Drug Guideline Title: DVT Prophylaxis in Intensive Care

Approved by: ICU Director
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Next Review Date: March 2018

Replaces Existing Drug Guideline: DVT Prophylaxis ICU

Previous Review Dates:

Background Information:
Venous thromboembolism (VTE) includes deep venous thrombosis (DVT) and pulmonary embolism (PE) and is a significant potential health complication for hospitalised patients. Serious adverse outcomes may occur, including an increased risk of recurrent thrombosis, morbidity from post thrombotic syndrome or death. The risk of developing VTE depends on the patient’s background risk factors and upon the condition or procedure for which the patient is admitted. Effective prophylaxis will be achieved through assessment of risk factors and existing medical conditions with application of appropriate drug therapy and/or mechanical devices.

1. Introduction:
The risk addressed by this policy:

Patient Safety

The Aims / Expected Outcome of this policy:

DVT Prophylaxis should be administered safely and appropriately without any adverse side effects

Related Standards or Legislation
NSQHS Standard 1 Governance
National Standard 4 Medication Safety

Related Policies
LH_PD2013_C03.01 Drug Administration
LH_PD2013_C03.03 Drug Calculation Formulas
LH_PD2013_C03.00 Drug Prescribing
PD2014_032 Prevention of Venous Thromboembolism
2. Policy Statement:
   • All care provided within Liverpool Hospital will be in accordance with infection control, manual handling and minimisation and management of aggression guidelines.
   • Medications are to be prescribed and signed by a medical officer/authorised nurse practitioner (NP) unless required during an emergency.
   • All drugs administered during an emergency (under the direction of a medical officer/authorised nurse practitioner) are to be documented during the event, then prescribed and signed following the event.
   • Medications are to be given at the time prescribed (as close to the time as is possible when multiple drugs require ‘same time’ administration and, when the nurse is caring for more than one patient, recognition is given to a possible short delay to administration – antibiotics and other lifesaving drugs are to be prioritised) and are to be signed by the administering nurse.
   • Parenteral medication prescriptions and the drug are to be checked with a second registered or endorsed enrolled nurse prior to administration. The “rights of drug administration" must be followed: right: patient, drug, dose, route, administration, time, reason for the drug, documentation, education and evaluation/outcome.
   • Adverse drug reactions are to be documented and reported to a medical officer.
   • Medication errors are to be reported using the hospital electronic reporting system: IIMS.
   • Guidelines are for adult patients unless otherwise stated

3. Principles / Guidelines

Risk assessment
   • Assess baseline risk of venous thromboembolism
   • Assess additional risk of venous thromboembolism
   • Assess risk of bleeding or contraindication to pharmacological prophylaxis
   • Assess contraindication to mechanical prophylaxis.
   • Consider risk of prophylaxis against benefit and formulate an overall risk assessment.
   • Reassess prophylaxis regularly and alter if condition changes.

Indications
   • All patients admitted to the intensive care unit will receive prophylaxis against thromboembolism unless specifically contraindicated.
   • Assess baseline risk of venous thromboembolism. This may include ICU patients who are sedated and ventilated with reduced mobility. Assess age, pregnancy, presence of malignancy, previous venous thromboembolism, varicose veins, marked obesity, oestrogen containing hormone replacement therapy, thrombophilia, phospholipid antibody syndrome.
   • Assess additional risk of venous thromboembolism. This will include patients undergoing major joint surgery, abdominal, pelvic, thoracic, orthopaedic and prolonged surgical procedures. Medical conditions such as acute / chronic respiratory infections, cardiac failure, AMI, stroke with resulting immobility, patients receiving chemotherapy and those with acute inflammatory bowel disease.

Contraindications
   • Assess risk of bleeding or contraindication to pharmacological prophylaxis. This includes:
     ➢ Current active major bleeding (atleast 2 units of blood / blood products to be transfused in 24 hrs)
     ➢ Clinically significant and measurable bleeding over past 48hours.
     ➢ Bleeding disorders (eg: haemophilia)
     ➢ Intracranial or spinal lesion, recent central nervous system bleeding
     ➢ Coagulopathy or coagulation factor abnormalities.
• Thrombocytopenia (prophylaxis not recommended with platelet count <50,000/microlitre). Severe platelet dysfunction.
• Active peptic ulcer or acute ulcerative gastrointestinal disease.
• Obstructive jaundice or cholestasis
• Recent major surgical procedure with high risk of bleeding.
• Concomitant use of medications that may effect clotting (eg: anticoagulants, antiplatelet agents, NSAIDs, thrombolytics)
• Recent lumbar puncture

• In Critically ill patients those at increased risk for venous thromboembolism include:
  • Increased age
  • Previous venous thromboembolism
  • Malignancy
  • Major Trauma
  • Prolonged pre-ICU hospital stay.
  • Mechanical ventilation
  • Use of paralysing agents
  • Emergency surgical procedures
  • Insertion of femoral central venous catheters
  • Sepsis with multiorgan failure
  • Cardiac failure

• Assess contraindication to mechanical prophylaxis. Graduated compression stockings can cause reduced blood flow, pressure ulcers or increase the risk of falls and are contraindicated in the following conditions:
  • Morbid obesity which makes it difficult to correctly fit the stockings.
  • Inflammatory conditions, skin disorders, edema or deformity of the lower limb.
  • Severe peripheral arterial disease.
  • Diabetic neuropathy.

