1. **Purpose**

To minimise the incidence of Venous Thromboembolism (VTE) in patients admitted to Mackay Hospital and Health Services (MHHS).

To ensure all patients receive appropriate risk assessment on admission and at regular intervals.

To ensure VTE prophylaxis is optimised to prevent adverse outcomes.

2. **Scope**

This procedure applies to all staff of the MHHS.

3. **Procedure for Venous Thromboembolism Prevention**

**Background Information:**

Venous Thromboembolism (VTE) encompasses deep vein thrombosis (DVT) and pulmonary embolism (PE). VTE is an important health-care problem, resulting in significant mortality and morbidity, and expenditure in healthcare resources.\(^1\) It is a significant problem for medical and surgical patients as most hospitalised patients have one or more risk factors for venous thromboembolism and these factors are generally cumulative.

PE is the most common cause of preventable death among hospitalised patients\(^1,\) 3 and the morbidity associated with DVT is often under recognised and includes complications such as the post thrombotic syndrome\(^4,\) 5. Effective prophylaxis using anticoagulants and/or mechanical compression reduces the development of VTE by up to 80%\(^6,\) 7. Provision of appropriate prophylaxis in at risk patients has been rated the number one patient safety clinical practice a hospital can adopt in terms of strength of evidence in efficacy, safety and cost effectiveness\(^9\).

All hospitalised patients should be assessed for their risk of VTE and appropriate VTE prophylaxis provided according to their level of risk and presence of contraindications.
Procedure: Venous Thromboembolism Prevention

Procedure

a) All medical and surgical patients are to undergo an individual risk assessment for VTE by the admitting medical officer according to the admitting clinical unit VTE prophylaxis guideline or by the Mackay Hospital and Health Service VTE procedure.

b) The patient’s VTE risk and/or appropriateness of prophylaxis should be reviewed if patient’s condition changes from admission by the treating medical team.

c) Documentation of risk assessment and presence of contraindications to any form of prophylaxis are to be recorded on the current National Inpatient Medication Chart (NIMC) by medical staff.

d) Each patient will be prescribed anticoagulant VTE prophylaxis in the NIMC by medical staff according to their individual risk and contraindications. See below for risk categorisation, additional risk factors and contraindications.

e) Each patient will be prescribed mechanical VTE prophylaxis in the NIMC by medical officer and/or registered nurse according to their individual risk and contraindications. See below for risk categorisation, additional risk factors and contraindications.

f) Mechanical compression will be measured and fitted by nursing staff, with measurements and size/type of garment recorded in the progress notes.

g) Patient education is to be provided on VTE risk, VTE prophylaxis type and duration of treatment, VTE signs and symptoms.

h) Prophylaxis received by the patient during hospitalisation and any post-discharge prophylaxis to be included in the discharge correspondence.

i) All difficult Venous Thromboembolism prophylaxis decisions can be referred to the Director of Medicine.

j) These guidelines do not replace clinical judgement of the individual clinician.

Obstetric Note

## Venous Thromboembolism Prevention Guidelines

### Recommendation for Medical Patients: Risk Assessment

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Clinical Features</th>
<th>Prophylaxis</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk</strong></td>
<td>Ischemic Stroke, ▲ Decompensated Heart failure, Acute on Chronic Respiratory Disease, Acute on Chronic Inflammatory Disease, Sepsis, Active cancer, Myocardial Infarction, History of VTE, #Age &gt;60 years unless well and ambulant.</td>
<td>Enoxaparin 40mgs daily; or Unfractionated Heparin 5000 units BD or TDS. (NB: Due to increased risk of bleeding if CrCL &lt;30ml/min or body weight &lt;50kg, consider Unfractionated Heparin.) *IPC and/or *GCS if anticoagulant contraindicated.</td>
<td>Until resolution of acute medical illness or hospital discharge. Reassess VTE risk as condition changes and when commencing a new medication chart. Discontinue anticoagulant when acute risk resolved.</td>
</tr>
<tr>
<td><strong>Lower Risk</strong></td>
<td>Medically stable patients with no additional risk factors, **Patients awaiting residential care placement.</td>
<td>If additional risk factors present consider Enoxaparin 40mgs daily or Unfractionated Heparin 5000 units BD.</td>
<td>Until hospital discharge.</td>
</tr>
</tbody>
</table>

Favour LMWH over LDUH

**To discontinue prophylaxis if patients are medically stable and awaiting transfer to another care facility with no other indication to continue prophylaxis.**

Note: Where extended prophylaxis is indicated on discharge from hospital and where CrCL <30ml/min or body weight <50kg, consider an adjusted dose of Enoxaparin. 2,500 units daily on discharge.

### Venous Thromboembolism Prevention Guidelines

#### Recommendation for Surgical Patients: A surgical patient is a patient who has undergone, or is scheduled for an operation Risk Assessment

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Clinical Features</th>
<th>Prophylaxis</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk</strong></td>
<td>Hip or Knee Arthroplasty.</td>
<td>Enoxaparin 40mgs (halve the dose if GRF&lt;30ml/min) daily or rivaroxaban 10mg daily or apixaban 2.5mg twice daily; And IPC and/or GCS until fully mobile.</td>
<td>28-35 days for Hip Arthroplasty. 10-14 days Knee Arthroplasty.</td>
</tr>
<tr>
<td><strong>High Risk</strong></td>
<td>Major Trauma.</td>
<td>Enoxaparin 40mgs daily; (halve the dose if GRF&lt;30ml/min) And IPC and/or GCS until fully mobile.</td>
<td>Until Hospital Discharge.</td>
</tr>
<tr>
<td><strong>High Risk</strong></td>
<td>Lower Leg fracture/injury with immobilisation with brace or cast, Hip Fracture Surgery.</td>
<td>Enoxaparin 40mgs daily; (halve the dose if GRF&lt;30ml/min) And IPC and/or GCS may be used in addition to anticoagulation if additional risk factors present.</td>
<td>For entire period of immobilisation. 28-35 days For hip fracture surgery.</td>
</tr>
<tr>
<td><strong>High Risk</strong></td>
<td>Major Abdominal Cancer surgery, Oesophagectomy and Gastrectomy.</td>
<td>Enoxaparin 40mgs (halve the dose if GRF&lt;30ml/min) daily; or Unfractionated Heparin 5000 units TDS; And GCS and/or IPC until fully mobile.</td>
<td>28-35 days.</td>
</tr>
</tbody>
</table>
# Procedure: Venous Thromboembolism Prevention

## High Risk
- Any Surgery with prior VTE and/or active cancer,
- Major Surgery # age > 40 years,
- Major gynaecology Laparoscopic procedure >1hr with 1 additional risk factor.

### Additional risks:
- Peurperium

### Enoxaparin
- 40mgs (halve the dose if GRF<30ml/min) daily;
- Or Unfractionated Heparin 5000 units BD or TDS;
- And GCS and/or IPC until fully mobile.

### Consultation
- With the Director of Obstetrics or Consultant

### Duration
- 5-10 days or until hospital discharge.

## Lower Risk
- All other Surgery with no additional risk factors,
- **Patients awaiting residential care placement.**

### Optional
- GCS,
- Optional Enoxaparin 40mgs (halve the dose if GRF<30ml/min) daily
- Or Unfractionated Heparin 5000 units BD if additional risk factors.

### Discharge
- Until hospital discharge.

**To discontinue prophylaxis if patients are medically stable and awaiting transfer to another care facility with no other indication to continue prophylaxis.**

(NB: Due to increased risk of bleeding if CrCL <30ml/min or body weight <50kg, consider Unfractionated Heparin.)

Note: Where extended prophylaxis is indicated on discharge from hospital and where CrCL <30ml/min or body weight <50kg, consider an adjusted dose of Enoxaparin. 2,500 units daily on discharge.

* LDUH – Low Dose Unfractionated Heparin
* LMWH – Low Molecular Weight Heparin
* IPC – Intermittent Pneumatic Compression
* GCS – Graduated Compression Stockings

**# Major Surgery:** Any intra-abdominal surgery or surgery >45 minutes

### Additional Risk Factors
- Immobility,
- Varicose Veins,
- Obesity,
- Oestrogen therapy,
- Pregnancy or pueperium,
- Strong family history of VTE,
- Some forms of cancer chemotherapy,
- Active inflammation,

### Inherited/acquired Thrombophilia
- Deficiency of antithrombin, protein C or S, homozygosity or double heterozygosity for factor V Leiden or the G20120A prothrombin gene mutation and phospholipid antibody syndrome.

