VTE PROPHYLAXIS TO POST OPERATIVE PATIENTS

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INTRODUCTION-

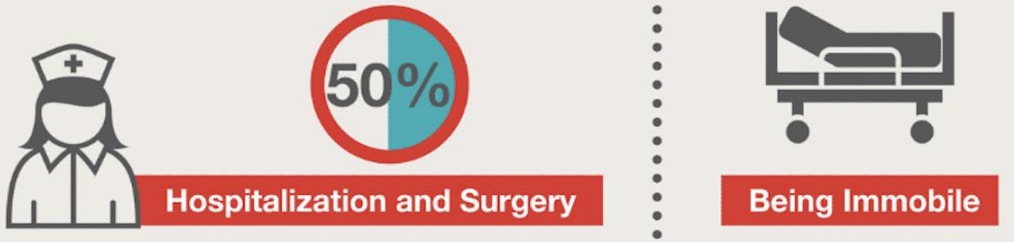
What is VTE Prophylaxis ?

- Venous thromboembolism (VTE) prophylaxis consists of pharmacologic and nonpharmacologic measures to diminish the risk of deep vein thrombosis (DVT) and pulmonary embolism (PE).
- DVT of the leg is the development of a blood clot in one of the major deep veins in the leg or thigh, which leads to impaired venous blood flow, usually causing leg swelling and pain.
- PE is a consequence of thrombus formation in distal veins, most commonly those of the deep venous system of the lower extremities. Thrombus formation in the venous system occurs as a result of venous stasis, trauma, and hypercoagulability. About 51% of deep venous thrombi will embolize to the pulmonary vasculature, resulting in a PE.

Causes of VTE Prophlaxis -

- previous VTE, thrombophilia, malignancy, postoperative setting, trauma, and indwelling central catheter
- chronic medical conditions, paresis, increasing age, obesity, estrogen-containing birth control pills and hormone replacement therapy, varicose veins, pregnancy and up to 6 week postpartum, first-degree relative with a history of VTE, extended travel, and admission to intensive care
- Risk factors
- previous VTE (deep vein thrombosis [DVT] and/or pulmonary embolism [PE])
- thrombophilia
- malignancy
- postoperative settings

Everyone Is at Risk. Some Factors Can Increase This Risk.



