Acacium Group

Mechanical Cough Assist (Adult & Child)

Procedure Reference | SOP VENT 19

Version | V4.1

Procedure Name	Mechanical Cough Assist (Adult & Child)
Purpose of Document	To ensure that the correct preparation, procedure & outcome are achieved by implementing a consistent and systematic approach to the procedure of assisted cough
Target Audience	All Carers & appropriately trained carers
Version	V4.1
Author	Kate Nicholson-Florence
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Lead Director	Karen Matthews-Shard
Review Frequency	2 yearly or when clinical or operation guidelines change
Last Reviewed	June 2024
Next Review Date	June 2026
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
V1	Jul 2018	Review	KMS/VM
V1.1	Mar 2020	Updated to new Template	CC
V2	Jun 2020	2 Yearly review	Clinical Advisory Group
V2.1	Oct 2020	Updated re Rebrand	CC
V3	Dec 2022	Reviewed and updated	Clinical Advisory Group
V4	Jan 2024	Rebrand	Clinical Advisory Group
V4.1	Jun 2024	Reviewed and updated	Clinical Advisory Group

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1. Introduction

The mechanical cough assist (known as the mechanical insufflator/exsufflator) assists the client in the mobilisation and clearance of bronchial secretions by inflating the lungs with a positive pressure then providing a rapid change to negative pressure to assist with the client's cough. Cough assist is a non-invasive therapy that safely and consistently removes secretions in clients with an ineffective ability to cough.

2. Definitions

Definition	Explanation
Cough Assist	Assisting the client to remove their secretions from their lungs
Insufflation	Inspiratory breath (breath in) with positive pressure
Exsufflation	Expiratory breath (breath out) with negative Pressure

3. Mechanical Cough Assist

The cough assist works by ambient air being compressed by a turbine and delivered to the client through a close-fitting facemask, mouthpiece or a tracheostomy.

Benefits of cough assist

- assists in the removal of secretions from lungreduces the occurrence of respiratory infections
- safe, non-invasive alternative to suctioning for clients without tracheostomy
- easy for clients and caregivers to operate

Cough Assist Flexibility

- can be used with a face mask, mouthpiece or with an adaptor to a client's tracheostomy
- approved for use in the home for both adults and children
- available in automatic and manual modes

Indications for Use

- Any client with retained secretions that are unable to clear
- Secretions due to a weak or ineffective cough. Conditions such as:
- SMA
- Neurodegenerative disease i.e. MND
- Spinal injury
- End stage respiratory disease

Contraindications

- cardiovascular instability
- pulmonary Cysts
- frank haemoptysis (fresh blood from the lungs)
- recent barotraumas (trauma to the lungs)
- extreme distress/anxiety to the cough assist procedure

Precautions

- known susceptibility to pneumothorax (collapsed lung)
- head injury
- very high oxygen requirements
- high degrees of airway resistance
- congestive cardiac failure

- airway abnormalities
- post lung transplant
- children with increased tone
- children with poor or no glottis control
- abdominal distension due to gas trapping

4. Hazards/complications that can be caused by Mechanical Cough Assist

- reduced cerebral perfusion leading to fainting or alterations in consciousness, such as, light-headedness or confusion, vertebral artery dissection
- incontinence
- fatigue
- headache
- paresthesia or numbness
- bronchospasm
- muscular damage or discomfort
- spontaneous pneumothorax, subcutaneous emphysema
- coughing spasms
- chest pain
- rib or costo-chondral junction fracture
- incisional pain
- anorexia, vomiting, and retching
- visual disturbances including retinal haemorrhage
- central line displacement
- gastro-oesophageal reflux.

All the above-named hazards are found more commonly within a hospital setting and not within the community where the majority of clients have had their conditions for a long time and are stable; however, staff need to be aware of the potential complications.

