وزارة الصحة
Ministry of Health

Venous Thromboembolism (VTE)

Prevention protocol for adult patients

Version 1.6

19 August 2024

وزارة الصحة
Ministry of Health

Aim and scope:
To standardize Venous Thromboembolism (VTE) risk assessment that delivers decision support to the point of care and standardize the clinical practice for VTE prevention to reduce morbidity and mortality related to thrombosis. The VTE prevention protocol developed to cover all related clinical specialties.

Targeted end users:
This protocol intended to be used by the physicians and other Health Care Providers working at MOH hospitals.

Targeted population:
All adult patients admitted to MOH hospitals.

Level of Evidence:
Review of best practice and expert opinion.

Disclaimer:
This living guidance is subject to updates with new emerging data or within 2 years.
The task force members have no conflict of interest. This protocol is not attached to any funding.

Scoring

VTE prevention protocols selected VTE and bleeding risk assessment based on:

- Modified Caprini tool for all cases except obstetric.
- Royal College of Obstetrics & Gynecology (RCOG) VTE and bleeding risk assessment tool for Obstetric cases only (Antenatal & Postnatal)

وزارة الصحة
Ministry of Health

Modified Caprini

RISK FACTORS			
1 score for each ❑ Age 41-60 years ❑ BMI > 25 Kg/m2 ❑ Minor surgery ❑ Swollen legs (current) ❑ Varicose veins ❑ Major Surgery (in the past month) ❑ lung disease (e.g., emphysema or COPD) ❑ Currently on bed rest or restricted mobility ❑ History of Inflammatory bowel disease ❑ Acute myocardial infarction ❑ Congestive heart failure (<1 month) ❑ Sepsis/ **Pneumonia** (<1month)/ ❑ History of unexplained or recurrent spontaneous abortion (>3) ❑ Pregnant or post-partum (<1 month) ❑ Oral contraceptives or hormone replacement	**2 score for each** ❑ Age: 61-74 years ❑ Arthroscopic Surgery ❑ Laparoscopy Surgery (>45 min) ❑ Major open Surgery (>45 min) ❑ Cancer (current or previous) ❑ Immobilizing Plaster cast ❑ Bed bound for more than 72hrs ❑ Central venous access	**3 score for each** ❑ Age≥ 75 years ❑ History of DVT/PE ❑ **Family history of VTE** ❑ Factor V Leiden ❑ Prothrombin 20210A ❑ Lupus anticoagulant ❑ Anticardiolipin antibodies ❑ Elevated serum homocysteine ❑ Heparin-induced thrombocytopenia ❑ Other congenital or acquired thrombophilia	**5 score for each** ❑ Hip, pelvis or leg fracture (within the past month) ❑ Stroke (within past month) ❑ Multiple trauma (within past month) ❑ Elective major lower extremity arthroplasty ❑ Acute Spinal cord injury – **paralysis** (within the past month)

Based on the calculation of scores from the selected risk factors the patient should fall in one of the following risk levels:

RISK LEVEL			
If total scores equal to 0 or 1: **Low** risk	If total scores equal to 2: **Moderate** risk	If total scores equal to 3 or 4: **High** risk	If total scores equal to or more than 5: **Highest** risk

وزارة الصحة
Ministry of Health

VTE prophylaxis based on Modified Caprini risk levels

I- For all MEDICAL and GENERAL SURGICAL conditions:

Category	Supportive Care	Pharmacotherapy	Precautions
• **Low Risk**	• Encourage ambulation if not restricted	• No thromboprophylaxis required	
• **Moderate Risk**	• Encourage ambulation if not restricted • Offer mechanical prophylaxis if pharmacological prophylaxis contraindicated	• Enoxaparin 40 mg SC **once** daily **OR** • Unfractionated Heparin 5000 Units SC BID or TID **OR** • Fondaparinux dose 2.5 mg SC q24h	If CrCl < 30ml/min, Enoxaparin 30 mg subcutaneously **once** daily and avoid Fondaparinux
• **High Risk**	• Encourage ambulation if not restricted **with or without** mechanical prophylaxis	• Enoxaparin 40mg SC **once** daily **OR** • Unfractionated Heparin 5000 Units SC TID **OR** • Fondaparinux dose 2.5 mg SC q24h	If CrCl < 30ml/min, Enoxaparin 30 mg subcutaneously **once** daily and avoid Fondaparinux
• **Highest Risk**	• Encourage ambulation if not restricted **with** mechanical prophylaxis	• Enoxaparin 40mg SC **once** daily **OR** • Unfractionated Heparin 5000 Units SC TID **OR** • Fondaparinux dose 2.5 mg SC q24h	If CrCl < 30ml/min, Enoxaparin 30 mg subcutaneously **once** daily and avoid Fondaparinux

Prophylactic Dose Anticoagulation based on BMI and CrCl:

CrCl (ml/min)	BMI (Kg/m^2)	Enoxaparin	Fondaparinux	Unfractionated heparin
>30	**<40**	40 mg SC q24h	2.5 mg SC q24h	5000 units SC q8-12h
	>40	40 mg SC q12h	5 mg SC q24h	7500 units SC q8h
<30	**<40**	5000 units SC q8-12h		
	>40	UFH 7500 units SC q8h		

Special consideration:

Oncology cases:

- Start prophylaxis early administration (postoperative, within 12 hours) or late administration (postoperative, after 12 hours) of antithrombotic prophylaxis in major surgical patients including cancer depending on bleeding risk
- Duration of anticoagulant for abdominal cancer surgery or previous VTE is **30 days**

Critical cases:

- For patient admitted to critical care units, routine assessment for VTE & bleeding risk is recommended and routine thrombo-prophylaxis is administered for at risk patients.
- For critical care patients who are at high-risk of bleeding, we recommend the optimal use of mechanical thromboprophylaxis with IPC at least until the bleeding risk decreases. When the high bleeding risk decreases.
- When the high bleeding risk decreases, we recommend that pharmacologic thromboprophylaxis be substituted for or added to the mechanical thromboprophylaxis.

