Prevention of thrombosis in COVID-19 +ve‡ adult inpatients over 16 years of age (pregnant and non-pregnant) not receiving renal replacement therapy (RRT) on Critical Care Wards requiring advanced respiratory support‡‡

‡Patients are classified as COVID-19 +ve if they have clinical features of COVID-19 infection and/or test positive for COVID-19.

‡‡Includes COVID-19 +ve inpatients in Critical Care wards (High Dependency or Intensive Care) who require advanced respiratory support such as high flow nasal oxygen, continuous positive airway pressure (CPAP), non-invasive or invasive mechanical ventilation.

- There is anecdotal and post mortem evidence that patients who are COVID +ve are at increased risk of venous thrombosis, particularly those who are most unwell
- It is possible that standard prophylactic doses of low molecular weight heparin (LMWH) are less effective in COVID +ve patients
- Increasing the frequency +/- duration of prophylactic doses of LMWH may reduce the risk of venous thrombosis
- Clinicians involved in the development of this guideline have thoroughly considered the pros and cons of moving away from standard thromboprophylaxis doses.

Recommendations

- **Prescribe dalteparin subcutaneously (SC) 5000 units twice daily** for every COVID +ve inpatient on Critical Care wards requiring advanced respiratory support who have no contraindications (see page-2 for details of contra-indications). Please note the dose adjustments and monitoring requirements below:

Dose adjustments

weight <50kg	**Reduce** dalteparin dose to 2500 units SC twice daily
weight >120kg	**Increase** dalteparin dose to 7500 units SC twice daily
Pregnant women	In pregnant women the booking weight should be used up to 34 weeks gestation. For patients >34 weeks gestation the woman's 34-36 week weight should be used where available and if needed the dose recalculated.
	Pregnant woman weighing >90kg – a dose of dalteparin higher than 5000 units SC twice daily may be required, so specialist advice should be sought from obstetrics/ haematology.

Monitoring requirements (CrCl calculator available here)
AntiXa monitoring (contact Haematology Lab at University Hospital Crosshouse on ext 27404 to arrange) is recommended in the following patient groups:

CrCl <30 ml/min	check antiXa 4 hours post dose after 5 doses
Weight <50kg	check antiXa 4 hours post dose after 5 doses
Weight >120kg AND CrCl ≥30ml/min	check antiXa 4 hours post dose after 3 doses
Weight >120kg AND CrCl<30ml/min	check antiXa 4 hours post dose after 3 doses and repeat after 5 doses

Target antiXa: 0.1-0.4 units/ml. If out with target, please seek advice from consultant haematologist, including further antiXa monitoring requirements.

- **Contraindications against thromboprophylaxis with LMWH**
  - Platelet count ≤ 50 x10^9/L *(patients with a platelet count between 30-49 x 10^9/L can be considered for dalteparin 5000units* ***once*** *daily depending on bleeding risks, at the discretion of their consultant)*
  - Receiving anticoagulation for another reason
  - Patient considered to be at high bleeding risk e.g. recent intracranial haemorrhage, untreated inherited/acquired bleeding disorders
  - Trauma with high bleeding risk
  - Active bleeding
  - Heparin induced thrombocytopaenia – see details in page 2
  - Acute stroke (use intermittent pneumatic compression if immobile & contact stroke team for guidance)
  - Within 12 hours of procedures e.g. surgery, lumbar puncture
  - Acute bacterial endocarditis
  - Persistent hypertension (BP ≥230/120 mmHg)
  - Liver failure and INR>2

- Patients with a contraindication for thromboprophylaxis should be considered for mechanical thromboprophylaxis with intermittent pneumatic compression (IPC).
- When clinical condition improves and patient is moved to a downstream ward, standard prophylactic LMWH should be prescribed until discharge as per NHS A&A Medical VTE prophylaxis guidelines.

Remember

- Patients with COVID-19 can develop abnormal coagulation and thrombocytopaenia **BUT** this is not common, and bleeding symptoms are rare.
- Prolonged PT, APTT and TCT are not a contraindication to administering thromboprophylaxis as long as fibrinogen is ≥1.0 (this is measured automatically by the lab if TCT ≥18secs).

Heparin induced thrombocytopaenia

If platelet count falls by more than 50% baseline, or there are any other indications to suggest the development of Heparin induced thrombocytopaenia (HIT), calculate HIT score (using this link) and discuss urgently with consultant haematologist.

PLEASE BE AWARE:

There is currently limited evidence to inform best practice in thromboprophylaxis in COVID 19 patients. Dalteparin dosing recommendations included in this guideline are off label (refer to Code of Practice for Medicines Governance – section 9b for further guidance on prescribing "off-label" medicines). Critical care areas using this guideline are requested to monitor major bleeding events[1] and thrombotic events to allow for an ongoing evaluation of the recommendation within this guideline and report any these events through DATIX.

Adapted with kind permissions from NHS Greater Glasgow & Clyde guideline (version 8) 28th April 2020

Bibliography

1. NICE guideline [NG186]. COVID-19 rapid guideline: reducing the risk of venous thromboembolism in over 16s with COVID-19. Published 20 November 2020. Available from: https://www.nice.org.uk/guidance/ng186 (accessed 15th January 2021).
2. NHS Greater Glasgow & Clyde. Prevention of thrombosis in COVID-19 +ve adult inpatients not receiving renal replacement therapy (RRT) on Critical Care Wards. Version 8, 28/4/20. Available from: https://handbook.ggcmedicines.org.uk/guidelines/covid-19-coronavirus/thromboprophylaxis-in-covid-19-patients/ (accessed 15th January 2021).

[1] Major bleeding is defined by ISTH as:

a. Fatal bleeding, and/or
b. Symptomatic bleeding in a critical area or organ, such as intracranial, intraspinal, intraocular, retroperitoneal, intraarticular or pericardial, or intramuscular with compartment syndrome, and/or
c. Bleeding causing a fall in hemoglobin level of 20 g L)1 (1.24 mmol L)1) or more, or leading to transfusion of two or more units of whole blood or red cells.