

# Parent & Carer Competency Guidance Notes for Non Invasive Ventilation (NIV) CYP



Name of CYP.....  
Name of Parent/Carer.....  
Name of Ventilator.....

Version 1, 2021. To be reviewed 2023.

*This document was compiled prior to the Field Safety Notice from Phillips Respironics in June 2021. Please contact your managing centre for additional guidance.*

This competency document (2021) was developed by the Paediatric Pan London Long Term Ventilation Group (PPLLTV). The PPLLTV is a group of clinical nurse specialists and allied health professionals. The team are experts in the care of paediatric tracheostomy, tracheostomy long term ventilation and non-invasive ventilation and work within all the main London Specialist Paediatric Centers. The ethos of this approach is to enable the care giver to deliver safe, high-quality care against one common standard. This document has been devised to enable the assessment of the caregiver's competence to care for a child or young person (CYP) requiring non-invasive ventilation and should be utilised in combination with the PPLLTV group non-invasive competencies document. The competencies are freely available for use by all, but practitioners should always refer to their local guidance if planning to use them in their own services

Its intended use is to guide those assessing the caregiver as well as act as a resource for the caregiver. The caregiver must demonstrate that they can undertake each relevant section and can consistently replicate each aspect of care, over a period of time, in a variety of contexts. When the caregiver feels confident and competent, they will sign each relevant section. Each section will be assessed and signed, by a qualified professional (assessor), once competency has been achieved.

The competency rating scale, adapted from Benner's Stages of Clinical Competence, enables the assessor to grade the caregiver's level of competence. The caregiver must demonstrate a minimum level of 'Achieved' in order to be deemed competent to care for the CYP without supervision.

**The "achieved" box can only be signed by a healthcare worker governed by a regulatory body e.g., NMC, HCPC or GMC. Healthcare Assistants (HCA's) can deliver training and sign the observed/discussed with support boxes but must be countersigned by a healthcare worker governed by a regulatory body.**

**Final sign off needs to be completed by a senior staff member with clinical experience and competency in line with local policy. They should have either been aware of all the training done previously or as a minimum verbally go through the competency book and then complete final sign off.**

**Observed /Discussed:** Insight would be gained during the theoretical training

**Performed/Discussed with support:** Caregiver able to demonstrate/discuss the outlined skill with assistance

**Achieved:** Caregiver is able to demonstrate/discuss the outlined skill independently

**Caregiver sign:** Caregiver to sign competency when they feel confident with the outlined skill

**Comments:** To discuss specific competencies


This document has been endorsed by:




This document was created by the PPLTV group with specialists from: Central LTV team, Evelina London Children's Hospital, Great Ormond Street Hospital, King's College Hospital, Royal Brompton and Harefield Hospitals, Royal London Hospital, St George's University Hospital and The Children's Trust, Tadworth.



With special thanks to Billie Coverly, NIV CNS King's College Hospital.

Competencies	Guidance
<b>Ventilator operation</b>	
Able to connect ventilator to the main power supply.	Ensure that the caregiver is aware where the power cable fits in to the machine. This will be different for each ventilator.
Able to explain what to do in a power outage.	<p>Prior to going home, inform your electricity supplier that in the event of a power cut you are priority for reconnection due to CYP relying on an electrical device for their health needs.</p> <p>Some machines will have an internal battery. See below on length of battery life</p> <p>Where an internal battery is present, the CYP can remain on the ventilator. If you have a second back up vent, consider switching to this if the battery is running low on the first ventilator.</p> <p>If the battery is running low and the CYP is dependant, a place of safety with a power supply should be sought, such as a friend or family or the nearest hospital.</p> <p>If the CYP is non dependant and the battery has run out, take the CYP off the ventilator immediately and if necessary wake them if their symptoms occur when asleep.</p> <p>If the ventilator has no internal battery and the CYP is not dependant take the CYP off the ventilator immediately and if necessary wake them if their symptoms occur when asleep.</p> <p>Return the CYP to the ventilator when power resumes.</p>
Able to turn the ventilator power on and off and determine if using mains or battery power.	Some machines will automatically switch on when plugged in. Other machines will have a power button. The caregiver will need to identify this and the light/symbol on the screen that indicates if the machine is connected to the power supply or running on battery.
Able to identify when the batteries need charging.	Able to locate where the battery symbol is on the screen and identify charge status.
Aware of length of battery life and what affects battery life. Aware if there is an internal and external battery.	<p>Stellar- 2hours.</p> <p>Trilogy- 4 hours internal 4 hours external.</p> <p>Phillips A40- No internal battery.</p> <p>Airsense, Lumis- No internal battery.</p>

