## PELVIC TRAUMA AND MULTIPLE TRAUMA

| | | |
|---|---|---|
| **Enoxaparin** | 40mg **DAILY** | Continued until the patient no longer has significantly reduced mobility. (If more than 12 weeks consult with haematologist). |
| **Venous foot /calf pumps** | Continuously unless mobilising | Until mobile and then continued dependant on risk assessment. |

Regularly reassess the patient's risks of VTE and bleeding.

Enoxaparin should be commenced within 24 hours of injury as long as:

1. Haemodynamically stable
2. No other significant contra-indicative injuries such as major head, spine, thoracic, abdominal injuries which should be discussed with relevant surgical and anaesthetic teams
3. The benefits of reducing the risk of VTE outweigh the risks of bleeding.
4. **Epidural/Spinal**

- **Pre-insertion:** Enoxaparin must not be given within 12 hours of a planned epidural / spinal
- **Post insertion:** Enoxaparin must not be given within 6 hours of an epidural / spinal procedure. If a traumatic procedure, wait 24 hours.
- **Ward care:**
- Epidural catheters must not be removed within 12 hours of a dose of Enoxaparin.
- After removal of an epidural catheter wait at least 6 hours before next dose of Enoxaparin.

### Antiplatelet agents.

Refer to hospital perioperative guidelines and see Perioperative antiplatelet therapy. British Journal of Anaesthesia 2007; 99(3): 316-28

### Clopidogrel

For patients who have had clopidogrel within 7 days prior to surgery - omit clexane dose on evening of surgery.
Do not recommence clopidogrel whilst on Rivaroxaban.
(Please refer to Trust guidelines)

### Aspirin

1. Continue therapy if aspirin for secondary prevention ie. (after MI, acute coronary syndrome, stent, stroke, peripheral vascular disease).
2. **Advised to stop aspirin 7 days prior to surgery if aspirin for primary prevention and recommence on completion of VTE therapy.**

### Combined Contraceptive pill

Oestrogen containing OCP This should be discontinued 4 weeks prior to surgery (including arthroscopy). This should be restarted only after full mobilisation. Careful counselling regarding the risk for pregnancy should be given. Progestogen only pill can be continued

### HRT

Consider discontinuing HRT 4 weeks prior to elective orthopaedic surgery. This should be restarted only after full mobilisation. If significant symptoms related to stopping HRT in past, consideration should be given to continuing after discussion of risks for VTE with patient.

## PATIENT WITH LOWER LIMB CAST/BOOT IMMOBILISATION:

**If immobilised in bed with lower limb cast/boot**

| | | |
|---|---|---|
| **Enoxaparin** | 40mg **DAILY** | Until mobile and then continued dependant on risk score, unless significant bleeding risks. |

**Once mobile with lower limb cast:**
**Patient risk to be stratified using "Plymouth Venous Thromboembolism (VTE) Risk Score" and treated with appropriate prophylaxis after clinical discussion with patient.**

**Very High Risk patients immobilised in cast**
Plymouth VTE risk score or consider in patients with NICE VTE risk factors (box 1)

| | | |
|---|---|---|
| **Enoxaparin** | 40mg **DAILY** | Continued for total time limb completely immobilised in cast/boot. (Consider stopping prophylaxis if lower limb immobilisation continues beyond 42 days). |

**Note:**
1. The dose of enoxaparin must be reduced in patients with **severe renal impairment** to **20mg DAILY** for prophylaxis. e-GFR is <30ml/min. Please refer to the product's SPC and the BNF for further information.