II- ORTHOPEDIC Surgery:

Category	Supportive Care	Pharmacotherapy	Precautions
A. Elective hip replacement			
For patient undergoing elective total hip replacement (THR)		Recommended thromboprophylaxis either: **a. LMWH:** - At a usual high-risk dose 40 mg SC q24h initiated 12 h **before** surgery **OR** - At a usual high-risk dose 30 mg SC q24h initiated 12 to 24 h **after** surgery **OR** **b. Fondaparinux dose 2.5 mg SC q24h initiated 6-8 hr after surgery** **OR** **c. Apixaban 2.5** mg twice daily initiated 12-24 hr after surgery **OR** **d. Adjusted-dose VKA (Warfarin)** started preoperatively the evening of the surgical day ***(INR target 2.5, INR range: 2.0 – 3.0 for 35 days)***	
For patient undergoing THR who have a high risk of bleeding	Optimal use of a mechanical method with IPC	When the high bleeding risk decreases, pharmacologic thrombo-prophylaxis be substituted for or added to the mechanical thrombo-prophylaxis	Patients placed on mechanical prophylaxis after surgery because of a high risk of bleeding should have their risk of bleeding consistently reassessed, with pharmacologic prophylaxis started as soon as the bleeding risk is decreased
B. Elective Knee Replacement			
For patient undergoing total knee replacement (TKR)		Recommended thromboprophylaxis either: **a. LMWH:** - At a usual high-risk dose 30 mg SC q24h initiated 12 to 24 h after surgery **OR** **b. Fondaparinux dose 2.5 mg SC q24h initiated 6-8 hr after surgery** **OR** **c. Apixaban 2.5** mg twice daily initiated 12-24 hr after surgery **OR** **d. Adjusted-dose VKA (Warfarin**) started preoperatively of the evening of the surgical day ***(INR target 2.5, INR range: 2.0 – 3.0 for 35 days)***	
For patient undergoing TKR who have a high risk of bleeding	Optimal use of a mechanical method with IPC	When the high bleeding risk decreases, pharmacologic thrombo-prophylaxis be substituted for or added to the mechanical thrombo-prophylaxis to extend pharmacological prophylaxis beyond 10 days after discharge	

Category	Supportive Care	Pharmacotherapy	Precautions
C. Hip Fracture Surgery (HFS)			
For patient undergoing HFS		Routine thromboprophylaxis minimum 10 days up to 35 days is recommended: **a. Fondaparinux** 2.5 mg SC q24h initiated 6-8h after surgery **OR** **b. LMWH** 30mg SC q12h initiated 12-24hr after surgery **OR** **c. Adjusted dose VKA (Warfarin)** preoperatively (INR target. 2.5. INR range. 2.0 to 3.0)	
D. Elective Spine Surgery			
• **Low risk**	Encourage ambulation	No thromboprophylaxis required	
• **Moderate Risk such as:** - Advanced age - Malignancy - Neurological deficit - Previous VT - An anterior surgical approach	Optimal use of peri-operative IPC	The recommended thromboprphylaxis options: **a. Enoxaparin** 40 mg SC once daily **OR** **b. Unfractionated Heparin** 5000 Units SC or TID	VTE prophylaxis after elective spinal surgery can typically be initiated 12–24 hours postoperatively. Prophylaxis may need to be delayed if the surgical site remains open
• **Highest Risk**	Optimal use of a mechanical method (i.e. GCS and/or IPC)	The recommended thromboprophylaxis is one of the pharmacological thromboprophylaxis options combined with mechanical method: **a. Enoxaparin** 40 mg SC once daily **OR** **b. Unfractionated Heparin** 5000 Units SC or TID	
E. Knee arthroscopy			
• **Low risk**	Encourage ambulation	No thromboprophylaxis required	
• **High risk (multiple risk factors or following a complicated procedure)**	Early mobilization	The recommended thromboprophylaxis is one of the pharmacological thromboprophylaxis options combined with mechanical method: LMWH minimum of 10 days. **a. Enoxaparin** 40 mg SC once daily **OR** **b. Unfractionated Heparin** 5000 Units SC or TID	
F. Isolated Lower Extremity Injuries Distal to the Knee			
For patient with Isolated Lower Extremity Injuries Distal to the Knee		Routine use of thromboprophylaxis is **NOT** suggested	

III. UROLOGIC Surgery:

Category	Supportive Care	Pharmacotherapy	Precautions
For patient undergoing transurethral or other low risk procedures	Early mobilization	The recommendation is **against** the use of thromboprophylaxis	
For patient undergoing major open urologic procedures		The recommendation is to use **routine** thromboprophylaxis with: **Pharmacological prophylaxis** alone: **a. Enoxaparin** 40 mg SC once daily **OR** **b. Unfractionated Heparin** 5000 Units SC TID **OR** **Pharmacological plus mechanical prophylaxis**	Patients with very high risk for bleeding, we recommend the optimal use of mechanical thrombo-prophylaxis with GCS and/or IPC at least until the bleeding risk decreases. When the high bleeding risk decreases, we recommend pharmacologic thrombo-prophylaxis substituted for or added to the mechanical thrombo-prophylaxis.

