

Guideline for VTE Prevention and Treatment in Pregnancy

Clinical Condition	Antepartum Management	Post-Partum Management	Comments
<ul style="list-style-type: none"> Attempting pregnancy; patient on long-term warfarin 	<ul style="list-style-type: none"> Switch to unfractionated heparin (UFH) or LMWH when planning pregnancy Selected patients expected to take a long time to become pregnant; continue warfarin + frequent pregnancy testing until pregnancy confirmed 		<ul style="list-style-type: none"> Patient at high risk for VTE; referral to High Risk Pregnancy Service recommended Patients with history of VTE, no longer on therapy; no therapy required prior to conception
Prevention of VTE			
<ul style="list-style-type: none"> History of single VTE caused by transient risk factor (resolved) No prior VTE; single thrombophilia (heterozygous); except Anti-thrombin III deficiency or antiphospholipid antibody syndrome (APLA) 	<ul style="list-style-type: none"> Clinical surveillance only 	<ul style="list-style-type: none"> Warfarin x 4-6 weeks, target INR 2.5; UFH/LMWH overlap 	<ul style="list-style-type: none"> Graduated compression stockings recommended antenatally and post-partum
<ul style="list-style-type: none"> History of single VTE with pregnancy (or estrogen related); risk factors present History of single idiopathic VTE; not currently anticoagulated Prior VTE + known thrombophilia or strong family history; not currently anticoagulated no prior VTE; known thrombophilia (e.g. Anti-thrombin III deficiency, prothrombin 20210A, Factor V Leiden (hetero/homozygous)) 	<p>Prophylaxis</p> <ul style="list-style-type: none"> Dalteparin 5000 units sc daily Enoxaparin 40 mg dc daily UFH 1st trimester 5000 units sc bid 2nd trimester 7500 units sc bid 3rd trimester 10000 units sc bid Clinical surveillance 	<ul style="list-style-type: none"> Warfarin x 6 weeks or until recommended duration of therapy complete, target INR 2.5; start warfarin the night of delivery Can use prophylactic dose LMWH or treatment dose LMWH if documented clot (see below) or Protein C or S deficiency 	<ul style="list-style-type: none"> Graduated compression stockings recommended antenatally and post-partum Prophylaxis should begin as soon as pregnancy is confirmed. SC UFH or LMWH should be discontinued 24 hrs prior to induction of labor Choice of agents should be based on patient preference and drug coverage
<ul style="list-style-type: none"> ≥ 2 episodes VTE; long-term warfarin therapy APLA with prior VTE 	<ul style="list-style-type: none"> Treatment dose LMWH or adjusted dose UFH (see Treatment of VTE below) 	<ul style="list-style-type: none"> Resume long-term anticoagulation 	
<ul style="list-style-type: none"> APLA; <i>no prior</i> VTE 	Prophylaxis as above + Add low dose ASA		
Treatment of VTE			
<ul style="list-style-type: none"> Any VTE objectively diagnosed antepartum 	<p>LMWH at treatment doses</p> <ul style="list-style-type: none"> Dalteparin 200 units/kg sc daily OR 100 units/kg q12h Enoxaparin 1.5 mg/kg sc daily OR 1 mg/kg q12h Tinzaparin 175 units/kg sc daily Switch patients to UFH at 35 – 36 weeks gestation 	<ul style="list-style-type: none"> Warfarin x 6 weeks or until recommended duration of therapy complete, target INR 2.5; start warfarin night of delivery Patients should receive LMWH prophylactic dose (e.g. dalteparin 5000 units) 6 – 8 hours post-delivery UFH/LMWH overlap at treatment dose starting first post-partum day If very high risk of thrombosis or bleeding, start IV heparin <i>no bolus</i> 6 – 8 hours after delivery 	<p>Monitoring</p> <ul style="list-style-type: none"> Baseline anti-Factor Xa level Repeat ONCE/trimester ONLY Draw anti-Xa level 4 hrs post-dose; target 0.5 – 1.2 U/mL Adjust dose by 1000 units (dalteparin, tinzaparin) or 10 mg (enoxaparin) according to anti-Xa level

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Treatment of VTE continued	<p>UFH IV infusion</p> <ul style="list-style-type: none"> 80 units/kg IV bolus followed by 18 units/kg/hour IV infusion Continue 4-5 days until PTT at target Convert to SC UFH dosing for outpatient therapy: 24 hour total IV heparin dose \div 2 = q12h sc heparin dose e.g. 35000 units/24 hours \div 2 = 17500 units sc q12h <p>UFH, adjusted dose SC</p> <ul style="list-style-type: none"> 18 units/kg x patient's weight in kg x 12 = dose to be given sc q12h e.g. 18 units/kg x 80 kg x 12 = 17280 units \approx 17000 units sc q12h 	<ul style="list-style-type: none"> See above 	<ul style="list-style-type: none"> Target PTT = 60 – 80 1st PTT after 3rd or 4th SC UFH dose After dose adjustment; repeat PTT after 3 – 4 doses at new dose Monitor PTT q1-2weeks after maintenance dose established Monitor PTT at the mid-interval after dose administration Adjust dose by 1000 – 2000 units/dose to therapeutic PTT If patient receiving > 25000 units/dose, consider switch to q8h dosing
Prosthetic heart valves			
<ul style="list-style-type: none"> Prosthetic heart valves 	<ul style="list-style-type: none"> Enoxaparin 1 mg/kg sc q12h UFH, adjusted dose (see above) Add ASA 75 – 162 mg/day if high risk 	<ul style="list-style-type: none"> Resume long-term anticoagulation Patients at very high risk of thrombosis or bleeding, start IV heparin <i>no bolus</i> 6 – 8 hours after delivery 	<ul style="list-style-type: none"> Patients MUST be referred to High Risk Pregnancy Service Draw anti-Xa level 4 hrs post-dose; target 1.0 – 1.2 U/mL For UFH, adjusted dose sc: adjust to mid-interval PTT of 2 x control
Neuraxial anaesthesia precautions			
<ul style="list-style-type: none"> Neuraxial anaesthesia should be avoided in patients: <ul style="list-style-type: none"> with known bleeding disorder where pre-operative hemostasis is impaired by anti-thrombotic drugs Patients receiving pre-operative anticoagulants: <ul style="list-style-type: none"> Insertion of spinal needle or epidural catheter should be delayed until the anticoagulant effect of the medication is minimal Wait 8 – 12 hours after sc dose UFH or q12h prophylactic dose LMWH Wait at least 18 hours after once daily LMWH injection Delay anticoagulant prophylaxis if hemorrhagic aspirate (“bloody tap”) during initial spinal needle placement Remove epidural catheter when anticoagulant effect at a minimum i.e. just prior to next scheduled dose Delay prophylaxis start until at least 2 hours after spinal needle or epidural catheter removal If warfarin is started post-operatively: <ul style="list-style-type: none"> Recommend continuous epidural analgesia for no longer than 1 – 2 days INR should be < 1.5 at the time of epidural catheter removal 			

References:

- Ginsberg J, Bates SM, Greer IA, et al. Use of anti-thrombotic agents during pregnancy; the 7th ACCP Conference on Antithrombotic and Thrombolytic Agents. CHEST. 2004; 126: 627S-644S.
- Geerts WH, Pineo GF, Heit JA, et al. Prevention of venous thromboembolism; the 7th ACCP Conference on Antithrombotic and Thrombolytic Agents. CHEST. 2004; 126: 338S-400S.
- Calgary Health Region High Risk Pregnancy Clinic, Dr. P. Gibson.