

# Heated Humidified High flow therapy (HHHFT) for children and young people

## A Pan London and South East of England approach

Indications (not exhaustive)	Contraindications	Cautions
<ul style="list-style-type: none"> <li>High Oxygen requirement</li> <li>Signs of respiratory distress</li> <li>Post extubation if clinically indicated</li> </ul>	<ul style="list-style-type: none"> <li>Nasal obstruction or craniofacial abnormalities</li> <li>Trauma/Surgery to nasopharynx</li> <li>Recurrent apnoea's</li> <li>Respiratory arrest or peri-arrest state</li> <li>Undrained pneumothorax</li> </ul>	<ul style="list-style-type: none"> <li>Drained pneumothorax</li> <li>Upper airway obstruction</li> </ul>

### Staffing ratios

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

Acuity	Low risk/long term use of HHHFT	Medium risk	High risk
<b>Descriptor</b>	Actively weaning HHHFT or established on HHHFT as a long term therapy Mild or no respiratory distress	Acute phase, some stability established but not able to wean FiO2 below 0.40 currently. Moderate respiratory distress.	Acute initiation phase, severe respiratory distress observing for responsiveness to HHHFT. High PEWS
<b>Nurse ratio</b>	<b>1:4 (1:3 &lt; 2yrs)</b>	<b>1:2 or 3</b>	<b>1:1</b>

**Isolation** for HHHFT is unnecessary unless condition indicates otherwise. Use of NHSE Infection prevention and control guidance recommended.

### Commencing treatment

- Select interface and equipment** based on local availability and patient age and weight  
**Note:** Interface size should not exceed 50% of nares. If flow rate below cannot be achieved on correct 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 recommended range below over a 5 minute period.
- Titrate FiO2** to maintain SpO2 ≥ 92 (or alternative patient range)
- Escalate or wean.** To avoid rapid deterioration or unnecessary continuation on HHHFT review response to HHHFT and follow escalation or weaning criteria below

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

Response to treatment			
●	●	●	
<b>Sustained response to HHHFT</b> Nursing ratio 1:4 (1:3 < 2yrs)	<b>Response to HHHFT</b> Nursing ratio 1:2 or 3 if cohort is ward level	<b>Unresponsive to treatment</b>	<b>*Red Flags for immediate escalation</b> <ul style="list-style-type: none"> <li>Any apnoeic/bradycardic episodes</li> <li>Increasing respiratory distress after HHHFT commenced</li> <li>Clinically tiring</li> <li>PEWS indicates immediate escalation to resus team</li> <li>FiO2 &gt; 0.60</li> </ul>
Wean FiO2 to 0.3-0.4 (depending on patient)	Moderate respiratory distress continues and/or FiO2 > 0.40-0.6	<b>In 1st hour:</b> ↓	<b>Immediate escalation</b> <ul style="list-style-type: none"> <li>Increase FiO2 to max</li> <li>Call 2222</li> <li>Prepare for intubation</li> <li>Liaise with retrieval team or on site L3PCC</li> <li>Communicate with the family</li> </ul>
↓ Half the flow rate ↓ If no clinical deterioration is seen after 4 hours HHHFT can be discontinued (or as soon as 1 hour if paediatric consultant confirms)	↓ Re-assess ECC's** and continue on current HHHFT settings until ready to wean ↓ Continue to observe for any deterioration or red flags*	<ul style="list-style-type: none"> <li>Re-assess ECC's**</li> <li>Ensure paediatric consultant has reviewed</li> <li>Discussion with retrieval service</li> <li>Discussion/review with anaesthetic reg</li> <li>Closely observe for any red flags*</li> </ul> ↓ <b>After 2nd hour or with any red flags:</b>	<b>Monitoring and patient management</b> Coloured dots refer to corresponding patient acuity
↓ Restart at weaning flow rate if stopping HHHFT not tolerated		<ul style="list-style-type: none"> <li>Consider NIV or IMV</li> <li>Prepare patient, team and family for intubation</li> </ul>	<b>**Essential Care Considerations (ECCs)</b> <ul style="list-style-type: none"> <li>Optimised positioning (e.g. head elevation)</li> <li>Consider referral for physiotherapy assessment</li> <li>Secretion clearance if indicated and safe to do so</li> <li>Consider feeding regime alteration according to risk and underlying disease.                             <ul style="list-style-type: none"> <li>High risk should be NBM with IV fluids</li> <li>Med risk should be assessed before feeding and fed with caution</li> </ul> </li> <li>Psychosocial support, clear communication, play and distraction</li> <li>Minimal handling/cluster cares</li> <li>Blood gas analysis not essential and acidosis a late sign of failure</li> </ul>
<b>Patient transfer</b> If patient transfer is required then a suitable risk assessment tool such as the STOPP tool should be used. Where portable HHHFT is not available a senior clinician should assess the appropriate oxygen delivery based on direct patient assessment.			