Competencies	Guidance
<b>Ventilator operation</b>	
Aware of the air inlet fan in the ventilator and the importance of keeping it clear.	The air inlet fan is where air is drawn into the ventilator. If this is covered or blocked it could cause the device to overheat. The location of the air inlet will be different for each ventilator.
Able to turn on the ventilator to deliver the pressure.	To turn on the device to deliver pressure, press the button with the symbol indicated in the image. 
Able to check the ventilator is delivering pressure when connected to the user.	Ensure that you can hear or feel the pressure blowing from the machine. The machine may also indicate pressure is being delivered on the LCD screen. This will be different for each ventilator.
Able to demonstrate an understanding of the display screen and describe the function of the keys.	Ensure the caregiver can identify the start/stop, alarm and navigation buttons. They should also be able to show an understanding of the key features indicated on the LCD screen.

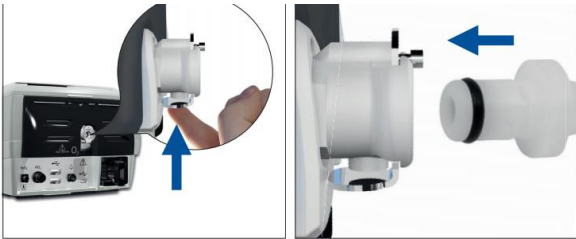

Competencies	Guidance
<b>Ventilator settings</b>	
Aware of the need for ventilatory support.	Ensure the caregiver understands the CYP's diagnosis and why this diagnosis requires ventilatory support.
<p>Able to describe in basic terms how the mode(s) of ventilation work.</p> <p>Mode:</p> <p>Pressures:</p>	<p>Able to identify if the CYP is on Bi-level (often known as BiPAP) or CPAP ventilation and able to explain how each works.</p> <p>BiPAP stands for Bilevel Positive Airway Pressure. It is a type of ventilation or breathing support. It provides assistance when breathing in (inspiratory positive airway pressure or IPAP) and breathing out (expiratory positive airway pressure, EPAP). The BiPAP machine also has a setting that maintains the breathing rate by ensuring a minimum number of efficient breaths are taken in one minute.</p> <p>BiPAP can also help to reduce the work of breathing. This will help to support the breathing muscles, improve the amount of oxygen in the lungs and help to remove waste gas (carbon dioxide) from the lungs.</p> <p>CPAP is Continuous Positive Airway Pressure. It is a type of non-invasive ventilation (NIV) or breathing support. CPAP works by providing a positive pressure of air through the mask and into the airway, which helps to keep the airway open. This helps to prevent breathing difficulties, increase the level of oxygen in the lungs and removes the unwanted gas (carbon dioxide) out of the lungs. CPAP is usually only needed during sleep.</p>
Able to demonstrate how to check the prescribed settings against the home care ventilation plan, how often to check these and that the machine is delivering the prescribed setting when connected to the CYP.	<p>Ensure the caregiver knows where the prescription is recorded and can locate the pressure settings on the ventilator screen. This should be checked daily prior to commencing ventilation or at the start of a shift.</p> <p>This will be via the  button on the Stellar</p> <p>On Lumis and Aairsense devices the set pressures will appear at the top of the LCD screen once the device is delivering pressure</p> <p>A40 and Trilogy - Press the menu button, scroll down using the arrows to information, press select.</p>
Able to discuss what to do if the settings were different on the home care plan to the ventilator.	If the settings are different, the caregiver should contact the hospital team immediately. They should consider if it is safe to use the ventilator.