### VTE Prophylaxis Contraindications

#### **Contraindications to pharmacological prophylaxis**
- Active major bleeding (e.g. at least 2 units of blood/blood products to be transfused in 24 hours).
- Current chronic clinically significant and measurable bleeding over 48 hours.
- Bleeding disorders (haemophilia).
- Recent central nervous system bleeding.
- Intracranial or spinal lesion.
- Abnormal blood coagulation including underlying coagulopathy abnormalities.
- Thrombocytopenia (platelet count <50,000/µl).
- Active peptic ulcer or active ulcerative gastrointestinal disease.
- Obstructive jaundice or cholestasis.
- Recent major surgical procedure of high bleeding risk.
- Concomitant use of medications that may affect clotting (e.g. anticoagulants, antiplatelet agents, selective/non-selective NSAIDs or thrombolytic agents).
- Regional axial anaesthesia or recent lumbar puncture.
- Adverse reaction to heparin products (e.g. Heparin Induced Thrombocytopenia).
- Terminal care.
Procedure: Venous Thromboembolism Prevention

**Contraindications to mechanical prophylaxis**

<table>
<thead>
<tr>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe peripheral arterial disease (Ankle-Brachial Index &lt;0.8).</td>
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<tr>
<td>Diabetic neuropathy</td>
</tr>
<tr>
<td>Severe oedema of the legs</td>
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<tr>
<td>Inflammatory conditions of the lower legs</td>
</tr>
<tr>
<td>Severe lower limb deformity</td>
</tr>
<tr>
<td>Recent skin graft</td>
</tr>
<tr>
<td>Terminal care</td>
</tr>
<tr>
<td>Any factor that prevents correct fitting of mechanical compression, e.g.</td>
</tr>
<tr>
<td>Morbid obesity</td>
</tr>
</tbody>
</table>

**Pharmacological Prophylaxis**

**Recommended Treatment:**
- Ensure correct dose, frequency, route, timing and duration.
- Consider the patient’s age, size and medical history when deciding the type and dose to be given.
- If the creatinine clearance is less than 30mL/min or the patient weighs less than 50kgs (actual weight), consider use of unfractionated heparin.
- Refer below for rivaroxaban and apixaban considerations in renal impaired patients.
- Creatinine clearance can be calculated using either a 24hr urine sample or the following equation:
  - \[ \text{CrCl mL/min} = (140-\text{age}) \times \text{ideal weight (kg)} \times 0.85 \text{ for females.} \]
  - \[ 0.814 \times \text{Serum Creatinine (μmol/L)}. \]
- **NOTE:** LMWHs cannot be used interchangeably (unit for unit) between agents or with unfractionated heparin.

**Duration of Therapy:**
- The duration of prophylaxis is important.
- In high risk patients duration of prophylaxis is recommended to be a minimum of 5 days.
- If the acute condition is unresolved and the patient is not fully ambulant after 5 days, prophylaxis should continue. Increasingly patients are being discharged early to continue their recuperation at home and may not be fully mobilising. It is important to be cautious with early discharge patients that may be convalescing and therefore still at risk of VTE, extended prophylaxis may be indicated.
- High risk patient groups where the value of extended prophylaxis should be continued for 4-6 weeks include patients following hip fracture or hip replacement and major curative cancer surgery, or 10-14 days in the case of knee replacement surgery\(^9\), \(^10\), \(^11\).
- Where extended prophylaxis is indicated on discharge from hospital and where CrCL <30mL/min or body weight <50kg, consider an adjusted dose of Enoxaparin. 2,500 units daily on discharge.
Procedure: Venous Thromboembolism Prevention

Route of Administration

Subcutaneous:
The injection should be made into the anterior abdominal wall, using a different site for each injection. The whole length of the needle should be introduced vertically into the thickness of a skin fold pinched up between thumb and forefinger. This skin fold should be held throughout the duration of the injection. Do not rub the injection site after administration. Care must be taken to avoid injecting the pre-operative dose into skin at the probable site of surgical incision. It is not recommended that insulin syringes be used for administration of unfractionated heparin.

Enoxaparin

Specific Product Information for VTE Prophylaxis:
Subcutaneous injection technique. Injection should be made preferably when the patient is reclining. Clexane is administered by deep subcutaneous injection. Injection of Clexane should be alternated between the left and right anterolateral abdominal wall using a different site for each injection. Do not expel the air bubble from the syringe before the injection to avoid the loss of drug. Clexane contains no antimicrobial agent and should be used only once and then discarded.
The needles on prefilled syringes of Clexane are covered in a silicon coating, to enable ease of penetration. Do not wipe the needle or allow Clexane solution to crystallise on the needle prior to use, as this will damage the silicon coating. A 'dart' injection technique should be used to administer Clexane. Do not rub the injection site after administration. Intravenous (bolus) injection technique (for the treatment of acute STEMI). For intravenous injection, the ampoule should be used. Clexane should be administered through an intravenous line and should not be coadministered with other medications. To avoid the possible mixture of Clexane with other drugs, the intravenous access chosen should be flushed with a sufficient amount of saline or dextrose solution prior to and following the IV bolus administration of Clexane to clear the port of drug. Clexane may be safely administered with normal saline solution (0.9%) or dextrose 5% in water.

Prefilled syringes. The prefilled syringes are ready for immediate use. The whole length of the needle should be introduced vertically (at a 90deg. angle to the skin) into the thickness of a skin fold held gently between the operator's thumb and finger. This skin fold should be held throughout the duration of the injection.

Graduated prefilled syringes. When using the 60 mg, 80 mg, 100 mg, 120 mg and 150 mg graduated prefilled syringes, the volume to be injected should be measured precisely according to the dosage recommended, without expelling the air bubble while adjusting dosage. If the dose required is exactly 60, 80, 100, 120 or 150 mg, inject the full contents of the syringe. The whole length of the needle should be introduced vertically (at a 90deg. angle to the skin) into the thickness of a skin fold gently held between the operator's thumb and finger. This skin fold should be held throughout the duration of the injection.

Ampoules. When using the ampoules of enoxaparin, the volume should be measured precisely with a graduated syringe fitted with an appropriate needle for the subcutaneous or intravenous injection.

Rivaroxaban (Xarelto) Specific Product Information for VTE Prophylaxis:
- Can be taken with or without food.
- Additional Contraindications:
Procedure: Venous Thromboembolism Prevention

- Concomitant treatment with strong inhibitors of either CYP 3A4 and P-glycoprotein such as HIV protease inhibitors (e.g. ritonavir) or systemically administered azole anti-mycotics (e.g. ketoconazole).
- In relation to pregnant women animal studies have shown rivaroxiban to cross the placental barrier.
- In relation to breastfeeding women animal studies have shown rivaroxiban to be secreted in breast milk.

- Renal Impairment:
  - **Mild** renal impairment (CrCl 50-80mL/min) no dose adjustment required.
  - Those with **moderate** renal impairment (CrCl 30-49mL/min) are at increased risk of bleeding and should therefore be monitored carefully for signs of bleeding complications.
  - **Severe** renal impairment (CrCl 15-29mL/min) Rivaroxaban should be used with caution.
  - Is contraindicated in renal impairment with CrCl <15mL/min.
  - For further information regarding management of Rivaroxaban refer to hospital guidelines.

Apixaban (Eliquis) Specific Product Information for VTE Prophylaxis:
- No dosage adjustment is required in low body weight or mild to moderate renally impaired patients.
- Apixaban is contraindicated for use in patients with CrCl<15mL/min.
- Apixaban is contraindicated in patients with hepatic disease associated with coagulopathy or severe hepatic impairment with clinically relevant bleeding risk.
- Additional Contraindications:
  - Concomitant treatment with strong inhibitors of either CYP 3A4 and P-glycoprotein such as HIV protease inhibitors (e.g. ritonavir) or systemically administered azole anti-mycotics (e.g. ketoconazole).

Timing of Administration in Surgical Patients General Recommendations
If patient has established haemostasis:

**LMWH (Enoxaparin.)**
Pre-operatively or post-operatively dose should **not** be given within 12 hours of surgery.
Unfractionated Heparin
Can be given intraoperatively or 6 hours post operatively.

**Rivaroxaban**
Initial dose should be taken 6-10 hours post operatively.

**Apixaban**
Initial dose should be taken 12-24 hours post operatively.
Procedure: Venous Thromboembolism Prevention

Neuraxial/Spinal Anaesthesia

Neuraxial anaesthesia reportedly reduces the risk of VTE in comparison to a general anaesthetic but should be avoided in patients with a known bleeding disorder or in those whose preoperative haemostasis is impaired by antithrombotic drugs. Heparin thromboprophylaxis is not a contraindication to neuraxial blockade. To reduce the potential risk of neuraxial haematoma, placement and removal of the needle and catheter is best performed when the anticoagulant effect of heparin products is low. Continue daily therapy if no sensory function complications.

