

# **Venous Thromboembolism (VTE)**

## **Prevention protocol for adult patients**

**Version 1.2**

**31 December 2023**

**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)

### Modified Caprini

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

**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: <b>Low</b> risk	If total scores equal to 2: <b>Moderate</b> risk	If total scores equal to 3 or 4: <b>High</b> risk	If total scores equal to or more than 5: <b>Highest</b> risk

### VTE prophylaxis based on Modified Caprini risk levels

#### I- For all MEDICAL and GENERAL SURGICAL conditions:

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

#### Prophylactic Dose Anticoagulation based on BMI and CrCl:

CrCl (ml/min)	BMI (Kg/m <sup>2</sup> )	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		7500 units SC q8h	
	>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
<b>A. Elective hip replacement</b>			
<u>For patient undergoing elective total hip replacement (THR)</u>		<p>Recommended thromboprophylaxis either:</p> <p><b>a. LMWH:</b> - At a usual high-risk dose 40 mg SC q24h initiated 12 h <u>before</u> surgery <b>OR</b> - At a usual high-risk dose 30 mg SC q24h initiated 12 to 24 h <u>after</u> surgery</p> <p><b>OR</b></p> <p><b>b. Fondaparinux dose 2.5 mg SC q24h initiated 6-8 hr after surgery</b> <b>OR</b></p> <p><b>c. Apixaban 2.5 mg twice daily initiated 12-24 hr after surgery</b> <b>OR</b></p> <p><b>d. Adjusted-dose VKA (Warfarin)</b> started preoperatively the evening of the surgical day (<i>INR target 2.5, INR range: 2.0 – 3.0 for 35 days</i>)</p>	
<u>For patient undergoing THR who have a high risk of bleeding</u>	Optimal use of a mechanical method with IPC	When the high bleeding risk decreases, pharmacologic thromboprophylaxis be substituted for or added to the mechanical thromboprophylaxis	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>B. Elective Knee Replacement</b>			
<u>For patient undergoing total knee replacement (TKR)</u>		<p>Recommended thromboprophylaxis either:</p> <p><b>a. LMWH:</b> - At a usual high-risk dose 30 mg SC q24h initiated 12 to 24 h after surgery <b>OR</b></p> <p><b>b. Fondaparinux dose 2.5 mg SC q24h initiated 6-8 hr after surgery</b> <b>OR</b></p> <p><b>c. Apixaban 2.5 mg twice daily initiated 12-24 hr after surgery</b> <b>OR</b></p> <p><b>d. Adjusted-dose VKA (Warfarin)</b> started preoperatively of the evening of the surgical day (<i>INR target 2.5, INR range: 2.0 – 3.0 for 35 days</i>)</p>	
<u>For patient undergoing TKR who have a high risk of bleeding</u>	Optimal use of a mechanical method with IPC	When the high bleeding risk decreases, pharmacologic thromboprophylaxis be substituted for or added to the mechanical thromboprophylaxis to extend pharmacological prophylaxis beyond 10 days after discharge	



