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Anticoagulation in Pregnancy

Background

Pregnancy is a time of increased risk for venous thromboembolism (VTE), secondary to the physiologic and anatomic changes of pregnancy. The baseline risk for a VTE in pregnancy is about 1 per 1,000 – 1,500 pregnancies. However, if additional risk factors are present, the risk is greater. (Table 1)

Medications

- Heparin
- Lovenox
- Coumadin
- Fondaparinux

Medical Intervention

1. Prophylaxis – aim is to prevent development of VTE
    a. Heparin
        i. 5,000 u SQ bid, first trimester
        ii. 7,500 u SQ bid, second trimester
        iii. 10,000 u SQ bid, third trimester
    b. Lovenox
        i. 40 mg SQ once daily

- Prophylaxis is typically started in the first trimester after confirmation of a viable, intrauterine gestation by ultrasound, and is continued for six weeks postpartum.

2. Therapeutic – treatment of an existing VTE, or prevention of VTE in patients with exceptional risk factors
    a. Heparin
        i. 10,000 u or more, every 8 – 12 hours, until aPTT at desired level (Note: this can be very difficult to achieve and is not preferred for therapeutic treatment)
    b. Lovenox
        i. 1 mg/kg every 12 hours, usually rounded off in 10 mg increments
    c. Coumadin
        i. Typically reserved for use in pregnancy for patients with mechanical heart valves with exceptionally high-risk of coagulation complication.
    d. Fondaparinux

i. Typically reserved for patients who have an absolute contraindication to the use of Heparin and Lovenox e.g. allergy, heparin induced thrombocytopenia (HIT).

Indications

- See Table 3 ACOG Practice Bulletin #196. July 2018 (See Appendix A)

Antepartum Management

- Notify the Anesthesia service if a patient is admitted to L&D and is currently treated with anticoagulation medication.
- Use of compression devices for lower extremities, may be placed prior to cesarean delivery.

1. Heparin
    a. Prophylaxis dosing (10,000 units [or less] bid
- Hold 12 hours prior to admission for delivery
- Obtain CBC, PTT level at time of admission to assess coagulation status
- If Platelet count is normal, and PTT is not elevated, patient may receive regional anesthesia (spinal, epidural).

    b. Therapeutic dosing (> 20,000 units in 24 hours)
- Hold 24 hours prior to admission for delivery
- Obtain CBC, PTT as noted above.

2. Lovenox
    a. Prophylactic dosing (40 mg/d)
- Hold 12 hours prior to admission for delivery
- Obtain CBC for platelet count

    b. Therapeutic dosing (1 mg every 12 hours)
- Hold 24 hours prior to admission for delivery
- Obtain CBC.

Intrapartum Management (See Appendix B and C)

1. Vaginal Delivery
(See ANMC Obesity in Pregnancy guideline)

-use appropriately sized blood pressure cuff
-anticipate higher dose of oxytocin for induction or augmentation of labor
-consider placement of prophylactic epidural catheter

If BMI ≥ 40 kg/M^2 at any point during pregnancy:
-Consider early IUPC and FSE

If BMI ≥ 50 kg/M^2 at any point during pregnancy:
-Anesthesia consult on admission

2. Cesarean Delivery
(See ANMC Cesarean Thromboprophylaxis Management guideline)

A. Baseline intervention
-Early ambulation
-Intermittent pneumatic compression devices
- Consider consultation with PT to assist in early mobilization of super-obese patients

B. Pharmacologic thromboprophylaxis
Begin pharmacologic therapy if:
- previous personal history of deep venous thrombosis or pulmonary embolism
- personal history of an inherited thrombophilia

Treatment will consist of:
BMI < 40 kg/M2
Enoxaparin (Lovenox) 40 mg subcutaneous q 12 hrs, starting 12 hrs post op

BMI ≥ 40 and <50 kg/M2
Enoxaparin (Lovenox) 40 mg subcutaneous q 12 hrs, starting 12 hrs post op

BMI ≥50 kg/M2
Enoxaparin (Lovenox) 60 mg subcutaneous q 12 hrs, starting 12 hrs post op