IV. LAPRAROSCOPIC Surgery:

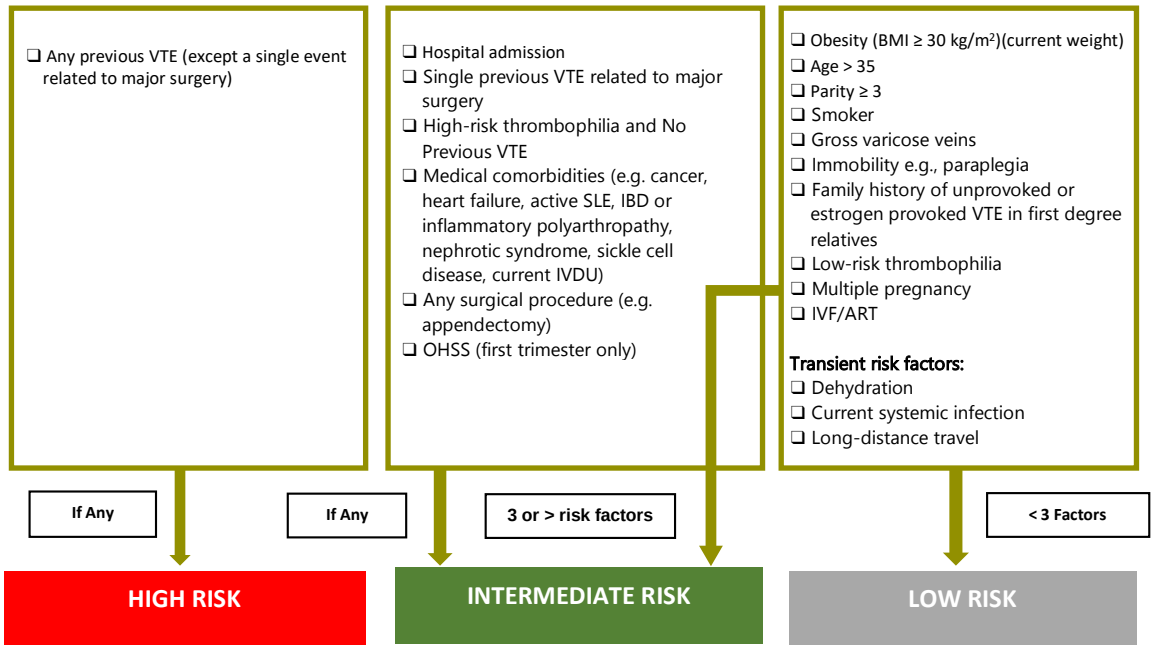
Category	Supportive Care	Pharmacotherapy	Precautions
For patient undergoing entirely laparoscopic procedures who don't have additional risk factors	Early mobilization	The recommendation is **against** the use of thromboprophylaxis	
For patient undergoing entirely laparoscopic procedures who don't have additional risk factors	Optimal use of a mechanical method (i.e., GCS and/or IPC)	The recommendation is the use of **routine** thromboprophylaxis with either: **Pharmacological prophylaxis** alone: **a. Enoxaparin** 40 mg SC once daily **OR** **b. Unfractionated Heparin** 5000 Units SC TID **OR** **Pharmacological plus mechanical prophylaxis**	

V. BARIATRIC Surgery:

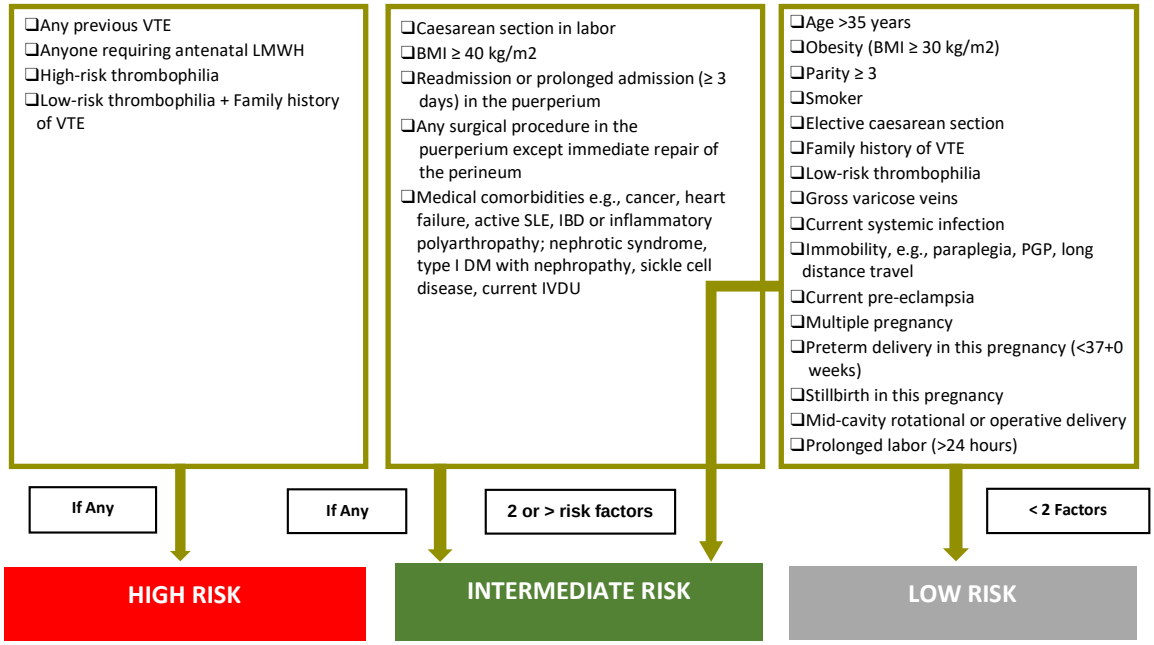
Category	Supportive Care	Pharmacotherapy	Precautions
For patient undergoing inpatient bariatric surgery	Optimal use of a mechanical method (i.e., GCS and/or IPC)	The recommendation is the use of **routine** thromboprophylaxis with either: **Pharmacological prophylaxis** alone: **a. Enoxaparin** 40 mg SC once daily **OR** **b. Unfractionated Heparin** 5000 Units SC TID **OR** **Pharmacological plus mechanical prophylaxis**	

RCOG VTE risk factors (refer to RCOG risk factor calculator):

VI. ANTENATAL:



VII. POSTNATAL:



وزارة الصحة
Ministry of Health

VTE Prophylaxis based on RCOG risk levels

Risk factors in pregnancy and the puerperium	
Pre-existing risk factors	**Score**
Previous VTE (except a single event related to major surgery)	4
Previous VTE provoked by major surgery	3
Known high-risk thrombophilia	3
Medical comorbidities e.g., cancer, heart failure; active systemic lupus erythematous, inflammatory polyarthropathy or inflammatory bowel disease; nephrotic syndrome; type I diabetes mellitus with nephropathy; sickle cell disease. current intravenous drug user	3
Family history of unprovoked or estrogen related VTE in first-degree relative	1
Known low-risk thrombophilia (no VTE)	1a
Age (> 35 years)	1
Obesity (body mass index [BMI] 30 0 kg/m2 or higher) either pre pregnancy or in early pregnancy	1 or 2b
Parity ≥ 3	1
Smoker	1
Gross varicose veins	1