Category	Supportive Care	Pharmacotherapy	Precautions
<b>C. Hip Fracture Surgery (HFS)</b>			
<b>For patient undergoing HFS</b>		<p>Routine thromboprophylaxis minimum 10 days up to 35 days is recommended:</p> <p><b>a. Fondaparinux</b> 2.5 mg SC q24h initiated 6-8h after surgery <b>OR</b> <b>b. LMWH</b> 30mg SC q12h initiated 12-24hr after surgery <b>OR</b> <b>c. Adjusted dose VKA (Warfarin)</b> preoperatively (INR target. 2.5. INR range. 2.0 to 3.0)</p>	
<b>D. Elective Spine Surgery</b>			
<ul style="list-style-type: none"> <li><b>Low risk</b></li> </ul>	Encourage ambulation	No thromboprophylaxis required	
<ul style="list-style-type: none"> <li><b>Moderate Risk such as:</b> <ul style="list-style-type: none"> <li>Advanced age</li> <li>Malignancy</li> <li>Neurological deficit</li> <li>Previous VT</li> <li>An anterior surgical approach</li> </ul> </li> </ul>	Optimal use of peri-operative IPC	<p>The recommended thromboprophylaxis options:</p> <p><b>a. Enoxaparin</b> 40 mg SC once daily <b>OR</b> <b>b. Unfractionated Heparin</b> 5000 Units SC or TID</p>	<p>VTE prophylaxis after elective spinal surgery can typically be initiated 12–24 hours postoperatively.</p> <p>Prophylaxis may need to be delayed if the surgical site remains open</p>
<ul style="list-style-type: none"> <li><b>Highest Risk</b></li> </ul>	Optimal use of a mechanical method (i.e. GCS and/or IPC)	<p>The recommended thromboprophylaxis is one of the pharmacological thromboprophylaxis options combined with mechanical method:</p> <p><b>a. Enoxaparin</b> 40 mg SC once daily <b>OR</b> <b>b. Unfractionated Heparin</b> 5000 Units SC or TID</p>	
<b>E. Knee arthroscopy</b>			
<ul style="list-style-type: none"> <li><b>Low risk</b></li> </ul>	Encourage ambulation	No thromboprophylaxis required	
<ul style="list-style-type: none"> <li><b>High risk (multiple risk factors or following a complicated procedure)</b></li> </ul>	Early mobilization	<p>The recommended thromboprophylaxis is one of the pharmacological thromboprophylaxis options combined with mechanical method:</p> <p>LMWH minimum of 10 days.</p> <p><b>a. Enoxaparin</b> 40 mg SC once daily <b>OR</b> <b>b. Unfractionated Heparin</b> 5000 Units SC or TID</p>	
<b>F. Isolated Lower Extremity Injuries Distal to the Knee</b>			
<b>For patient with Isolated Lower Extremity Injuries Distal to the Knee</b>		Routine use of thromboprophylaxis is <b>NOT</b> suggested	

### III. UROLOGIC Surgery:

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

### IV. LAPAROSCOPIC Surgery:

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

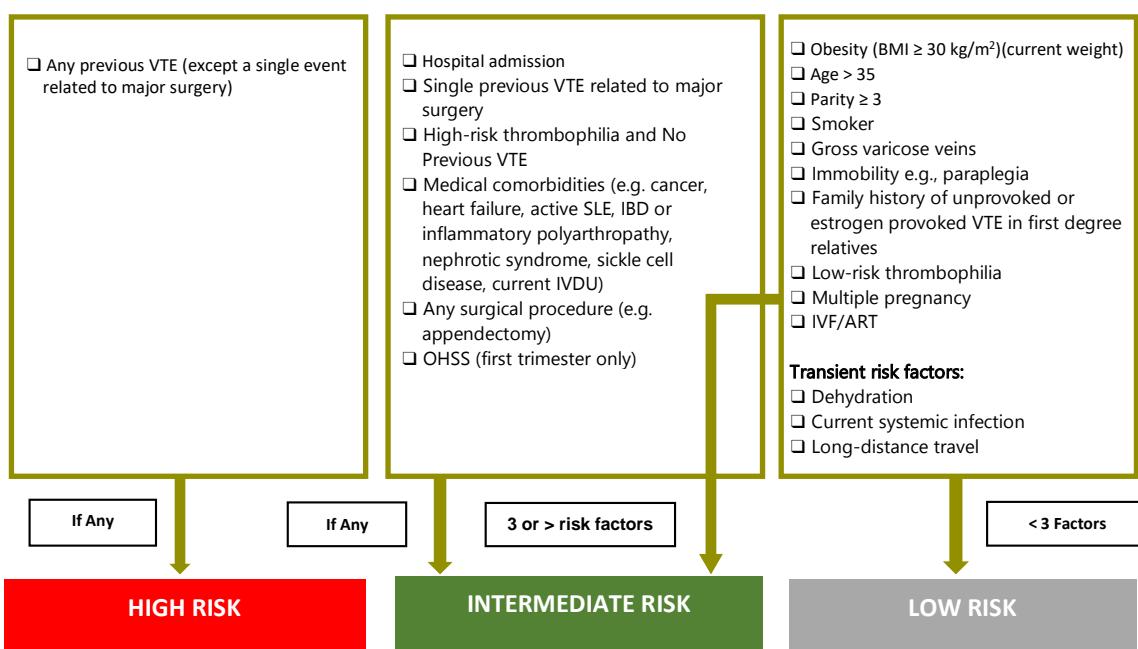
### V. BARIATRIC Surgery:

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

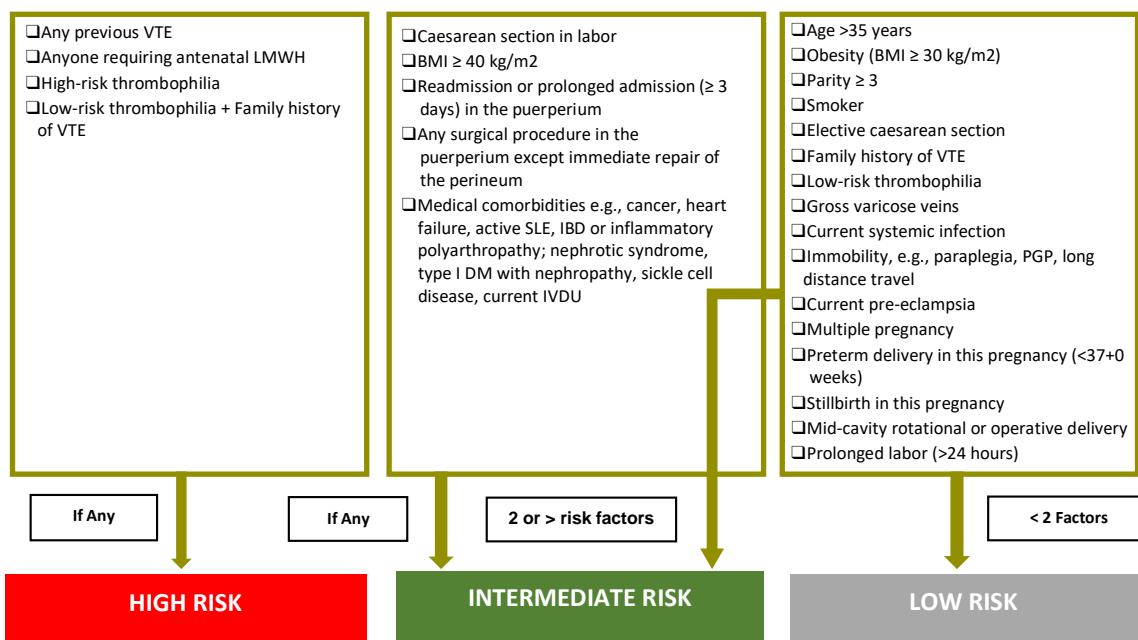
Category	Supportive Care	Pharmacotherapy OR Pharmacological plus mechanical prophylaxis	Precautions

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

#### VI. ANTENATAL:



#### VII. POSTNATAL:



### VTE Prophylaxis based on RCOG risk levels

Risk factors in pregnancy and the puerperium		Score
Pre-existing risk factors		
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 erythematosus, inflammatory polyarthropathy or inflammatory bowel disease; <sup>[1]</sup> nephrotic syndrome; type I diabetes mellitus with nephropathy; sickle cell disease; <sup>[2]</sup> 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/m <sup>2</sup> 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 erythematosus, inflammatory polyarthropathy or inflammatory bowel disease; <sup>[1]</sup> nephrotic syndrome; type I diabetes mellitus with nephropathy; sickle cell disease; <sup>[2]</sup> 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 perineal, 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. <sup>[1,2]</sup>
- If total score 3 antenatally, consider thromboprophylaxis from 28 weeks. <sup>[1,2]</sup>
- If total score ≥ 2 postnatally, consider thromboprophylaxis for at least 10 days. <sup>[1,2]</sup>