Postpartum Management

- Early ambulation
- Continue pneumatic compression devices until ambulatory
- Epidural catheter should be removed four hours (or more) prior to restarting anticoagulation medication
- Restart prophylaxis-level anticoagulation about 12 hours after delivery
    - Lovenox 40 mg/d
    - Heparin 5,000 u bid
- Restart therapeutic-level anticoagulation about 24 hours after delivery
    - Lovenox 1 mg/kg every 12 hours
    - Suggest re-weighing the patient after delivery
    - If therapeutic anticoagulation dosing is essential prior to 24 hours after delivery, suggest using Heparin instead of Lovenox

References

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Table 1. Risk of Venous Thromboembolism With Different Inherited Thro

	Prevalence in General Population (%)	VTE Risk Per Pregnancy (No History) (%)	VTE Risk Per Pregnancy (Previous VTE) (%)
Factor V Leiden heterozygote	1–15	0.5–3.1	10
Factor V Leiden homozygote	<1	2.2–14.0	17
Prothrombin gene heterozygote	2–5	0.4–2.6	>10
Prothrombin gene homozygote	<1	2–4	>17
Factor V Leiden/ prothrombin double heterozygote	0.01	4–8.2	>20
Antithrombin deficiency	0.02	0.2–11.6	40
Protein C deficiency	0.2–0.4	0.1–1.7	4–17
Protein S deficiency	0.03–0.13	0.3–6.6	0–22

Abbreviation: VTE, venous thromboembolism.

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Appendix A

Table 3. Recommended Pharmacologic Thromboprophylaxis in Pregnancy and the Postpartum Period

Clinical Scenario	Antepartum Management	Postpartum Management
No history of VTE, no thrombophilia	Surveillance* without anticoagulation therapy	Surveillance without anticoagulation therapy or postpartum prophylactic anticoagulation therapy if the patient has multiple risk factors.†
VTE diagnosed during pregnancy	Adjusted-dose LMWH/UFH	Adjusted-dose LMWH/UFH for a minimum of 6 weeks postpartum. Longer duration of therapy may be indicated depending on the timing of VTE during pregnancy, prior VTE history, or presence of a thrombophilia. Oral anticoagulants may be considered postpartum based upon planned duration of therapy, lactation, and patient preference.
Single provoked VTE (precipitated by a specific event such as surgery, trauma, or immobility) unrelated to estrogen or pregnancy due to a transient (resolved) risk factor, no thrombophilia	Surveillance* without anticoagulation therapy	Surveillance without anticoagulation therapy or postpartum prophylactic anticoagulation therapy if the patient has additional risk factors.†
History of single unprovoked VTE (no identified precipitating factor present; includes prior VTE in pregnancy or associated with hormonal contraception), not on long-term anticoagulation	Prophylactic, intermediate-dose, or adjusted-dose LMWH/UFH	Prophylactic, intermediate-dose, or adjusted-dose LMWH/UFH regimen for 6 weeks postpartum
Low-risk thrombophilia‡ without previous VTE	Surveillance* without anticoagulation therapy	Surveillance without anticoagulation therapy or postpartum prophylactic anticoagulation therapy if the patient has additional risks factors†
Low-risk thrombophilia‡ with a family history (first-degree relative) of VTE	Surveillance* without anticoagulation therapy or prophylactic LMWH/UFH	Postpartum prophylactic anticoagulation therapy or intermediate-dose LMWH/UFH
Low-risk thrombophilia‡ with a single previous episode of VTE—Not receiving long-term anti-coagulation therapy	Prophylactic or intermediate-dose LMWH/ UFH	Postpartum prophylactic anticoagulation therapy or intermediate-dose LMWH/UFH
High-risk thrombophilia§ without previous VTE	Prophylactic or intermediate-dose LMWH/ UFH	Postpartum prophylactic anticoagulation therapy or intermediate-dose LMWH/UFH
High-risk thrombophilia§ with a single previous episode of VTE or an affected first-degree relative—Not receiving long-term anti-coagulation therapy	Prophylactic, intermediate-dose, or adjusted-dose LMWH/UFH	Postpartum prophylactic anticoagulation therapy, or intermediate or adjusted-dose LMWH/UFH for 6 weeks (therapy level should be equal to the selected antepartum treatment)
Two or more episodes of VTE—Not receiving long-term anticoagulation therapy (regardless of thrombophilia)	Intermediate-dose or adjusted-dose LMWH/UFH	Postpartum anticoagulation therapy with intermediate-dose or adjusted-dose LMWH/UFH for 6 weeks (therapy level should be equal to the selected antepartum treatment)
Two or more episodes of VTE—Receiving long-term anticoagulation therapy (regardless of thrombophilia)	Adjusted-dose LMWH or UFH	Resumption of long-term anticoagulation therapy. Oral anticoagulants may be considered postpartum based upon planned duration of therapy, lactation, and patient preference.