Obstetric risk factors	Score
Previous VTE (except a single event related to major surgery)	4
Previous VTE provoked by major surgery	3
Known high-risk thrombophilia	3
Medical comorbidities e.g., cancer, heart failure; active systemic lupus erythematous, inflammatory polyarthropathy or inflammatory bowel disease; nephrotic syndrome; type I diabetes mellitus with nephropathy; sickle cell disease. current intravenous drug user	3
Pre-eclampsia in current pregnancy	1
ART/IVF (antenatal only)	1
Multiple pregnancy	1
Caesarean section in labor	2
Elective caesarean section	1
Mid-cavity or rotational operative delivery	1
Prolonged labor (> 24 hours)	1
PPH (> 1 liter or transfusion)	1
Preterm birth < 37+0 weeks in current pregnancy	1
Stillbirth in current pregnancy	1

Transient risk factors	Score
Any surgical procedure in pregnancy or puerperium except immediate repair of the 3 perinea, e.g., appendicectomy, postpartum sterilization	3
Hyperemesis	4
OHSS (first trimester only)	1
Current systemic infection	1
Immobility, dehydration	1

- If total score ≥ 4 antenatally, consider thromboprophylaxis from the first trimester.
- If total score 3 antenatally, consider thromboprophylaxis from 28 weeks.
- If total score ≥ 2 postnatally, consider thromboprophylaxis for at least 10 days.
- If admitted to hospital antenatally consider thromboprophylaxis.
- If prolonged admission (≥ 3 days) or readmission to hospital within the puerperium, consider thromboprophylaxis.

VTE prophylaxis for OBSTETRICS (Ante and Post-natal):

- Pharmacological thromboprophylaxis should be avoided, discontinued or postponed in women at risk of bleeding after careful consideration of the balance of risks of bleeding and thrombosis.
- LMWH is safe and easy to use postpartum and has the advantage of not requiring monitoring.
- For those women receiving LMWH antenatally (and therefore for 6 weeks postpartum) or for those requiring 10 days' postpartum thromboprophylaxis, it is the agent of choice.
- Experience of LMWH in the puerperium reports no problems during breastfeeding

Category	Supportive Care	Pharmacotherapy	Precautions
• **Low Risk**	- Early mobilization & avoid dehydration	- No thromboprophylaxis required	
• **Moderate Risk**	- Encourage ambulation - Intermittent pneumatic compression or Graduated compression stockings	The recommendation is the use of **routine** thromboprophylaxis with either: **a. Enoxaparin** SC once daily according to **current** weight as the following: **Weight** — **Enoxaparin** < 50 kg — ❑20 mg daily 50–90 kg — ❑40 mg daily 91–130 kg — ❑60 mg daily 131–170 kg — ❑80 mg daily > 170 kg — ❑0.6 mg/kg/ day **OR** **b. Unfractionated Heparin** 5000 Units SC BID or TID Antenatal prophylaxis from 28 weeks in pregnancy.	
• **High Risk**	- Encourage ambulation - Intermittent pneumatic compression or Graduated compression stockings	The recommendation is the use of **routine** thromboprophylaxis with either: **a. Enoxaparin** SC once daily according to **current** weight as the following: **Weight** — **Enoxaparin** < 50 kg — ❑20 mg daily 50–90 kg — ❑40 mg daily 91–130 kg — ❑60 mg daily 131–170 kg — ❑80 mg daily > 170 kg — ❑0.6 mg/kg/ day **OR** **b. Unfractionated Heparin** 5000 Units SC BID Antenatal prophylaxis from first trimester.	

Medication Related Information				
Medication	**Contraindication**	**Major Drug Interactions**	**Required dose adjustment**	**Pregnancy**
Unfractionated Heparin (UFH)	- Severe thrombocytopenia - Uncontrolled active bleeding; except when due to DIC	Apixaban Dabigatran Endoxaban Mifepristone Rivaroxaban Streptokinase Urokinase	**Renal impairment**: No specific recommendations are available **Hepatic impairment**: No specific recommendations are available **Geriatric**: No adjustment necessary; however, a higher incidence of bleeding has been reported in patients over 60 years of age, especially women, therefore lower	Fetal risk cannot be ruled out

Medication Related Information				
Medication	**Contraindication**	**Major Drug Interactions**	**Required dose adjustment**	**Pregnancy**
			doses of heparin may be indicated in these patients.	
Enoxaparin	- Active major bleeding - History of immune-mediated heparin-induced thrombocytopenia within the past 100 days or in presence of circulating antibodies - Hypersensitivity to benzyl alcohol (present in multi-dose formulation) - Hypersensitivity to enoxaparin sodium, heparin, or pork products	Apixaban Dabigatran Endoxaban Mifepristone Rivaroxaban Urokinase	**Renal impairment** (CrCl 30 to 80 mL/min): No adjustment necessary. **Renal impairment** (CrCl less than 30 mL/min): Unfractionated heparin recommended instead of low-molecular-weight heparin (LMWH); if LMWH is used, reduce usual recommended dose by 50%. **Renal impairment** (CrCl less than 30 mL/min) in prevention of DVT following abdominal surgery: 30 mg subQ once daily. **Renal impairment** (CrCl less than 30 mL/min) in prevention of DVT following hip or knee replacement surgery: 30 mg subQ once daily. **Renal impairment** (CrCl less than 30 mL/min) in prevention of DVT in medical patients during acute illness: 30 mg subQ once daily.	Fetal risk cannot be ruled out
Warfarin	- Blood dyscrasias - Cerebral aneurysms - CNS hemorrhage - Dissecting aorta - Eclampsia, preeclampsia, threatened abortion - Gastrointestinal, genitourinary, or respiratory tract ulcerations or overt bleeding - Hemorrhagic tendencies - Hypersensitivity to warfarin or any component of the product - Major regional or lumbar block anesthesia - Malignant hypertension - Pericarditis and pericardial effusion - Pregnancy, except in pregnant women with mechanical heart valves, who are at high risk of thromboembolism - Recent or potential surgery of central nervous system or eye - Recent or potential traumatic surgery resulting in large open surface Spinal puncture and other procedures with potential for uncontrollable bleeding Unsupervised and potentially noncompliant patients	Tamoxifen Streptokinase Urokinase Allopurinol Amiodarone Barbiturates Cholestyramine resin	**Renal impairment:** No adjustment necessary; monitor INR more frequently in patients with compromised renal function to maintain INR within the therapeutic range **Geriatric:** Consider using lower initial and maintenance dosage **Pregnancy, mechanical valve:** Warfarin to goal INR plus aspirin 75 mg to 100 mg/day during second and third trimesters; during first trimester, warfarin may be continued in patients who can achieve therapeutic INR with doses of 5 mg/day or less. Frequent monitoring required. Discontinue warfarin and initiate continuous infusion unfractionated heparin prior to planned vaginal delivery (guideline dosing)	Contraindicated
Fondaparinux	- Contraindicated in patients with a CrCl < 30 mL/min/1.73 m2 Body weight less than 50 kg in VTE prophylaxis - Active major bleeding	Apixaban Dabigatran Endoxaban Mifepristone Rivaroxaban	**Renal impairment (CrCl 30 to 50 mL/min):** Use with caution; may cause prolonged anticoagulation. **Hepatic impairment (mild to moderate):** No dosage adjustment required; however, observe closely for signs/symptoms of bleeding.	Fetal risk cannot be ruled out