Insertion/Removal Guidelines

<table>
<thead>
<tr>
<th>LDUH Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidural catheters should be removed a minimum of 6 hours after last heparin dose and not less than 2 hours before the next dose. A platelet count should be conducted prior to removal of epidural catheter in patients who have had more than 4 days of heparin therapy to identify heparin induced thrombocytopenia.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LMWH (Enoxaparin) Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prophylactic LMWH</strong></td>
</tr>
<tr>
<td>Epidural catheter placement and removal should occur at least 12 hrs after standard prophylactic once daily LMWH doses.</td>
</tr>
<tr>
<td>Epidural catheter should be removed 10-12 hours after the last dose of LMWH and the next dose should not be administered earlier than 2-4 hours after removal.</td>
</tr>
<tr>
<td>Continue daily therapy if no sensory or motor function complications.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Therapeutic LMWH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operatively a dose should <strong>not</strong> be given within 24 hours of the start of surgery.</td>
</tr>
<tr>
<td>Epidural infusion should be avoided in those where therapeutic doses are necessary as part of the postoperative management strategy.</td>
</tr>
<tr>
<td>Where a single dose spinal or epidural is planned immediately prior to surgery this should not be performed within 24 hours of the previous therapeutic dose.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rivaroxaban Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial dose of Rivaroxaban should be taken 6-10 hours after surgery, provided haemostasis has occurred.</td>
</tr>
<tr>
<td>Epidural catheter should be removed no less than 18 hours after the last administration of Rivaroxaban.</td>
</tr>
<tr>
<td>Next dose post epidural catheter removal should not be administered earlier than 6 hours post removal.</td>
</tr>
<tr>
<td>If traumatic puncture occurs, administration should be delayed by 24 hours.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Apixaban Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apixaban should be commenced 12-24 hours post operatively.</td>
</tr>
<tr>
<td>Epidural/spinal catheter should be removed 20-30 hours post the last dose of apixaban (one dose should be missed).</td>
</tr>
<tr>
<td>The first dose post removal of epidural/spinal catheter should be administered no sooner than 5 hours after removal of the catheter.</td>
</tr>
</tbody>
</table>

Precautions

Laboratory Monitoring:

Prior to commencement of heparin based therapy, a baseline platelet count should be obtained and monitored regularly at least 3 times per week until heparin is stopped to identify possible occurrence of HIT.

For patients who are receiving heparin or have received heparin in the previous 2 weeks, investigation of HIT is recommended if the platelet count falls by 50%, and/or a thrombotic event occurs, between day 5
Procedure: Venous Thromboembolism Prevention

and 14 (inclusive) following initiation of heparin.
If HIT is strongly suspected or confirmed, all heparin therapy should be ceased and a specialist should be consulted for advice on confirmation of diagnosis, treatment options and the use of an alternative, non-heparin anticoagulant.
Rivaroxaban/apixaban: routine monitoring of anticoagulation or liver function is NOT required for patients.

Other Precautions:
If clinically significant bleeding should occur with the use of heparin based products, then Protamine sulphate should be administered according to the reversal of heparin guidelines. This is on the bottom of the heparin intravenous infusion form
Concomitant use of medications that may affect clotting and increase risk of bleeding (e.g. anticoagulants, antiplatelet agents, selective/non-selective NSAIDs or thrombolytic agents).

Mechanical Prophylaxis
- Two types of mechanical devices are used in the prevention of Venous Thromboembolism. They are Graduated Compression Stockings (T.E.D.S) and Sequential Compression Devices and Foot Impulse Technology.
- To be implemented by medical and nursing staff according to unit protocol and review of contraindications
- To be documented by nursing staff and signed for each shift on medication chart or care plan and document in patients chart.
- Patients with PVD should generally not receive mechanical prophylaxis; it may be used in patients with PVD if the patient has had an appropriate vascular assessment completed by medical staff.
- Patient’s condition may alter and staff will need to:
  - Re-measure to ensure device fitting remains optimal;
  - Notify treating team medical staff if contraindications become apparent;
  - Avoid devices that restrict the application of the mechanical prophylaxis eg. Identification bracelets or wanderers alarms.

Contraindications to Mechanical Prophylaxis
- Severe peripheral vascular disease.
- Severe peripheral neuropathy.
- Severe lower limb oedema.
- Wounds
- Recent skin graft or vein ligation.
- Critical limb ischaemia (ischaemic resting pain, ischaemic ulceration or short distance claudication).

Please Note
- When treating a DVT, sequential compression devices should not be used. A treatment compression stocking should be used.
- Sequential Compression Devices, Foot Impulse Technology and Graduated Compression stockings can be combined in prophylaxis treatment.
Procedure: Venous Thromboembolism Prevention

Duration
Mechanical compression should be continuous therapy from time of immobility to the return of full ambulation but can be removed for 1-2 hours for hygiene requirements, unless specified by the treating medical team. Early ambulation is encouraged as the optimum measure of VTE prophylaxis and the use of mechanical prophylaxis should not impede this.

Education
Education of patient and carer should be an important part of the care provided, and must encompass issues as the reason for using compression stockings, care of the skin and the need to monitor for swelling of the legs.

Sequential Compression Devices (SCD)
Sequential Compression Devices (SCD) is a more efficacious prophylaxis than graduated compression stockings to prevent DVT in surgical patients.

Implementation Guidelines:
- Measure and fit calf or thigh according to manufactures recommendations.
- Document measurements and size of sleeve for baseline measurements in progress notes.
- Document compliance and usage on nursing care plan.
- Tighten Velcro straps.
- Ensure all connections are secure.
- Pressure points should be checked at least once per shift.
- Leg garments are single use only.
- Decision to cease is clinical, as with all prophylactic measures.
- If the patient is sitting out of bed ONLY and not ambulating the SCD is to be kept on due to the risk of venous stasis.

Graduated Compression Stockings
Patient’s condition may alter and staff will need to:
- Re-measure to ensure fitting remains optimal.
- Notify treating team medical staff if contraindications become apparent.
- Avoid devices that restrict the application of the stockings eg. Identification bracelets or wanderers alarms.

Implementation Guidelines
- Stockings must be measured and fitted for the individual patient. For measuring guidelines please refer to manufactures recommendations. Only full length stockings should be used.
- Stockings should be removed at least daily to allow for skin care, hygiene and a skin integrity assessment.
**Procedure: Venous Thromboembolism Prevention**

- Check each shift for correct placement, no restrictions to perfusion and satisfactory neurovascular status.
- Should be applied prior to surgery whenever possible.

**Foot Impulse Technology (FIT)**

Foot Impulse Technology (FIT) is a more efficacious prophylaxis than graduated compression stockings alone in the prevention of DVT in surgical patients.

**Implementation Guidelines:**

- Measure and fit the foot/hand appropriately to ensure correct size according to manufacturer’s recommendations
- Document application and continued use in the progress notes and on the patient care plan.
- Ensure pads are secured firmly (can be used over the top of traction socks)
- Ensure all connections are secure
- Pressure is preset at 130mmHg
- Pressure points should be checked at least once per shift
- Pads are single use only (DO NOT discard tubing)
- Decision to cease is clinical, as with all prophylactic measures
- FIT should be kept on even when sitting in chair due to the risk of venous stasis.
- FIT should be continued until patient has regained pre-admission mobility status.
# Procedure: Venous Thromboembolism Prevention

**Venous Thromboembolism Prevention Guidelines**  
Recommendation for Breast and Endocrine Surgical Patients

## Risk Assessment

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Clinical Features</th>
<th>VTE Prophylaxis and Duration</th>
</tr>
</thead>
</table>
| **High Risk** | Any surgery or procedure >45 minutes with prior history of VTE or presence of additional risk factors.∞ | Enoxaparin. 40mgs daily or heparin 5000 units BD or TDS for 7-10 days or until hospital discharge;  
*And*  
*GCS and/or *IPC until patient fully mobile or hospital discharge. Ensure adequate mobility and hydration. |
| **Lower Risk** | All breast and endocrine procedures with no other risk factors. | Consider GCS and/or IPC. Duration: Until patient fully mobile or hospital discharge. Ensure adequate mobility and hydration. |

### Contraindications

- Chemoprophylaxis
  - Active or ongoing bleeding;  
  - High risk bleeding, e.g. active peptic ulcer disease, thrombocytopenia (plt <50x10L);  
  - Coagulopathy (INR >1.3);  
  - Therapeutic anticoagulation;  
  - Adverse reaction to LDUH or LMWH;  
  - Renal impairment with Enoxaparin;  
  - Other, e.g. palliative or very high falls risk;  
  - Other, e.g. very high falls risk or terminally ill.  

- Mechanical Prophylaxis
  - Severe peripheral vascular disease;  
  - Critical limb ischaemia;  
  - Severe peripheral neuropathy;  
  - Severe leg deformity;  
  - Recent skin graft;  
  - Other

- *LMWH – Low Molecular Weight Heparin  
* UFH – Unfractionated Heparin  
* GCS – Graduated Compression Stockings  
* IPC – Inter-pneumatic Compression

### Additional VTE Risk Factors:
- Inflammatory bowel disease, prior VTE, active cancer, immobility,  
- Thrombophilia, oestrogen therapy, pregnancy or puerperium, active inflammation, strong family history of VTE and/or obesity.