- If admitted to hospital antenatally consider thromboprophylaxis. [17]
- If prolonged admission ( $\geq 3$  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												
• <b>Low Risk</b>	- Early mobilization & avoid dehydration	- No thromboprophylaxis required													
• <b>Moderate Risk</b>	- Encourage ambulation - Intermittent pneumatic compression or Graduated compression stockings	<p>The recommendation is the use of <b>routine</b> thromboprophylaxis with either:</p> <p><b>a. Enoxaparin</b> SC once daily according to <b>current</b> weight as the following:</p> <table> <thead> <tr> <th>Weight</th> <th>Enoxaparin</th> </tr> </thead> <tbody> <tr> <td>&lt; 50 kg</td> <td><input type="checkbox"/> 20 mg daily</td> </tr> <tr> <td>50–90 kg</td> <td><input type="checkbox"/> 40 mg daily</td> </tr> <tr> <td>91–130 kg</td> <td><input type="checkbox"/> 60 mg daily</td> </tr> <tr> <td>131–170 kg</td> <td><input type="checkbox"/> 80 mg daily</td> </tr> <tr> <td>&gt; 170 kg</td> <td><input type="checkbox"/> 0.6 mg/kg/ day</td> </tr> </tbody> </table> <p><b>OR</b></p> <p><b>b. Unfractionated Heparin</b> 5000 Units SC BID or TID Antenatal prophylaxis from 28 weeks in pregnancy.</p>	Weight	Enoxaparin	< 50 kg	<input type="checkbox"/> 20 mg daily	50–90 kg	<input type="checkbox"/> 40 mg daily	91–130 kg	<input type="checkbox"/> 60 mg daily	131–170 kg	<input type="checkbox"/> 80 mg daily	> 170 kg	<input type="checkbox"/> 0.6 mg/kg/ day	
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• <b>High Risk</b>	- Encourage ambulation - Intermittent pneumatic compression or Graduated compression stockings	<p>The recommendation is the use of <b>routine</b> thromboprophylaxis with either:</p> <p><b>a. Enoxaparin</b> SC once daily according to <b>current</b> weight as the following:</p> <table> <thead> <tr> <th>Weight</th> <th>Enoxaparin</th> </tr> </thead> <tbody> <tr> <td>&lt; 50 kg</td> <td><input type="checkbox"/> 20 mg daily</td> </tr> <tr> <td>50–90 kg</td> <td><input type="checkbox"/> 40 mg daily</td> </tr> <tr> <td>91–130 kg</td> <td><input type="checkbox"/> 60 mg daily</td> </tr> <tr> <td>131–170 kg</td> <td><input type="checkbox"/> 80 mg daily</td> </tr> <tr> <td>&gt; 170 kg</td> <td><input type="checkbox"/> 0.6 mg/kg/ day</td> </tr> </tbody> </table> <p><b>OR</b></p> <p><b>b. Unfractionated Heparin</b> 5000 Units SC BID Antenatal prophylaxis from first trimester.</p>	Weight	Enoxaparin	< 50 kg	<input type="checkbox"/> 20 mg daily	50–90 kg	<input type="checkbox"/> 40 mg daily	91–130 kg	<input type="checkbox"/> 60 mg daily	131–170 kg	<input type="checkbox"/> 80 mg daily	> 170 kg	<input type="checkbox"/> 0.6 mg/kg/ day	
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Medication Related Information				
Medication	Contraindication	Major Drug Interactions	Required dose adjustment	Pregnancy
Unfractionated Heparin (UFH)	<ul style="list-style-type: none"> <li>- Severe thrombocytopenia</li> <li>- Uncontrolled active bleeding; except when due to DIC</li> </ul>	Apixaban Dabigatran Endoxaban Mifepristone Rivaroxaban Streptokinase Urokinase	<b>Renal impairment:</b> No specific recommendations are available <b>Hepatic impairment:</b> No specific recommendations are available <b>Geriatric:</b> No adjustment necessary; however, a higher incidence of bleeding has been reported in patients over 60 years of age, especially women, therefore lower doses of heparin may be indicated in these patients.	Fetal risk cannot be ruled out
Enoxaparin	<ul style="list-style-type: none"> <li>- Active major bleeding</li> <li>- History of immune-mediated heparin-induced thrombocytopenia within the past 100 days or in presence of circulating antibodies</li> <li>- Hypersensitivity to benzyl alcohol (present in multi-dose formulation)</li> <li>- Hypersensitivity to enoxaparin sodium, heparin, or pork products</li> </ul>	Apixaban Dabigatran Endoxaban Mifepristone Rivaroxaban Urokinase	<b>Renal impairment</b> (CrCl 30 to 80 mL/min): No adjustment necessary. <b>Renal impairment</b> (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%. <b>Renal impairment</b> (CrCl less than 30 mL/min) in prevention of DVT following abdominal surgery: 30 mg subQ once daily. <b>Renal impairment</b> (CrCl less than 30 mL/min) in prevention of DVT following hip or knee replacement surgery: 30 mg subQ once daily. <b>Renal impairment</b> (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	<ul style="list-style-type: none"> <li>- Blood dyscrasias</li> <li>- Cerebral aneurysms</li> <li>- CNS hemorrhage</li> <li>- Dissecting aorta</li> <li>- Eclampsia, preeclampsia, threatened abortion</li> <li>- Gastrointestinal, genitourinary, or respiratory tract ulcerations or overt bleeding</li> <li>- Hemorrhagic tendencies</li> <li>- Hypersensitivity to warfarin or any component of the product</li> <li>- Major regional or lumbar block anesthesia</li> <li>- Malignant hypertension</li> <li>- Pericarditis and pericardial effusion</li> <li>- Pregnancy, except in pregnant women with mechanical heart valves, who are at high risk of thromboembolism</li> <li>- Recent or potential surgery of central nervous system or eye</li> <li>- Recent or potential traumatic surgery resulting in large open surface</li> <li>Spinal puncture and other procedures with potential for uncontrollable bleeding</li> <li>Unsupervised and potentially noncompliant patients</li> </ul>	Tamoxifen Streptokinase Urokinase Allopurinol Amiodarone Barbiturates Cholestyramine resin	<b>Renal impairment:</b> No adjustment necessary; monitor INR more frequently in patients with compromised renal function to maintain INR within the therapeutic range <b>Geriatric:</b> Consider using lower initial and maintenance dosage <b>Pregnancy, mechanical valve:</b> 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

