



Acacium Group

Bi-Level Ventilation (BiPAP)

Procedure Reference | SOP VENT 15

Version | V3.1

Procedure Name	Bi-Level Ventilation (BiPAP)
Purpose of Document	To ensure that the correct preparation, procedure & outcome are achieved by implementing a consistent and systematic approach to BiPAP care
Target Audience	All nurses & appropriately trained carers
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Equality Impact Assessment (EIA) Form	Acacium Group is committed to Equality, Diversity and Inclusion and in line with our values, we strive to ensure that everyone that is part of the Acacium community is not disadvantaged or discriminated against given their individual need or characteristics. To support this, an Equality Impact Assessment has been undertaken on this policy/procedure. This information is held centrally and can be requested from the Clinical Governance Team.
About Acacium Group	Details of all Acacium Group trading companies that this policy applies to are detailed within Appendix A

Document History			
Version	Date	Changes made/comments	By whom
V1	Dec 2016	Implementation of document history page	KNF/VM
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1. Introduction

BiPAP (Bi-level Positive Airway Pressure) is a type of ventilation treatment used in both children and adults. It is used to improve breathing for a variety of medical conditions. These conditions include some types of lung disease, sleep apnoea, neuromuscular disease, and/or skeletal diseases.

BiPAP provides airway support by blowing air into the airway, usually through a mask covering the nose/mouth or both or a tracheostomy or a mouth piece ventilation. The pressure increases when the client breathes in and decreases when they breathe out, making it easier for clients who have difficulty breathing spontaneously at their own rate and depth. BiPAP should rest the respiratory muscles and reduce the work of breathing. Before BiPAP was recommended, the Client may have begun using a simpler form of treatment known as CPAP or 'Continuous Positive Airway Pressure', which supports breathing only when a person is inhaling.

BiPAP can have a backup rate set, this means if the client becomes tired and drops their respiratory rate below the set backup rate the ventilator will kick in and initiate a breathe for the client.

2. Aim

To provide safe and effective evidence-based ventilation care that meets the clinical needs of the client and promotes continuity of care.

3. Who needs to be aware of this procedure

All Acacium Group workers may care for the client who requires BiPAP as long as they have received appropriate training and have been assessed as competent to deliver the required standards of care.

4. Hazards/complications

If the client breaths are not in sync with the ventilator, it will adjust the pressure to the message it is receiving, this can send the wrong pressure during inspiration or expiration, which can cause discomfort while breathing. One of the common reasons for this is a mask leak there are other reason that can cause this please follow the training received and care plan, If the problem persists, it may mean that the respiratory service which provides the client with care must be contacted for support.

Prevention of complications

Bloating and aspiration

Due to the positive pressure applied above the larynx a certain amount of air can enter the stomach.

- Care must be taken that the client's stomach is regular 'vented' via the feeding tube (releasing the air) if the Client is unable to clear naturally (burping) if applicable
- Monitor for distended abdomen
- Encourage the client to 'burp' if no feeding tube is present.
- The client should sleep in an elevated position (30 degrees)

Distended abdomen

- Most often caused by bloating
- If feeding tube is in place stop feed temporarily and aspirate air from stomach. Abdomen should look less distended once air is aspirated

- Check head and mask position
- Position the client in an elevated position
- Once client is comfortable re-start the feed
- If no feeding tube in place sit the client up if possible and encourage to 'burp'
- A distended abdomen can cause problems with ventilation as it splints the lungs, which causes the client to take smaller breaths.

Aspiration

- Aspiration has to be suspected if the client starts coughing excessively and feed is seen to come out of the mouth
- Remove mask and position the client to the side
- Suction the client as appropriate
- If feeding tube in place aspirate the stomach for air and excessive feed
- Monitor oxygen saturation and other vital signs (respiratory rate, heart rate, temperature)
- If aspiration is suspected you should follow the escalation process as per the client's care plan.

Technical complications

Disconnection alarm

- Disconnection may be prevented by good positioning of the client and their mask
- Mouth strap may be used to avoid pressure loss via mouth during nasal support (this is for adults only)
- check tubing system for potential air leakage.

Machine failure

- Risks due to machine failure are limited by close monitoring of machine and client (refer to care plan)

Humidifier failure

- Handle humidifier and all associated tubes with care
- Ensure water chamber never goes dry, by checking regularly per care plan instructions.
- Refer to manufacturer's guide.

Oxygen Saturation Machine failure

- Refer to manufacturer's guide for possible source of errors
- In the event of false reading, change the site of the saturation probe
- Assess client for general wellbeing and check oxygen source (as applicable)
- If false reading persists change saturation probe
- If error still not rectified change oxygen lead
- If machine cannot be restarted disconnect and observe client closely until the end of the shift
- Should machine failure happen during the night, disconnect and monitor the client closely until the morning. Hand over to the office team who can contact the Community nurses for replacement
- If the client is known to be unstable and requires continuous oxygen therapy – transfer immediately to hospital for observation.

