

GUIDELINE FOR USE OF

Unfractionated Heparin (UFH) for systemic anticoagulation – ADULTS

Cork University Hospital

Guideline Addendum – March 2021

- THE PREPARATION OF IV HEPARIN **CONTINUOUS INFUSION** HAS BEEN AMENDED.
- TO PREPARE IV HEPARIN CONTINUOUS INFUSION FOR SYSTEMIC ANTICOAGULATION:
 - Draw up 25ml of Unfractionated Heparin 1000 units/ ml in a syringe
 - Add 25mls of 0.9% sodium chloride to produce a concentration of 500 units/ml.

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GENERAL

In all cases, send blood for baseline FBC, coagulation screen, U&E's and LFT's before initiating therapy. Exercise caution with renal/liver patients as they will be at a higher risk of bleeding. Refer to Haematology SpR if patient has thrombocytopenia.

BASELINE aPTT

Take a baseline aPTT – discuss with Haematology if not normal.

BOLUS DOSE FOR PATIENTS WHO HAVE NOT RECEIVED HEPARIN WITHIN THE LAST 6 HOURS

Preparation: Heparin Sodium Injection 1,000 units/ml. **Dose:** prescribe 5000 units as stat dose: **5mls of 1,000 units/ml**. If bolus dose is not to be administered or was administered previously (e.g. Cath Lab), the prescriber should sign in the administration chart to signify this.

IV CONTINUOUS INFUSION

To make up the heparin syringe:

- Draw up 25ml of Unfractionated Heparin 1000 units/ ml in a syringe (use five vials of 5000 units/ 5ml).
- Add 25mls of 0.9% sodium chloride to produce a concentration of 500 units/ml.
- Administer via a syringe pump.
 - START THE INFUSION AT A RATE OF **2mls/hour** (1,000 units/hour)
 - Check APTT ratio/APTT (secs) 4 hours after infusion start.
 - Sampling: Do not take coag. samples from lines or from veins proximal to the site of the heparin infusion, as this may lead to erroneous results.

DOSING FOR EXTREMES OF BODY WEIGHT

Dose adjustments to both the bolus dose and the initial infusion dose may be necessary at extremes of bodyweight (<50kg, >100kg). Please contact Consultant/Haematology in these cases.

TARGET APTT RANGE

- The target APTT ratio is **1.5 – 2.5** (see corresponding APTT (secs) below)
- A subset of this range may be appropriate in certain clinical scenarios e.g. high bleeding risk, severe DVT/PE. Contact Consultant/Haematology in these cases.
- For a target range outside the recommended range, a different dose adjustment table must be prescribed (Use Appendix 2).
- If the APTT / APTT ratio is outside the normal range, adjust the Heparin Infusion as per Table 1 below.
- A significant change in the patient's clinical condition should prompt an immediate APTT determination, followed by dose adjustment if necessary.

RESTARTING AFTER TEMPORARY BREAK IN INFUSION

Note: if restarting infusion after a temporary break (e.g. procedure) restart at the rate that had achieved the target APTT as this is based on the individual patient's response.

ADMINISTRATION CHART

- A Heparin Infusion Prescription Chart is available to document prescribing and administration of variable dosing of heparin (Appendix 1)
- If using another subset of this range (1.5-2.5) is required complete Appendix 2.
- If using the Heparin Infusion Prescription Chart, prescribe on the regular section: 'heparin infusion - see separate infusion chart'

HEPARIN INDUCED THROMBOCYTOPENIA (HIT)

- All patients who are to receive heparin should have a platelet count on the day of starting treatment.
- For patients previously exposed to heparin in the last 100 days, obtain a platelet count 24 hours after starting heparin.
- For all other patients, alternate day platelet counts should be performed from days 4 to 14 of therapy.
- Signs of HIT include a 50% reduction of platelet count, thrombosis, or skin allergy.
- If HIT is strongly suspected or confirmed, contact haematology.

Table 1: Dose Adjustments to be made based on APTT Ratio / APTT (secs)

APTT Ratio[#]	APTT (secs)[#]	Heparin Infusion Rate Change Recommended	Recheck APTT (hours)
Above 6.6	Above 178	Stop the infusion for 1 hour, then reduce by 500 units/hour (↓ by 1ml/hour) and maintain at this rate until next APTT	4
5.1 – 6.6	137 – 178	Reduce by 500 units/hour (↓ by 1ml/hour) and maintain at this rate until next APTT	4
4.1 – 5.0	110 – 136	Reduce by 300 units/hour (↓ by 0.6ml/hour) and maintain at this rate until next APTT	4
3.1 – 4.0	84 – 109	Reduce by 100 units/hour (↓ by 0.2ml/hour) and maintain at this rate until next APTT	4
2.6 – 3.0	70 – 83	Reduce by 50 units/hour (↓ by 0.1ml/hour) and maintain at this rate until next APTT	4
1.5 – 2.5	40 – 69	No change necessary	4
1.2 – 1.4	33 – 39	Increase infusion by 200 units/hour (↑ by 0.4ml/hour) and maintain at this rate until next APTT	4
Less than 1.2	Less than 33	Increase infusion by 400 units/hour (↑ by 0.8ml/hour) and maintain at this rate until next APTT	4

[#] Use APTT Ratio if available. If not, use APTT (secs) and adjust dose accordingly.

Worked Example 1:

Step 1: A patient weighing 60kg receives a bolus dose of 5000units equivalent to 5mls of Heparin 1,000 units/ml.

Step 2: The patient is started on the Heparin infusion of 2mls/hour

Step 3: The APTT ratio is measured 4 hours after the infusion is started. The APTT ratio target is 1.5 – 2.5. The APTT ratio returned is 2.9. Using Table 1, it is recommended to reduce the infusion by 0.1ml/hour i.e. From 2mls/hour to 1.9mls/hour. Check APTT 4 hours later.