Medication Related Information				
Medication	**Contraindication**	**Major Drug Interactions**	**Required dose adjustment**	**Pregnancy**
	- Thrombocytopenia associated with positive in vitro test for antiplatelet antibody in the presence of fondaparinux sodium - History of serious hypersensitivity reaction (eg, angioedema, anaphylactoid or anaphylactic reactions)		**Geriatric:** Pay particular attention to dosing directions and concomitant medications (especially anti-platelet medication). **Hemodiafiltration in patients with heparin-induced thrombocytopenia:** Initiate at 0.03 mg/kg post dialysis body weight, administered via the efferent line of the dialyzer; titrate in increments of 0.01 mg/kg post dialysis body weight based on post dialysis anti-Xa activity.	
Apixaban	- Contraindicated in patients with a CrCl < 25 mL/min/1.73 m2 SCr > 2.5 mg/dL - Active pathological bleeding - Severe hypersensitivity (eg, anaphylactic reactions) to apixaban	Rifampin, phenytoin, carbamazepine, St. John's wort) protease inhibitors, itraconazole, ketoconazole	50% dose reduction if receiving 5 or 10 mg twice daily with strong CYP3A4 and P-gp inhibitor (e.g., protease inhibitors, itraconazole, ketoconazole, conivaptan)	Fetal risk cannot be ruled out

وزارة الصحة
Ministry of Health

References:

1. American College of Chest Physician VTE prevention guideline 2012
2. Royal college of obstetrics and gyencological (RCOG) VTE guidelines 2015
3. Ay C, Dunkler D, Marosi C, et al. Prediction of venous thromboembolism in cancer patients. Blood 2010; 116:5377.
4. 3. Mandala M, Clerici M, Corradino I, et al. Incidence, risk factors and clinical implications of venous thromboembolism in cancer patients treated within the context of phase I studies: the 'SENDO experience'. Ann Oncol 2012; 23:1416
5. Micromedex last access Jun 2021.
6. Barbar S , Noventa F , Rossetto V , et al . A risk assessment model for the identification of hospitalized medical patients at risk for venous thromboembolism: the Padua Prediction Score . J Thromb Haemost. 2010;8(11):2450-2457
7. Susan R. Kahn, et al, “Prevention of VTE in nonsurgical patients: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines”, Chest 2012;141;e195S-e226S.Samana MM et al. N Engl J Med 199;341:793-800.
8. Leizorovicz A et al. Circulation 2004;110:873-9.
9. Cohen AT et al. J Thromb Haemost. 2003;1(suppl 1):P2046.
10. Lechler E, Schramm W, Flosbach CW. THE PRIME study group. The venous thrombotic risk in non-surgical patients: epidemiological data and efficacy/safety profile of a low-molecular-weight heparin (enoxaparin). Haemostasis 1996;26(Suppl 2):49-56
11. Kleber FX et al. Randomized comparison of enoxaparin with unfractionated heparin for the prevention of venous thromboembolism in medical patients with heart failure or severe respiratory disease. Am Heart J. 2003 Apr;145(4):614-21.
12. Hillbom M, Erilä T, Sotaniemi K, Tatlisumak T, Sarna S, Kaste M. Enoxaparin vs heparin for prevention of deep-vein thrombosis in acute ischaemic stroke: a randomized, double-blind study. Acta Neurol Scand. 2002 Aug;106(2):84-92.
13. Sherman DG. et al. The efficacy and safety of enoxaparin versus unfractionated heparin for the prevention of venous thromboembolism after acute ischaemic stroke (PREVAIL Study): an open-label randomised comparison. Lancet. 2007;369:1347–55.
14. Mandalà M, Falanga A, Roila F. Management of venous thromboembolism (VTE) in cancer patients: ESMO Clinical Practice Guidelines. Annals of Oncology 2011; 22 (6): vi85-vi92.

KINGDOM OF SAUDI ARABIA

وزارة الصحة
Ministry of Health

Hospital:_____ :مستشفى
Region:_____ المنطقة /المحافظة
Dept./Unit:_____ القسم/الوحدة:

MRN: رقم الملف الطبي
ID/PP .NO: رقم اثبات الهوية /جواز
NAME of Patient: _____ الاسـم :
NATIONALITY:_____ الجنسية:
AGE:_____ YEARS سنه MONTHS شهر DAYS يوم العمر:_____
DATE OF BIRTH: 20____/____/ ___ هـ _____/____/___ تاريخ الميلاد
GENDER: ❑ Male ❑ Female انثى ذكر الجنس:

Adult In-Patient Venous Thromboembolism (VTE) Assessment and Prophylaxis

Note: (To be assessed for all adult (above 14years) patients during admission and repeated if patients' condition changed)

Diagnosis:	Date of admission:	Time of admission:	BMI:
□ Admission	□ Post-surgical procedure	□ Change in condition	□ Other