5. Consent

Acacium Group staff should be aware that carers and relatives do not have the right to give consent on behalf of the client however staff may be able to act as long as they are able to demonstrate that any actions are in the best interest of the client. There may be a representative legally appointed to provide consent on the client's behalf.

Please read the policy on Consent thoroughly and ensure valid consent has been gained.

6. Client and relatives/carers involvement

Initially the need for BiPAP may be distressing to the relatives or carers of the client. Where possible, they should be fully consulted and informed about the care required. It is important to allow family members to feel involved with the care provision and in time family members may be taught how to undertake some BiPAP care for the client.

7. Client information

Detailed information should be provided. Where possible this should be in written format to allow for reference of the information.

8. Infection prevention and control

Sterile procedures are not required for the maintenance of a client's BiPAP ventilation equipment and for setting up BiPAP. However a good level of cleanliness is required. Cleaning should be according to manufacturer's instructions.

If the Acacium Group worker feels that they are at risk from respiratory secretions they should use eye protection, face mask and apron inline with current and national policies. They should complete an OH self assessment if they have any concerns.

9. Safety checks

Safety checks should be undertaken at the beginning of each shift and should include:

- Check all emergency equipment and document findings
- Ventilator settings and alarm limits are as prescribed per care plan
- Ventilator circuit is checked for leakage, loose connections
- Mask is fitted correctly and comfortably
- Ventilator batteries are available, charged and attached (in case of power failure)
- Spare ventilator and ventilator circuits available
- Oxygen connected correctly and working as required
- Torch available in case of power failure
- Sufficient stock available until the next order is due
- Assess client to gather baseline information of their wellbeing

10. Malfunction of the BiPAP machine or failure of supplies

Adults/Children who are dependent on BiPAP can NOT be without their ventilator overnight. If the ventilator fails and there is no backup ventilator transfer immediately to hospital. If the adult/child is able to self-

ventilate safely the repair/ replacement can take place the next day. Please follow the client's contingency plan for ventilator failure in the care plan.

The manufacturer must be contacted as soon as is practically possible or the specialist hospital team if the manufacturer is not available.

Ensure Acacium Group workers are all able to ascertain the manufacturer's contact details

11. Interfaces used to provide non-invasive ventilation can be

- nasal masks
- nasal prongs or nasal 'pillows'
- mouthpieces
- oro-nasal mask
- total face mask

The choice of interface is largely dependent on comfort, amount of strapping needed, nasal or mouth breathing, acceptable control leaks.

12. Fitting the interfaces

- Let the client assist with fitting the mask
- Use forehead supports to redistribute the pressure away from the nasal bridge
- Avoid over-tightening: lift and reposition the mask to eliminate leaks vs. tightening heads straps
- Masks should not rest on the teeth (above or below the lip)

13. Ongoing clinical assessment

Regular assessment of health status according to need should be done to ensure the Client remains at a constant level of health or that problems are detected early. The following should be assessed and documented:

- respiratory rate
- continuous pulse oximetry (if indicated)
- blood pressure (in adults if indicated)
- chest wall movement
- tidal Volumes (the volume that the Client is breathing in)
- co-ordination of respiratory effort with ventilator
- increased use of accessory muscles
- chest pain/indicators of myocardial ischaemia
- client comfort
- mental state

Additional observation of nutritional status, eyes and mouth should be undertaken. Regular eye and mouth care may also be required.

14. Looking after the BiPAP equipment

Action	Rationale
Bi-level ventilation machine	

1.	Ensure that BiPAP settings are as per clients care plan and prescription	To ensure that settings and functions are not altered from what works best for the client and to keep the machine clean.
	Bi-level ventilation mask, headgear and tubing	
2.	<p>The mask and tubing should be disconnected and air dried daily. (unless the client is on BiPAP 24/7 via a tracheostomy).</p> <p>They should also be washed regularly (once a week or more frequently if necessary) in warm soapy water, ensure manufacture guidance is followed for that product. To do this take the mask apart, separating the headgear parts, mask frame and soft cushion; fold over the Velcro ends on the headgear so that they do not become frayed.</p> <p>When finished, rinse all the parts well and allow them to dry in the air, away from direct sunlight.</p> <p>Children use disposable ventilator circuits – please check the care plan for the frequency of change required.</p>	To keep the equipment clean, minimising the risk of infection.
	Airway filter	
3.	The air filter should be replaced approximately every 6 months or per manufacture guidance, and more frequently if required/needed. Please check the client's care plan for further information regarding frequency of replacement Do not wash and/or recycle used air filters.	To ensure air filter system works efficiently.

