairment
- Local condition in which stockings may cause damage, such as fragile “tissue paper” skin, dermatitis, gangrene or recent skin graft
- Known allergy to material of manufacture
- Severe leg oedema
- Unusual leg size or shape or major limb deformity preventing correct fit

Use caution and clinical judgment when applying anti-embolism stockings over venous ulcers or wounds.

- Measure legs and use correct stocking size. Staff who fit stockings should be trained in their use and should show patients how to use them.
- If oedema or postoperative swelling develops, ensure legs are re-measured and stockings refitted.
- If arterial disease suspected, seek expert opinion before fitting stockings.
- Use stockings that provide graduated compression and produce a calf pressure of 14-15mmHg
- Encourage patients to wear the stockings day and night from admission until they no longer have significantly reduced mobility.

- Remove stockings daily for hygiene purposes and to inspect skin condition. If patient has significant reduction in mobility, poor skin integrity or sensory loss, inspect skin two or three times per day, particularly over heels and bony prominences.
- Discontinue use of stockings if there is marking, blistering or discolouration of skin, particularly over heels and bony prominences, or if patient has pain or discomfort. If suitable, offer intermittent pneumatic compression or foot impulse devices as alternative.
- Show patients how to use anti-embolism stockings correctly and ensure they understand that this will reduce their risk of developing VTE.
- Monitor use of anti-embolism stockings and offer assistance if they are not being worn correctly.

Foot impulse and intermittent pneumatic compression devices

- Do not offer these devices to patients with a known allergy to the material of manufacture.
- Encourage patients on the ward who have these devices to use them for as much of the time as is possible and practical both when in bed and when sitting in a chair.

For all patients

- Do not allow patients to become dehydrated unless clinically indicated.
- Encourage patients to mobilize as soon as possible.

For patients having elective orthopaedic surgery

Oral contraceptives and HRT

- Advise women to consider stopping oestrogen containing contraceptives or HRT 4 weeks before surgery.
- Provide advice on alternative contraceptive methods.

Pre-existing antiplatelet therapy

- Assess risks and benefits of stopping pre-existing antiplatelet therapy 1 week before surgery. Consider involving the multidisciplinary team in the assessment.

Anti-coagulants

- **Warfarin –** Stop 5 days before surgery and allow INR to fall to below 1.5.

If patient is low-risk indication for warfarin, no bridging therapy prior to surgery is required, however patients will receive alternative prophylaxis post-operatively until INR >2.0.
For high-risk warfarin indications, patients will receive therapeutic tinzaparin at a dose of 175units/kg daily until the day prior to surgery, on this day they will be given a prophylactic dose. A prophylactic dose of tinzaparin will also be given on the day of surgery and therapeutic tinzaparin restarted the day after and continued until INR >2.0

Warfarin will be restarted the day after surgery as long as haemostasis is maintained and the surgeon is in agreement.

- **Direct Oral Anti-coagulants (DOACs)–**

DOAC	Renal Function	
Rivaroxaban (once daily)	CrCl >30mL/min	Miss two doses prior to procedure
	CrCl 15-30mL/min	Miss three doses prior to procedure
Apixaban (twice daily)	CrCl > 30mL/min	Miss four doses prior to procedure
	CrCl 15-30mL/min	Miss six doses prior to procedure
Dabigatran (twice daily)	CrCl > 30mL/min	Miss four-six doses prior to procedure
	CrCl 15-30mL/min	Miss eight-twelve doses prior to procedure

DOACs can be restarted the day after surgery as long as haemostasis is maintained, and the surgical team is in agreement. Patients will receive alternative prophylaxis until the DOAC is restarted, this should be stopped as soon as the DOAC is started.

The intention of the surgeon in regards to restarting anticoagulation should be documented on the operation note and in the patient's notes.

For patient's requiring emergency surgery refer to "Peri-operative Management of Patients with Fractured Neck of Femur on Oral Anticoagulants"

Anaesthesia

- Consider regional anaesthesia, in addition to other methods of VTE prophylaxis, as it carries a lower risk of VTE than general anaesthesia. Take into account patient preferences, suitability for regional anaesthesia and any other planned method of VTE prophylaxis.

- If regional anaesthesia is used plan the timing of pharmacological prophylaxis to minimize risk of epidural haematoma. If antiplatelet or anticoagulation agents are being used or their use is planned, refer to the summary of product characteristics for guidance about safety and timing of these agents in relation to regional anaesthesia.
- Do not routinely offer pharmacological or mechanical VTE prophylaxis to patients having surgery with local anaesthesia by local infiltration with no limitation of mobility.

Specific Patient Groups

- **Lower limb immobilisation**
  Consider prophylaxis with tinzaparin for patients with lower limb immobilisation whose risk of VTE outweighs their risk of bleeding, (use orthopaedic risk assessment tool to assess patient risk). Consider stopping prophylaxis if immobilisation continues beyond 42 days.