## ARTHROSCOPIC KNEE SURGERY

VTE Prophylaxis is generally not needed for people undergoing arthroscopic knee surgery where:

- total anaesthesia time is less than 90 minutes **and**
- the person is low risk of VTE

Consider prophylaxis if:

- total anaesthesia time is more than 90 minutes **or**
- the persons risk is of VTE outweighs their risk of bleeding

| | | |
|---|---|---|
| **Enoxaparin** | 40mg **DAILY** for 14 days after surgery | Start 6-12 hours after surgery. |

## PATIENTS ALREADY RECEIVING ANTICOAGULATION

See Plymouth NHS Trust warfarin bridging guidelines

### If need to convert Rivaroxaban to Enoxaparin / Heparin

- **Discontinue Rivaroxaban**
- **Conversion for Renal impairment:** e-GFR <30ml/min) Give 20 mg prophylactic dose Enoxaparin 12 hours after last Rivaroxaban dose
- **Suspected / Confirmed new VTE or suspected PE** Give treatment dose Enoxaparin / Heparin immediately. (Unless major bleeding concerns)

### If need to convert from Enoxaparin to Rivaroxaban

1. Give Rivaroxaban 12 hours after last Enoxaparin dose

### If Rivaroxaban Vomited

1. Give further dose of Rivaroxaban if vomited within 4 hours of dose and a tablet can be clearly seen.
2. If continued vomiting give prophylactic dose Enoxaparin 40 mg od.

## PLYMOUTH VTE RISK ASSESSMENT SCORE V3

To be completed by all patients 16 years or older immobilised in a lower limb cast/boot

Please tick every box relevant to yourself (the patient)

### PATIENT DETAILS

| Risk | Score |
|---|---|
| • Age ≥ 60 years | 1 |
| • Very overweight (BMI ≥ 20kg/m2) | 2 |
| • Unable to walk before accident /injury | 2 |

### CURRENT MEDICATION

| Risk | Score |
|---|---|
| • Oral contrceptive pill (birth pill) | 1 |
| • Hormone replacement therapy (HRT) | 1 |

### FAMILY HISTORY

| Risk | Score |
|---|---|
| • Known family history of 3 leg vein clots (deep vein thrombosis) in close family (brother, sister, father, mother) | 2 |

### MEDICAL HISTORY

| Risk | Score |
|---|---|
| • Varicose veins | 1 |
| • Heart disease / lung disease/ bowel disease/ hormone disease or other long term medical condition requiring treatment | 1 |
| • Abdominal surgery (tummy) in last 6 weeks | 2 |
| • Active cancer | 3 |
| • Previous history of leg vein clots (deep vein thrombosis) | |
| • Previous history of lung clots (plmonary embolus) | 3 |
| • Pregnant oe within 6 weeks of childbirth | 3 |
| • Achilles Tendon rupture | 3 |
| • Complex lower limb surgery or pelvic fracture in last 6 weeks and advised by surgeon to have prolonged DVT prophylaxis | 3 |
| • Known blood clotting disease (e.g. Thrombophilia/Sickle Cell) Please discuss with Dr who may contact a Haematologist | |

**Total risk factor score:** _____

| SCORE | RECOMMENDATION |
|---|---|
| 0 - 2 | Mobilisation as able; |
| **3 or more** | **Enoxaparin 40mg DAILY or equivalent**, refer to Guidelines for VTE prophylaxis in orthopaedics and trauma |

Notes:

3. If patient has long standing blood disease or bleeding history consult haematologist. Clexane may be contraindicated in patients who:
   - Have a known bleeding disorder or thrombocytopenia (platelets <50x109 /1)
   - Stroke or risk of central nervous system bleeding e.g. head injury or previous subarachnoid haemorrhage
   - GI bleed in previous 4 months
   - Aortic aneurysm or pericarditis
   - Previous history of heparin induced thrombocytopenia (HIT)
2. If patient is already receiving anticoagulant treatment (eg. Warlarin, Rivaroxaban Dabigatran), continue unless surgery planned (Discuss with surgical team.)
3. The dose of **Enoxaparin** must be reduced in patients with **severe renal impairment to 20mg DAILY** tor prophylaxis. e-GFR is <30ml/min. Please refer to the product's SPC and the BNF for further information.
4. The dose of **Enoxaparin** must be **increased to 40mg twice a day** tor patients with **body mass greater than 100kg**. If **body mass greater than 150kg** consult haematologist.
5. This document provides general guidance for treatment but does not necessarily account tor all clinical situations. Where a senior doctor's view differs, their advice should be followed and variation to the guidelines documented wherever possible.