If any of the following occurs, seek medical attention immediately:

- unexplained increase in pain
- unexplained increase in spasm
- sudden onset of breathlessness.
- Possible Aspiration

Modes of cough assist operation:

There are five modes of operation (it will depend on the machine the client has – the mode for use will be documented in the service user's care plan:

- **Manual:** Positive and negative pressures are applied using the manual switch on the front of the machine or with a remote hand-held switch (dependent on the machine)
- **Basic Auto**: In basic auto the machine cycles between insufflation and exsufflation followed by a pause for a maximum of 20 cycles
- **Timed Programmable Auto**: The cough assist can be pre-programmed to deliver a timed sequence, which could include one or more insufflations before exsufflation. This sequence can be repeated up to 10 times
- **Triggered Programmable Auto:** This is the same as the timed auto mode with client trigger on insufflations (the client is able to initiate the breath)
- **NIV:** Non-Invasive Ventilation mode is provided to give the client up to 15 minutes of respiratory support prior to or post treatment

5. Cleaning and infection Control

The bacterial filter, connector and face mask are all single patient use, and the client will have their own. The tubing, connector and mask should be washed thoroughly in warm soapy water and air dried. This should be completed following each use if there are visible secretions on the mask, connector or tubing, or if no visible secretions on a daily-weekly basis dependent on usage. Manufacturer's instructions and client specific care plan should detail frequency consumables should be changed. The cough assist machine should be wiped over on a weekly basis or more frequently if needed

It is important to follow standard Infection Control Precautions.

6. Who may undertake this procedure

All Acacium Group workers that provide direct care to clients as long as they have been trained in this procedure, assessed as competent and are able to demonstrate understanding of the risks and limitations. All employees must follow Acacium Group policy on Assisted Ventilation and this Standard Operating Procedure.

7. Assessment of need

- Spontaneous cough that fails to clear secretions from the airway
- Ineffective spontaneous cough as judged by:
- Clinical observation
- Long-term care of clients with tendency to retain airway secretions and who are unable to produce an effective cough themselves
- Presence of tracheostomy tube.

8. Consent

Please read Acacium Group policy on consent thoroughly and ensure valid consent has been gained.

9. Client and relatives/carers involvement

Carers who have been trained and are competent to do so and where it has been commissioned, can undertake the procedure.

Where Acacium Group have agreed with commissioner, family and relatives will be taught to undertake this procedure by a trained and competent nurse.

10. Client information

As part of obtaining valid consent the risks, benefits and alternatives to treatment will have been discussed.

The procedure must be explained fully in order to gain full cooperation with the procedure.

11. Frequency

- Cough procedures should be performed as frequently as needed and in line with the clients care plan and cough assist prescription. No data exists to support a specific frequency

- Mechanical Cough Assist procedures should be performed in conjunction with other forms of therapy to mobilise and remove secretions, this would include, nebulizers, suctioning during and at the conclusion of the therapy, Chest physio where prescribed and as detailed the client's care plan.

12. Monitoring

The client's response to the assisted cough should be documented within the clients care notes and should include:

- If client had any pain, discomfort, dyspnoea
- sputum expectorated following cough to note colour consistency, odour, volume of sputum produced/changes to client's normal sputum appearance and any signs of infection
- breath sounds
- presence of any adverse neurologic signs or symptoms following cough

13. Assessment of outcomes

- the presence of sputum specimen following a cough
- clinical observation of improvement
- client's subjective response to therapy.

14. Equipment

- Material (such as tissues or gauze pads to cover mouth or tracheostomy tube during cough to catch any expectorated secretions
- Appropriate PPE as per current guidance and recommendations for Infection Control
- access to suction equipment (if available)

15. Procedure

Cough Assist Machine via a mask/mouth piece

	Action	Rationale
1.	Plug the electrical cord into the power socket and into the back of the Cough Assist Machine and turn the power on.	To check that the Cough Assist Machine is working.
2.	Plug the tubing (Circuit) into the Cough Assist Machine ensuring that the end with the filter goes into the machine and attach the face mask to the other end of the tubing.	To ensure that infection control is maintained through the procedure.
3.	Explain procedure to client and obtain consent	To reduce any anxiety and ensure co-operation. Legal and moral obligation to gain Consent.