- **Fragility fractures of the pelvis, hip and femur**
  Consider prophylaxis for one month with tinzaparin starting 6-12 hours after surgery and continued until patient no longer has significantly reduced mobility relative to normal or anticipated mobility.
  Tinzaparin should be prescribed pre-operatively if surgery is delayed beyond the day after admission.
  Consider intermittent pneumatic compression for people with fragility fractures of the pelvis, hip or proximal femur at the time of admission if pharmacological prophylaxis is contraindicated.

  Oral agents are not licensed and not recommended by NICE for VTE prophylaxis in patients with fragility fractures.

- **Elective total hip replacement**

  Tinzaparin for 28 days with anti-embolism stockings.

  Rivaroxaban, Apixaban and dabigatran within their marketing authorisation, are an option for the prevention of venous thromboembolism in adults having elective total hip replacement if tinzaparin is refused by the patient.

- **Elective total knee replacement**
  Tinzaparin for 14 days with anti-embolism stockings until discharge.
  Rivaroxaban, Apixaban and dabigatran within their marketing authorisation, are an option for the prevention of venous thromboembolism in adults having elective total knee replacement if tinzaparin is refused by the patient.

- **Other knee surgery**
  Consider prophylaxis with tinzaparin starting 6-12 hours after surgery for 14 days if total anaesthetic time is >90 minutes and the risk of VTE is higher than the bleeding risk.

- **Foot and ankle surgery**
  Consider prophylaxis with tinzaparin if patient requires immobilisation and the anaesthetic time is >90 minutes. Consider stopping if the immobilisation continues beyond 42 days.

- **Upper limb surgery**
  Consider tinzaparin if total anaesthetic time is >90 minutes or where the operation is likely to make it more difficult for patients to mobilise.

- **Spinal surgery**
  Consider mechanical prophylaxis on admission for 30 days or until mobile or discharged.

- **Major Trauma**
  Consider tinzaparin, adjunct graduated compression stockings or intermittent pneumatic compression devices until discharge.

- **Lower limb amputation**
  Consider tinzaparin prophylaxis for a minimum of 7 days for patients who are undergoing lower limb amputation whose risk of VTE outweighs their risk of bleeding. Consider mechanical prophylaxis on admission for those patients for whom pharmacological prophylaxis is contraindicated. Continue prophylaxis until patient no longer has significantly reduced mobility relative to anticipated mobility.

If an alternative method of pharmacological prophylaxis is required for a patient, this should be discussed with a pharmacist or haematology.

Prescribing

For elective patients prophylaxis should be prescribed by the anaesthetist in theatre responsible for the patient, as part of the JAC bundle for the correct procedure.

For emergency patients the doctor clerking the patient must perform the VTE risk assessment and prescribe prophylaxis as indicated.

Prophylactic doses of tinzaparin are weight dependent therefore patient weight should be measured and recorded on JAC.

Tinzaparin should be given by a once daily subcutaneous injection at 18:00 at the following doses:

For **lower limb** orthopaedic surgery:

- 2500 units/day if body weight <50kg
- 4500 units/ day if body weight > 50kg

For **other orthopaedic** surgery

- 2500 units/day if body weight <50kg
- 3500 units/day if body weight 50-70kg
- 4500 units/ day if body weight > 70kg

Dose reduction is required in renal impairment, according to the following guidelines:

- eGFR 30-50ml/min – dose as above
- eGFR 20-30ml/min – consider dose reduction to 2500 units
- eGFR <20ml/min – discuss with haematology on an individual patient basis.

The initial dose may be delayed by the prescriber for patients undergoing surgery later in the day.

For patients with a large BMI a dose of 50units/kg may be used.

TED stockings may be required. These can be prescribed on JAC by searching “VTE preventative stockings”.

Discharge

The decision for thromboprophylaxis on discharge should be made according to the guidelines and discussed with the senior registrar/consultant if there are any queries.

For patients who are required to be discharged on prophylaxis the type, duration and dose must be clearly documented in both the patient's notes and the discharge letter.

- Inform patient and carers of the decision and provide with the hospital leaflet "Prevention of Venous Thromboembolism on Discharge from hospital"
- Prophylaxis doses of tinzaparin can be supplied from the ward by the nursing staff via PGD.
- Nursing staff to assess ability of patient to self-administer tinzaparin medication and teach this if appropriate. If patients are unable to self-administer tinzaparin, a relative may be taught, or otherwise contact the district nursing team to arrange ongoing treatment in the community. A drug therapy record will also need to be signed by a prescriber.

References

NICE. Venous Thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism (NG89). 2018

The Handbook of Peri-Operative Medicines. UCKPA. 2nd Edition 2017

SPC Innohep 10,000units/ml. Leo Pharma, accessed 11/09/18

BMJ Best Practice. VTE Prophylaxis 12th July 2018