STEP 1 : Mark risk factors then calculate the total score

Risk Factor Score =1	Risk Factor Score = 2	Risk Factor Score = 3
① Age 41 to 60 years	② Age 61- 74 years	③ Age ≤ 75 years
① Medical patient at bed rest (e.g: Sickle cell disease, dehydration, diabetes, …. etc)	② Arthroscopic surgery	③ Personal history of DVT/PE
① Minor surgery planned	② Malignancy (present or previous)	③ Family history of thrombosis
① History of prior major surgery (< 1 month)	② Major surgery (> 45 minutes) under G.A.	③ Positive Factor V Leiden
① Varicose veins	② Laparoscopic surgery(> 45 minutes)	③ Elevated serum homocysteine
① History of inflammatory bowel disease	② Patient confined to bed (> 72 hours)	③ Positive lupus anticoagulant
① Swollen legs (current)	② Immobilizing plaster cast for lower limbs (< 1 month)	③ Elevated anticardiolipin antibodies
① Obesity (BMI > 25)	② Central venous access	③ Positive prothrombin 20210A
① Acute myocardial infarction		③ Heparin-induced thrombocytopenia (HIT)
① Congestive heart failure (< 1 month)		③ Other congenital or acquired thrombophilia : Protein C, Protein S, Antithrombin III
① Sepsis(< 1 month)		**Risk Factor Score = 5**
① Serious lung disease incl. pneumonia (< 1 month)		⑤ Elective Knee or Hip Arthroplasty
① Abnormal pulmonary function (COPD)		⑤ Hip and / or Pelvis fracture (< 1 month)
① Oral contraceptives or hormone replacement therapy		⑤ Stroke(< 1 month)
① Pregnancy or postpartum **(refer to antenatal and postnatal VTE prophylaxis forms)**		⑤ Multiple trauma(< 1 month)
① History of unexplained stillborn infant, recurrent spontaneous abortion (≥ 3), premature birth with toxemia or growth restricted infant		⑤ Acute spinal cord (paralysis), (< 1 month)

:Total Risk Factor Score ( )

STEP 2 : Assess risk versus the benefit of prophylaxis in the patients with any of the following

Contraindications	Warnings/Precaution
□ Patient on therapeutic doses of: **Heparin / Enoxaparin / Fondaparinux / Warfarin / Rivaroxaban / Dabigatran / Apixaban**	□History of gastrointestinal bleed or Hemorrhagic stroke
□ Hypersensitivity to low molecular weight heparin, unfractionated heparin, (including heparin-induced thrombocytopenia)	□Renal failure with Creatinine clearance less than 30 ml/min (for Enoxaparin-modify the dose)
Active bleeding / Fall Patients□	□ Coagulopathy (hiqh aPTT, PT/INR ≥ 1.5)
□ Uncontrolled HTN (SBP >185 and /or DBP > 110 mmHg)	□ Clinically significant thrombocytopenia (Platelet count less than 50)
□Epidural anesthesia (within last 12 hours or planned within next 12 hours)	□ Recent intraocular surgery or intracranial surgery

If the patient has any of the above or contra indicated to anticoagulation, order Mechanical Prophylaxis

□ Sequential Compression Device (SCD)**[first priority]** □ Properly fitted graduated elastic compression stockings (ECS) (15-30mmHg) □ Both

If there are any contraindications to (SCD) & (ECS): Gangrene; Recent Skin Graft; Suspected existing lower limb Deep Venous Thrombosis: Use electric stimulation device.

NAME of Patient: _____ : الاسم **MRN:** | | | | | | | | | | | | | | رقم الملف الطبي

STEP 3 : MANDATORY to Select One or More of the Risk level and Treatment Options

Risk Score	Risk Level	Pharmacologic	Mechanical Device
1-0	□**Low**	□Early ambulation	
2	□**Moderate**	LMWH*:(CrCl > 30mL/min) □ Enoxaparin 40 mg subcutaneously once daily LMWH:(CrCl < 30mL/min) □ Enoxaparin 30 mg subcutaneously once daily LMWH: If BMI ≥ 40: □ Enoxaparin 60 mg subcutaneously once daily OR □ Enoxaparin 40 mg subcutaneously BID □ Heparin 5000 units subcutaneously every 12 hrs. □ Fondaparinux dose 2.5 mg SC q24h (HIT or Allergy) avoid if CrCl < 30ml/min	
4-3	□**High**	LMWH*:(CrCl > 30mL/min) □ Enoxaparin 40 mg subcutaneously once daily LMWH:(CrCl < 30mL/min) □ Enoxaparin 30 mg subcutaneously once daily LMWH: If BMI ≥ 40: □ Enoxaparin 60 mg subcutaneously once daily OR □ Enoxaparin 40 mg subcutaneously BID □Heparin 5000 units subcutaneously every 8 hrs. □ Fondaparinux dose 2.5 mg SC q24h (HIT or Allergy) avoid if CrCl < 30ml/min	
or more 5	□**Highest**	LMWH*:(CrCl > 30mL/min) □ Enoxaparin 40 mg subcutaneously once daily LMWH:(CrCl < 30mL/min) □ Enoxaparin 30 mg subcutaneously once daily LMWH: If BMI ≥ 40: □ Enoxaparin 60 mg subcutaneously once daily OR □ Enoxaparin 40 mg subcutaneously BID □ Heparin 5000 units subcutaneously every 8 hrs. □ Fondaparinux dose 2.5 mg SC q24h (HIT or Allergy) avoid If CrCl < 30ml/min	□ **Plus: SCD**

***The recommended LMWH could be used as alternative according to hospital formulary**

In **Oncology-surgery**, **Orthopedic (TKR,THR,HFS)**, **abdominal surgery and Bariatric surgery**: consider extended- prophylaxis after discharge (4-5 weeks): **Enoxaparin or DOAC**

□ No orders for prophylaxis, Reason: _____

This is a general guideline and the physician's clinical judgment may override it.

If the patient's condition changes or if there is a procedure with bleeding risk, the risk stratification must be revised using a new form by the Primary Team

Labs: Check baseline CBC and at least every 72 hours thereafter. Notify physician if platelet count less than 100,000 or drop by 50% from baseline

Nurse interventions

❑ The nurse notified the physician to fill out the form

❑ Providing VTE mechanical prophylaxis devices.

❑ The nurse provided patient/family education (the patient received his/her injection by him/her-self.

❑The patient receive only education about administration.

❑ The nurse applies prevention measures (non-pharmacologic measures): ❑ Assist in early mobilization. ❑ teaching foot-leg exercises.

❑ Compression/elastic stockings

Nurse'/Midwifery Name and Stamp: _____

Date, Time and Signature: _____

❑ Patient educated by pharmacist (medication information: indication, duration, frequency, important for adherence, suspected side effect…etc.