4.	Position the client comfortably following the care plan.	To ensure optimum respiratory status.
5.	If required prepare suction tubing, suction catheter and ensure that the suction machine is next to the client.	To ensure that suction is available and ready for use in case the client require suctioning during the procedure.
6.	Turn on the Cough Assist Machine, when operating the Cough Assist Machine sounds like a quiet vacuum cleaner.	To check that the Cough Assist Machine is working.
7.	Make sure the client is comfortable and ready to start using the Cough Assist Machine.	To obtain consent from the client.
8.	Before you place the mask/mouthpiece on the client ask the client to start breathing in and out in time with the Cough Assist Machine. You can either watch the pressure gauge for inspiration/expiration or feel the air coming out of the mask (remember air coming out of the mask is timed with the Client breathing in).	This makes it more comfortable for the client when treatment commences.
9.	During the pause between expiration and inspiration or just at the start of inspiration, seal the mask firmly around the client's mouth and nose/ask the client to firmly hold the mouthpiece in their mouths.	To ensure the client receives the maximum pressure from the inspiratory breaths.
10.	Instruct the client to take a deep breath in with the machine during inspiration and to cough strongly (if possible) during expiration.	To maximise the effects of the mechanical cough assist and remove the optimum amount of secretions.
11.	Leave the mask on the client's face for the number of cycles prescribed and detailed within their care plan. If you need to remove the mask for suction take the mask off the client's face with during the pause or the start of the next inspiration.	To maximise the comfort of the client.
12.	Allow the client to recover and ensure that they are comfortable.	To prevent the client from becoming fatigued.
13.	Document in the client's daily records.	To ensure accurate records are kept.

Cough Assist Machine via a tracheostomy

	Action	Rationale
1.	Plug the electrical cord into the power socket and into the back of the Cough Assist Machine and turn the power on.	To check that the Cough Assist Machine is working.

2.	Plug the tubing (Circuit) into the Cough Assist Machine ensuring that the end with the filter goes into the machine and attach the face mask to the other end of the tubing.	To ensure that infection control is maintained through the procedure.
3.	Explain procedure to client and obtain consent	To reduce any anxiety and ensure co-operation. Legal and moral obligation to gain Consent.
4.	Position the client comfortably following the care plan.	To ensure optimum respiratory status.
5.	If required prepare suction tubing, suction catheter and ensure that the suction machine is next to the client.	To ensure that suction is available and ready for use in case the client require suctioning during the procedure.
6.	Turn on the Cough Assist Machine, when operating the Cough Assist Machine sounds like a quiet vacuum cleaner.	To check that the Cough Assist Machine is working.
7.	Make sure the client is comfortable and ready to start using the Cough Assist Machine.	To obtain consent from the client.
8.	During the pause between expiration and inspiration or just at the start of inspiration, attach the tubing onto the client's tracheostomy ensuring that it is secure.	To ensure the client receives the maximum pressure from the inspiratory breaths.
9.	Instruct the client to take a deep breath in with the machine during inspiration and to cough strongly (if possible) during expiration.	To maximise the effects of the mechanical cough assist and remove the optimum amount of secretions.
10.	Leave the tubing attached to the client's tracheostomy for the number of cycles prescribed and detailed within their care plan If you need to disconnect the tubing from the client's tracheostomy for suction, disconnect the tubing during the pause or the start of the next inspiration.	To maximise the comfort of the client.
11.	Allow the client to recover and ensure that they are comfortable.	To prevent the client from becoming fatigued.
12.	Document in the client's daily records.	To ensure accurate records are kept.

16. Associated Policies / SOPs

Policies

CLIN 02 Assisted Ventilation Policy
CLIN 06 Consent Policy
CLIN 07 Infection Prevention and Control Policy
CLIN 19 Resuscitation Policy

SOPs

SOP VENT 01 Tracheostomy Dressing Change (Adult & Child)
SOP VENT 02 Tracheostomy Care General Guidelines
SOP VENT 03 Humidification of a Client's 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
SOP VENT 09 Assembling a Ventilator Circuit
SOP VENT 10 Cleaning the Ventilator Equipment
SOP VENT 11 Safe Management of a Ventilated Service User During Outings
SOP VENT 12 Safe Management of a Ventilated Service User During Power Cuts
SOP VENT 13 Safe use of Battery Packs
SOP VENT 14 Assisted Airway Maintenance and Cough (Adult)
SOP VENT 15 BiPAP
SOP VENT 16 Oral and Nasal Suctioning
SOP VENT 18 CPAP
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 (Adult & Child)
SOP VENT 27 Nebuliser Therapy

17. References

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- A Review on Cough Augmentation Techniques: Assisted Inspiration, Assisted Expiration and Their Combination Dec 2020 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8604061/
- https://www.nice.org.uk/guidance/ng211/chapter/Recommendations#rehabilitation-after-spinal-cord-injury

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:

pulse Part of Acacium Group	Thornbury Nursing Services Part of Acacium Group
Thornbury Community Services Part of Acacium Group	Scottish Nursing Guild Part of Acacium Group