



BEST PRACTICE GUIDANCE FOR USING HEATED HUMIDIFIED HIGH FLOW THERAPY (HHHFT) IN CHILDREN & YOUNG PEOPLE: AN EAST OF ENGLAND APPROACH

Introduction:

Over the past few years the use of HHHFT has increased to support children with respiratory distress and those requiring oxygen therapy, particularly infants with bronchiolitis.

This guidance has been adapted from the North and South Thames Paediatric Networks and retrieval services document and reviewed by EoE clinicians. The process collated available guidance documents from the network regions, alongside the latest evidence base to produce and implement a guideline that will standardise practice across the Networks. The East of England Paediatric Critical Care ODN thanks these colleagues for sharing their work.

Please note that this guidance is to be used in all paediatric areas in conjunction with any condition specific guidance and local escalation policy that may be in place e.g. management of bronchiolitis, management of severe asthma.

The contents for the Guideline are as follows:

Main document: Heated Humidified High flow therapy (HHHFT) for children and young people. This is advised to be used in colour for visual triggers.

Appendix 1 HHHFT Equipment QR codes

Appendix 2 References and team credits

Search our website for:

- The EoE HHHFT best practice guidance
- HHHFT educational resource book for nurses
- HHHFT clinical competency for nurses

https://www.networks.nhs.uk/nhs-networks/eastof-england-paediatric-critical-care

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Heated Humidified High flow therapy (HHHFT) for children and young people: An East of England Approach

Indications (not exhaustive) Contraindications Cautions

- High Oxygen requirementSigns of respiratory distress
- Nasal obstruction or craniofacial abnormalities
 Trauma/Surgery to nasopharynx
- Drained pneumothorax
- Upper airway obstruction

- Post extubation if clinically indicated
- Recurrent apnoeas
- Respiratory arrest or peri-arrest state
- Undrained pneumothorax

Staffing ratios

Staff to patient ratio should be determined based on the patient's overall condition. A validated paediatric early warning score (PEWS), such as the national PEWS should be used, and other critical care interventions considered. Patient ratios should be adjusted accordingly and flexibility is required as condition may change rapidly.

Acuity	Low risk/long term use of HHHFT	Medium risk	High risk	
Descriptor	Actively weaning HHHFT or established	Acute phase, some stability established but	Acute initiation phase, severe respiratory	
	on HHHFT as a long term therapy	not able to wean FiO2 below 0.40	distress observing for responsiveness to	
	Mild or no respiratory distress	Moderate respiratory distress.	HHHFT. High PEWS	
Nurse ratio	1:4 (1:3 < 2yrs)	1:2 or 3	1:1	
Isolation for HHHFT is unnecessary unless condition indicates otherwise. Use of NHSE Infection prevention and control guidance recommended.				

Commencing treatment

- 1. <u>Select interface and equipment</u> based on local availability and patient age and weight
- Note: Interface size should not exceed 50% of nares. If the flow rate cannot be achieved on correct fitting interface then use max flow for interface.
 On initiation, a competent clinician should observe patient for comfort and compliance. If necessary, the flow can be increased to reach the recommended range over a period of 5 minutes.
- **3.** <u>Titrate FiO2</u> to maintain SpO2≥92 (or alternative patient range)
- 4. <u>Escalate or wean.</u> To avoid rapid deterioration or unnecessary continuation of HHHFT, review response to HHHFT regularly, at least 1 hour post initiation and then at least 4-6 hrly.

<12 kg	2L/Kg/min
13 - 15 Kg	20 – 30 L/min
16 - 30 Kg	25 – 35 L/min
31 – 50 Kg	30 – 40 L/min
>50 Kg	40 – 50 L/min

Treatment guide *Red Flags for immediate escalation **Sustained response Response to** Unresponsive to to HHHFT HHHFT treatment • Any apnoeic/bradycardic episodes Nursing ratio 1:4 Nursing ratio 1:2 Nursing ratio 1:1 • Increasing respiratory distress after HHHFT commenced (1:3 for < 2 yrs) • Clinically tiring (raised pC02) • PEWS indicates immediate escalation to resus team Moderate respiratory Sustained response In 1st hour or • Significant concern from parent or carer distress continues to HHHFT confirmed. any red flags* • FiO2 > 0.60 Commence weaning and/or FiO2 > 0.40-0.6 **Immediate escalation** Wean Fi02: 0.3 - 0.4 • Increase FiO2 to max • Call 2222 • Liaise with retrieval team or on site L3PCC If oxygen saturation Reassess ECCs ** Re assess ECCs** • Communicate with the family remains in desired continue on current Ensure paediatric Monitoring and patient management range, halve the flow HHHFT settings. consultant has Coloured dots refer to corresponding patient acuity rate reviewed the child. Continuous oxygen saturations Continue to observe Min hourly observations and escalation according to PEWS•• for any deterioration Discussion with Consider continuous ECG if required • • or red flags * transport service 2 hrly mouth and nose care including pressure area check • • • Discussion/review with If no clinical • Hourly documentation of FiO2, flow rate, and temperature & equipment anaesthetic team deterioration is seen specific checks • • • Closely observe for any after 4 hrs, HHHFT can **Essential Care Considerations (ECCs) red flags* be discontinued (or as • Optimised positioning (eg. Head elevation) soon as 1 hr if When ready to wean: Consider NIV if available Consider referral for physiotherapy assessment paediatric consultant see weaning and appropriate confirms) • Secretion clearance if indicated and safe to do so guidance in green • Consider feeding regime alteration according to risk and underlying box. disease. High risk should be NBM with IV fluids Restart at weaning • Medium risk should be assessed before feeding and fed with caution Any red flags* flow rate if • Psychosocial support, clear communication, play and distraction discontinuing HHHFT Prepare patient and • Minimal handling/cluster cares. Blood gas analysis not essential and not tolerated team for intubation acidosis a late sign of failure. For patient transfer considerations, please go to next page