University Hospitals Plymouth NHS Trust

# GUIDELINES FOR VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS IN ORTHOPAEDICS AND TRAUMA

DEVELOPED BY: Mr J Keenan, Dr T Nokes and Dr T Gale
Guidelines are evidenced-based.

This local guideline has been produced as an aid to risk assessment and prevention of venous thromboembolism based on current published evidence and guidelines including NICE 2018(NG89).

This document provides general guidance for Plymouth Hospitals NHS Trust but does not necessarily account for all clinical situations. Where a senior doctor's view differs, their advice should be followed and variation to the guidelines documented wherever possible. **Every patient should be assessed individually before applying guidance on thromboprophylaxis.**

Orthopaedic patients not undergoing surgery should also be risk assessed and given appropriate Prophymaxis with Clexane depending on NICE risk assessment criteria.

**Plymouth Hospitals**
**NHS Trust**

June 2019. Review date June 2023

## NICE VTE Risk Assessment Recommendation (NG89 2018 + Department of Health 301292 1p March 2010)

- surgical procedure with a total anaesthetic and surgical time of more than 90 minutes,
- surgical procedure with a total anaesthetic and surgical time of more than 60 minutes if the surgery involves the pelvis or lower limb
- acute surgical admission with inflammatory or intra-abdominal condition
- surgery with significant reduction in mobility
- significantly reduced mobility for 3 days or more

### Risk factors for VTE (Box 1)

- Active cancer or cancer treatment
- Age over 60 years
- Critical care admission
- Dehydration
- Known thrombophilias
- Obesity (BMI over 30 kg/m2)
- One or more significant medical comorbidities (such as heart disease, metabolic, endocrine or respiratory pathologies, acute infectious diseases or inflammatory conditions)
- Personal history or a 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 paternity

### Risk factors for bleeding (Box 2)

- Active bleeding or high bleeding risk procedure
- Acquired bleeding disorders (such as acute liver failure)
- Concurrent use of anticoagulants known to increase the risk of bleeding (such as warfarin with international normalised ratio [INR] higher than 2)
- Epidural/spinal anaesthesia or lumbar puncture expected within the next 12 hours (clexane) or 18 hours (rivaroxaban)
- Epidural/spinal anaesthesia or lumbar puncture within the previous 4 hours(clexane and rivaroxaban)
- Acute stroke
- Thrombocytopenia (platelets less than 75 x 109/l)
- Uncontrolled systolic hypertension (230/120 mmHg or higher)
- Untreated inherited bleeding disorders (such as haemophilia and von Willebrand's disease)

### ELECTIVE KNEE ARTHROPLASTY - PRIMARY & REVISION

| | | |
|---|---|---|
| **Venous foot / calf pumps** | Continuously unless mobilising | Until fully ambulant (usually until discharge) |
| **Aspirin** | 75mg **ONCE DAILY** for 14 days | • Start Aspirin 6-12 hours after surgery completed<br>• Use tranexamic acid as UHP guidelines during surgery |

If no bleeding concerns start 6-12 hours post surgery. First evening dose to be omitted if after midnight (ie surgery finishes after 6 pm)

**Very High Risk patients:**
Previous or family history of venous thromboembolism; active cancer or within 6 months of cancer treatment; obesity (BMI > 30kg/m2); thrombophilia

| | | |
|---|---|---|
| **Venous foot / calf pumps** | Continuously unless mobilising | Until fully ambulant (usually until discharge) |
| **Rivaroxaban** | 10mg **DAILY** for 14 days | • Surgery completed before 1pm start 10pm<br>• Surgery completed after 1pm start 8am following day<br>• Use tranexamic acid during surgery as advised in UHP guidelines |

First evening dose may be omitted at discretion of surgeon or anaesthetist. First evening dose to be omitted if after midnight, (ie surgery finishes after 6 pm)