Abbreviations: LMWH, low-molecular-weight heparin; UFH, unfractionated heparin; VTE, venous thromboembolism.

*VTE risk assessment should be performed prepregnancy or early in pregnancy and repeated if complications develop, particularly those necessitating hospitalization or prolonged immobility.

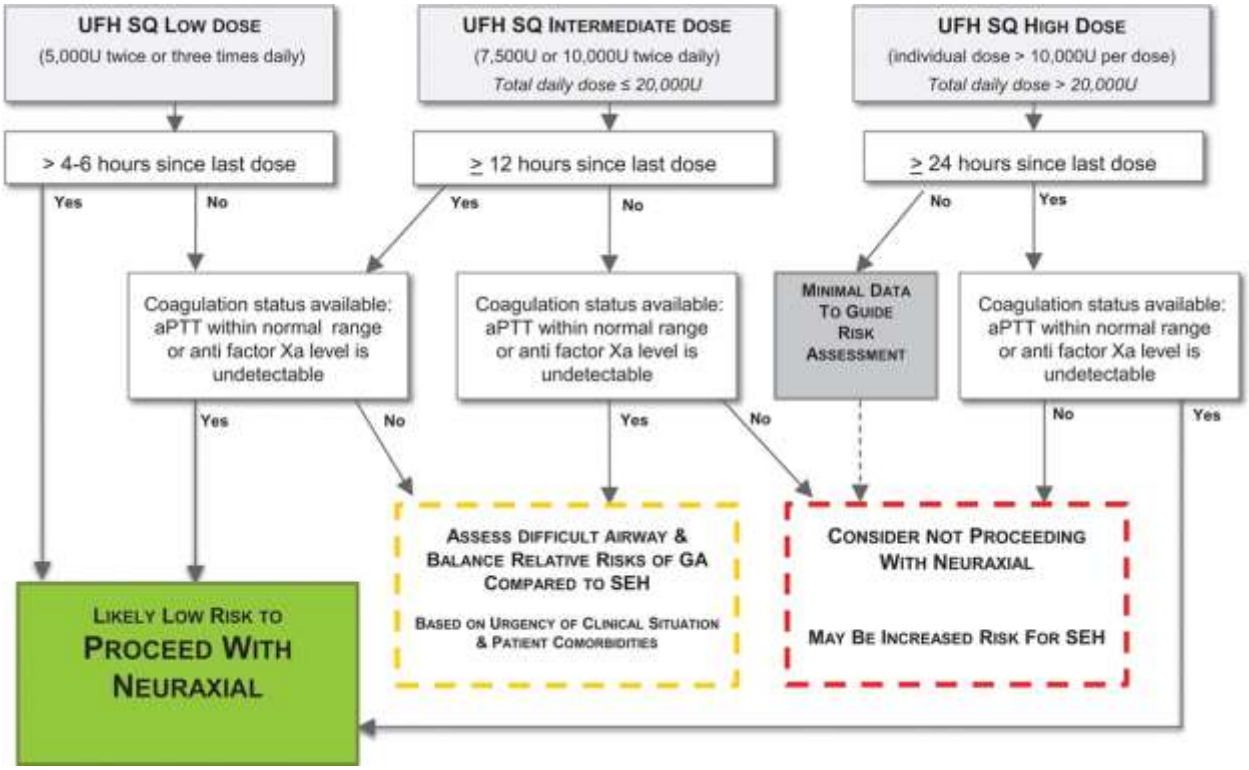
†First-degree relative with a history of a thrombotic episode, or other major thrombotic risk factors (eg, obesity, prolonged immobility, cesarean delivery).