Competencies	Guidance
<b>Alarms</b>	
Aware of what alarms are set and what they mean.	Caregiver should have knowledge of which alarms are set on the ventilator. Please see user manuals for detailed lists of alarms, possible causes and trouble shooting for each specific ventilator.
Able to demonstrate how to check the alarms are working and how often to do this.	Firstly check which alarms are set and then check alarms are working by turning the ventilator on to deliver pressure whilst not connected to the CYP. The ventilator should trigger alarms relating to disconnection. Then occlude the tubing and check for alarms triggering relating to blockages/occlusion. This should be done every time the vent is switched on.
Aware of how to respond appropriately to alarms.	If the ventilator is alarming and the cause is not obvious, the caregiver should carry out a systematic check, initially checking that the CYP is clinically well, they should then check mask fit and ensure exhalation ports in the mask are not obstructed. The circuit and connections should then be checked to ensure they are fitted correctly and there is no damage to the circuit.
Aware of what to do if you cannot find the cause of the alarm and who to contact.	If no cause for the alarm has been found, take the CYP off the machine and consider calibrating and changing the circuit. If available, swap to a spare ventilator. If problem persists, contact the team managing the ventilator or if a service contract has been provided, contact the service contract providers.
Able to silence the alarm, mute/unmute the alarm and aware of the risks if the alarm was left muted.	<p>Stellar- During therapy press  once to mute an alarm. Press a second time to un-mute an alarm.</p> <p>If the problem is still present, the alarm will sound again after two minutes.</p> <p>A40 and Trilogy - When an alarm occurs, you can temporarily silence the it by pressing the Alarm Indicator/Audio Pause button  The alarm is silenced for 60 seconds and then sounds again if the cause of the alarm has not been corrected. Each time you press the Alarm Indicator/Audio Pause button, another 60 second period is started. Once muted you are unable to unmute the alarm, so therefore must stay with the CYP until the alarm symbol has cleared.</p> <p>Lumis- Press the dial. A list of activated alarms will appear, and the flashing alarm mute icon will be displayed in the top right corner of the screen. The alarm will be muted for 2 minutes.</p> <p>Airsense- please note, this device does not alarm.</p>




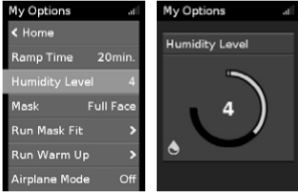
Competencies	Guidance
<b>Oxygen supply via NIV</b>	
<p>Able to demonstrate how to correctly place a saturation probe if applicable.</p>	<p>Can demonstrate:</p> <ul style="list-style-type: none"> <li>• How to correctly place a saturation probe.</li> <li>• How frequently the probe site should be moved.</li> <li>• How skin temperature, e.g., cold extremities, can have an affect on the reading of the saturation probe.</li> </ul>
<p>Aware of expected oxygen saturation levels and how and when to monitor them if applicable.</p>	<p>Demonstrate how to measure and record the oxygen saturations of CYP.</p> <p>Be aware of how to set the parameters and alarms on an oxygen saturation monitor. This should be assessed for each new piece of equipment.</p> <p>Caregiver should be able to explain why parameters are important i.e., implications of too low or too high saturations and discuss what appropriate alarm settings may normally be for a CYP.</p> <p>Demonstrate awareness as to why CYP may have specific parameters for O2 saturations.</p> <p>Knows the steps to be taken if the oxygen saturations of the CYP are low/poor trace. For example: Is this due to movement of the CYP? Is the CYP's circulation poor so the probe is struggling to work. Is the probe flashing and indicating that it may need replacing?</p>
<p>Aware of current oxygen requirement if applicable.</p>	<p>Can identify CYP's current oxygen requirement and how that is given e.g. by walled oxygen, concentrator or oxygen cylinder.</p> <p>Awareness of who provides that oxygen when in the home/community environment.</p>

Competencies	Guidance
<b>Oxygen supply via NIV</b>	
<p>Able to demonstrate how to attach oxygen via the ventilator.</p>	<p><b>Stellar</b>- Insert one end of the oxygen supply tubing into the oxygen connector port. The tubing automatically locks into place. Attach the other end of the oxygen supply tubing to the oxygen supply.</p>  <p><b>Trilogy</b>- has an oxygen port at the back of the ventilator- allows flow up to 15L.</p> <p>For other devices, oxygen can be added directly into the circuit by using a filter with a built-in oxygen port or via an alternative oxygen connector.</p>  <p>Caregiver should be aware that oxygen flow must be turned off when the device is not operating, so that unused oxygen does not accumulate within the device and create a risk of fire.</p>
<p>Has completed appropriate oxygen competencies.</p>	<p>Caregiver should have completed/be aware of the PPLOG (Paediatric Pan London Oxygen Group) competencies or other local oxygen competencies.</p>

