Monitoring of Tinzaparin (Innohep®) (Low Molecular Weight Heparin (LMWH))

Following the publication of the NICE guidance for 'Venous Thromboembolism – Reducing the Risk in patients admitted to hospital', it is likely more patients will be prescribed LMWHs. In addition, the NPSA have produced a rapid response report titled 'Reducing treatment dose errors with low molecular weight heparins' (http://www.nrls.npsa.nhs.uk/resources/?EntryId45=75208). As a result, it is important to understand the risks of these types of drugs and the monitoring parameters required around their use.

Tinzaparin is classified as the following by the South of Tyne and Wear Group (SoTW):

- For travel prophylaxis, DVT treatment or use during pregnancy = **GREEN +**
- For prophylactic use (except pregnancy) = **GREEN +**
- Post operative use = **RED**

For **RED** indications prescribing should remain with the initiating Specialist.

For **GREEN +** indications, it is accepted that some drugs should be initiated by a primary Care or Secondary Care specialist but can be safely maintained in primary care without on-going specialist monitoring.

Checklist and monitoring for Prophylactic doses of Tinzaprin (Innohep®) for VTE (Low Molecular Weight Heparin (LMWH))

Prophylactic doses (for medical and surgical patients) will be for:
Orthopaedic surgery patients:

- 50 units/kg 2 hours before surgery, then 50 units/kg every 24 hours *or* 4500 units 12 hours before surgery, then 4500 units every 24 hours (subcutaneously)

General surgery patients:

- 3500 units 2 hours before surgery, then 3500 units every 24 hours. (subcutaneously)

Doses given are as a guide only and should not be used as a basis for prescribing, for full dosing information consult the BNF or Summary of Product Characteristics.

Monitoring requirements:
There are no routine monitoring requirements for prophylactic dosing, however, monitoring of Anti-Xa may wish to be considered in some patient groups who are on long-term treatment where there may be a risk of drug accumulation and risk of overdose e.g. in patients with renal failure.

Common adverse effects:

- Reversible mild non-immunologically-mediate thrombocytopenia (type 1)
- Haemorrhage
- Transient elevation of liver transaminases (ASAT/ALAT)
- Subcutaneous haematoma at injection site

Long term treatment:

- Hypoaldosteronism (leading to increases in plasma potassium levels)
- Hyperkalaemia (especially in patients with diabetes mellitus, chronic renal failure)
- Possible link to osteoporosis (although yet to be confirmed with tinzaparin specifically)

For full information about the monitoring requirements of treatment doses, drug interactions, cautions and contra-indications consult the BNF online (www.bnf.org.uk) or electronic Medicines Compendium (www.medicines.org.uk).

References:

SPC Innohep®
http://www.medicines.org.uk/EMC/medicine/5176/SPC/Innohep+20%2c000+IU+ml+and+Innohep+syringe+20%2c000+IU+ml/#PRODUCTINFO

British Journal of Haematology 'Guidelines on the use and monitoring of heparin'
http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2141.2005.05953.x/full

Checklist and monitoring for treatment doses of Tinzaparin (Innohep®) for VTE (Low Molecular Weight Heparin (LMWH))

Treatment doses (are dependent upon the indication) and should only be prescribed by/under the direction of a Specialist.

Checklist

- Patient must be weighed prior to commencing treatment, weight (kg) should be documented on patient's medicine chart and in clinical notes
- Dose should be calculated according to patient weight and renal function
- Check renal function when prescribing treatment doses, but should not delay the first doses being given. Monitoring of anti-factor Xa activity should be considered in patients with severe renal impairment (creatinine clearance < 30 ml/min); however, available evidence suggests that no dose reduction is needed in patients with creatinine clearance levels down to 20 ml/min (see Summary of Product Characteristics (SPC) for full details)
- Recommended doses for treatment of VTE (taken from the SPC) is 175 units /kg given as a single daily injection. The dose in pregnancy is based on early pregnancy body-weight.

Doses given are as a guide only and should not be used as a basis for prescribing, for full dosing information consult the BNF or SPC

Monitoring

Platelets should be monitored before starting treatment and then at day 5 of treatment, further monitoring will depend of whether the patient has a history of low platelet count (on advice of initiating healthcare professional). Monitoring of Activated Partial Thromboplastin Time (APTT) should only be used as an indication of overdosage (measure of bleeding). Monitoring of Anti-Xa may wish to be considered in some patient groups who are on long-term treatment where there may be a risk of drug accumulation and risk of overdose e.g. in patients with renal failure.

Communication

Where patients are being transferred between providers, (discharge) communication should include: dose, weight, renal function, indication and duration of treatment.

Treatment Dose Chart for Tinzaparin

The dose prescribed should be 175units/kg subcutaneously once daily. The dose in pregnancy is based on early pregnancy body-weight.

Please note, the colours in the chart relate to the colour-coding of the syringe of the corresponding dose.

Treatment Dose Chart For Tinzaparin			
Weight (kg)	Dose	Volume of syringe	Syringe size
40	**7000 units**	**0.35ml**	**0.5ml Red**
45	**7875 units**	**0.4ml**	
50	**8750 units**	**0.45ml**	
55	**9625 units**	**0.5ml**	
60	**10500 units**	**0.55ml**	**0.7ml yellow**
65	**11375 units**	**0.55ml**	
70	**12250 units**	**0.6ml**	
75	**13125 units**	**0.65ml**	
80	**14000 units**	**0.7ml**	
85	**14875 units**	**0.75ml**	**0.9ml Blue**
90	**15750 units**	**0.8ml**	
95	**16625 units**	**0.85ml**	
100	**17500 units**	**0.9ml**	
105	**18375 units**	**0.9ml**	
110	**19250 units**	**0.95ml**	**Multi-dose vial, for patients above 105kg in weight, multidose vials should be used.**
115	**20125 units**	**1.00ml**	
120	**21000 units**	**1.05ml**	
125	**21875 units**	**1.1ml**	
130	**22750 units**	**1.15ml**	