### Specific Recommendations:
- Breast cancer surgery GCS and IPC.  
- Neck procedures (e.g. uncomplicated thyroidectomy or parathyroidectomy) GCS, if prolonged surgery consider IPC.  
- Laparoscopic procedures GCS and IPC and consideration of LDUH if haemostasis is good.

### Note:
- If patient not undergoing surgery refer to Whole Hospital Medical Risk Stratification.
### Venous Thromboembolism Prevention Guidelines

**Recommendation for Colorectal Unit Patients**

**If patient undergoing surgery or surgery is imminent use this guideline Surgical Risk Assessment**

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Clinical Features</th>
<th>VTE Prophylaxis and Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk</strong></td>
<td>All Bowel Resections; Any surgery with history of VTE or Active Cancer.</td>
<td>Enoxaparin. 40mgs daily or heparin 5000 units BD or TDS. Duration: 5-10 days or until hospital discharge except 28-35 days for major abdominal cancer surgery; And GCS and/or IPC to commence from admission until patient fully mobile or hospital discharge.</td>
</tr>
<tr>
<td><strong>High Risk</strong></td>
<td>Any major surgery age &gt;40 years.</td>
<td>Enoxaparin. 40mgs daily or heparin 5000 units BD or TDS. Duration: 5-10 days or until hospital discharge; And GCS and/or IPC until patient fully mobile or hospital discharge.</td>
</tr>
<tr>
<td><strong>Lower Risk</strong></td>
<td>All other Colorectal Surgery.</td>
<td>Consider GCS. Consider heparin 5000 units BD if additional risk factors.∞ Duration: Until hospital discharge.</td>
</tr>
</tbody>
</table>

### Contraindications

<table>
<thead>
<tr>
<th>Chemoprophylaxis</th>
<th>Mechanical Prophylaxis</th>
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<tbody>
<tr>
<td>Active bleeding; High risk bleeding, e.g. History of GI bleeding, platelets &lt; 50 x 10^9/L; Severe hepatic disease (INR &gt;1.3); Adverse reaction to Heparin; On current anticoagulation; Renal impairment with Enoxaparin; Other, e.g. palliative or very high falls risk.</td>
<td>Severe peripheral vascular disease; Severe peripheral neuropathy; Recent skin graft; Severe leg deformity; Confirmed DVT is a contraindication to IPC but not GCS; Other, e.g. palliative or very high falls risk.</td>
</tr>
</tbody>
</table>

Major surgery: intra-abdominal surgery or surgery > 45 minute duration

* UFH – Unfractionated Heparin
* LMWH – Low Molecular Weight Heparin
* GCS – Graduated Compression Stockings
* IPC – Inter-Pneumatic Compression

**Additional VTE Risk Factors:** Inflammatory bowel disease, prior VTE, active cancer, immobility, Thrombophilia, oestrogen therapy, pregnancy or puerperium, active inflammation, strong family history of VTE and/or obesity.

Note: Where extended prophylaxis is indicated on discharge from hospital and where CrCL <30ml/min or body weight <50kg, consider an adjusted dose of Enoxaparin. 2,500 units daily on discharge.

**Note:** If patient not undergoing surgery refer to Whole Hospital Medical Risk Stratification.
## Procedure: Venous Thromboembolism Prevention

### Venous Thromboembolism Prevention Guidelines
Recommendation for Medical Oncology and Haematology Patients

### Risk Assessment

<table>
<thead>
<tr>
<th>Category</th>
<th>Clinical Features</th>
<th>VTE Prophylaxis and Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk</td>
<td>All inpatients with Active cancer that are admitted for more than one night.</td>
<td>Enoxaparin. 40mgs daily. Due to increased risk of bleeding if CrCL &lt;30ml/min or body weight &lt;50kg, consider Unfractionated Heparin. Given at 1600 Daily. Duration: Duration of hospital admission; And *GCS and/or *IPC until hospital discharge. Ensure adequate mobility and hydration.</td>
</tr>
</tbody>
</table>

### Contraindications

<table>
<thead>
<tr>
<th>Chemoprophylaxis</th>
<th>Mechanical Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleeding; Haemorrhagic disorder; Actual or potential haemorrhagic states; plts &lt; 50 x 10^9/L or likely to be within 24hr; Active Cancer with high risk of bleeding, e.g. CNS disease, Gastric cancer or Gastric Lymphoma; Terminally ill; Planned intrathecal therapy within 24hrs; Severe hepatic disease(INR &gt;1.3); Adverse reaction to UFH or LMWH; On current anticoagulation.</td>
<td>Severe peripheral vascular disease; Severe peripheral neuropathy; Severe leg deformity; Recent skin graft; Terminally ill.</td>
</tr>
</tbody>
</table>

UFH – Unfractionated Heparin  
* LMWH – Low Molecular Weight Heparin  
* GCS – Graduated Compression Stockings  
* IPC – Inter-Pneumatic Compression

### Recommendations:

1. Regular monitoring of FBE and platelet counts by medical and nursing staff.  
2. RMO to routinely assess patients on admission for risk of VTE and if indicated prescribe appropriate VTE prophylaxis.  
3. Nursing staff are to check daily before 1600 administration of LMWH for any contraindication for chemical prophylaxis.  
4. RMO to withhold LMWH if platelets <50 x 10^9/L or likely to be <50 x 10^9/L on the next morning.  
5. RMO to withhold LMWH 12-24hrs pre or post-surgery.  
6. Patient’s contraindicated to LMWH should receive mechanical prophylaxis (GCS/TEDs) if no contraindication to mechanical prophylaxis.
**Procedure: Venous Thromboembolism Prevention**

**Venous Thromboembolism Prevention Guidelines**  
**Recommendation for Neurosurgical Patients**

### RISK ASSESSMENT

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Clinical Features</th>
<th>VTE Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk</td>
<td>Major Trauma;</td>
<td>IPC during surgery.</td>
</tr>
<tr>
<td></td>
<td>Other Surgery with prior VTE and/or active cancer;</td>
<td>IPC and/or GCS remain insitu while patient recumbent.</td>
</tr>
<tr>
<td></td>
<td>Major Surgery # age &gt; 40 years.</td>
<td>Consider UFH 5000 units BD once haemodynamically stable and haemostasis achieved.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review daily.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure mobility and hydration status appropriate.</td>
</tr>
<tr>
<td>Lower Risk</td>
<td>All other Surgery.</td>
<td>IPC during surgery.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IPC and/or GCS remain insitu while patient recumbent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor mobility and hydration.</td>
</tr>
</tbody>
</table>

### Contraindications

<table>
<thead>
<tr>
<th>Chemoprophylaxis</th>
<th>Mechanical Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleeding;</td>
<td>Severe peripheral vascular disease;</td>
</tr>
<tr>
<td>High risk bleeding;</td>
<td>Severe peripheral neuropathy;</td>
</tr>
<tr>
<td>Severe hepatic disease (INR &gt; 1.3);</td>
<td>Recent skin graft;</td>
</tr>
<tr>
<td>Adverse reaction to Unfractionated Heparin;</td>
<td>Severe leg deformity;</td>
</tr>
<tr>
<td>On current anticoagulation;</td>
<td>Other, e.g. palliative or very high falls risk.</td>
</tr>
<tr>
<td>Other, e.g. palliative or very high falls risk.</td>
<td></td>
</tr>
</tbody>
</table>

#Major surgery is any intra-abdominal operation and all other operations lasting longer than 45 minutes

* UFH – Unfractionated Heparin
* GCS – Graduated Compression Stockings
* IPC – Inter-pneumatic Compression
# Procedure: Venous Thromboembolism Prevention

## Venous Thromboembolism Prevention Guidelines
### Recommendation for Orthopaedic Patients

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Risk Factors</th>
<th>Recommended Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIGH</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|               | 1. Orthopaedic surgery of pelvis, hip or lower limbs  
               | 2. Other orthopaedic surgery with additional medical risk factors:  
               |   - Previous VTE  
               |   - Active cancer  
               |   - Acute neurological disease  
               |   - Sepsis  
               |   - Inflammatory bowel disease  
               |   - Marked obesity  
               |   - Oestrogen therapy | Unless contraindicated, use:  
                         |               | Graduated compression stockings (GCS) for 6 weeks AND  
                         |               | Intermittent pneumatic compression (IPC) until discharge  
                         |               | **COMBINED WITH one of the following:**  
                         |               | 1. Aspirin 150 – 300mg daily for 6 weeks  
                         |               | 2. Unfractionated heparin subcut 5000 units TWICE or THREE times a day for 3 days  
                         |               | **OR**  
                         |               | Enoxaparin subcut 40mg ONCE daily for 3 days.  
                         |               | Use 20 mg ONCE daily if:  
                         |               | - CrCl less than 30 mL/min  
                         |               | - low body weight (less than 50kg)  
                         |               | **THEN** on Day 4, start aspirin 150 – 300mg daily for 6 weeks  
                         |               | 3. If patient on warfarin pre-operatively, discuss with surgeon or proceduralist prior to restarting warfarin |
| **LOW**       | Other orthopaedic / day surgery | Discuss with treating team.  
                         |               | Consider aspirin, GCS and / or IPC |

### Contraindications

#### Chemoprophylaxis

- Active bleeding;  
- High risk bleeding;  
- Severe hepatic disease (INR >1.3);  
- Adverse reaction to Unfractionated Heparin;  
- On current anticoagulation;  
- Other, e.g. palliative or very high falls risk.