Competencies	Guidance
<b>Mask fit</b>	
Able to fit the mask correctly and check the tightness of the straps.	Caregiver should be observed fitting the mask on to the CYP, checking the correct tightness of straps and ensuring the mask is not occluding the nose or mouth.
Able to check for mask leak.	Caregiver should be observed listening and feeling for leak around the edges of the mask and if applicable, checking the machine leak reading. Ensure that mask leak is not confused with air being released from the exhalation port.
Able to check that the exhalation port is working and recognises the risks associated if blocked.	Caregiver should be observed making a visual inspection of the exhalation port to ensure that nothing is blocking the exhalation port before fitting the mask to the CYP. They should also hover a hand over the exhalation port to ensure air is flowing through.
Aware of risk of airway occlusion and action to take if this occurs.	Caregiver should be observed checking the mask is not occluding the nose or mouth and that the exhalation port is clear. If this does occur, they should know how to remove any blockage, or readjust the mask fit so that it is not occluding the airway. If damage to the mask is causing the occlusion, they should dispose of the mask and use the spare provided to them.
Aware of how to obtain a new mask if required.	In the event of using the spare mask, the caregiver should contact the care provider to acquire a new mask. The process for this may differ for each trust. Please be aware of local procedures.
Able to identify early signs of a pressure sore and aware of what to do if one develops.	<p>Pressure sores can be caused by the pressure of the mask or strapping pressing on the skin, particularly over bony areas such as the nasal bridge. In the early stages they can appear as a red mark on the skin that doesn't fade after an hour post removing the mask. Pressure sores can develop in to ulcers, but should never be allowed to get to this stage.</p> <p>Pressure sores can be prevented by ensuring that the straps are not too tight and that the mask fit is good.</p> <p>If any signs of a pressure sore are observed, the care team should be contacted immediately, who will advise on the best course of treatment.</p>

Competencies	Guidance
<b>Circuit setup</b>	
Aware of the purpose of the various parts of the circuits.	The caregiver should be able to identify all parts of the circuit, including the tubing, humidifier, mask and any other specific connections. They should also be able to explain the purpose of each of these connections.
Able to assemble a ventilator circuit (circuit+mask+connectors required).	The caregiver should be observed setting up the circuit.
Able to set up a dry/HME circuit if appropriate (Including antibacterial filter if applicable, following local policy).	The caregiver should be observed setting up the circuit with the appropriate connections for a dry circuit
Able to learn circuit test (calibrate) and know when to do this if applicable.	The caregiver should be observed performing a learn circuit or calibration. This should be done if the type of mask or tubing is changed, or if there is a persistent alarm, the cause of which cannot be determined, on the ventilator
Aware of how often to fully clean the mask and circuit.	<p>The face mask should be wiped down daily with a clean cloth and water.</p> <p>The tubing, humidifier chambers and mask should be washed weekly.</p>
Aware of how to clean and dry the mask and tubing.	The humidifier chambers (except for with the A40), mask and tubing should be soaked in warm water and detergent for 10-15 minutes, the rinsed through thoroughly. They should be left to air dry and not dried with paper or towels due to small fibres collecting on the equipment .
Aware of consumables (mask/circuit/filters) and when they need changing.	<p>For ResMed and Trilogy devices, the tubing, humidifier chambers and mask should be disposed of and replaced 6 monthly</p> <p>For the Philips A40 the tubing and mask should be disposed of and replaced 6 monthly, however the humidifier is not disposable.</p>
Aware of who supplies ventilation equipment once discharged.	Different trusts operate differently, so please liaise with your managing respiratory team to confirm who supplies the ventilation equipment once discharged.
Aware of the effect of a fan on a circuit.	Caregiver should be aware that if a fan is directed at a ventilator circuit, it can cause a build up of condensation in the circuit. There is a risk that this could then get into the CYP's airway causing aspiration. As such, caregiver should avoid directing fans onto ventilation circuits.

Competencies	Guidance
<b>Humidification</b>	
Can explain why and when humidification is required.	Caregiver should be able to explain that humidification is important in preventing build up of thick secretions and infections in these secretions. They should also know it will increase CYP comfort and improve gas exchange.
Able to attach humidifier correctly to ventilator and can add water correctly.	Caregiver should be observed setting up the circuit with the humidifier and adding water into the humidifier chamber correctly. This will be different for each device. Safety- please be aware of spilling water on electrical parts.
Aware water must be distilled (in hospital) or cooled boiled (home) and to change water daily.	For cooled boiled water, this can be boiled in a kettle and left to cool, only then can it be added to the humidifier. This water should be changed daily in the morning and not left to stand in the ventilator when not in use.
Aware not to transport, move or tilt ventilator when humidifier is attached.	Caregiver should be aware not to move the ventilator with the humidifier attached and should show awareness of the risks that water may get in to the CYPs airway, or flow back into the ventilator if they do this.

