

PROTOCOL #35 - Maternal Fetal Medicine, University of New Mexico

ANTICOAGULATION IN PREGNANCY

A. **General**

Thromboembolic disease remains a major cause of maternal morbidity and mortality during pregnancy and the puerperium. Anticoagulation during pregnancy remains an area of controversy. In an attempt to standardize our approach and reduce the risk of both recurrent thromboembolism and bleeding, the following protocol will be followed.

B. **Indications for Therapeutic Anticoagulation**

1. acute pulmonary embolus
2. deep venous thrombophlebitis
3. septic pelvic thrombophlebitis
4. embolic events with prosthetic heart valves
5. other hematologic, cardiac or neurologic conditions requiring anticoagulation.

C. **Procedure for Intravenous Therapeutic Heparinization**

1. **Baseline labs:**
Whenever a patient is to be heparinized, a baseline PT/PTT, platelet count, and Hct must be drawn first. Calculate target PTT as 1.5-2.0 x baseline (e.g., baseline PTT = 30 sec.: Target = 45-60 sec.)
2. **Loading dose.** Heparin 5000 u IV bolus.
3. **Maintenance dose.**

- a. Mix 25,000 u heparin sodium in 250ml DSNS and start at 13 ml/hr (1320 u/hr) via IMED pump.
- b. Check APTT six hours after the bolus and adjust according to the following sliding scale:

	Rate change		Repeat	
APTT,s	Bolus(U)	Hold(min)	mL/h	APTT
<1.50x	5000	0	+3	6 h
1.5-2.0x	0	0	0	Next morning
2.0-3.0	0	30	-2	6 h
>3.0	0	60	-4	6 h

- c. Continue IV heparin for 7 - 10 days. (Consider 4 -5 days for uncomplicated calf DVT.)

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D. Subsequent (out-patient) therapeutic heparinization

1. The patient may be switched to "SQ" (subcutaneous) heparin for the duration of the pregnancy. The dose for SQ heparin is usually 2/3 the 24 hour IV dose (e.g., if patient is on 1,000 u/hr or 24,000 u/day her SQ dose would be 16,000 u/day).
2. Aim for APTT of 1.5 - 2.0 X control. Draw follow up APTTs midway between doses (e.g., if patient is on q 12 h dosing, draw a follow up APTT six hours after last dose). If subtherapeutic, increase by 50 u/kg; if overanticoagulated, reduce by 50 u/kg and repeat APTT. (e.g., 80 kg woman on 16,000 u SQ/day: $80 \text{ kg} \times 50 \text{ u/kg} = 4000 \text{ u}$; new dose = 20,000 u/day).
3. Coumadin is contraindicated during pregnancy because of its potential to cause fetal bleeding (especially intracranial bleeding) even though the maternal PT remains in her therapeutic range. It may be preferable to use it postpartum however. In general breast feeding is not contraindicated.

E. Labor and delivery or elective Cesarean: management of therapeutically heparinized patients

1. Ideally admit for induction/delivery at term with a ripe cervix the day prior to the planned procedure.
 - a. Place on IV heparin and follow the sliding scale as above (C.).
 - b. If last SQ dose more than 8 hours prior pt. should be rebolused with 5000 U IV. - If last SQ dose less than 8 hours prior, pt. may just be started on the drip as guided by the sliding scale and her admission APTT (see C. above).
 - c. Stop infusion for delivery.
 - d. Resume infusion 4 - 6 hours PP (post vaginal delivery)/18-24 hours (post cesarean delivery) and continue X 5 - 7 days.
 - e. Switch to coumadin for 3 - 6 months post-partum
 - f. Avoid conduction anesthesia
2. If the patient needs emergent cesarean delivery:
 - a. Stop heparin
 - b. type and cross for at least 2 units PRBC
 - c. If unable to wait four hours for heparin to wear off from the drip (or 8 hours after last SQ dose), consider protamine (1 mg. neutralizes 100 U heparin) (e.g., pt. on 1,000 U/hr. IV: give 10 mg slow IV)
(Caution): protamine may cause hypotension or may act as an anticoagulant if too much is given.
 - d. resume IV heparin 18 - 24 hrs. postop.

F. "Prophylactic" Anticoagulation

1. Indications. Patients who have had a prior pulmonary embolus or DVT while pregnant

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or on OCPs, as well as those with certain hereditary deficiencies of a natural anticoagulant (e.g., ATIII deficiency), and those with antiphospholipid antibodies, or massive obesity, are candidates for prophylactic anticoagulation during the current pregnancy.

2. **Dose**

- 5,000 U SQ q 12 h (consider increasing to 7,500 - 10,000 U SQ q 12 h in the third trimester, especially in obese patients).
- Should continue for 3 - 6 weeks postpartum
- Monitoring of APTT is not necessary

G. Heparin Side Effects

1. Bleeding
 - 5-10% incidence
2. Thrombocytopenia
 - 5-30% incidence
 - (obtain platelet count q 4 weeks)
3. Osteoporosis
 - 1-5% incidence (usually after 15 weeks of therapeutic regimen
 - bone densitometry studies indicated throughout duration of pregnancy).
4. Hypersensitivity
 - <1% incidence

CONSULTATION: Twenty-Four hour consultation is available by calling the Maternal Fetal Medicine service at the University of New Mexico Hospital, 1-888-866-7257.