Hospitalization and Surgery

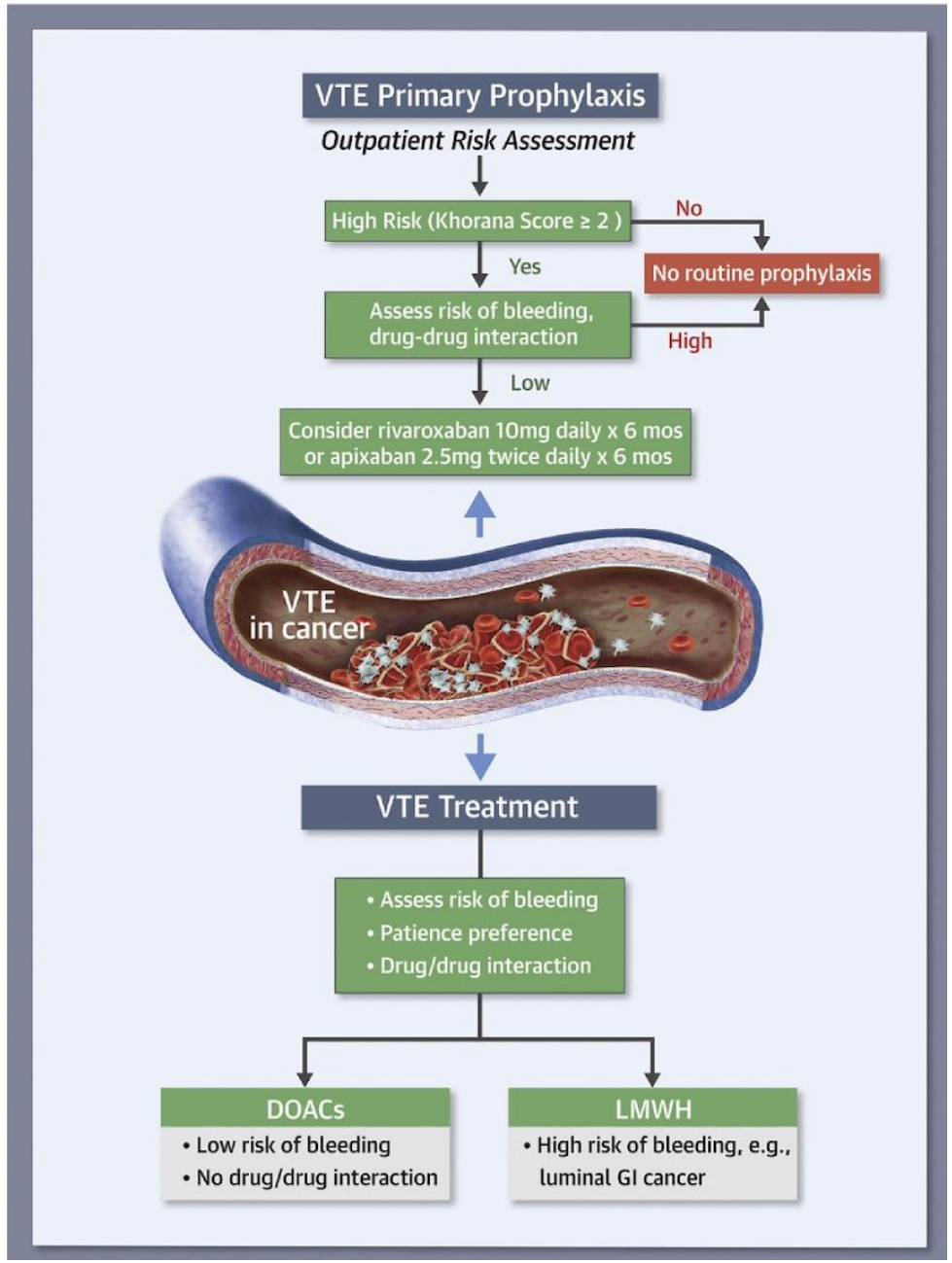
One-half of blood clots occur during or soon after a hospital stay or surgery.

Being Immobile

Not moving for long periods of time (for example, extended bed rest or extended travel).

Other Risk Factors

- Older age
- Overweight or obese
- Family history of VTE
- Recent or recurrent cancer
- During and just after pregnancy
- Estrogen-based medicine such as hormonal birth control or hormone replacement therapy
- Injury and trauma



- Venous thromboembolism (VTE) can occur after major general surgery. Pulmonary embolism is recognized as the most common identifiable cause of death in hospitalized patients in the United States. The risk of deep venous thrombosis (DVT) and pulmonary embolism (PE) is higher in colorectal surgical procedures compared with general surgical procedures. The incidence of venous thromboembolism in this population is estimated to be 0.2 to 0.3%. Prevention of VTE is considered a patient-safety measure in most mandated quality initiatives. The measures for prevention of VTE include mechanical methods (graduated compression stockings and intermittent pneumatic compression devices) and pharmacologic agents. A combination of mechanical and pharmacologic methods produces the best results. Patients undergoing surgery should be stratified according to their risk of VTE based on patient risk factors, disease-related risk factors, and procedure-related risk factors. The type of prophylaxis should be commensurate with the risk of VTE based on the composite risk profile.

- Venous thromboembolism (VTE), consisting of deep vein thrombosis and pulmonary embolism, is the third most common cardiovascular disorder in the United States with approximately 300,000 new cases diagnosed annually. Patients with kidney disease have been shown to have a higher prevalence of VTE and other cardiovascular conditions in comparison to patients with normal kidney function.

- Despite recent advances in our understanding of the natural history of VTE, considerable uncertainty remains regarding the optimal prevention and therapeutic management of patients with decreased kidney function. Unfortunately, patients with reduced kidney function, as measured by a decreased estimated glomerular filtration rate (eGFR), are of excluded in contemporary treatment studies of VTE since they are at increased risk for bleeding. As a result, guidelines on anticoagulant selection and dosing in patients with decreased estimated GFR for the prevention and treatment of VTE are not clearly established, likely leading to variation in the management of these patients in the broader community setting with an unclear impact on patient outcomes.