Medication Related Information				
Medication	Contraindication	Major Drug Interactions	Required dose adjustment	Pregnancy
<b>Fondaparinux</b>	<ul style="list-style-type: none"> <li>- Contraindicated in patients with a CrCl &lt; 30 mL/min/1.73 m<sup>2</sup></li> <li>Body weight less than 50 kg in VTE prophylaxis</li> <li>- Active major bleeding</li> <li>- Thrombocytopenia associated with positive in vitro test for antiplatelet antibody in the presence of fondaparinux sodium</li> <li>- History of serious hypersensitivity reaction (eg, angioedema, anaphylactoid or anaphylactic reactions)</li> </ul>	Apixaban Dabigatran Endoxaban Mifepristone Rivaroxaban	<p><b>Renal impairment (CrCl 30 to 50 mL/min):</b> Use with caution; may cause prolonged anticoagulation.</p> <p><b>Hepatic impairment (mild to moderate):</b> No dosage adjustment required; however, observe closely for signs/symptoms of bleeding.</p> <p><b>Geriatric:</b> Pay particular attention to dosing directions and concomitant medications (especially anti-platelet medication).</p> <p><b>Hemodialfiltration in patients with heparin-induced thrombocytopenia:</b> 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.</p>	Fetal risk cannot be ruled out
<b>Apixaban</b>	<ul style="list-style-type: none"> <li>- Contraindicated in patients with a CrCl &lt; 25 mL/min/1.73 m<sup>2</sup></li> <li>SCr &gt; 2.5 mg/dL</li> <li>- Active pathological bleeding</li> <li>- Severe hypersensitivity (eg, anaphylactic reactions) to apixaban</li> </ul>	Rifampin, phenytoin, carbamazepine, St. John's wort) protease inhibitors, itraconazole, ketoconazole, conivaptan	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

