FOR CRITICAL CARE USE ONLY

Critical Care VTE prophylaxis protocol

Indications: All patients on the unit EXCEPT NEURO PATIENTS- SEE BOX BELOW

- In critical care use subcutaneous dalteparin for VTE prophylaxis at doses below.
- All patients should have a LMW (low molecular weight) Heparin level measured after 7 days if CrCl <30mls/min.
- All patients should have a LMW Heparin level after 3 days if they are in both extreme range of weight and have renal impairment (CrCl<10ml/min or requiring CVVHD renal replacement therapy). See table and groups highlighted in red.
- All patients with CrCl<30ml/min requiring an invasive procedure/intervention e.g. biopsy/surgery: withhold s/c dalteparin the evening before the procedure, and take a "trough" LMW Heparin level to ensure there is no accumulation (level should be less than 0.1 anti-Xa units/ml).
- To check an anti-Xa level see guidance below.
- For patients with CrCl <30 ml/min who may require surgery within 24 hours (elective or emergency), use unfractionated heparin 5000units sc twice daily. Includes all Transplant patients in the first 24hours. Discuss with relevant specialties thereafter.

Guidance on LMW Heparin (anti-factor Xa) monitoring for *prophylactic* doses of LMWH

- Order as "LMW Heparin assay" on TRAK (search for "heparin" and you will get 5 choices – choose "LMW Heparin assay"; automated test done at RIE site, available 24 hours a day, please inform haematology laboratory staff if request is urgent; courier to RIE lab if at other sites
- Use a green-top citrated tube; ensure sample is filled to the "level" marked on the side of the tube as the lab cannot assay the sample if underfilled.
- Level must be checked 3-4 hours post administration of the dose of LMW Heparin.
- Target "peak" range is 0.1-0.4 units/ml.
- Check a one-off level and thereafter as required.

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Pharmacological thromboprophylaxis- DALTEPARIN

CrCl mls/min	<50kg	50-100kg	100-150kg	>150kg
>30	2500 units daily	5000 units daily	5000 units twice daily	7500 units twice daily
10-30	*2500 units daily (with caution)	5000 units daily	5000 units twice daily	*7500 units twice daily
<10 or CVVHD	*2500 units daily (with caution)	**5000 units daily	**5000 units daily	*7500 units daily

***Check anti-Xa level after 3 days in extreme range of weight and renal impairment**
****Check anti-Xa level after 7 days**

Enhanced Pharmacological thromboprophylaxis for Covid 19 (+)ve patients - DALTEPARIN

CrCl mls/min	<50kg	50-100kg	100-150kg	>150kg
>30	2500 units twice daily	5000 units twice daily	7500 units twice daily	10,000 units twice daily
10-30	2500 units twice daily (with caution)	5000 units twice daily	7500 units twice daily	10,000 units twice daily
<10 or CVVHD	2500 units once daily (with caution)	5000 units once daily	7500 units once daily	10,000 units once daily

Check anti-Xa levels, 3-4 hours after 1st dose and discuss with Haematology.
Note Covid-19 patients on CVVHD might require full anticoagulation with unfractionated heparin.
***Review enhanced protocol Day 14 or prior to discharge from critical care if earlier than D14**

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Cautions and contraindications:

- potentially bleeding lesions (e.g. varices, active peptic ulcer in last 3 months)
- advanced liver disease
- severe uncontrolled arterial hypertension
- uncorrected bleeding disorders (e.g. haemophilias)
- active bleeding of any sort
- platelet count <50 x 10^9/L * **for Covid -19 (+)ve patients platelet count<30 x 10^9/L**
- acquired coagulopathy i.e. APTTr ≥1.5 or INR ≥1.5
- previous history of HIT

Mechanical thromboprophylaxis

1. All patients will wear graduated elastic compression stockings (TEDS).
2. Intermittent pneumatic compression devices (IPCD) should be used if pharmacological prophylaxis contraindicated.

Mechanical thromboprophylaxis should NOT be used if patients have any of the following:

- a stroke where IPCD should be used alone
- massive leg oedema
- severe peripheral artery disease
- severe peripheral neuropathy
- major leg deformity
- dermatitis
- an existing DVT in a leg

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NEURO PATIENTS-mechanical thromboprophylaxis as above.
Subarachnoid haemorrhage: once aneurysm is secured (e.g.coiled or clipped), dalteparin as above.
Intracerebral haemorrhage: use of pharmacological thromboprophylaxis should be discussed with the referring neurosurgeon initially and at 14 days.
Traumatic head injury: should not receive pharmacological thromboprophylaxis initially. VTE prophylaxis should be given within 48-72 hours of injury in stable* traumatic brain injury following discussion with the neurosurgery.
*clinical, radiological and/or monitoring parameters.

Elective neurosurgery: All patients should receive dalteparin.
Spinal cord injury (SCI): All patients should receive dalteparin unless incomplete SCI associated with suspected or proven spinal haematoma.
Haemorrhagic stroke: Use of aspirin and heparin should be discussed with the stroke team initially and at 14 days.
Cerebral infarction: If no thrombolysis given, aspirin 300mg should be considered immediately, then continued (300mg daily) for 2 weeks. If thrombolysis has been given, withhold aspirin for 24 hours. Discuss dalteparin with stroke team at 24 hours post event for all stroke patients.

References

1. Douketis J et al. Prophylaxis against deep vein thrombosis in critically ill patients with severe renal insufficiency with the low molecular-weight heparin dalteparin: an assessment of safety and pharmacodynamics: the DIRECT study. Arch Intern Med. 2008;168(16):1805-12
2. The PROTECT Investigators for the Canadian Critical Care Trials Group and the Australian and New Zealand Intensive Care Society Clinical Trials Group. Dalteparin versus Unfractionated Heparin in Critically ill Patients. The New England Journal of Medicine. 2011;363:1305-1314.
3. Park D et al. Treatment with Dalteparin is associated with a lower risk of bleeding compared to treatment with unfractionated heparin in patients with renal insufficiency. J Gen Intern Med. 2016 Feb;31(2):182-187.
4. University Hospital Division Antithrombotic Guide (NHS Lothian). Version 4.1. October 2018.
5. Scottish Intercollegiate Guidelines Network (SIGN). Prohylaxis of Venous Thromboembolism. Edinburgh:SIGN,2014.(SIGN publication no.122)
6. International Stroke Trial Collaborative Group. The International Stroke Trial (IST): a randomised trial of aspirin, subcutaneous heparin, both or neither among 19, 435 patients with acute ischaemic stroke. Lancet 1997:349:1569-81

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