#### Mechanical Prophylaxis

- Severe peripheral vascular disease;  
- Severe peripheral neuropathy;  
- Recent skin graft;  
- Severe leg deformity;  
- Other, e.g. palliative or very high falls risk.

Due to increased risk of bleeding if CrCL <30ml/min or body weight <50kg, consider Unfractionated Heparin.

# Additional VTE Risk Factors:
- Inflammatory bowel disease, prior VTE, active cancer, immobility, Thrombophilia, oestrogen therapy, pregnancy or puerperium, active inflammation, strong family history of VTE and/or obesity.

Note: Where extended prophylaxis is indicated on discharge from hospital and where CrCL <30ml/min or body weight <50kg, consider an adjusted dose of Enoxaparin. 2,500 units daily on discharge.
Procedure: Venous Thromboembolism Prevention

Venous Thromboembolism Prevention Guidelines
For Hip Fracture Patients (Section One)

All hip fracture patients are considered to be at HIGH risk of VTE.
NO prophylaxis is required if patient is fully anticoagulated.
For each patient:
1. Assess risk of VTE (use guidelines below) and document VTE risk on Medication Chart.
2. Consider the risk : benefit ratio of prophylaxis – check contraindications.
3. Prescribe appropriate prophylaxis. If unsure, discuss with Registrar / Consultant.
4.

<table>
<thead>
<tr>
<th>Recommended Mechanical Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unless contraindicated, use:</td>
</tr>
<tr>
<td>Intermittent pneumatic compression (IPC) on admission</td>
</tr>
<tr>
<td>Graduated compression stockings (GCS) optional</td>
</tr>
<tr>
<td>After surgery, continue IPC +/- GCS until discharge</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommended Pharmacological Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>If not taking any anti-platelet drug pre-op</td>
</tr>
<tr>
<td>On admission: Use aspirin 150-300mg daily</td>
</tr>
<tr>
<td>Post-op: Continue aspirin 150-300mg daily for 6 weeks then stop</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If taking aspirin pre-op</th>
</tr>
</thead>
<tbody>
<tr>
<td>On admission: Use aspirin 150-300mg daily</td>
</tr>
<tr>
<td>Post-op: Use aspirin 150-300mg daily for 6 weeks then usual dose</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If taking aspirin and clopidogrel pre-op (for recent MI or stents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>On admission: Continue clopidogrel; use aspirin 150-300mg daily</td>
</tr>
<tr>
<td>Post-op: Continue clopidogrel; use aspirin 150-300mg daily for 6 weeks then usual dose</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If taking aspirin and clopidogrel pre-op (for other indications)</th>
</tr>
</thead>
<tbody>
<tr>
<td>On admission: Stop clopidogrel; use aspirin 150-300mg daily</td>
</tr>
<tr>
<td>Post-op: Restart clopidogrel 1 week after surgery; Continue aspirin 150-300mg daily for 6 weeks then usual dose</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If taking clopidogrel due to aspirin intolerance pre-op</th>
</tr>
</thead>
<tbody>
<tr>
<td>On admission: Continue clopidogrel and use unfractionated heparin subcut 5000 units TWICE daily</td>
</tr>
<tr>
<td>Post-op: Continue clopidogrel and use unfractionated heparin subcut 5000 units TWICE daily until discharge</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If taking warfarin pre-op</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to Management of Warfarin</td>
</tr>
</tbody>
</table>
Venous Thromboembolism Prevention Guidelines
For Hip Fracture Patients (Section Two)
Flowchart Perioperative Management

If on warfarin pre-op, consider indication & assess overall thromboembolic risk as follows

<table>
<thead>
<tr>
<th>HIGH risk</th>
<th>INTERMITTENT risk</th>
<th>LOW risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Any mitral valve prosthesis</td>
<td>• Bi-leaflet aortic valve prosthesis with good cardiac function, but with at least 1 additional risk factor(s)†</td>
<td>• Bi-leaflet aortic valve prosthesis without any risk factors‡</td>
</tr>
<tr>
<td>• Recent mechanical valve &lt; 3 mon</td>
<td>• AF with CHADS2* = 3 or 4</td>
<td>• AF with CHADS2* = 0 or 2 with no history of stroke or TIA</td>
</tr>
<tr>
<td>• Mechanical valve and stroke or TIA &lt;6 months</td>
<td>• CHADS2* 0-2 with history of stroke / TIA</td>
<td>• Cerebrovascular disease with no history of stroke or TIA</td>
</tr>
<tr>
<td>• AF with:</td>
<td>• VTE within 3-12 mon</td>
<td>• Single episode of VTE &gt;12 mon ago</td>
</tr>
<tr>
<td>- CHADS2* = 5 or 6</td>
<td>• Recurrent VTE</td>
<td></td>
</tr>
<tr>
<td>- Recent stroke / TIA &lt;3 mon</td>
<td>• Low risk thrombophilia</td>
<td></td>
</tr>
<tr>
<td>- Rheumatic valvular heart disease</td>
<td>• Active cancer</td>
<td></td>
</tr>
<tr>
<td>- VTE in past 1-3 mon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Recurrent idiopathic VTE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• High risk thrombophilia</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Withhold warfarin on admission. Consider reversal – discuss with consultant.

Bridging therapy recommended
Consult treating team about bridging therapy
Bridging therapy not required

Start IV heparin infusion when INR < 1.8. Cease infusion 4 – 6 hours before surgery. Consider IVC filter in those at high risk of bleeding.

If bridging required, use unfractionated heparin subcut 5000 units TWICE daily. Cease heparin 12 hours before surgery.
Use aspirin 150 – 300mg daily

Test INR on day of surgery; discuss with surgeon if INR > 1.5

Check with surgeon & anaesthetist before restarting anticoagulants post-op

Restart IV heparin infusion 48 hours after surgery if haemostasis satisfactory. Restart warfarin at usual maintenance dose. Cease heparin when INR > 1.8.
Use unfractionated heparin subcut 5000 units TWICE daily 12 hours post-op. Restart warfarin at usual maintenance dose. Cease when INR > 1.8
Consult treating team before restarting warfarin. Aim to restart at usual maintenance dose on Day 7 post-op. Continue aspirin 150 – 300mg daily until INR > 1.8.

Notes:
Procedure: Venous Thromboembolism Prevention

* The CHADS2 index predicts the risk of stroke in patients with atrial fibrillation:
  Congestive heart failure (1 point), hypertension (1 point), age>75 (1 point), diabetes (1 point), prior stroke or TIA (2 points)
  - deficiency of protein C, protein S, or antithrombin III; antiphospholipid antibody syndrome, or multiple thrombophilias,
  - homozygous factor V Leiden Mutation.
  - e.g. heterozygous factor V Leiden or prothrombin gene mutation

<table>
<thead>
<tr>
<th>Contraindications</th>
<th>Mechanical Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleeding;</td>
<td>Severe peripheral vascular disease;</td>
</tr>
<tr>
<td>High risk bleeding;</td>
<td>Severe peripheral neuropathy;</td>
</tr>
<tr>
<td>Severe hepatic disease (INR &gt;1.3);</td>
<td>Recent skin graft;</td>
</tr>
<tr>
<td>Adverse reaction to Unfractionated Heparin;</td>
<td>Severe leg deformity;</td>
</tr>
<tr>
<td>On current anticoagulation;</td>
<td>Other, e.g. palliative or very high falls risk.</td>
</tr>
<tr>
<td>Other, e.g. palliative or very high falls risk.</td>
<td>Other, e.g. palliative or very high falls risk.</td>
</tr>
</tbody>
</table>

Due to increased risk of bleeding if CrCL <30ml/min or body weight <50kg, consider Unfractionated Heparin

# Major surgery is any intra-abdominal operation and all other operations lasting longer than 45 minutes
* UFH – Unfractionated Heparin
* GCS – Graduated Compression Stockings
* IPC – Inter-pneumatic Compression

* Additional VTE Risk Factors: Inflammatory bowel disease, prior VTE, active cancer, immobility, Thrombophilia, oestrogen therapy, pregnancy or puerperium, active inflammation, strong family history of VTE and/or obesity.

