iCCnet CHSA

Clinical Protocol - HEPARIN

This clinical guideline or clinical protocol is based on a review of best practice evidence and expert opinion. It is intended to guide practice and does not replace clinical judgement. Health practitioners in Country Health SA are expected to review specific details of each patient and assess the applicability of the relevant guideline to that clinical situation. When clinical management varies, the rationale must be documented in the patient medical records including the decision made, by whom, and detailed reasons for the departure from the guideline/protocol.

Endorsed by Drug & Therapeutics Committee

National Safety and Quality Health Service Standards

Tick the Standard (s) this document relates to (can be more than one).

Governance for Safety and Quality in Health Care	Partnering with Consumers	Preventing & Controlling Healthcare associated infections	Medication Safety	Patient Identification & Procedure Matching	Blood and Blood Products	Clinical Handover	Preventing & Managing Pressure Injuries	Recognising & Responding to Clinical Deterioration	Preventing Falls & Harm from Fall
			✓						

SYNONYMS: Heparin

PRESENTATION:
5000 units in 1 mL ampoule
25 000 units in 5 mL ampoule

INDICATION:
Prophylaxis and treatment of thromboembolic disorders:
Thrombophlebitis
Deep vein thrombosis (DVT)
Pulmonary emboli
Occlusive vascular disease
Unstable angina/NSTEMI
Post-thrombolytic therapy in acute STEMI
Only to be used for aPTT samples in patients with normal baseline tests

ACTION:
Inactivate clotting factors IIa (thrombin) and Xa by binding to antithrombin III

CONTRAINDICATIONS:
Intramuscular injection (increased incidence of haematoma, irritation and pain at injection site)
Hypersensitivity to heparin or pork products
Previous acute thrombocytopenia
Severe active thrombocytopenia
Active bleeding states e.g. haemorrhage
Gastric or duodenal ulcers
Haemophilia
Severe hepatic impairment
Severe hypertension
Sub-acute bacterial endocarditis

Precautions:
During and immediately after major surgery
Epidural or spinal anaesthesia (increased risk of haematoma)

Where risk of bleeding and its consequences are higher such as with coexistent peptic ulcer, occult malignancy, liver disease, haemostatic defect, age > 65 years, an anaemia prospective group, or where the patient is being administered drugs which offset platelet function
(e.g. aspirin, dipyridamole, non-steroidal anti-Inflammatory drugs); a cross match should be considered.

Heparin infusion should be stopped 4-6 hours prior to surgery or other invasive procedure or according to individual surgical unit protocol. Prior to surgery check aPTT and platelet count

PREPARATION:

Step 1: INITIAL INTRAVENOUS BOLUS: 60 units/kg to maximum of 4000 unit bolus

Ideal Body weight (kg)	Heparin bolus dose (units)	Heparin 5,000 units/mL
45 – 49	2,700	0.54 mL
50 – 54	3,000	0.60 mL
55 – 59	3,300	0.66 mL
60 – 64	3,600	0.72 mL
65 – 69	3,900	0.78 mL
> 70	4,000	0.80 mL

Step 2: MAINTENANCE INFUSION: Add 25,000 units of HEPARIN sodium to 500 mL of glucose 5% (or compatible fluid) and infuse at a rate of 12 units/kg per hour

Ideal Body weight (kg)	Heparin dose (units/hr)	Infusion rate (mL/hr)
45 – 49	540	11
50 – 54	600	12
55 – 59	660	13
60 – 64	720	14
65 – 69	780	16
70 – 74	840	17
75 – 79	900	18
80 – 84	960	19
> 85	1000	20

Step 3: ONGOING MAINTENANCE INFUSION RATES: Adjust the dose/infusion rate based on the patient's individual aPTT results (Note: Therapeutic range may differ between laboratories).