- **REVIEW OF LITERATURE**

Deep venous thrombosis (DVT) and pulmonary embolism (PE) are one of the causes for deaths . The rate is increasing and have clinical presentations in community settings and hospitalized patients requiring timely prophylaxis . VTE is increasing among various methods for thromboprophylaxis .Anticoagulants have many side effects which leads to limitations of their use .If both medicines and mechanical approach such as intermittent pneumatic compression, venous foot pump becomes impractical , neuromuscular electrical stimulation can be done through research to know about its efficacy and implications.

- **METHODOLOGY**

- **AIM-**

  The main aim of this study is to know whether VTE prophylaxis was given or not to post operative patient so that it would be helpful in improving the health services.

- **RESEARCH QUESTIONS-**

  What was the clinical outcome of VTE prophylaxis in patients going under surgeries like THR/TKR, Obgy and gyne or renal transplant and overall patients well being ?

OBJECTIVES:

- Perform VTE risk stratification and design a therapeutic plan for VTE prophylaxis in hospitalized patients.
- Based on current evidence, design an appropriate therapeutic regimen for VTE prophylaxis after major orthopedic surgery.
- Justify an appropriate diagnostic approach and treatment plan for a patient with suspected or confirmed heparin-induced thrombocytopenia.

MECHANICAL METHODS-

- **Anti-embolism stockings**

Anti-embolism stockings (AES) exert graded circumferential pressure from distal to proximal regions of the leg conforming to a Sigel pressure profile. These increase blood velocity, promote venous return, and have been shown to be effective.[78] AES should not be used if the patient has peripheral vascular disease, arteriosclerosis, severe peripheral neuropathy, massive leg oedema or pulmonary oedema, oedema secondary to congestive cardiac failure or local skin/soft tissue diseases, and in patients with acute stroke. Thigh length stockings may be considered preferable as more effective but current evidence is poor; however, if these are not suitable because of compliance or fit, knee length versions should be used.

- **Intermittent pneumatic compression**

Intermittent pneumatic compression periodically compresses the calf and or thigh muscles with inflation pressures of 35–40 mm Hg at a rate of about 10 beats min^{-1}. They mimic the muscle pump effect of walking, promote fibrinolysis, and have been shown to reduce VTE risk.[9]

- **Foot impulse devices**

Foot impulse devices (or foot pumps) increase venous outflow and reduce stasis in immobilized patients. They are designed to mimic normal walking by compressing the plantar venous plexus producing a pulsatile flow in the veins. These have been shown to be effective after orthopaedic surgery in reducing asymptomatic DVT.[10] There is no evidence that they reduce risk of symptomatic DVT.

- **Pharmacological methods**

Pharmacological prevention involves perioperative administration of anticoagulant drugs. The agents relevant to UK practice currently are unfractionated heparin, low-molecular-weight heparins (LMWHs), oral Direct Factor Xa inhibitors, warfarin, aspirin, danaparoid, fondaparinux, lepirudin, and dextrans.

- **Unfractionated heparin**

Heparin is a naturally occurring anticoagulant derived mainly from porcine intestine or bovine lung. It is a large polysaccharide varying in size from 5 to 40 kDa. It binds to endogenous antithrombin, producing a complex that inhibits activated coagulation factors, including factors Xa and IIa (thrombin). Unfractionated heparin is effective in VTE prevention; however, subcutaneous administration is less predictable than LMWH. It does have an easily measurable mode of action, is reversible, and may be preferred in patients with renal failure (estimated glomerular filtration rate <30 ml min^{-1} 1.73 m^{-2}).[11] For most patients, it is inconvenient to deliver, may induce greater bleeding risks when compared with LMWH, and may cause the rare complication of heparin-induced thrombocytopaenia (HIT). Unfractionated heparin is delivered as a twice or three times per day subcutaneous injection. The anticoagulant effect of heparin is measured using the activated partial thromboplastin time (aPPT). This not required for prophylactic heparin use; however, because of the risks of HIT, platelets should be monitored intermittently up to Day 14 of administration.