**Note:**
1. In patients with **severe renal impairment** (e-GFR is <30ml/min) use Enoxaparin 20 mg daily **instead** of Rivaroxaban. Please refer to the Enoxaparin SPC and the BNF for further information.
2. Use Rivaroxaban with caution in combination with rifampicin, phenytoin, phenobarbital carbamazepine and St John's Wort.
3. **Epidural/Spinal**
   **Pre-insertion:** Rivaroxaban must not be given within 18 hours of a planned epidural / spinal .Post insertion: Rivaroxaban must not be given within 6 hours of an epidural / spinal procedure. If a traumatic procedure, wait 24 hours.
   **Ward care:**
   Epidural catheters must not be removed within 18 hours of a dose of Rivaroxaban.
   After removal of an epidural catheter wait at least 6 hours before next dose of Rivaroxaban.

### ELECTIVE HIP ARTHROPLASTY - PRIMARY & REVISION

| | | |
|---|---|---|
| **Venous foot/ calf pumps** | Continuously unless mobilising | Until fully ambulant (usually until discharge) |
| **Enoxaparin** then **Aspirin** | 40mg **DAILY** for 10 days 75mg **DAILY** for further 28 days | • Surgery completed before 1pm start 10pm<br>• Surgery completed after 1pm start 8am following day<br>• Use tranexamic acid during surgery as advised in UHP guidelines |

First evening dose may be omitted at discretion of surgeon or anaesthetist depending on bleeding risk. First evening dose to be omitted if after midnight (ie surgery finishes after 6 pm)

**Very High Risk patients:**
Previous or family history of venous thromboembolism; active cancer or within 6 months of cancer treatment; obesity (BMI > 30kg/m2); thrombophilia

| | | |
|---|---|---|
| **Venous foot / calf pumps** | Continuously unless mobilising | Until fully ambulant (usually until discharge) |
| **Rivaroxaban** | 10mg **DAILY** for 35 days | • Surgery completed before 1pm start 10pm<br>• Surgery completed after 1pm start 8am following day<br>• Use tranexamic acid during surgery as advised in UHP guidelines |

First evening dose may be omitted at discretion of surgeon or anaesthetist. First evening dose to be omitted if after midnight, (ie surgery finishes after 6 pm)

**Note:**
1. In patients with **severe renal impairment** (e-GFR is <30ml/min) use Enoxaparin 20 mg daily **instead** of rivaroxaban. Please refer to the Enoxoparin SPC and the BNF for further information.
2. Use Rivaroxaban with caution in combination with rifampicin, phenytoin, phenobarbital carbamazepine and St John's Wort.
3. **Epidural/Spinal**
   • **Pre-insertion:** Rivaroxaban must not be given within 18 hours of a planned epidural / spinal
   • **Post insertion:** Rivaroxaban must not be given within 6 hours of an epidural / spinal procedure. If a traumatic procedure, wait 24 hours.
   **Ward care:**
   Epidural catheters must not be removed within 18 hours of a dose of Rivaroxaban. After removal of an epidural catheter wait at least 6 hours before next dose of Rivaroxaban.
4. **Enoxaparin** dose may need to vary depending on patient weight (trust guidlines)

### FRACTURE NECK OF FEMUR

| | | |
|---|---|---|
| **Enoxaparin** | 40mg **DAILY** for 28 days | From admission and continued for **28 days**, post surgery depending on bleeding risk |
| **Venous foot/ calf pumps** | • If Pharmacologial Prophylatis is containdicated<br>• Continuously unless mobilising | Until fully ambulant (usually until discharge) |