Note: Where extended prophylaxis is indicated on discharge from hospital and where CrCL <30ml/min or body weight <50kg, consider an adjusted dose of Enoxaparin. 2,500 units daily on discharge.
Procedure: Venous Thromboembolism Prevention

Venous Thromboembolism Prevention Guidelines
Recommendation for Psychiatric Geriatric Patients

### RISK ASSESSMENT

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Medical Patients</th>
<th>VTE Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk</strong></td>
<td>Age &gt;60 years with clinical features of dehydration and immobility, Ischaemic Stroke, History of VTE, Decompensated cardiac failure, Active cancer, Acute on chronic lung disease, Acute inflammatory disease.</td>
<td>Low Dose *UFH or LMWH; Or *GCS or *IPC if heparin contraindicated. # For minimum of 10 days until re-hydrated and/or mobile 20m at least 3 times per day.</td>
</tr>
<tr>
<td><strong>Lower Risk</strong></td>
<td>Minor medical illness.</td>
<td>Consider GCS. Maintain adequate mobility and hydration.</td>
</tr>
</tbody>
</table>

### Contraindications

**Chemoprophylaxis**
- Active bleeding;
- High risk bleeding;
- Renal impairment;
- Severe hepatic disease (INR >1.3);
- Adverse reaction to UFH or LMWH;
- On current anticoagulation;
- Other, e.g. palliative or very high falls risk.

**Mechanical Prophylaxis**
- Severe peripheral vascular disease;
- Severe peripheral neuropathy;
- Recent skin graft;
- Severe leg deformity;
- Other, e.g. palliative or very high falls risk.

* UFH – Unfractionated Heparin
* LMWH – Low Molecular Weight Heparin
* GCS – Graduated Compression Stockings
* IPC – Inter-Pneumatic Compression

# To discontinue prophylaxis if patients are medically stable and awaiting residential care placement with no other indication to continue prophylaxis.

# Caveat – there have been no randomised trials of cessation of prophylactic anticoagulation after the minimum recommended period and once a patient is walking at least 3 times per day for at least 20 metres. These recommendations are based on standard accepted clinical practice and expert opinion.
# Venous Thromboembolism Prevention Guidelines

## Recommendation for Rehabilitation Medical Patients

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Medical Patients</th>
<th>VTE Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk</strong></td>
<td>Ischaemic Stroke, History of VTE, Decompensated cardiac failure, Active cancer, Acute on chronic lung disease, Acute on chronic inflammatory disease, Age &gt;60 years unless otherwise well and ambulant. #</td>
<td>Low Dose *UFH or LMWH; Or *GCS or *IPC if heparin contraindicated. # For minimum of 10 days until mobile 20m at least 3 times per day. Ensure adequate mobility and hydration.</td>
</tr>
<tr>
<td><strong>Lower Risk</strong></td>
<td>Minor medical illness.</td>
<td>Consider GCS. Maintain adequate mobility and hydration.</td>
</tr>
</tbody>
</table>

## Contraindications

### Chemoprophylaxis
- Active bleeding;
- High risk bleeding;
- Renal impairment;
- Severe hepatic disease (INR >1.3);
- Adverse reaction to UFH or LMWH;
- On current anticoagulation;
- Other, e.g. palliative or very high falls risk.

### Mechanical Prophylaxis
- Severe peripheral vascular disease;
- Severe peripheral neuropathy;
- Recent skin graft;
- Severe leg deformity;
- Other, e.g. palliative or very high falls risk.

* UFH – Unfractionated Heparin
* LMWH – Low Molecular Weight Heparin
* GCS – Graduated Compression Stockings
* IPC – Inter-Pneumatic Compression

# While patients aged over 60 years are currently classified as high risk, those that are otherwise well and ambulant may not be at high risk for VTE in the absence of other risk factors.
# To discontinue prophylaxis if patients are medically stable and awaiting residential care placement with no other indication to continue prophylaxis.
# Caveat – There have been no randomised trials of cessation of prophylactic anticoagulation after the minimum recommended period and once a patient is walking at least 3 times per day for at least 20 metres. These recommendations are based on standard accepted clinical practice and expert opinion.
## Procedure: Venous Thromboembolism Prevention

### Venous Thromboembolism Prevention Guidelines
Recommendation for Rehabilitation Surgical Patients

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Clinical Features</th>
<th>VTE Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk</td>
<td>Total Knee or Hip replacement; Multiple trauma; Major surgery* with history of cancer and/or VTE; Major surgery, age &gt;40 years.</td>
<td>*LMWH Heparin or Low dose UFH; And * GCS and/or *IPC. Minimum 30 days treatment from date of surgery. Cease when mobile 20m at least 3 times per day. Ensure mobility and hydration status appropriate.</td>
</tr>
<tr>
<td>Lower Risk</td>
<td>All other surgery.</td>
<td>Consider GCS. Consider LMWH or LDUH if additional risk factors.∞ Monitor mobility and hydration.</td>
</tr>
</tbody>
</table>

### Contraindications

<table>
<thead>
<tr>
<th>Chemoprophylaxis</th>
<th>Mechanical Prophylaxis</th>
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* Major surgery is any intra-abdominal operation and all other operations lasting longer than 45 minutes
* LMWH – Low Molecular Weight Heparin
* UFH – Unfractionated Heparin
* GCS – Graduated Compression Stockings
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∞ Additional VTE Risk Factors: Inflammatory bowel disease, prior VTE, active cancer, immobility, Thrombophilia, oestrogen therapy, pregnancy or puerperium, active inflammation, strong family history of VTE and/or obesity.

# To discontinue prophylaxis if patients are medically stable and awaiting residential care placement with no other indication to continue prophylaxis.

# Caveat – There have been no randomised trials of cessation of prophylactic anticoagulation after the minimum recommended period and once a patient is walking at least 3 times per day for at least 20 metres. These recommendations are based on standard accepted clinical practice and expert opinion.
Procedure: Venous Thromboembolism Prevention

Venous Thromboembolism Prevention Guidelines
Recommendation for Spinal Injuries Patients

Acute Spinal Cord Injury (SCI) Procedure

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Start</th>
<th>Cease</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower limb passive</td>
<td>Day 1</td>
<td>Twice daily for 6 weeks or until mobilised from bed then once daily.</td>
<td></td>
</tr>
<tr>
<td>movements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCS</td>
<td>Day 1</td>
<td>When distal oedema is controlled.</td>
<td>Should continue when anti-thrombotic agents are in use.</td>
</tr>
<tr>
<td>IPC</td>
<td>Day 1</td>
<td>Until mobilised from bed.</td>
<td>Use of these may need to be prioritised.</td>
</tr>
<tr>
<td>Unfractionated Heparin</td>
<td>Day 1 5000U TDS</td>
<td>Withhold last dose of UFH prior to surgery.</td>
<td>LMWH commenced day 2 post-op.</td>
</tr>
<tr>
<td>Enoxaparin 40mgs DAILY</td>
<td>Day 2 Post-op</td>
<td>If complete motor SCI – 8 weeks.</td>
<td>If surgery is planned LMWH should not be used in pre-operative period.</td>
</tr>
<tr>
<td></td>
<td>begin Enoxaparin</td>
<td>If complete motor SCI and other risk factors – 12 weeks.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40mgs DAILY</td>
<td>If functional LL movement – until mobilised from bed.</td>
<td></td>
</tr>
</tbody>
</table>

Acute or chronic SCI and prolonged bed rest
If prolonged bed rest is required for patients with either acute or chronic SCI because of medical or other complications re-institution of thromboembolic prophylaxis should be considered.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Start</th>
<th>Cease</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCS</td>
<td>Day 1</td>
<td>When distal oedema is controlled.</td>
<td>Should continue when anti-thrombotic agents are in use.</td>
</tr>
<tr>
<td>UFH</td>
<td>Day 2 5000U TDS</td>
<td>Until mobilised from bed.</td>
<td>Withhold last dose of UFH prior to surgery.</td>
</tr>
</tbody>
</table>
**Procedure: Venous Thromboembolism Prevention**

**Venous Thromboembolism Prevention Guidelines**

**Recommendation for Stroke Patients**

<table>
<thead>
<tr>
<th>Stroke Unit Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Category</strong></td>
</tr>
<tr>
<td>High Risk</td>
</tr>
<tr>
<td>High Risk</td>
</tr>
</tbody>
</table>

**Contraindications**

**Chemoprophylaxis**

Active bleeding, e.g. Intracranial bleeding; High risk bleeding, e.g. Severe hepatic disease (INR >1.3), Thrombocytopenia; Impaired haemostasis; Adverse reaction to Unfractionated Heparin or LMWH; On current anticoagulation or has received recent Lysis; Cerebral Aneurysm or AV malformation; Bacterial Endocarditis; Other, e.g. palliative or very high falls risk.

**Mechanical Prophylaxis**

Severe peripheral vascular disease; Severe peripheral neuropathy; Recent skin graft; Severe leg deformity; Other, e.g. palliative or very high falls risk.