‡Low-risk thrombophilia: Factor V Leiden heterozygote; prothrombin G20210A mutation heterozygote; protein C or protein S deficiency, antiphospholipid antibody.

§High-risk thrombophilias include Factor V Leiden homozygosity, prothrombin gene G20210A mutation homozygosity, heterozygosity for factor V Leiden and prothrombin G20210A mutation, or antithrombin deficiency.

Appendix B

Figure 3.:
Decision aid for urgent or emergent neuraxial procedures in the obstetric patient receiving UFH.



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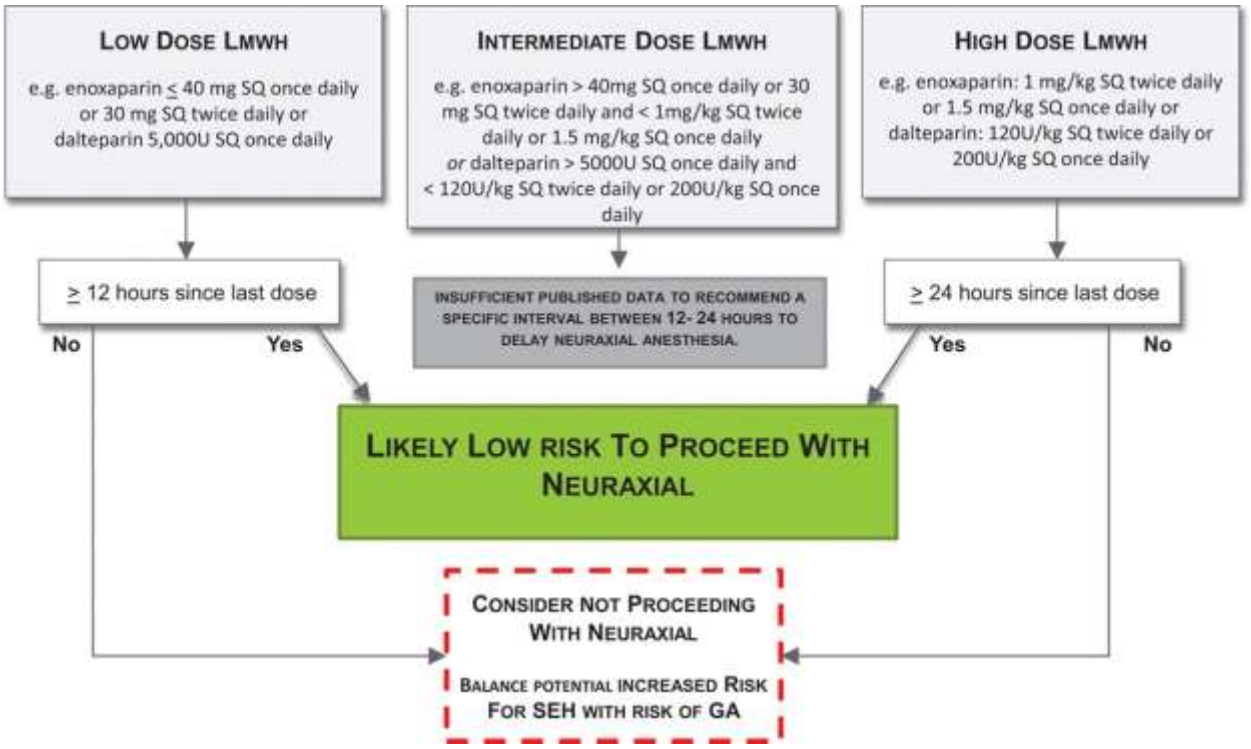
Appendix C

Figure 4.:

Decision aid for urgent or emergent neuraxial procedures in the obstetric patient receiving LMWH.



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