

Guideline for Peri-operative Prophylaxis of Venous Thrombo- Embolism in General and Orthopaedic Surgery

Last Updated: 2nd September 2010

Parameters of the Guideline:

- Target population: Adult patients undergoing general surgical and orthopaedic operations
- Patient Groups specifically excluded from Guideline: Non operative patients, paediatric patients.
- Contra-Indications: Potential for bleeding as given below.

Definitions:

Deep Venous Thrombosis: (DVT) Thrombosis of a deep vein, usually starting in the calf

Pulmonary Embolism: (PE) Obstruction of the pulmonary artery or its branches usually by an embolus from a site of DVT

Venous Thrombo-embolism: (VTE) = DVT and / or PE

Background:

Patients who undergo an operation are at an increased risk of developing VTE. This VTE usually takes the form of asymptomatic or symptomatic DVT. VTE can result in sudden death due to PE and significant short term and long term morbidity due to non fatal PE and chronic venous stasis (post thrombotic leg syndrome).

The incidence of VTE in Caucasian populations has been very well documented. Symptomatic DVT occurs in about 1/1000 persons in the general population. [1] Of these one third manifest PE while two thirds manifest DVT alone. [2]

However most (90%) PE arises from asymptomatic DVT. [1] Long term sequelae in the form of leg ulcers are seen in 2 – 10% of patients 10 years after symptomatic DVT. [1] These ulcers are usually very resistant to treatment. DVT has a mortality of 6% and PE of 12% within one month of diagnosis [2] and up to 10% of hospital deaths are attributable to PE. [1]

There is very little data on the incidence in other races. It has been anecdotally assumed that the incidence of VTE among Asians and Pacific Islanders is lower than that among Caucasians. However the true incidence of VTE in this group is not known. Various studies have shown conflicting results with some indicating that the incidence is lower by one third to one fifth [2, 3,4,5] while others indicating that it is the same as that among the Caucasian population. [6] This is an area that needs further study so that DVT prophylaxis guidelines can be tailor made to our situation and we avoid the pitfalls of both over treatment and under treatment.

Rationale for a Guideline:

VTE is a condition that lends itself very well to prophylaxis. The disease is difficult to diagnose clinically and difficult to treat. Screening is not very accurate nor is it cost effective as compared to prophylaxis. On the other hand, risk factors are known, definite mechanical and pharmacological prophylactic methods are available (even in resource limited areas), and prophylaxis has been established beyond doubt to provide reduction in mortality and morbidity.

Indications for VTE Prophylaxis:

High Risk

Prophylaxis should be given to all patients undergoing surgery under general anaesthesia or regional anaesthesia of the lower limbs with **one or more** of the following:

Any patient > 60 years – any surgery (> 30 / 60 minutes), (e.g thyroidectomy, mastectomy, hernia repair etc.)

Any patient < 60 years - any surgery > 60 minutes for abdominal & pelvic surgery OR > 90 minutes surgery on other parts of the body.

Any patient

- With known thrombophilias
- With a personal history or first-degree relative with a history of VTE
- With varicose veins with phlebitis
- With active cancer
- Using hormone replacement therapy
- Using oestrogen-containing contraceptive therapy
- Who is Immobile or bedridden

Moderate Risk

Prophylaxis should be given to all patients undergoing surgery under general anaesthesia or regional anaesthesia of the lower limbs with **two or more** of the following:

Obesity BMI =>30kg/m²

Dehydration

Any significant medical comorbidities (for example: heart disease; metabolic, endocrine or respiratory pathologies; acute infectious diseases, inflammatory conditions)

Pregnancy & puerperium (if not contraindicated)

Contraindications for VTE Prophylaxis using Heparin

Active bleeding

Lumbar puncture / epidural / spinal anaesthesia expected within the next 12 hours

Lumbar puncture / epidural / spinal anaesthesia within the previous 4 hours

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)

Acute stroke

Thrombocytopenia (platelets less than $75 \times 10^9/l$)

Uncontrolled systolic hypertension (230/120 mmHg or higher)

Untreated inherited bleeding disorders (such as haemophilia and von Willebrand's disease)

Methods of prophylaxis:

General Methods:

Encourage mobility, leg exercises

Adequate hydration

Mechanical Methods: *(depending on availability)*

Anti embolism stockings (TED Stockings). Above knee stockings are preferable

Foot impulse devices

Intermittent pneumatic compression devices

Pharmacological Methods:

Regional anaesthesia has a lower risk of VTE than general anaesthesia

Stop oral contraceptives or HRT 4 weeks before elective surgery

Low molecular weight heparins (dosage – depending on formulation)

If not available than use - Unfractionated Heparin (UFH) 7500 units 12 hourly by subcutaneous injection.

Monitoring: In general monitoring of low dose UFH or LMWH is not required. It should be done only in cases of bleeding or accidental overdose. [1]

- High Risk cases – should be given Pharmacological plus Mechanical prophylaxis
- Moderate Risk cases - should be given pharmacological or mechanical prophylaxis

Side Effects of heparins:

Bleeding: As the half life is short stoppage of heparin is usually enough.

If required protamine sulphate may be used. Dose: 1 mg to neutralize 100 units of heparin. As heparin is rapidly metabolized the dose of protamine should be reduced as time elapses after heparin injection. For e.g. if 30 minutes have elapsed after heparin injection the dose should be one half of the usual.

Heparin Associated Thrombocytopenia (HAT) is immune mediated and usually occurs between 5-10 days of starting heparin. It can be seen with LMWH or UFH, though more with UFH. [1]. HAT should be considered in any patient whose platelet count falls by 50% or more.

Heparins and Spinal / Epidural block

Delay first dose until after block or surgery.

Exercise caution while removing epidural catheters too.

References:

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