Competencies	Guidance
<b>Humidification</b>	
<p>Aware of what to do if ventilation causing severe oral dryness and nasal congestion.</p>	<p><b>ResMed</b> devices- it is possible to increase humidity levels on the devices which will aid with dryness and nasal congestion.</p> <p><b>Stellar:</b> The humidification can be increased by turning up the humidifier control indicated in the picture.</p>  <p><b>Lumis/airsense</b></p> <ol style="list-style-type: none"> <li>1. In My Options, turn the dial to highlight Humidity Level and then press the dial.</li> <li>2. Turn the dial to adjust the humidity level and press the dial to save the change</li> </ol> <p>NB. the humidifier will need to be attached in order to access this menu.</p>  <p>For <b>Trilogy MR810</b> humidifier - The control for humidity is on the humidifier- 1 being the lowest humidity and 3 being the highest.</p> <p>For <b>Philips A40</b></p> <ol style="list-style-type: none"> <li>1. From the Main Menu screen, use the Up/Down key to highlight the Settings and Alarms item.</li> <li>2. Press the Right key to select Settings and Alarms.</li> <li>3. Select humidification, in this setting you should be able to change between levels 0-5</li> </ol>
<p>If using external humidifier, knows humidifier should be placed below the ventilator.</p>	<p>External humidifiers should be placed below the ventilator to avoid risk of water running back in to the ventilator.</p>

Competencies	Guidance
<b>Nebulisers</b>	
Aware of the reasons for delivering medications via nebuliser.	<p>There are several different medications that can be delivered via nebuliser. The most regularly used are:</p> <p><b>Saline</b>, usually 0.9% or 3%. These are given to prevent or treat thick secretions.</p> <p><b>Bronchodilators</b>, such as salbutamol and Ipratropium bromide. These are given to CYP who are asthmatic or experience wheeze.</p>
<p>Able to safely set up and administer a nebuliser [N.B May require specific training on the equipment used in the home by community/agency]</p> <p>Demonstration completed on: (name of equipment).....</p>	<p>Must demonstrate administering the nebuliser using correct medication administration procedures.</p> <p>Can demonstrate use of nebuliser equipment- either jet neb or Aerogen if applicable.</p>
Aware of how to remove nebuliser and clean equipment.	<p><b>Aerogen:</b> Refer to manufacturing policy.</p> <p><b>Jet Nebulisers-</b> these can be rinsed with water after every use and then left to air dry. They should not be dried with paper or towels due to small fibres collecting on the equipment .</p>
Aware of the effect of nebulisers in circuits and how this can trigger alarms.	<p>Nebulisers in the circuit can affect the ventilators ability to accurately read the flow in the machine, which can cause the ventilator trigger volume and flow related alarms.</p> <p>If using an external humidifier, nebulisers can also change the circuit temperature and trigger the humidifier to alarm.</p>

Competencies	Guidance
<b>Air inlet filters</b>	
Able to explain the purpose of the air inlet and aware of the importance of keeping this clear.	The air inlet fan is where air is drawn into the ventilator. If this is covered or blocked it could cause the device to overheat. The location of the air inlet will be different for each ventilator.
Able to change the air inlet filter.	This will be different for each ventilator
Aware of when to change/clean filter. - Please follow manufacturers' guidance and be aware of differences between devices.	<p>For ResMed devices, replace at least 6 monthly, but check monthly and change if grey or damaged. Do not wash or reuse filters.</p> <p>For Philips Trilogy and A40 you should clean the grey foam filter weekly, with soapy water and leave to air dry. It should be replaced it with a new one every three months.</p>
Aware that the filter may need to be changed more frequently if you are in an environment with more dust/air pollution.	Filters may collect become more soiled if there are increased dust particles in the air e.g. from household dust, construction sites or air pollution. In this instance, they may need to be changed more regularly.