**Note:**
1. Admission **Enoxaparin** dose to be omitted if surgery planned within 12 hours.
2. **Enoxaparin** should be stopped 6-12 hours prior to surgery.
3. First dose at least 6-12 hours after completion of surgery. First evening dose may be omitted at discretion of surgeon or anaesthetist if bleeding concerns.
4. **Epidural/Spinal**
   • **Pre-insertion:** Enoxaparin must not be given within 12 hours of a planned epidural / spinal
   • **Post insertion:** Enoxaparin must not be given within 6 hours of an epidural / spinal procedure. If a traumatic procedure, wait 24 hours.
   **Ward care:**
   Epidural catheters must not be removed within 12 hours of a dose of Enoxaparin. After removal of an epidural catheter wait at least 6 hours before next dose of Enoxaparin.
5. The dose of Enoxaparin must be reduced in patients with **severe renal impairment to 20mg DAILY** for prophylaxis. If the e-GFR is <30ml/min, please refer to the product's SPC and the BNF for further information.
6. **Enoxaparin** dose may need to vary depending on patient weight (trust guidlines)

### ELECTIVE UPPER LIMB SURGERY & ISOLATED UPPER LIMB TRAUMA

Minor surgical procedures not requiring general anaesthetic:
(Eg. Carpel tunnel release, minor Dupytrens release, Trigger finger release, Joint Injection) - risk assessment not required and prophylaxis not required.
Other upper limb surgery patients
Patient risk assessed at pre op / on admission
(see Risk assessment recommendation, box 1 and 2)
For most upper limb procedures **no standard prophylaxis is required** as long as the patient remains mobile unless significant risk factors present (eg past history of VTE or general anaesthetic over 90 minutes )
If a patient is assessed to be at increased risk of VTE
Consider offering combined VTE prophylaxis with mechanical and pharmacological methods.

| | | |
|---|---|---|
| **Enoxaparin** | 40mg **DAILY** | Initially for 10 days post intervention and reviewed to assess necessity to continue |

**Note:**
1. **Enoxaparin** 10 days - Check full blood count on admission and at day 4 to 7 (before discharge) to exclude heparin induced thrombocytopenia (HIT).
2. **Enoxaparin** longer than 10 days - Check full blood count on admission and at day 4 to 7 (before discharge) and at 10 to 14 days to exclude heparin induced thrombocytopenia (HIT).
3. The dose of **Enoxaparin** must be reduced in patients with **severe renal impairment** to **20mg DAILY** for prophylaxis. e-GFR is <30ml/min. Please refer to the product's SPC and the BNF for further information.

### ELECTIVE MINOR / INTERMEDIATE LOWER LIMB SURGERY / FOOT AND ANKLE SURGERY & LOWER LIMB TRAUMA

(other than hip replacement, knee replacement or hip fracture surgery)
- **Patient risk assessed at pre op / on admission** (see NICE Risk Assessment Recommendation, box 1 and 2)
- After **discussion with the patient**
- Consider offering combined VTE prophylaxis with mechanical and pharmacological methods to patients having orthopaedic surgery until patients mobility no longer significantly reduced.
- **For Femur and proximal tibia fractures this would normally be for 28 days**
- If imobilised ina lower limb cast/boot see **PLYMOUTH VTE RISK ASSESSMENT SCORE V3**

| | | |
|---|---|---|
| **Venous foot / calf pumps** | Continuously unless mobilising | Until mobile and then continued dependant on risk assessment. |
| **Enoxaparin** | 40mg **DAILY** | Continued until the patient no longer has significantly reduced mobility. (If more than 12 weeks consult with haematologist). |

**Note:**
1. **Enoxaparin** 10 days - Check full blood count on admission and at day 4 to 7 (before discharge) to exclude heparin induced thrombocytopenia (HIT).
2. **Enoxaparin** longer than 10 days - Check full blood count on admission and at day 4 to 7 (before discharge) and at 10 to 14 days to exclude heparin induced thrombocytopenia (HIT).
3. The dose of **Enoxaparin** must be reduced in patients with **severe renal impairment** to **20mg DAILY** for prophylaxis. e-GFR is <30ml/min. Please refer to the product's SPC and the BNF for further information.
   **Orthopaedic patients not undergoing surgery should also be risk assessed and given appropriate prophylaxis with Clexane depending on NICE risk assessment criteria.**