❑ Patient educated by health educator

Main Responsible Physician's Name and Stamp: _____ Date, Time and Signature: _____

KINGDOM OF SAUDI ARABIA

وزارة الصحة
Ministry of Health

Hospital:_____ :مستشفى
Region:_____ المنطقة /المحافظة
Dept./Unit:_____ :القسم/الوحدة

MRN: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐ رقم الملف الطبي
NAME of Patient: _____ الاسـم :
NATIONALITY:_____ :الجنسية
AGE:_____ ☐ YEARS سنه ☐ MONTHS شهر ☐ DAYS يوم العمر:_____
DATE OF BIRTH: 20____/____/____ هـ _____/____/____ تاريخ الميلاد
GENDER: ❑ Male ❑ Female انثى ☐ ذكر ☐ الجنس:

Antenatal Venous Thromboembolism Assessment and Prophylaxis

(to be assessed at first visit to obstetrics clinic and repeated in 2nd and 3rd trimester or if admitted)

❑Any previous Venous thromboembolism (VTE) except a single event related to major surgery

❑Hospital admission.
❑Single previous VTE related to major surgery.
❑High-risk thrombophilia + no VTE
❑BMI ≥ 40 kg/m2
❑Medical comorbidities e.g., cancer, heart failure, active systemic lupus erythematosus, inflammatory bowel disease or inflammatory polyarthropathy, nephrotic syndrome, type I DM with nephropathy, sickle cell disease
❑current IV Drug user
❑Any surgical procedure e.g., appendectomy
❑ Ovarian hyper stimulation syndrome (OHSS) (first trimester only)

❑Obesity (BMI ≥ 30 kg/m2)
❑Age >35
❑Parity ≥ 3
❑Smoker
❑Gross varicose veins
❑Current pre-eclampsia
❑Immobility, e.g., paraplegia, pelvic girdle pain
❑Family history of unprovoked or estrogen provoked VTE in first-degree relative
❑Low-risk thrombophilia
❑Multiple pregnancy
❑IVF/ART
Transient risk factors: Dehydration/ hyperemesis; Current systemic Infection, long-distance travel.

If Any → **HIGH RISK**
Requires antenatal prophylaxis with LMWH.
Refer to Consultant in pregnancy expert/team

If Any → **INTERMEDIATE RISK**
Consider antenatal prophylaxis with LMWH.

Four or more risk factors: prophylaxis from first trimester.
Three risk factors: prophylaxis from 28weeks.

<3Factors → **LOWER RISK**
Fewer than Three risk factors.
Mobilization and avoidance of dehydration

Thromboprophylaxis doses for antenatal and postnatal LMWH
The recommended LMWH could be used as alternative according to hospital formulary

Weight	Enoxaparin	Tinzaparin (75 u/kg/day)	CrCl
< 50 kg	❑20 mg daily	❑3500 units daily	**CrCl > 30 ml/min** Enoxaparin dose based to Wight. **CrCl < 30 ml/min** Heparin 5000 IU subcutaneously of unfractionated heparin could be used and repeated every 12 hours until LMWH can be resumed after delivery.
50–90 kg	❑40 mg daily	❑4500 units daily	
91–130 kg	❑60 mg daily	❑7000 units daily	
131–170 kg	❑80 mg daily*	❑9000 units daily	
> 170 kg	❑0.6 mg/kg/day	❑75 u/kg/day	
High prophylactic dose for women weighing 50–90 kg	❑40 mg 12 hourly	❑4500 units 12 hourly	

Mark contraindications to LMWH
- ❑ **Known bleeding disorder**
- ❑ **Active bleeding**
- ❑ **Thrombocytopenia (platelet count < 50,000)**
- ❑ **Acute stroke in previous 4 weeks (hemorrhagic or ischemic)**
- ❑**Uncontrolled hypertension**
- ❑**Severe renal disease(glomerular filtration rate[GFR]<30ml/min/1.73m2**
- ❑**Severe liver disease (prothrombin time above normal range or known varices**)

Patient at significant risks for bleeding or contraindication to anticoagulation: ❑
❑Use Sequential Compression Device (SCD) [first priority]
❑Properly fitted graduated compression stockings (15-30mmHg)

Contraindications of SCD: Gangrene; Recent Skin Graft; Suspected existing Deep Venous Thrombosis

Special Cases:
- ❑ Previous VTE + Anti phospholipid syndrome (APS): High dose. (The same dose of LMWH but TWICE daily)
- ❑ Previous VTE + Anti Thrombin deficiency: High dose. (The same dose of LMWH but TWICE daily)
- ❑ Recurrent VTE (2 or more): High dose. (The same dose of LMWH but TWICE daily)

❑ **Unfractionated Heparin: Indications**

❑Around the time of delivery in women at very high risk of thrombosis (when there may be reluctance to use LMWH in case regional anesthetic techniques are required)

❑In women at increased risk of hemorrhage

❑The required interval between a prophylactic dose of unfractionated heparin and regional analgesia or anesthesia is less (4 hours) than with LMWH (12 hours)

✓This is a general guideline and the physician's clinical judgment may override it.

✓If the patient's condition changes or if there is a procedure with bleeding risk, the risk stratification must be revised using a new form by the Primary Team

✓Labs: Check baseline CBC and at least every 72 hours thereafter. Notify physician if platelet count less than 100,000 or drop by 50% from baseline, or renal impairment (CrCl < 30mL/min)

Admission Date& time
Physicians Name:_____ **Signature:**_____
Date &time :_____

Nurse interventions:

❑ The nurse notified the physician to fill out the form

❑ Providing VTE mechanical prophylaxis devices.

❑ The nurse provided patient/family education (the patient received his/her injection by him/her-self.

❑The patient receive only education about administration.

❑ The nurse applies prevention measures (nonpharmacologic measures):

- ❑ Assist in early mobilization.
- ❑ teaching foot-leg exercises.
- ❑ Compression/elastic stockings

Nurse'/Midwifery Name and Stamp: _____ **Date, Time and Signature:** _____

❑ Patient educated by pharmacist (medication information: indication, duration, frequency, important for adherence, suspected side effect…etc.

