ENOXAPARIN 2021

Newborn use only

<table>
<tr><td>Alert</td><td>Enoxaparin is one type of low molecular weight heparin (LMWH).
Commonly known as Clexane.
High risk medication. An overdose can be fatal.
Treatment must be discussed with the Haematologist on-call before commencement.
LMWH is not a suitable choice of anticoagulant in patients with significant bleeding risk (unfractionated heparin (UFH) is preferred), who are clinically unstable or about to have invasive procedures. This is due to longer half-life than UFH and only partial reversal with protamine.
Monitoring is performed with anti-factor Xa levels. The APTT is not useful in monitoring LMWH therapy. Please check with your local pathology department on what time of the day/night anti-factor Xa sample processing is performed.</td></tr>
<tr><td>Indication</td><td>Prophylaxis of thromboembolic disorder.

(Note: Enoxaparin/heparin does not treat the clot that has already occurred but rather its role is to prevent clot extension, i.e. secondary prophylaxis)</td></tr>
<tr><td>Action</td><td>It binds to and potentiates anti-thrombin III activity leading to irreversible inactivation of factor Xa, and to a lesser degree inactivation of factor IIa; in turn, inhibiting thrombin and fibrinogen generation.</td></tr>
<tr><td>Drug type</td><td>Antithrombotic agent/ anticoagulant; LMWH</td></tr>
<tr><td>Trade name</td><td>Clexane, Clexane Forte</td></tr>
<tr><td>Presentation</td><td>Clexane (enoxaparin sodium) prefilled syringes, with/out automatic safety lock system, solution for injection*:
20 mg/0.2mL
40 mg/0.4mL
60 mg/0.6mL
80 mg/0.8mL
100 mg/1mL
*containing 10 000 anti-Xa unit/mL

Clexane Forte, with/out automatic safety lock system, solution for injection$^{\Delta}$:
120mg/0.8mL
150mg/1mL
$^{\Delta}$ containing 15 000 anti-Xa unit/mL

Enoxaparin injections for patient specific doses can be aseptically prepared by local pharmacy.</td></tr>
<tr><td>Dose</td><td>Subcutaneous (SC) injection:[1]

<table>
<tr><th></th><th><2 months of age</th><th>≥2 months</th></tr>
<tr><td>Prophylactic dose</td><td>0.75 mg/kg/dose 12 hourly</td><td>0.5 mg/kg/dose 12 hourly</td></tr>
<tr><td>Treatment dose</td><td>1.5 mg/kg/dose 12 hourly</td><td>1 mg/kg/dose 12 hourly</td></tr>
</table>

Subsequent dose titration is as per anti-Xa levels. The first anti-Xa measurement is usually done after 3 to 4 doses, i.e. around 48 hours after the commencement.
Target peak anti-Xa range: 0.5 to 1.0 units/mL to be measured 4 hours (3-5 hours) after the last subcutaneous injection.[1] Refer to dose adjustment below:[8]

<table>
<tr><th>Anti-factor Xa concentration unit/mL</th><th>Dose adjustment</th><th>Next anti-factor Xa measurement</th></tr>
<tr><td><0.35</td><td>increase next dose by 25%</td><td>4 hr following dose adjustment</td></tr>
<tr><td>0.35 - 0.49</td><td>increase next dose by 10%</td><td>4 hr following dose adjustment</td></tr>
<tr><td>0.5 - 1.0</td><td>no change</td><td>Weekly 4 hr following a dose
If change in renal function, addition of antibiotics, signs of bleeding, check level 4 hr after next dose.</td></tr>
<tr><td>1.1-1.5</td><td>decrease next dose by 20%</td><td>Before next dose and 4 h following dose adjustment</td></tr>
<tr><td>1.6 to 2.0</td><td>hold dose until anti-factor Xa level <1 then decrease next dose by 30%</td><td>4 hr following dose adjustment</td></tr>
</table>
</td></tr>
</table>

	>2.0	hold dose until anti-factor Xa level <0.5 then decrease next dose by 40%	12 h until anti-factor Xa level <0.5, then 4 hr following reinstitution of therapy

Dose adjustment	Therapeutic hypothermia - Enoxaparin is not the preferred anticoagulant. Renal impairment – Monitor anti-Xa factor closely. Dose adjustment is required in severe renal impairment. Discuss with haematologist. Hepatic impairment – Dose adjustment is not established.
Maximum dose	
Total cumulative dose	
Route	Subcutaneous injection.
Preparation	Enoxaparin injections for patient specific administration can be aseptically prepared by local pharmacy as follows: Draw 0.8 mL of sodium chloride 0.9% into a 2 mL syringe. Inject the contents of enoxaparin 20 mg/0.2 mL pre-filled syringe into the sodium chloride syringe to make a final volume of 1 mL. The resulting solution contains 20 mg/mL.