Heated Humidified High flow therapy (HHHFT) for children and young people: An East of England Approach



Transfer considerations

BCYP requires Heated Humidified High Flow Therapy (HHHFT) AND requires intra-hospital transfer

(eg. Emergency department to ward, or between hospital areas) *Note: for inter-hospital transfer call transport service for advice*.

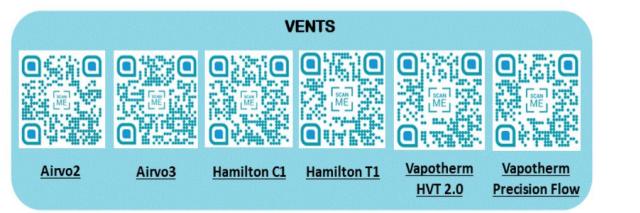
This guidance should be used in conjunction with the full HHHFT guideline and STOPP tool and care should be escalated as appropriate.

A	Assessment by senior clinician to establish risk of deterioration during transfer			
	LOW RISK	MEDIUM RISK	HIGH RISK	
	Appropriate es Clinical condition can rapidly	Refer to HHHFT Guideline to establish n nical judgement should always be used and transfer of patie calation of patients should always occur and the need for ir change especially during initiation of treatment, transfer of should only be moved if deemed appropriate by sen	ent requires adequate risk assessment ntubation of high risk patients should be assessed of any patient, regardless of risk, should be treated with caution	
C		Is there reliable transfer equipment and sufficient		
FOR ALL PATIENTS, COMMENCE THERAPY PRIOR TO TRANSFER, REFER TO GUIDELINE ABOV Transfer by a Registered Nurse trained in Should be transferred by a competent health care Should be transferred by a Paediatric Airw				
	Transfer by a Registered Nurse trained in Paediatric Basic Life Support (pBLS)	Should be transferred by a competent health care professional* and a Registered Nurse trained in Paediatric Immediate Life Support (pILS)	Should be transferred by a Paediatric Airway Competent Health Care Professional** and a Registered Nurse trained in Paediatric Immediate L Support (pILS)	
	DO NOT commence on HHHFT prior to	If transfer CAN OCCUR WITHIN 30 MINS, DO NOT	Senior clinician MUST ASSESS patient once established on HHHFT to esta	
	transfer.	commence on HHHFT prior to transfer.	RISK OF DETERIORATION without HHHFT. If transfer deemed appropria	
	Administer oxygen via appropriate device.	Clinical team must assess patient prior to transfer in	paediatric airway competent health care professional should transfer pa	
		order to establish RISK OF DETERIORATION.	with a Registered Nurse trained in Paediatric Immediate Life Support (p	
	Ensure therapy can commence	Ensure therapy can commence immediately on arrival at		
	immediately on arrival at destination.	destination.	Consider trial period in situ to establish therapy and assess tolerance ar	
		Should be transferred by a competent health care	stability.	
	Do not delay transfer if patient remains	professional* and a Registered Nurse trained in		
	LOW RISK.	Paediatric Immediate Life Support (pILS)	Administer 15L oxygen via a non-rebreathe mask or deliver PEEP via ma	
		If transfer CANNOT OCCUR WITHIN 30 MINS, treat as	and Ayres t-piece if competent to do so.	
		per HIGH RISK group	Keep patient NBM, NGT on free drainage Ensure HHHFT can commence immediately on arrival at destination	

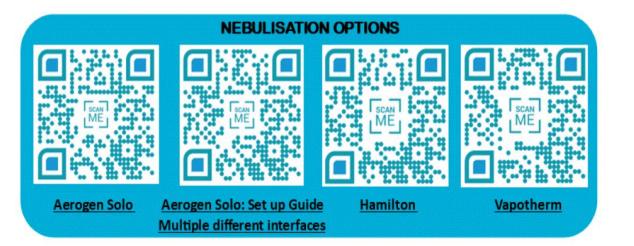
Ensure appropriate oxygen delivery, adequate oxygen supply and Bag Valve Mask (BVM) available.

Consider personnel required for safe transfer *able to effectively ventilate using BVM & insert upper airway adjuncts

**competent in advanced airway adjuncts eg.LMA/iGel, can intubate in an emergency. Re assess immediately prior to transfer









Appendix 2 - Team credits

With special thanks to the North Thames Paediatric Network and the South Thames Paediatric Network and their respective working groups and commissioning bodies for sharing the original guideline from which this East of England approach is derived. This has been shared with the East of England and agreement obtained to adopt it by the ODN for use across the EoE PCC ODN region.

Appendix 3 - Reference list/ Bibliography

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