South Australian Perinatal Practice Guidelines

Heparin infusion (unfractionated)

Indications

- Intravenous (IV) unfractionated heparin (UH) infusion is the preferred mode of treatment in acute venous thromboembolism and pulmonary embolism when there is haemodynamic instability (RCOG 2007)
- Alternative anticoagulation before surgery (LSCS or Gynaecological) or induction of labour if the woman is on other form of therapeutic anticoagulation (i.e. LMWH / Clexane or warfarin). **Nb**: warfarin should be ceased at least 3-4 days before surgery where possible

Intravenous unfractionated heparin infusion

Heparin sodium: 5,000 IU per 1 mL

Before commencing infusion:

- Take blood for group and save, Activated Partial Thromboplastin Time (APTT), complete blood picture and any thrombophilia studies that may be recommended

Dosage and administration

NB: Omit the loading dose and commence infusion at 1,000 IU per hour in the following:

- **If the woman has received thrombolysis**
- **If the last dose of therapeutic LMWH (e.g. Clexane®) has been given < 12 hours before commencing IV UH infusion**
- ***Consult with Physicians / Haematology if known renal impairment***

Set up

- Draw up x 5 ampoules of heparin sodium 5,000 units (IU) (a total of 25,000 IU) and make up to 50 mL in sodium chloride 0.9 %
- Administer through syringe pump

Loading dose

- Give intravenous bolus loading dose of 5,000 IU heparin sodium

Maintenance dose

- Commence IV UH infusion at 1,000 IU per hour

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Ongoing maintenance dose according to APTT

- Check APTT 4-6 hours after bolus dose, and 6 hours after any dose change
- In consultation with physician / obstetrician, adjust the rate of administration of UH to prolong the APTT to a range 1.5 to 2.5 times the laboratory baseline value
- If APTT is within the therapeutic range, maintain infusion rate and check APTT daily
- Contact haematologist for advice if a therapeutic APTT is not established within the first 24 hours

Precautions

- If bleeding occurs, cease UH and notify medical officer
- Cease intravenous UH when in labour or 6 hours before
- Elective operative delivery: *check CBE* and APTT after 4 hours to assess return to normal before considering regional anaesthesia

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Side effects

- Thrombocytopenia
- Osteoporosis (reversible)
- Rise in serum transaminases

Investigations

- Women on regular therapeutic heparin should have daily APTT and alternate daily complete blood picture for thrombocytopenia
- If there is a significant fall in the platelet count, an opinion should be sought from a consultant haematologist / physician

Complications

- If a complication occurs during treatment (e.g. haemorrhage), the appropriate consultant opinion as to whether to continue, vary or discontinue the unfractionated heparin treatment, should be sought
- In acute pulmonary embolism, oxygen and intravenous fluids may be required to maintain PO_2 and cardiac output

Clinical considerations

- Do not draw blood from the same line or arm as the unfractionated heparin infusion
- Fill coagulation tubes to the specified mark to avoid erroneous results
- Avoid intramuscular injections and arterial stabs during anticoagulant treatment
- Place a copy of this guideline in the clinical chart for ready reference by clinical staff

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Heparin antidote

- If anticoagulation with heparin needs to be discontinued for clinical reasons, termination of the heparin infusion will usually suffice
- If an immediate effect is required, consider administering protamine sulphate
- Discuss with Consultant Physician and / or Haematologist
- Protamine is a medication that requires a high level of caution when being prescribed and administered. Protamine sulfate neutralises heparin by virtue of its positive charge. Following IV administration, neutralisation occurs within 5 minutes
- Protamine is available in ampoules containing 50 mg in 5 mL and can be administered without need for dilution. If required however, it can be diluted in both 5 % glucose and 0.9 % sodium chloride

Dosage

- Give up to 1 mg protamine for every 100 units heparin received in the preceding 2 hours, to a maximum of 50 mg protamine. Reduce dose of protamine according to time elapsed since last administration of heparin (see table).

Time since last heparin dose	Protamine dose (mg) per 100 units heparin received in prev 2 hours
< 30 minutes	1 mg
30-60 minutes	0.5-0.75 mg
60-120 minutes	0.375-0.5 mg
> 120 minutes	0.25-0.375 mg

- The rate of administration of protamine must not exceed 5 mg protamine / minute. Dilution may facilitate slow administration. Rapid administration can cause circulatory compromise – hypotension, bradycardia, systemic and pulmonary hypertension and dyspnoea, as well as anaphylaxis, flushing and fever. Management is supportive, with resuscitation where appropriate.
- Women with known hypersensitivity reactions to fish (especially salmon), and those who have received previous protamine therapy, including protamine-containing insulins (NPH - intermediate acting insulin) may be at risk of hypersensitivity reactions
- Obtain blood for PT and APTT 15 minutes after the administration of protamine sulphate

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Abbreviations

APTT	Activated Partial Thromboplastin Time
IV	Intravenous
mL	Millilitre(s)
NB	Note
%	Percent
RCOG	Royal College of Obstetricians and Gynaecologists
UH	Unfractionated heparin

Version control and change history

PDS reference: OCE use only

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1.0	17 Aug 04	19 Feb 08	Original version
2.0	19 Feb 08	09 Jan 12	Reviewed
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