



LRI Children's Hospital

Venous Thromboembolism (VTE) Prophylaxis in Children

Staff relevant to:	All staff caring for patients admitted to UHL Children's Hospital
Team approval date:	October 2024
Version:	2
Revision due:	October 2027
Written by:	Lucinda Sanders
Trust Ref:	C56/2023

1. Introduction and Who Guideline applies to

This guideline is for all paediatric patients admitted to the children's hospital. All children under the age of 16 yrs should have a VTE risk assessment completed on admission to hospital this should be reassessed every third day during the admission or if risk factors change. 16yrs and over should have an adult VTE risk assessment completed.

Venous thrombosis is substantially lower in children compared with adults. Several factors may protect children from VTE, contributing to the relatively lower incidence. However Venous thromboembolism (VTE) is increasingly recognised in the paediatric population due to an increase in the use of central venous catheters; the most common risk factor for VTE in children. Other risk factors include immobility, sepsis and malignancy etc. In hospitalised children, 80% of VTE is provoked, occurring in patients with more than one risk factor.

Although venous thrombosis may occur all through childhood, there are 2 peak age groups at risk for VTE, these being neonates (use of central venous catheters) and >13 years adolescents/teenagers due to physiological changes in the coagulation system and an increase in risk factors such as; smoking, obesity, OCP. The incidence of VTE then increases significantly throughout adult life.

Related Guidelines

Diabetic Ketoacidosis (DKA) Quick Reference UHL Childrens Intensive Care Guideline C67/2019

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Diabetes (Including Diabetic Ketoacidosis) UHL Childrens Hospital Guideline C10/2019

Thromboprophylaxis Post Congenital Heart Surgery UHL Childrens Intensive Care Guideline C44/2016

Nephrotic Syndrome UHL Childrens Medical Guideline E4/2019

Stroke UHL Childrens Guideline D9/2020

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2. Guideline Standards and Procedures

Thromboprophylaxis describes the use of various measures to reduce the risk of thrombosis:

- Early mobilization of post-surgery patients
- Optimal hydration Oral or Intravenous
- Mechanical interventions such as compression stockings
- Pharmacological Thromboprophylaxis, usually with Low molecular weight heparin (LMWH)

When considering which patients should be offered Thromboprophylaxis, the perceived risk of thrombosis should be assessed (see risk factor chart page 4), as should the risk of intervention, particularly if heparin is being considered.

The VTE risk assessment chart is shown below and serves as a basis for the consideration of Thromboprophylaxis in all patients considered being at an increased risk of VTE. More complex patients should be discussed on an individual basis with haematology.

<u>Note</u>

• Patients presenting with stroke, Nephrotic syndrome, DKA should be considered for LMWH Thromboprophylaxis please refer to the specific guidelines linked above.

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- Patients that are pregnant should be discussed with obstetric team
- Complex cardiac abnormalities/procedures should be managed individually lead by their consultant and liaison with haematology
- Day case surgical patients do not require VTE risk assessment

Thromboprophylaxis does not entail giving heparin to all patients and it would be anticipated that only a minority will require pharmaceutical Thromboprophylaxis.

Mechanical Thromboprophylaxis

- For those paediatric patients with >1 risk factor (see page 4 for risk factors) should be considered for TED stockings as per flow chart (see page 3). These are only suitable for older children.
- Graduated compression stockings reduce lower limb venous stasis and increase blood velocity but do not increase the risk of bleeding
- IF using TEDs it is essential that they are correctly fitted and contraindications considered e.g. poor skin quality, arterial compromise
- There are paediatric sizes but note the minimum circumference is 26.4cm which is the relaxed circumference of the smallest stocking available

Pharmacological Thromboprophylaxis

- Should be considered for children that have 3 risk factors for VTE (see page 4)
- LMWH is the anticoagulant of choice currently for VTE prophylaxis
- LMWH is administered subcutaneously
- Check base line full blood count and coagulation screen before starting LMWH
- Maintain platelet count >75 x109/l and fibrinogen >1g/l for full dose heparin to be given
- Note Dalteparin is the LMWH currently used in Paediatics at UHL (Enoxaparin is used in adults 16yrs +)
- Dose as per BNF; note Dalteparin is administered OD in prophylaxis and BD in treatment
- Aim for a prophylactic anti Xa level of 0.1-0.3units/ml, 3-4 hours after administration of dose
- Level should be checked weekly in patients if patient is otherwise stable
- When the Heparin assay is taken it should be 3-4 hours post dose, the tube should be appropriately filled and walked to the lab – level 4 Sandringham building for analysis
- When requested please state which heparin i.e. Dalteparin the patient is on and the time the last dose was given
- Heparins are renally excreted and therefore children with altered creatinine clearance may need closer monitoring and these patients should be discussed with a haematologist
- If surgery is required for a patient receiving LMWH, it is recommended that 2 doses are omitted prior to surgery, i.e. the morning dose is given on the day before surgery, with LMWH then being restarted post-surgery if responsible team are happy the patient is haemostatically secure.