Worked Example 2:

Step 1: A patient weighing 82kg receives a bolus dose of 5000units equivalent to 5mls of Heparin 1,000 units/ml.

Step 2: The patient is started on the Heparin infusion of 2mls/hour.

Step 3: The APTT ratio is measured 4 hours after the infusion is started. The APTT ratio target is 1.5 – 2.5. The APTT ratio returned is 1.3. Using Table 1, it is recommended to increase the infusion by 0.4ml/hour i.e. From 2mls/hour to 2.4mls/hour. Check APTT 4 hours later.

References:

Heparin sodium 5,000 I.U./ml (23,000 I.U. in 5ml) Summary of Product Characteristics. Wockhardt UK Ltd. Available from: http://www.imb.ie/images/uploaded/swedocuments/LicenseSPC_PA1339-009-007_14082013100105.pdf

How to Anticoagulation. Drug and Therapeutics Bulletin 1992; 30: 77-80

St Vincents University Hospital. Procedure to standardise management of SVUH patients on an unfractionated heparin infusion. Version 06 – 13-03-2009.

Guy's and St Thomas' NHS Foundation Trust. Clinical Guideline. Adult guidelines for Unfractionated Heparin infusions for systemic anticoagulation for APTT 2 – 2.5. Review date 30 May 2015.

Appendix 1

CONSIDER ALLERGIES BEFORE PRESCRIBING - CHECK FRONT OF CHART	NAME		DATE OF BIRTH
	WARD	MRN	WEIGHT (KG)

HEPARIN INFUSION PRESCRIPTION FOR VARIABLE DOSING

(For weight <50kg or >100kg, contact Consultant/Haematology)

1. Initial Bolus Dose: Prescription

Administration

Medication	Dose	Route	Date to be given	Time to be given hh:mm	Prescriber signature	Prescriber signature if bolus NOT to be administered	Given by /Checked by	Time given
Heparin Sodium Injection 1,000 units/ml	5,000 units (5 ml)	IV Bolus					/	

2. Variable Dosing Infusion

Target APTT Ratio: 1.5 – 2.5 (corresponding APTT (secs))

Prescription

Monitoring & Dose Adjustment by Protocol

Administration

Medication Heparin Sodium in Normal Saline 25,000 units/50ml (500 units per ml)	Dose 1,000 units/hour (2ml/hour) initially – check APTT 4 hours after start of infusion, then adjust as per protocol		Date	Lab Result Time hh:mm	APTT Result	Infusion Rate (ml/hour)	Infusion Adjustment Time hh:mm	Time of Next APTT	Given by / Checked by
Route: Intravenous									/
Start Date:		Start Time:							/
Prescriber sign:		Contact No.							/
Stop Date:		Stop Time:							/
Prescriber sign:		Contact No.							/
PROTOCOL FOR HEPARIN ADJUSTMENT – CHECK APTT EVERY 4 HOURS									
APTT (secs)	APTT Ratio	Dose Adjustment							/
Above 178	Above 6.6	Stop the infusion for 1 hour, then reduce by 500 units/hour (↓ by 1ml/hour) and maintain this rate until next APTT check							/
137 – 178	5.1 – 6.6	Reduce by 500 units/hour (↓ by 1ml/hour) and maintain this rate until next APTT check							/
110 – 136	4.1 – 5.0	Reduce by 300 units/hour (↓ by 0.6ml/hour) and maintain this rate until next APTT							/
84 – 109	3.1 – 4.0	Reduce by 100 units/hour (↓ by 0.2ml/hour) and maintain this rate until next APTT check							/
70 – 83	2.6 – 3.0	Reduce by 50 units/hour (↓ by 0.1ml/hour) and maintain this rate until next APTT check							/
40 – 69	1.5 – 2.5	No change necessary							/
33 – 39	1.2 – 1.4	Increase infusion by 200 units/hour (↑ by 0.4ml/hour) and maintain this rate until next APTT check							/
Less than 33	Less than 1.2	Increase infusion by 400 units/hour (↑ by 0.8ml/hour) and maintain this rate until next APTT check							/

Appendix 2

CONSIDER ALLERGIES BEFORE PRESCRIBING - CHECK FRONT OF CHART	NAME		DATE OF BIRTH
	WARD	MRN	WEIGHT (KG)

HEPARIN INFUSION PRESCRIPTION FOR VARIABLE DOSING

3. Initial Bolus Dose: Prescription

Administration

Medication	Dose	Route	Date to be given	Time to be given hh:mm	Prescriber signature	Prescriber signature if bolus NOT to be administered	Given by /Checked by	Time given
Heparin Sodium Injection 1,000 units/ml		IV Bolus					/	

4. Variable Dosing Infusion

Target APTT Ratio: - (corresponding APTT (secs))

Prescription

Monitoring & Dose Adjustment by Protocol

Administration

Medication Heparin Sodium in Normal Saline 25,000 units/50ml (500 units per ml)		Dose 1,000 units/hour (2ml/hour) initially – check APTT 4 hours after start of infusion, then adjust as per protocol	Date	Lab Result Time hh:mm	APTT Result	Infusion Rate (ml/hour)	Infusion Adjustment Time hh:mm	Time of Next APTT	Given by / Checked by
Route: Intravenous									/
Start Date:		Start Time:							/
Prescriber sign:		Contact No.							/
Stop Date:		Stop Time:							/
Prescriber sign:		Contact No.							/
PROTOCOL FOR HEPARIN ADJUSTMENT – CHECK APTT EVERY 4 HOURS									
APTT (secs)	APTT Ratio	Dose Adjustment							/
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