**References:**

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

MRN: \_\_\_\_\_  
 ID/PP .NO: \_\_\_\_\_  
 NAME of Patient: \_\_\_\_\_  
 NATIONALITY: \_\_\_\_\_  
 AGE: \_\_\_\_\_ YEARS سن: \_\_\_\_\_ MONTHS شهر: \_\_\_\_\_ DAYS يوم: \_\_\_\_\_  
 DATE OF BIRTH: 20 / / \_\_\_\_\_ تاریخ المیاد: / / \_\_\_\_\_  
 GENDER:  Male  Female ذكر:  أنثی:   
 رقم الملف الطبي  
 رقم اثبات الهوية / جواز  
 الاسم: \_\_\_\_\_  
 الجنسية: \_\_\_\_\_  
 العمر: \_\_\_\_\_  
 تاريخ الميلاد: / / \_\_\_\_\_  
 الجنس: \_\_\_\_\_

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

Note: (To be assessed for all adult ( $\geq 18$  years) patients during admission and repeated if patients' condition changed)

Diagnosis:

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

### Risk Factor Score = 5

- ⑤ Elective Knee or Hip Arthroplasty  
 ⑤ Hip and / or Pelvis fracture (< 1 month)  
 ⑤ Stroke(< 1 month)  
 ⑤ Multiple trauma(< 1 month)  
 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
<input type="checkbox"/> Patient on therapeutic doses of: Heparin / Enoxaparin / Fondaparinux / Warfarin / Rivaroxaban / Dabigatran / Apixaban	<input type="checkbox"/> History of gastrointestinal bleed or Hemorrhagic stroke
<input type="checkbox"/> Hypersensitivity to low molecular weight heparin, unfractionated heparin, (including heparin-induced thrombocytopenia)	<input type="checkbox"/> Renal failure with Creatinine clearance less than 30 ml/min (for Enoxaparin-modify the dose)
Active bleeding / Fall Patients <input type="checkbox"/>	<input type="checkbox"/> Coagulopathy (high aPTT, PT/INR $\geq 1.5$ )
<input type="checkbox"/> Uncontrolled HTN (SBP $> 185$ and /or DBP $> 110$ mmHg)	<input type="checkbox"/> Clinically significant thrombocytopenia (Platelet count less than 50)
<input type="checkbox"/> Epidural anesthesia (within last 12 hours or planned within next 12 hours)	<input type="checkbox"/> 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.