Target aPTT = 50 – 70 seconds

For aPTTs obtained <12 hours after starting thrombolytic therapy:
- Adjust infusion upward if aPTT < 50s

- Do NOT discontinue or decrease infusion unless significant bleeding or aPTT > 150s

aPTT (s)	Change in infusion rate	Repeat aPTT
< 40	Give 3,000 units bolus dose and increase 2 mL/hr	6hr
40 – 49	Increase 1 mL/hr	6hr
50 – 75	NO CHANGE	Next morning
76 – 85	Decrease 1 mL/hr	Next morning
86 – 100	STOP infusion for 30 minutes, then decrease 2 mL/hr	6hr
101 – 150	STOP infusion for 60 minutes, then decrease 3 mL/hr	6hr
> 150	STOP infusion for 60 minutes, then decrease 6 mL/hr after. **MO input and consider seeking haematologist consult (see overleaf).**	6hr

NOTE: 50 units = 1mL (decrease 50 units/hr = 1 ml/hr)*

STABILITY:

ADMINISTRATION: IV injection, IV infusion or subcutaneous injection

COMPATABILITY:

INTERACTION: Care is needed when using heparin in patients who are taking other drugs that affect the clotting process:
NSAIDS
Antiplatelet drugs (aspirin, clopidogrel)
Anticoagulants (warfarin, dabigatran, rivaroxiban, apixaban)
Thrombolytics
Other drugs that increase potassium concentration (ACE inhibitors, potassium sparing diuretics)

Warfarin therapy
See Country Health SA Warfarin Guidelines (found on Country Health SA Wiki: http://wiki.health.sa.gov.au/Chsa/Drug_and_Therapeutics)

CHANGING TO/FROM ENOXAPARIN
From IV unfractionated heparin to subcutaneous enoxaparin
- cease heparin infusion and give subcutaneous enoxaparin dose immediately

From subcutaneous enoxaparin to IV heparin infusion
- cease enoxaparin
- commence heparin per protocol including bolus dose when next enoxaparin dose would have been due (i.e. 12 hours after last enoxaparin dose if patient was on twice daily dosing; or 24 hours after last enoxaparin dose if patient was on once daily dosing).

DOSE TITRATION: Refer to Preparation above

DURATION OF TREATMENT: Refer Preparation above

MONITORING:

Baseline complete blood picture, then daily while on heparin infusion
Baseline INR and aPTT prior to initiation of heparin
Measure aPTT six hours after commencement of infusion
If aPTT is within therapeutic range maintain infusion rate and check aPTT daily (0800)
If aPTT is not within therapeutic range, adjust infusion rate according to protocol unless otherwise directed
Remeasure aPTT six hours after a change in infusion rate, and daily (0800)

Intravenous
Check APTT according to heparin infusion sliding scale
NB: APTT should be maintained at the therapeutic level
Check all urine, faeces and vomitus for macroscopic blood

Subcutaneous
Check abdomen for bruising
Vary position of injection site
Apply pressure over the injection site for 5 minutes after administration

PLATELET MONITORING
Check prior to commencing heparin
- recent (< 100 days) heparin exposure
- repeat day 1, then alternate days until heparin is ceased
- no recent heparin exposure
- repeat day 3, then alternate days until heparin is ceased

If platelets decrease by > 50% from baseline OR platelet count is < 150 x 10^9 /L
Contact duty haematologist URGENTLY
Royal Adelaide Hospital (08) 8222 4000
Queen Elizabeth Hospital (08) 8222 6000
Flinders Medical Centre (08) 8204 5511

The likelihood of Heparin Induced Thrombocytopaenia using a clinical scoring system and appropriate diagnostic advice will be provided by haematology
DELAY IN ACHIEVING APTT IN THERAPEUTIC RANGE
If you suspect "heparin resistance" or if your patient requires > 40,000 units heparin/24 hours to achieve a therapeutic APTT, or your patient has a greater than therapeutic APTT for > 24 hours
Contact duty haematologist URGENTLY

ADVERSE EFFECTS:

If bleeding occurs **cease heparin infusion immediately**, resuscitate patient and check aPTT. Note the possibility of occult bleeding for patients on heparin infusion (monitor Hb and haemodynamic status, investigate any changes)

Bleeding/haemorrhage
Mild transient thrombocytopenia
Severe thrombocytopenia (rare)
Hyperkalaemia
Mild transient elevation of LFTs

Skin necrosis at injection site (rare)
Hypersensitivity manifested by - pruritus, urticaria and asthma-like symptoms