❑ Patient educated by health educator

KINGDOM OF SAUDI ARABIA

وزارة الصحة
Ministry of Health

Hospital:_____ :مستشفى
Region:_____ المنطقة /المحافظة
Dept./Unit:_____ القسم/الوحدة:

MRN: ☐☐☐☐☐☐☐☐☐☐☐☐ رقم الملف الطبي
NAME of Patient: _____ الاسـم :
NATIONALITY:_____ الجنسية:
AGE:_____ ☐ YEARS سنه ☐ MONTHS شهر ☐ DAYS يوم العمر:_____
DATE OF BIRTH: 20____/____/____ هـ _____/____/____ تاريخ الميلاد
GENDER: ❑ Male ❑ Female انثى ☐ ذكر ☐ الجنس:

Postnatal Venous Thromboembolism Assessment and Prophylaxis

(to be assessed after delivery and repeated during obstetrics clinic visit or if re-admitted)

❑Any previous Venous Thromboembolism (VTE)

❑Anyone requiring antenatal LMWH

❑High-risk thrombophilia

❑Low-risk thrombophilia + Family history

❑Caesarean section in labor
❑BMI ≥ 40 kg/m2
❑Readmission or prolonged admission (≥ 3 days) in the puerperium
❑Any surgical procedure in the puerperium except immediate repair of the perineum
❑Medical comorbidities e.g., cancer, heart failure, active systemic lupus erythematosus, inflammatory bowel disease or inflammatory polyarthropathy; nephrotic syndrome, type I DM with nephropathy, sickle cell disease
❑Current IV Drug user

❑Age >35 years
❑Obesity (BMI ≥ 30 kg/m2)
❑Parity ≥ 3
❑Smoker
❑Elective caesarean section
❑Family history of VTE
❑Low-risk thrombophilia
❑Gross varicose veins
❑Current systemic infection
❑Immobility, e.g., paraplegia, pelvic girdle pain, long distance travel
❑Current pre-eclampsia
❑Multiple pregnancy
❑Preterm delivery in this pregnancy (<37+0 weeks)
❑Stillbirth in this pregnancy
❑Mid-cavity rotational or operative delivery
❑Prolonged labour (>24 hours)
❑Postpartum Hemorrhage >1 liter or blood transfusion

If Any → **HIGH RISK**

At least 6 weeks' postnatal prophylactic LMWH

If Any → **Two or more risk factors** → **INTERMEDIATE RISK**

At least 10 days 'postnatal prophylactic LMWH
Note: If persisting or > 3 risk factors consider extending thromboprophylaxis with LMWH

LOWER RISK
(Fewer than two risk factors)
Early mobilization and avoidance of dehydration

Thromboprophylaxis doses for antenatal and postnatal LMWH
***The recommended LMWH could be used as alternative according to hospital formulary**

Weight	Enoxaparin	Tinzaparin (75 u/kg/day)	CrCl
< 50 kg	❑20 mg daily	❑3500 units daily	**CrCl > 30 ml/min** Enoxaparin dose based to wight. **CrCl < 30 ml/min** Heparin 5000 IU subcutaneously of unfractionated heparin could be used and repeated every 12 hours until LMWH can be resumed after delivery.
50–90 kg	❑40 mg daily	❑4500 units daily	
91–130 kg	❑60 mg daily	❑7000 units daily	
131–170 kg	❑80 mg daily	❑9000 units daily	
> 170 kg	❑0.6 mg/kg/day	❑75 u/kg/day	
High prophylactic dose for women weighing 50–90 kg	❑40 mg 12 hourly	❑4500 units 12 hourly	

Mark contraindications to LMWH

- ❑ **Known bleeding disorder**
- ❑ **Active bleeding**
- ❑ **Thrombocytopenia (platelet count < 50,000)**
- ❑ **Acute stroke in previous 4 weeks (hemorrhagic or ischemic)**
- ❑**Uncontrolled hypertension**
- ❑**Severe renal disease(glomerular filtration rate[GFR]<30ml/min/1.73m2**
- ❑**Severe liver disease (prothrombin time above normal range or known varices**)

Patient at significant risks for bleeding or contraindication to anticoagulation:
❑Use Sequential Compression Device (SCD) [first priority]
❑Properly fitted graduated compression stockings (15-30mmHg)

Contraindications of SCD: Gangrene; Recent Skin Graft; Suspected existing Deep Venous Thrombosis

Special Cases:
- ❑ Previous VTE + Anti phospholipid syndrome (APS): High dose. (The same dose of LMWH but TWICE daily)
- ❑ Previous VTE + Anti Thrombin deficiency: High dose. (The same dose of LMWH but TWICE daily)
- ❑ Recurrent VTE (2 or more): High dose. (The same dose of LMWH but TWICE daily)

❑ **Unfractionated Heparin: Indications**

❑Around the time of delivery in women at very high risk of thrombosis (when there may be reluctance to use LMWH in case regional anesthetic techniques are required)

❑In women at increased risk of hemorrhage

❑The required interval between a prophylactic dose of unfractionated heparin and regional analgesia or anesthesia is less (4 hours) than with LMWH (12 hours)

✓This is a general guideline and the physician's clinical judgment may override it.

✓If the patient's condition changes or if there is a procedure with bleeding risk, the risk stratification must be revised using a new form by the Primary Team

✓Labs: Check baseline CBC and at least every 72 hours thereafter. Notify physician if platelet count less than 100,000 or drop by 50% from baseline, or renal impairment (CrCl < 30mL/min)

Admission Date& time
Physicians Name:_____ **Signature:**_____
Date &time :_____

Nurse interventions:

❑ The nurse notified the physician to fill out the form

❑ Providing VTE mechanical prophylaxis devices.

❑ The nurse provided patient/family education (the patient received his/her injection by him/her-self.

❑The patient receive only education about administration.

❑ The nurse applies prevention measures (nonpharmacologic measures):

- ❑ Assist in early mobilization.
- ❑ teaching foot-leg exercises.
- ❑ Compression/elastic stockings

Nurse'/Midwifery Name and Stamp: _____ **Date, Time and Signature:** _____

❑ Patient educated by pharmacist (medication information: indication, duration, frequency, important for adherence, suspected side effect…etc.

❑ Patient educated by health educator