15. Problem solving

Problem	Cause	Suggested action
Maintenance of airway	Deteriorating respiratory function. Physically tiring.	Check that the mask/nasal cushions are correctly fitted with a good seal. Regular monitoring of respiratory function including skin colour, breathing pattern, respiratory rate, oxygen saturation. Refer client to hospital if deterioration is a concern.
Dehydration	Decreased oral intake. Nausea and vomiting. Thicker secretions	Encourage fluids. Administer prescribed medication
Aspiration, if unable to maintain own airway.	Inability to maintain own airway. Continuous pressure from BiPAP system. Insufflation of air.	Observe and assess client closely. Refer for emergency hospital admission.
Gastric distension and	Insufflation of air from the flow	Encourage client to belch to

discomfort may cause nausea and vomiting.	from the BiPAP machine.	relieve air as it aids comfort. Contact the GP or hospital specialist for advice.
Dry mouth.	BiPAP system utilises a very high oxygen flow which has a drying effect.	Carry out regular mouth care. Give client regular sips of water, ice to suck or drinks as client is able to take. Cluster cares when mask is off – give drink and attend to mouth care.
Eyes: only applies to face mask (BiPAP): Dry. Sore.	Mask: air leak. High flow oxygen.	Ensure mask is well sealed with no leaks. Apply regular eye care. Adjust mask to facial contour. Monitor.
Conjunctival oedema	Facial pressure from mask causing oedema.	Alter and position mask as comfortable. Position padding around head strap to relieve pressure.
Tissue integrity problems	Difficulty in moving. Fear of moving. Pressure of mask on the face, nose and ears	regular pressure relief of interface used. Apply barrier creams or tapes as per the client's care plan.
Mask incorrectly sealed.	Incorrect fitting/placement of the mask.	Alter mask. Ensure mask is correct size. Alter position to ensure correct seal.
Anxiety.	Tight fitting mask. Feeling of claustrophobia and isolation. Fear of dying.	Reassure client. Inform client of any changes taking place. Communicate with the services user's family, keep them informed and involve them in care and communication with client. Consider reverting back to the bottom pressure and re-ramping (if the ventilator allows).
Maintenance of safety of client and environment.	BiPAP machine or tubing not caught up in furniture, bedroom furniture, wheelchair, etc.	Observe client and BiPAP system closely to ensure equipment is working optimally and there is no failure of the system.
Communication: Inability to communicate effectively. Feelings of isolation.	Mask restriction.	Reassure client and ensure comfort. Encourage client to communicate how they feel.

16. Associated Policies / SOPs

Policies

Care planning

CLIN 02 Assisted Ventilation Policy

CLIN 06 Consent Policy

CLIN 12 Safe Use of Medical Devices

CLIN 19 Resuscitation Policy

SOPs

- SOP VENT 01 Tracheostomy Dressing Change (Adult and Child)
- SOP VENT 02 Tracheostomy Care General Guidelines
- SOP VENT 03 Humidification of a Client/Client with a Tracheostomy
- SOP VENT 04 Tracheal Suctioning (Adult & Child)
- SOP VENT 05 Tracheostomy Tube Care (Adult)
- SOP VENT 06 Tracheostomy Tube Change (Adult)
- SOP VENT 07 Tracheostomy Tube Change (Child)
- SOP VENT 08 Administration of a Nebuliser through a Ventilator Circuit (Child)
- SOP VENT 09 Assembling a Ventilator Circuit
- SOP VENT 10 Cleaning & Maintenance of Ventilator Masks and Circuits (Adult & Child)
- SOP VENT 11 Safe Management of a Child During Outings
- SOP VENT 12 Safe Management of a Ventilated Child During Power Failure
- SOP VENT 13 Safe Use of Battery Packs (Child)
- SOP VENT 14 Assisted Cough
- SOP VENT 15 BiPAP
- SOP VENT 16 Oral and Nasal Suctioning
- SOP VENT 17 Care of the Mechanically Ventilated Client
- SOP VENT 18 CPAP
- SOP VENT 19 Mechanical Cough Assist
- SOP VENT 20 Changing Tracheostomy Cotton Ties (Child)
- SOP VENT 21 Changing Tracheostomy Velcro Tapes (Child)
- SOP VENT 22 Phrenic Nerve Pacing
- SOP VENT 23 Laryngectomy Care General Guidelines
- SOP VENT 24 Emergency Tracheostomy Tube Change (Adult)
- SOP VENT 25 Emergency Tracheostomy Tube Change (Child)
- SOP VENT 26 Nasopharyngeal Airway Management
- SOP VENT 27 Nebuliser Therapy

17. References

- Bi-level ventilation patient information leaflet, 2005, Great Ormond Street Hospital
- Invent standard guideline competency: non-invasive ventilation, Invent, 2007
- Guidelines for the use of non-invasive ventilation, 2008, Brighton & Sussex University Hospitals NHS Trust

Appendix A: About Acacium Group

Acacium Group consists of a number of trading companies, each providing services within core niche areas of the health and social care industries. Therefore, as this document is a Group Policy, the Policy herein applies to all trading companies detailed below:

 Part of Acacium Group	 Part of Acacium Group
 Part of Acacium Group	 Part of Acacium Group