• Intermittent pneumatic compression devices or foot pumps can exacerbate ischemic disease and are contraindicated with peripheral arterial disease or arterial ulcers.

Administration Guidelines
• Select the form of prophylaxis to be used based on the risk assessment. This could include mechanical, pharmacological (or combination of both) prophylaxis.
• Reassess prophylaxis regularly and alter if condition changes.

Unfractionated heparin
• All patients receive heparin 5000 units s/c 12 hourly unless heparin is contraindicated or there is concern that the patient is at risk of bleeding.
• Post operatively the dose should be given as soon as the surgical team are happy that it is safe, ideally within 12 hours of surgery.
• In neurosurgical patients the surgeons should be consulted as to when heparin is commenced.

High risk patients (very high risk patients include: Obesity (BMI >30), Malignancy, a Previous DVT or PE, or a history of a prothrombotic disorder)
• The dose is increased in very high-risk patients to Heparin 5000 units s.c. 8 hourly. An APTT and INR should be performed at admission, and daily. If the APTT increases to greater than 50% of the admission APTT, the heparin dose should be reduced to 5000U 12 hourly.
• Patients with body weight less than 40 kg should have the dose of heparin reviewed.

Low molecular weight heparin
• Enoxaparin is the low molecular weight heparin currently prescribed in the ICU. It is the primary pharmacological prophylaxis in the following patients only unless discussed with the ICU staff specialist:
  ⇒ Hip replacements, total knee replacements.
  ⇒ Multi trauma patients who do not have multi organ failure or high risk of bleeding,
  ⇒ Spinal injuries after consultation with neurosurgeons
• **Dose:** Enoxaparin 40 mg sc daily. First dose to be given as soon as the surgical team are comfortable that it is safe, ideally within 12 hours.

• **Contraindications and precautions** - it is not used in patients with renal impairment, patients over 100 kg or less than 55 kg without discussion with the ICU staff specialist.

• Patients at risk of bleeding or with acute spinal injuries or neurosurgical injuries should not receive enoxaparin until the ICU staff specialist and Neurosurgeons have been consulted

**Important: Patients who have had a spinal or an epidural/spinal catheter**

- No heparin is to be administered within 6 hours of insertion or removal of these devices.
- No enoxaparin is to be administered within 12 hours of insertion or removal of these devices.
- In patients receiving pre-operative anticoagulant, insertion of epidural catheter should be delayed for at least 8-12 hours after a subcutaneous dose of heparin or a twice daily dose of enoxaparin, or at least 18 hours after a once daily dose of enoxaparin.

**Non pharmacological methods:**

- All patients admitted to Liverpool Intensive Care Unit will have either graduated compression stockings or pneumatic calf compressors unless they have the following contraindications:
  - Morbid obesity which makes it difficult to correctly fit the stockings.
  - Inflammatory conditions, skin disorders, edema or deformity of the lower limb.
  - Severe peripheral arterial disease and peripheral vascular insufficiency
  - Diabetic neuropathy.
  - A documented DVT, surgical wound or devices on the lower limb.
- Patients with a contraindication for heparin/enoxaparin, and those with multiple risk factors for thromboembolism should receive both graduated compression stockings and calf compressors.
- Patients with a contra-indication to prophylaxis who develop a DVT should be considered for an IVC filter.

**Clinical considerations.**

- Need to monitor patients APTT and INR daily.
- Need to monitor platelet count in all patients receiving heparin to detect the development of heparin induced thrombocytopenia.
- Prophylaxis should generally not be interrupted for procedures or surgery unless there is a particularly high bleeding risk.
- The withholding and commencing of thromboprophylaxis in patients with spinal or epidural catheters should be as per the timing specified above (**Patients who have had a spinal or an epidural/spinal catheter**).
- Ensure patients are measured and the appropriate size graduated compression stockings are applied. Examine the skin under the stockings to assess for development of pressure areas at least once per shift.
- Intermittent pneumatic compression, where indicated should be started as soon as possible and continued with few interruptions until discharge.
- In patients who develop renal impairment, and are on LMWH (enoxaparin), the dose will need to be decreased or an alternate form of prophylaxis will need to be used as LMWH is cleared primarily by the kidneys.

4. **Performance Measures**

All incidents are documented using the hospital electronic reporting system: IIMS and managed appropriately by the NUM and staff as directed.

5. **References / Links**


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