It should be noted that there is little evidence base to support the use of LMWH prophylaxis in childhood and no validated guidance for who should receive LMWH. Therefore any child <13yrs with 3 or more risk factors and LMWH is being considered



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Children's Hospital VTE risk assessment form						
Date of admission						
Risk assessed by		PLEASE AFFIX PATIENT LABEL HERE				
Signature						
Designation		-				
Date						
Review the patient related factors shown on the assessment sheet for thrombosis risk, ticking each and any box that applies. Clinicians may consider further risks apply in addition to those listed.						
Bleeding risk						
Patient related	Tick	Admission related		Tick		
Acquired bleeding disorders (such as acute		Neurosurgery, spinal surgery or eg	ye surgery,			
liver failure)		Cardiac				
Untreated inherited bleeding disorders (such		Lumbar puncture/epidural/spinal a	naesthesia			
As haemophilia and Von Willebrand Disease)		expected within the next 12 hours				
Concurrent use of anticoagulants known to		Lumbar puncture/epidural/spinal a	naesthesia			
increase the risk of bleeding (such as warfarin with INR>2)		within the previous 24 hours				
Thrombocytopenia (platelets <75)		Active bleeding				
Uncontrolled systolic hypertension (>230/120						
mmHg)						
Thrombosis Risk						
Patient related	Tick	Admission related		Tick		
Central venous catheter		Significantly reduced mobility for 3 days or more				
Active cancer or cancer treatment		Severe trauma with IS (Injury Severity Score)>9				
Dehydration		Spinal cord injury with paralysis				
Known thrombophilia		Total anaesthetic + surgical time > 60 minutes				
Obesity (BMI>30 kg/m2)		Acute severe sepsis				
One or more significant medical conditions (e.g. congenital or low output heart disease, sickle cell disease, metabolic or inflammatory conditions)						
Parental/family history of VTE age <40 years		Critical care admission, intubated and ventilated				
Use of oestrogen containing contraceptive		Severe burns				
therapy						
Pregnancy or <6 weeks post-partum (NICE 2018)						
If an increased risk of bleeding is documented on the risk assessment – thromboprophylaxis with LMWH is relatively contraindicated.						
Prescribe the appropriate intervention if required and complete all the prescription chart documentation						
Outcome (tick all that apply)				Tick		
No Thromboprophylaxis						
Mechanical Thromboprophylaxis						
Low Molecular Weight Heparin (LMWH)						
Risk Assessment Score						
Completed by:			Date:			

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3. Education and Training

None

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Assessment complete on admission	NerveCentre assessment completion data	Consultant lead	monthly	Children's Quality & Safety Board
Appropriate prophylaxis prescribed	Audit of medical records	Consultant lead	monthly	Children's Quality & Safety Board

5. Supporting References

Anticoagulation protocols for Birmingham Children's Hospital March 2020

https://b-s-h.org.uk/guidelines/guidelines/investigation-management-and-preventionof-venous-thrombosis-in-children/

https://ashpublications.org/bloodadvances/article/2/22/3292/16093/American-Society-of-Hematology-2018-Guidelines-for

https://www.bjaed.org/article/S2058-5349(19)30084-8/pdf

APA Thromoboprophylaxis Guidelines

6. Key Words

Heparin, Mechanical Thromboprophylaxis, Pharmacological Thromboprophylaxis, TEDS

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs. As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

Contact and review details					
Guideline Lead (Name and Title)	Executive Lead				
Lucinda Sanders - Consultant	Chief Medical Officer				
Details of Changes made during review:					
Related guidelines reviewed and updated					
Section 2:					
Note has been reviewed and updated:					
Removed patients with PIMS-TS;					
Addition of patients with DKA, pregnant patients and day case surgical patients					
Pharmacological Thromboprophylaxis section updated:					
BNF doses removed; Enoxaparin specified for use in adults 16yrs+					
Added 'Patients who have a bleeding risk LMWH is contraindicated'					
Flow Chart : Risk Assessment for Venous Thromboembolism (VTE) for < 16 years					
updated :					
(For < 13yrs and > 2 risk factors should also be discussed with haematology on an individual					
basis) added to title					
3+ risk factors box changed to > 2 risk factors					
Exclusion list extended to include Day case surgery; those on separate proformas DKA,					
Stroke, pregnancy					

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