Dose	1.5 mg	2 mg	3 mg	4 mg	5 mg
Volume	0.075 mL	0.1 mL	0.15 mL	0.2 mL	0.25 mL

	Discard remaining solution.
Administration	Administer subcutaneously. Do not remove the air bubble in the prefilled syringe. Rotate the site of subcutaneous injection. Enoxaparin may also be administered via an Insuflon catheter placed into the subcutaneous tissue. However, Insuflon catheters are not recommended for infants less than 3kg . When administering enoxaparin via an Insuflon catheter, the air bubble in the syringe should be removed. Do not rub the injection site after administration. Note: Injection in low birth weight infants with little subcutaneous fat may enter intramuscular rather than subcutaneous which can impact anti-Xa level due to different absorption rate and pharmacokinetics. Also significant tissue oedema at injection sites may also impact absorption.
Monitoring	Anti-factor Xa levels Platelet count every 2-3 days Potassium levels Renal function
Contraindications	Hypersensitivity to enoxaparin, heparin or other low molecular weight heparins Active uncontrollable bleeding Severe thrombocytopenia (MIMS) Haemorrhagic stroke Acute bacterial endocarditis (MIMS) History of heparin-induced thrombocytopenia (HIT) within the past 100 days (MIMS)
Precautions	Risk of haemorrhage – example, acquired or congenital bleeding disorders Concomitant medical conditions: Hepatic insufficiency, uncontrolled hypertension, a history of gastrointestinal ulceration, recent neuro- or ophthalmologic surgery and haemorrhage. Heparin-induced thrombocytopenia (HIT) Spinal anaesthesia
Drug interactions	Drugs affecting haemostasis should be discontinued prior to enoxaparin therapy unless strictly indicated: Anticoagulants, thrombolytics, non-steroidal anti-inflammatory agents, aspirin, antiplatelet agents or systemic glucocorticoids. If the combination is indicated, enoxaparin should be used with careful clinical and laboratory monitoring of the haemostatic factors, when appropriate. Drugs that increase serum potassium levels may be administered concurrently with enoxaparin sodium under careful clinical and laboratory monitoring.
Adverse reactions	Elevated liver enzymes, anaemia, diarrhoea, peripheral oedema, fever, allergic reaction, urticarial, bruising/ pain at injection site, bleeding, hyperkalaemia

	Rare: Thrombocytopenia, hyperkalaemia, cholestasis, bullous dermatitis, osteoporosis, allergic reaction
Compatibility	Glucose 5%, sodium chloride 0.9%
Incompatibility	No information available
Stability	Discard any unused contents of syringes. Aseptically prepared product by local pharmacy is stored refrigerated at 2-8°C with an expiry date of 7 days.
Storage	Store below 25°C. Do not freeze. Aseptically prepared product by local pharmacy is stored refrigerated at 2-8°C.
Excipients	Water for injections
Special comments	Protamine may be used to reverse anticoagulant effect of enoxaparin but the reversal is partial.
Evidence	Refer to full version.
Practice points	Refer to full version.
References	Refer to full version.

VERSION/NUMBER	DATE
Original	**14/01/2021**
REVIEW	14/01/2026

Authors Contribution

Original author/s	Nilkant Phad, Srinivas Bolisetty, Juliana Teo
Evidence Review	Tim Schindler
Expert review	Juliana Teo, Hari Ravindranathan
Nursing Review	Eszter Jozsa, Kirsty Minter, Renae Gengaroli, Samantha Hassall
Pharmacy Review	Wendy Huynh, Michelle Jenkins
ANMF Group contributors	Bhavesh Mehta, Himanshu Popat, John Sinn, Rajesh Maheshwari, Carmen Burman, Jessica Mehegan, Helen Huynh, Karel Allegaert, Thomas Young
Final editing and review of the original	Thao Tran, Srinivas Bolisetty
Electronic version	Cindy Chen, Ian Callander
Facilitator	Srinivas Bolisetty