**Chemical Prophylaxis Recommendations:**

Withhold if lumbar puncture within preceding 24 hours.
Unfractionated Heparin 5000 units BD if Creatinine Clearance <30mmol/min or low body weight <50kg.
Note: Where extended prophylaxis is indicated on discharge from hospital and where CrCL <30ml/min or body weight <50kg, consider an adjusted dose of Enoxaparin. 2,500 units daily on discharge.
Exercise caution in the patient receiving dual anti-platelet therapy.
Chemoprophylaxis in patients with intracerebral haemorrhage should only be commenced senior medical staff, and are usually withheld within the early management, and only administered to patients at high risk of VTE.
# Procedure: Venous Thromboembolism Prevention

## Venous Thromboembolism Prevention Guidelines
**Recommendation for Trauma Patients**

### Risk Assessment

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Clinical Features</th>
<th>VTE Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk</td>
<td>Major Trauma with immobility.</td>
<td>Unfractionated heparin 5000 units BD/TDS. Or Enoxaparin. 40mgs/day at 2000hrs. IPC or FIT and GCS until fully mobile. Promote adequate hydration and mobilise as able. Consider Doppler Ultrasound scanning of lower limbs as monitoring procedure on day 3-5 post injury and continued weekly (or as indicated) until optimal VTE prophylaxis has commenced. Consider IVC filter in consultation with Vascular team.</td>
</tr>
<tr>
<td></td>
<td>In a subset of very high risk patients (for example complex pelvis and lower limb injuries).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note liver and spleen contraindication.</td>
<td></td>
</tr>
<tr>
<td>High Risk</td>
<td>Trauma requiring major or extended surgical intervention.</td>
<td>Consider unfractionated heparin 5000 units TDS with the aim to convert to Enoxaparin as soon as possible. IPC and GCS until fully mobile. Promote adequate hydration and mobilise as injury allows.</td>
</tr>
<tr>
<td></td>
<td>Note liver and spleen contraindication.</td>
<td></td>
</tr>
<tr>
<td>High Risk</td>
<td>Complex Trauma with Spinal Cord or Head Injury.</td>
<td>In consultation with Spinal/Neurosurgical team consider: 5000 units heparin TDS initially. Convert to Enoxaparin. 40mgs day. IPC and GCS until fully mobile. Promote adequate hydration and mobilise as injury allows.</td>
</tr>
<tr>
<td>Lower Risk</td>
<td>Minor trauma, All other surgery.</td>
<td>IPC during surgery. IPC and/or GCS remain insitu while patient recumbent. Promote adequate hydration and mobilise as able. Optional LMWH Enoxaparin. 40mgs/day at 2000hrs if additional risk factors.</td>
</tr>
</tbody>
</table>

### Contraindications

<table>
<thead>
<tr>
<th>Chemoprophylaxis</th>
<th>Mechanical Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleeding.</td>
<td>A confirmed DVT is a contraindication to intermittent pneumatic compression devices but not graduated compression stockings;</td>
</tr>
<tr>
<td>High risk of bleeding (e.g. platelets &lt; 50 x 109/L); Severe hepatic disease (INR &gt; 1.3); Adverse reaction to Unfractionated Heparin or Low Molecular Weight Heparin; On current therapeutic anticoagulation; Liver and splenic lacerations – refer to General Surgeons for advice on starting chemical prophylaxis; Intracranial haemorrhage – refer to Neurosurgeons for advice on starting chemical prophylaxis; Operative spinal fractures – refer to Spinal Surgeons.</td>
<td>Severe peripheral arterial disease; Severe peripheral neuropathy; Severe leg deformity; Recent skin graft; External fixator – consider foot pump.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GCS – Graduated Compression Stockings</th>
<th>Confirmed VTE consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPC – Inter-pneumatic Compression</td>
<td>Treatment compression stocking (Class II: 20-30mmHg) see Hospital policy.</td>
</tr>
<tr>
<td>FIT – Foot Impulse Technology</td>
<td>IVC filter in consultation with Vascular team.</td>
</tr>
</tbody>
</table>
Procedure: Venous Thromboembolism Prevention

**Venous Thromboembolism Prevention Guidelines**
**Recommendation for Upper Gastro Intestinal Patients**

Patients are stratified into low and high risk groups and if there are any concerns please discuss with the UGI registrar or fellow.

<table>
<thead>
<tr>
<th>Upper Gastro Intestinal Unit Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Category</strong></td>
</tr>
<tr>
<td>High Risk</td>
</tr>
<tr>
<td>High Risk</td>
</tr>
<tr>
<td>High Risk</td>
</tr>
<tr>
<td>Lower Risk</td>
</tr>
</tbody>
</table>

**Contraindications**

<table>
<thead>
<tr>
<th>Chemoprophylaxis</th>
<th>Mechanical Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleeding, e.g. Intracranial bleeding; High risk bleeding, e.g. Severe hepatic disease (INR&gt; 1.3), Thrombocytopenia; Impaired haemostasis; Adverse reaction to Unfractionated Heparin or LMWH; On current anticoagulation or has received recent Lysis; Cerebral Aneurysm or AV malformation; Bacterial Endocarditis; Other, e.g. palliative or very high falls risk.</td>
<td>Severe peripheral vascular disease; Severe peripheral neuropathy; Recent skin graft; Severe leg deformity; Other, e.g. palliative or very high falls risk.</td>
</tr>
</tbody>
</table>

These are guidelines to assist in planning VTE prophylaxis; all decisions should be made on individual patient risk stratification.

Note: Where extended prophylaxis is indicated on discharge from hospital and where CrCL <30ml/min or body weight <50kg, consider an adjusted dose of Enoxaparin. 2,500 units daily on discharge.

Note: If patient not undergoing surgery refer to Medical Risk Stratification.
**Procedure: Venous Thromboembolism Prevention**

**Venous Thromboembolism Prevention Guidelines**

**Recommendation for Urology Patients**

Variation to these guidelines may occur after an individual assessment of the patient’s VTE risk and associated clinical condition.

<table>
<thead>
<tr>
<th>Urology Unit Risk Assessment</th>
<th>Clinical Features</th>
<th>VTE Prophylaxis and Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk</strong></td>
<td>All major procedures and age &gt;40 years.</td>
<td>Enoxaparin. 40mgs daily or heparin 5000 Units BD or TDS; And GCS +/- IPC from hospital admission until patient fully mobile.</td>
</tr>
<tr>
<td><strong>At Risk</strong></td>
<td>All Minor procedures including TURP and TURBT and age &gt;40 years. Penile and Sphincter Prosthesis</td>
<td>GCS from hospital admission until patient fully mobile.</td>
</tr>
<tr>
<td><strong>Lower Risk</strong></td>
<td>Endoscopic Procedures and age &gt;40 years.</td>
<td>Consider GCS: Early mobilisation, adequate nutrition and hydration.</td>
</tr>
</tbody>
</table>

**Contraindications**

<table>
<thead>
<tr>
<th>Chemoprophylaxis</th>
<th>Mechanical Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active bleeding, e.g. Intracranial bleeding; High risk bleeding, e.g. Severe hepatic disease (INR &gt;1.3), Thrombocytopenia; Impaired haemostasis; Adverse reaction to Unfractionated Heparin or LMWH; On current anticoagulation or has received recent Lysis; Cerebral Aneurysm or AV malformation; Bacterial Endocarditis; Other, e.g. palliative or very high falls risk.</td>
<td>Severe peripheral vascular disease; Severe peripheral neuropathy; Recent skin graft; Severe leg deformity; Other, e.g. palliative or very high falls risk.</td>
</tr>
</tbody>
</table>

**Additional Information:**

All patients with additional risk factors, irrespective of age, should be considered for pharmacological and mechanical management. Additional risk factors include but are not limited to:

- History of venous thromboembolism (VTE),
- Malignancy,
- Obesity,
- Increased age,
- Varicose veins,
- Oestrogen containing preparations,
- Thrombophilia factors.

Note: If patient not undergoing surgery refer to Medical Risk Stratification
# Venous Thromboembolism Prevention Guidelines
## Recommendation for Vascular Surgery Patients

## RISK ASSESSMENT

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Clinical Features</th>
<th>VTE Prophylaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk</td>
<td>All vascular surgery other than Carotid TEA.</td>
<td>Heparin 5000 units BD or TDS. Withhold morning of surgery. If RTW before 1200 for PM dose if RTW after 1200 for dose 8am next morning. Ensure adequate mobility and hydration. GCS for AAA repair if no contraindications.</td>
</tr>
<tr>
<td>High Risk</td>
<td>Carotid TEA.</td>
<td>IPC and/or GCS peri/post operatively until fully ambulant. Maintain appropriate mobility and hydration status.</td>
</tr>
<tr>
<td>Lower Risk</td>
<td>Minor medical illness or minor procedure with no medical risk factors.</td>
<td>Consider GCS. Monitor mobility and hydration.</td>
</tr>
</tbody>
</table>

## Contraindications

**Chemoprophylaxis**
- Active bleeding;
- High risk bleeding;
- Renal impairment;
- Severe hepatic disease (INR >1.3);
- Adverse reaction to Unfractionated Heparin or LMWH;
- On current anticoagulation;
- Other, e.g. palliative or very high falls risk.