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

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

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

MRN: \_\_\_\_\_

NAME of Patient: \_\_\_\_\_

NATIONALITY: \_\_\_\_\_

AGE: \_\_\_\_\_ YEARS سن: \_\_\_\_\_ MONTHS شهر: \_\_\_\_\_ DAYS يوم: \_\_\_\_\_

DATE OF BIRTH: 20 / / هـ تاریخ المیاد: \_\_\_\_\_ / /

GENDER:  Male  Female  ذكر  انثى الجنس: \_\_\_\_\_

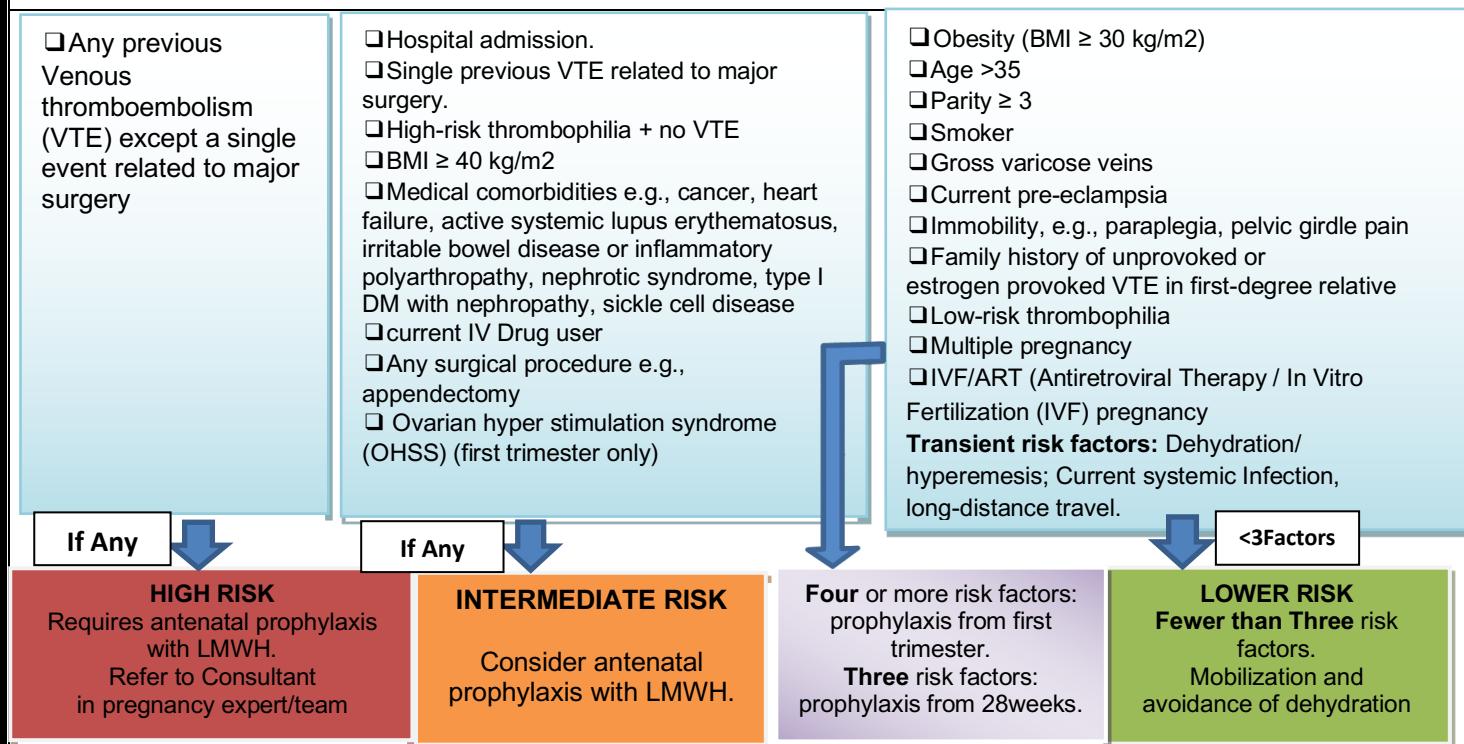
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الجنسية:

## 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)



Thromboprophylaxis doses for antenatal and postnatal LMWH The recommended LMWH could be used as alternative according to hospital formulary				Mark contraindications to LMWH
Weight	Enoxaparin	Tinzaparin (75 u/kg/day)	CrCl	
< 50 kg	<input type="checkbox"/> 20 mg daily	<input type="checkbox"/> 3500 units daily	<b>CrCl &gt; 30 ml/min</b> Enoxaparin dose based to Wight. <b>CrCl &lt; 30 ml/min</b> Heparin 5000 IU subcutaneously of unfractionated heparin could be used and repeated every 12 hours until LMWH can be resumed after delivery.	<input type="checkbox"/> Known bleeding disorder
50–90 kg	<input type="checkbox"/> 40 mg daily	<input type="checkbox"/> 4500 units daily		<input type="checkbox"/> Active bleeding
91–130 kg	<input type="checkbox"/> 60 mg daily	<input type="checkbox"/> 7000 units daily		<input type="checkbox"/> Thrombocytopenia (platelet count < 50,000)
131–170 kg	<input type="checkbox"/> 80 mg daily*	<input type="checkbox"/> 9000 units daily		<input type="checkbox"/> Acute stroke in previous 4 weeks (hemorrhagic or ischemic)
> 170 kg	<input type="checkbox"/> 0.6 mg/kg/day	<input type="checkbox"/> 75 u/kg/day		<input type="checkbox"/> Uncontrolled hypertension
High prophylactic dose for women weighing 50–90 kg	<input type="checkbox"/> 40 mg 12 hourly	<input type="checkbox"/> 4500 units 12 hourly		<input type="checkbox"/> Severe renal disease(glomerular filtration rate[GFR]<30ml/min/1.73m <sup>2</sup> )
				<input type="checkbox"/> 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: \_\_\_\_\_

Date &amp;time : \_\_\_\_\_

**Signature:** \_\_\_\_\_

## 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



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

MRN: \_\_\_\_\_

NAME of Patient: \_\_\_\_\_ الاسم: \_\_\_\_\_

NATIONALITY: \_\_\_\_\_ الجنسية: \_\_\_\_\_

AGE: \_\_\_\_\_ YEARS سن: \_\_\_\_\_ MONTHS شهر: \_\_\_\_\_ DAYS يوم: \_\_\_\_\_

DATE OF BIRTH: 20 / / هـ تاريخ الميلاد: \_\_\_\_\_ / / \_\_\_\_\_

GENDER:  Male ذكر: \_\_\_\_\_  Female أنثى: \_\_\_\_\_

## 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  $\geq 40$  kg/m<sup>2</sup>

Readmission or prolonged admission ( $\geq 3$  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, irritable bowel disease or inflammatory polyarthropathy; nephrotic syndrome, type I DM with nephropathy, sickle cell disease

Current IV Drug user

Age  $>35$  years

Obesity (BMI  $\geq 30$  kg/m<sup>2</sup>)

Parity  $\geq 3$

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

### HIGH RISK

At least 6 weeks' postnatal prophylactic LMWH

If

### INTERMEDIATE RISK

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

Two or more risk factors

### 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	Mark contraindications to LMWH
< 50 kg	<input type="checkbox"/> 20 mg daily	<input type="checkbox"/> 3500 units daily	CrCl $> 30$ ml/min Enoxaparin dose based on weight.	<input type="checkbox"/> Known bleeding disorder
50–90 kg	<input type="checkbox"/> 40 mg daily	<input type="checkbox"/> 4500 units daily	CrCl $< 30$ ml/min	<input type="checkbox"/> Active bleeding
91–130 kg	<input type="checkbox"/> 60 mg daily	<input type="checkbox"/> 7000 units daily	Heparin 5000 IU subcutaneously of unfractionated heparin could be used and repeated every 12 hours until LMWH can be resumed after delivery.	<input type="checkbox"/> Thrombocytopenia (platelet count $< 50,000$ )
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High prophylactic dose for women weighing 50–90 kg	<input type="checkbox"/> 40 mg 12 hourly	<input type="checkbox"/> 4500 units 12 hourly		<input type="checkbox"/> Severe renal disease(glomerular filtration rate[GFR]<30ml/min/1.73m <sup>2</sup> )
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#### Special Cases:

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**Admission Date& time**

Physicians Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date &amp;time : \_\_\_\_\_

**Nurse interventions:**

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  - Compression/elastic stockings

Nurse'/Midwifery Name and Stamp: \_\_\_\_\_

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

Patient educated by health educator