Competencies	Guidance
<b>Unwell CYP</b>	
Able to describe signs of respiratory distress.	<p>It is important to assess the CYP as well as any monitoring available. Knowing what is normal for the CYP will be vital in identifying if there is any change in their condition.</p> <p>Assessment should be structured and must include:</p> <ul style="list-style-type: none"> <li>• Observation of breathing (to include chest movement, respiratory rate, effort and oxygen saturations)</li> <li>• Observation of circulation (to include colour and temperature)</li> <li>• Observation of the CYP's responsiveness/neurology compared to their normal</li> </ul>
Able to describe action to be taken if CYP shows sign of respiratory distress.	<p>Able to recognise changes to the CYP's normal parameters, following the structured assessment approach above, and what action to take next.</p> <p>This could include demonstration of:</p> <ul style="list-style-type: none"> <li>• Assessing that the mask is fitted correctly and checking for leak</li> <li>• Assessing if the CYP is comfortable and synchronising with their ventilator (if applicable)</li> <li>• If the CYP has been prescribed oxygen, administer in accordance with their care plan.</li> <li>• In the case of respiratory arrest, aware to remove mask and commence BLS</li> </ul>
Able to describe the risks to the CYP if they show signs of vomiting/ dehydration and action to be taken.	<p>A CYP using NIV is at risk of aspiration if they vomit whilst wearing the mask, as vomit could be blown back into the airway. If the CYP has been vomiting, use of the mask should be risk assessed before use.</p>
Aware of escalation process on the home care ventilation plan if applicable.	<p>If the CYP has been given a care plan, the caregiver should have knowledge of the care plan and know the steps to be taken if escalation is required.</p>
Caregiver has received BLS if required.	<p>It may not be necessary for the caregiver to receive BLS, but in some circumstances it is advisable. This should be delivered by a BLS trainer and specific advice pertaining to NIV should be given.</p>
In the case of respiratory arrest, aware to remove mask and commence BLS.	<p>Caregiver should be made aware that in the even of a respiratory arrest, the NIV will not adequately ventilate the CYP. In this event, the mask should be removed an BLS commenced.</p>

Competencies	Guidance
<b>Safety awareness</b>	
Aware of the importance of effective hand washing.	Caregiver should be able to demonstrate correct hand washing technique and be aware of its importance. By practicing good hand hygiene they reduce the risk of infection entering the equipment and subsequently the CYP's airways.
Aware of how to access ventilator resources and support.	All equipment manuals are easily accessible online through manufacturers websites or via <a href="https://www.manualslib.com/">https://www.manualslib.com/</a> Managing respiratory teams will also be able to provide support and resources. Caregiver should be aware of how to contact them.
Aware of risks of abdominal distension and what action to take if this occurs.	In some cases, NIV can cause abdominal distension, particularly if using a full face mask. Usually this gas will be passed through the digestive system without too much discomfort. If the gas does cause discomfort, the CYP can be assisted with 'burping' or if they have a gastric tube, the caregiver could consider aspirating the tube. If the problem persists, the caregiver should contact the managing team.
Aware of the risks of not using NIV.	For some CYP's it may be life threatening to not use NIV as prescribed. For others, while it may not be immediately life threatening, there remains risks and side effects. In the short term, they may experience symptoms such as headaches and lethargy the following day. In the long term, persistent low oxygen and high carbon dioxide levels overnight can affect brain and heart development.
Aware of key contacts for when at home. Name: _____ Tel: _____	Caregiver should be aware of how and when to contact their managing centre. They should also be aware that for general health matters, they should still see their GP. In an emergency they should call 999 or attend A+E before contacting their managing centre.
Aware of who to contact if your ventilator is faulty or requires service. Name: _____ Tel: _____	Some families will be required to contact their managing team. Others will have their equipment managed by other providers such as ResMed 24 hour service or Lane Fox. Caregiver should know who to contact and how to contact them, in the event that they have a faulty ventilator and know that this is an urgent matter.

Competencies	Guidance
<b>Travel and transport</b>	
Able to identify all equipment needed for travel.	<p>The CYP may not require their ventilator at all times, however, the caregiver should know if they are required to carry their ventilator with them for outings.</p> <p>They should also be aware of other possible equipment they may require, such as saturation monitors, suction or oxygen and a mobile phone.</p>
Able to demonstrate going out on a trip, using the buggy/wheelchair and safely securing the equipment if applicable.	<p>Caregiver should be able to demonstrate packing the buggy or wheelchair in a way that all emergency equipment is safely secured, but accessible if required.</p>