**Mechanical Prophylaxis**
- Severe peripheral vascular disease;
- Severe peripheral neuropathy;
- Recent skin graft;
- Severe leg deformity;
- Other, e.g. palliative or very high falls risk.

# Major surgery is any intra-abdominal operation and all other operations lasting longer than 45 minutes

* LMWH – Low Molecular Weight Heparin
* UFH – Unfractionated Heparin
* GCS – Graduated Compression Stockings
* IPC – Inter-pneumatic Compression

Note: If patient not undergoing surgery refer to Medical Risk Stratification.
Procedure: Venous Thromboembolism Prevention

4. References


5. Consultation

<table>
<thead>
<tr>
<th>Date</th>
<th>Key Stakeholder /s</th>
<th>Position</th>
<th>Status Tracking</th>
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<tbody>
<tr>
<td>October 2008</td>
<td>Simone Talbot</td>
<td>CNC Surgical</td>
<td>Developed &amp; Approved</td>
</tr>
<tr>
<td>November 2008</td>
<td>Sharon Roche</td>
<td>Anaesthetist</td>
<td>Developed &amp; Approved</td>
</tr>
<tr>
<td>November 2008</td>
<td>Nils Wagner</td>
<td>Surgeon</td>
<td>Developed &amp; Approved</td>
</tr>
<tr>
<td>November 2008</td>
<td>Phillipa Cuttance</td>
<td>Director of Obstetrics</td>
<td>Developed &amp; Approved</td>
</tr>
<tr>
<td>November 2008</td>
<td>Jayne McKenna</td>
<td>CNC Theatre</td>
<td>Developed &amp; Approved</td>
</tr>
<tr>
<td>November 2008</td>
<td>Herwig Drobetz</td>
<td>Orthopaedic Surgeon</td>
<td>Developed &amp; Approved</td>
</tr>
<tr>
<td>February 2009</td>
<td>Tim Sole</td>
<td>Director of Medicine</td>
<td>This WPI is not to be used on the Medical Floor (rescinded by Dr Maung Khant (2011) see revision</td>
</tr>
<tr>
<td>December 2010</td>
<td>Revised to meet new</td>
<td>Renea Collins</td>
<td>Amended Guidelines following Mackay Conference and ensured information is correct</td>
</tr>
<tr>
<td></td>
<td>International guidelines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 2011</td>
<td>Sent to Dr Khant/ Dr</td>
<td></td>
<td>All Approved</td>
</tr>
<tr>
<td></td>
<td>Wagner /Dr Westcott</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr Drobetz and CNC</td>
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</tr>
<tr>
<td></td>
<td>and Educators for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>approval</td>
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</table>

6. Procedure Revision and Approval History

<table>
<thead>
<tr>
<th>Date</th>
<th>Amendment</th>
<th>Authorised by</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2011</td>
<td>The document was updated by Renea Collins and J Stirling and J Sander to ensure best practice in line with guidelines</td>
<td>Working Party below to ensure best practice</td>
</tr>
</tbody>
</table>
### Procedure: Venous Thromboembolism Prevention

<table>
<thead>
<tr>
<th>Date</th>
<th>Review Activity</th>
<th>Participants and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 2010</td>
<td>Review of document and insert Critical Care prophylaxis into one document as requested by Louise Kerslake and Michael Rampton &amp; Dr R Van Raalte</td>
<td>Kathleen Morris/ Carmel Warren Karen Baker/ Lauren Rampton/ Judy Sander/ Jasmine Stirling Louise Kerslake and Michael Rampton</td>
</tr>
<tr>
<td>July 2014</td>
<td>Princess Alexandra Hospital has recently updated their document. The decision to form a working party to review the medical and nursing guidelines to ensure MHHS perspective and consultation Working party formed</td>
<td>Graham Beacom Medication Safety Chair Ron Nightingale Working party Michael Rampton Toni Simmons Lisa Byrne Lauren Rampton</td>
</tr>
<tr>
<td>July 2014</td>
<td>Document circulated to all NUMS Educators, Clinical Nurse Consultants, Clinical Directors Nursing Directors Directors Of Nursing</td>
<td>Feedback supplied by Dr K Braniff and Dr Pretorius and document updated. Document reviewed by Dr Hamid Approved Document reviewed by Ron Nightingale Intensive Care information updated by Critical Care Protocol Committee</td>
</tr>
</tbody>
</table>

### 7. Audit Strategy

<table>
<thead>
<tr>
<th>Level of risk</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit strategy</td>
<td>Prime and HQCC Audits</td>
</tr>
<tr>
<td>Audit tool attached</td>
<td>No</td>
</tr>
<tr>
<td>Audit date</td>
<td>Continuous</td>
</tr>
<tr>
<td>Audit responsibility</td>
<td>All Staff</td>
</tr>
</tbody>
</table>

**Key Elements / Indicators / Outcomes**

All patients admitted or seen by any unit or facility in the district will be risk assessed treated and managed in accordance with *Prevention of Venous Thromboembolism: Best Practice Guidelines for Australia & New Zealand 4th Edition. Health Education & Management Innovations Pty Ltd.*
8. Appendices

Appendix 1 - Prophylaxis for Venous Thromboembolism in ICU

Deep venous thrombosis is a common complication for patients in Intensive Care Unit. All patients must be assessed for their risk of deep venous thrombosis on admission to ICU and at least daily during their ICU stay. This is to be documented in the VTE section of the patient’s drug chart.

The type of prophylaxis required depends both on their risk category and contraindications to pharmacological and non-pharmacological methods.

Pharmacological prophylaxis is superior to mechanical methods and should be used in all ICU / HDU patients unless contraindications exist. Mechanical methods have also been shown to be effective, and their effects are additive.

In all patients, avoid dehydration and encourage early mobilisation where possible.

Mechanical Prophylaxis

All patients should receive TED stockings or sequential compression devices. In higher risk patients, both should be applied.

Contraindications to mechanical prophylaxis include:

- Injury to lower limb
- Ulceration / wound to lower limb
- Advanced peripheral vascular disease

Established DVT is a contraindication to Sequential compression devices, but not to TED stockings

Pharmacological Prophylaxis

- Prior to initiation of thromboprophylactic drugs, ensure current FBE, eGFR, APTT and INR are reviewed.
- All patients should receive weight adjusted Dalteparin daily s/c unless specific conditions exist (see below).

All anticoagulant therapy is contraindicated in the following circumstances

Absolute Contraindications

- Post head injury with blood visible on CT
- Haemorrhagic stroke / subarachnoid haemorrhage
- Coagulopathy (INR > 2.0, APTT > 80, platelet count <80)
- Ocular haemorrhage
- Active bleeding (gastrointestinal, surgical or traumatic) active or potentially active
- Consultant decision that anticoagulation is contraindicated
- Incomplete acute spinal cord injuries

Relative Contraindications - Seek Consultant Opinion Before Prescription

- Known active GI ulcer – if prophylaxis is used, give heparin 5000units bd
Procedure: Venous Thromboembolism Prevention

- Renal impairment – give weight adjusted Dalteparin s.c. daily
- High risk Surgical / traumatic bleeding - eg lacerated abdominal organs without bleeding, major pelvic fracture with haemodynamic stability etc – give heparin 5000units tds. Change to LMWH as soon as considered safe
- Complete spinal cord injuries – seek neurosurgical advice early

Traumatic Brain Injury

- Traumatic brain injury with blood visible on CT is a contraindication to pharmacological prophylaxis
- Once blood clears from the CT, heparin 5000 BD should be prescribed and changed to clexane once considered safe
- Traumatic brain injury without haemorrhage should receive heparin 5000units BD until clexane is considered safe (guideline – 72 hours)

Epidural Catheters

- Anticoagulation should not be given less than 12 hours prior, or 2 hours after, epidural insertion or removal
- Anticoagulation is contraindicated if
  - Elderly (>70 years)
  - Other antithrombotic agents (NSAIDs, aspirin, clopidogrel, tirofiban, warfarin) are being used

Screening Ultrasonography
High risk patients who have not received optimal conventional DVT prophylaxis should be screened for DVT twice weekly. High risk patients include:

- Spinal cord injury
- Major pelvic fracture
- Major head injury

Postoperative Anticoagulation
Anticoagulation can be commenced within 12 hours of surgery unless:

- Active bleeding
- Expressly stated by surgeon

Other Points

- Obese patients - Consider increasing dose of LMWH or unfractionated heparin

Scheduled Surgery – in most cases thromboprophylaxis should not be stopped prior to surgery. Seek surgical advice day prior to surgery