- **Low-molecular-weight heparins**

- LMWHs are made from short-chain polysaccharides with a molecular weight <8 kDa. They have a similar mode of action to unfractionated heparin, but a more predictable dose–response with primarily anti-factor-Xa activity and only limited anti-IIa activity. A range of products are obtained by various methods of fractionation or depolymerization of heparin which include enoxaparin, daltaparin, and tinzaparin, which give varying chemical, physical, and biological properties. LMWHs are more effective at reducing the risk of both DVT and PE with a lower risk of bleeding, HIT, and osteoporosis than unfractionated heparin. LWMHs are cleared by the kidneys and should be used with caution in severe renal failure. Doses of LMWHs depend on the formulation but all are delivered as a once daily subcutaneous injection. LMWHs require no laboratory monitoring although an anti-Xa assay can be used if drug accumulation is suspected in cases of severe renal failure.[1112] Platelets should be monitored because of the risks of HIT as with unfractionated heparin.

- **Warfarin**

- Warfarin inhibits the production of the vitamin K-dependent coagulation factors II, VII, IX, and X in the liver. Warfarin should be administered at a dose that minimizes the hazards of bleeding and its effects should be monitored using the INR. Evidence is variable when comparing its VTE and PE prevention effects with LMWH, although major differences in bleeding risks have not been determined. Warfarin is delivered as a single oral daily dose, which is its main advantage, aiming for an INR of 1.3–1.5. Disadvantages with its use include an unpredictable effect on coagulation, delay in reaching therapeutic effect and potential drug interactions. Monitoring is therefore required every 3 days until stable and then weekly.

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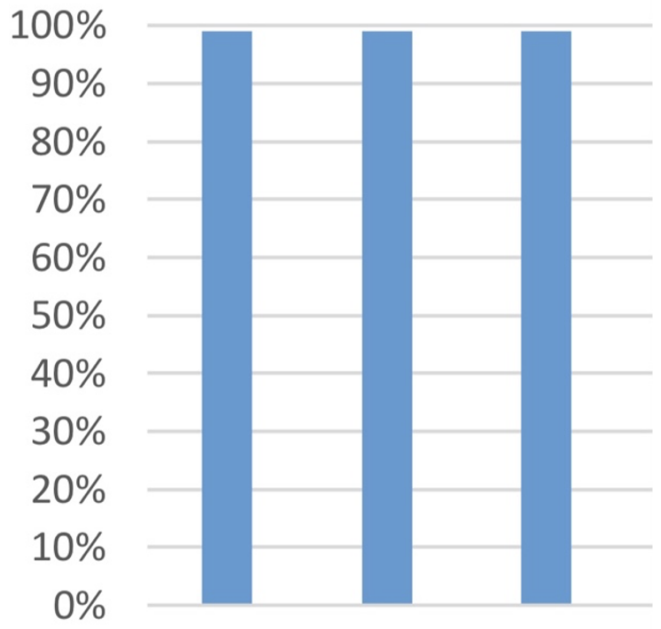
RESULT-

DEPARTMENT	TOTAL SAMPLES COLLECTED
OBGY/ GYNE	27
ORTHOPAEDICS	34
NEPHROLOGY	19
TOTAL	80

VTE prophylaxis form (march 1st to 20th may) 2023



DEPARTMENT	VTE PROPHYLAXIS FORM
Obgy/gyne	100%
Orthopaedics	98%
Nephrology	99%

CONCLUSION-

SUGGESTIONS:

- Identification and management of barriers:
  It is important to identify and investigate barriers such as lack of awareness, resources or specific challenges as understanding barriers help targeted implementations.
- Education and training of hospital staff (doctors and nurses):
  Conduct education and training of hospital staff at regular intervals regarding VTE prophylaxis protocols and ensure strict adherence to specific procedures and guidelines.
- Continuous Monitoring and Feedback:
  Implementation of continuous monitoring and feedback to track compliance rates. Motivation and encouragement are vital tools for improvement.
- Standardization of hospital processes:
  Establishment of standardized processes especially in areas with low VTE prophylaxis form compliance rates to reduce variability and improve compliance rate.
- Quality Improvement programs:
  Quality improvement initiatives especially in areas with low VTE prophylaxis form and encouragement of evidence-based strategies.
- Conducting audits and accountability
  Audits should be held in regular intervals to assess compliance rates and identify areas of non-compliance. Hospital staff not following the proper procedures and protocols should be held accountable.
- By implementing the above suggestions, the hospital (Quality department) can work towards improving the compliance rate for VTE prophylaxis form , thereby ensuring that all protocols are followed strictly and ultimately resulting in optimum patient safety and quality care.

THANK YOU