Acacium Group

Assembling a Ventilator Circuit (for Wet & Dry Circuit)

Procedure Reference | SOP VENT 09

Version | V4.1

Procedure Name	Assembling a Ventilator Circuit (for Wet & Dry Circuit)
Purpose of Document	To ensure that the correct preparation, procedure & outcome are achieved by implementing a consistent and systematic approach to assembling ventilator circuits
Target Audience	All Nurses & appropriately trained carers
Version	V4.1
Author	Karen Matthews-Shard
Date of Approval	November 2010
Published Date	November 2010
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	July 2018	Review	KMS/VM
V1.1	Feb 2020	Updated to new Template	CC
V2	June 2020	2 Yearly review	Clinical Advisory Group
V2.1	Oct 2020	Update 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 frequency for changing the ventilator circuits will be documented in the client's Care Plan, this will be in line with manufacturers guidelines, local infection control policies and advice from the long-term ventilation/ respiratory teams. Please refer to the client's Care Plan for guidance.

2. Aim

To assemble a ventilator circuit correctly, whilst minimising the risk of infection to the client

3. Equipment: Wet Circuit

- Appropriate PPE in line with current guidance
- Anti-Bacterial hand rub
- Anti-Bacterial filter (if applicable)
- Circuit/tubing
- Exhalation port
- Humidifier chamber
- Humidifier machine
- Heater/humidifier wires
- Ventilator and mains lead
- Oxygen port (if required)
- Swivel elbow (if applicable)
- Sterile water for irrigation/ cool boiled water
- Prescribed ventilator settings

4. Equipment: Dry Circuit

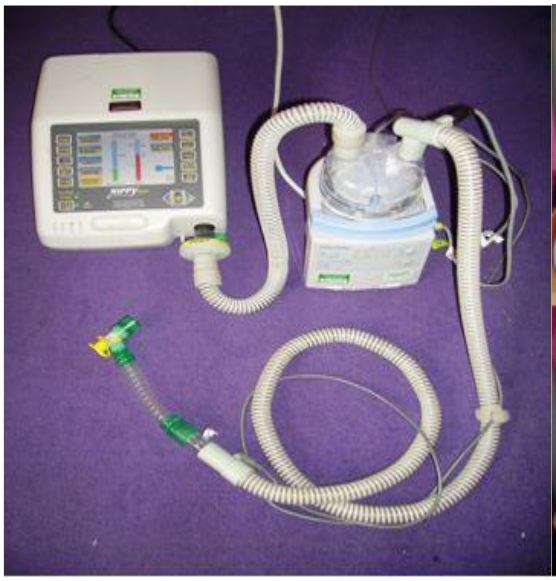
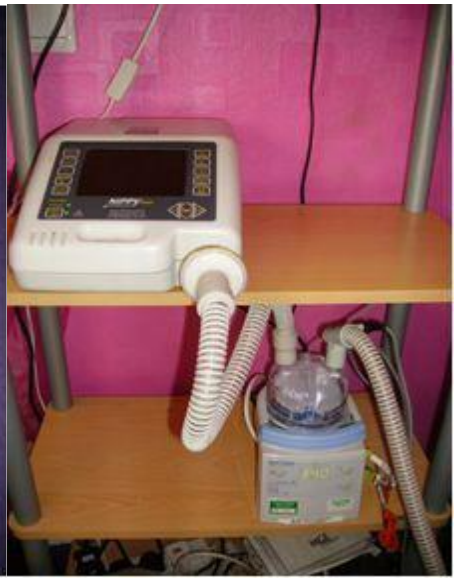
- Circuit/ tubing
- Ventilator and mains lead
- Exhalation port
- Oxygen port (if required)
- Swivel elbow (if applicable)
- Prescribed ventilator settings
- Heat and moisture exchange (if applicable)

When changing a wet or dry circuit please ensure the client is comfortable and that any emergency equipment is available and functional, e.g. suction, tracheostomy box, ambubag, this list is not exhaustive.

5. Procedure

Assembling a ventilator circuit (wet circuit)

Below are pictures of an example of a wet circuit

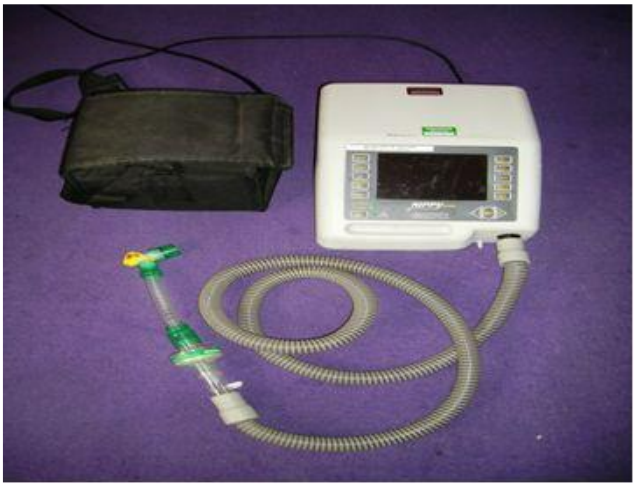
	Action	Rationale
1.	Establish the need to change the ventilation circuit (frequency if circuit contaminated with secretions). This will be indicated in the client's care plan.	To ensure the task needs to be undertaken.
2.	Establish whether the client need to be transferred to a spare ventilator, this will depend on the client's dependency on the ventilator, i.e. whether they are able to breathe off the ventilator or require continuous assistance. This will be documented in the clients Care Plan.	To ensure the safety of the client throughout the procedure.
3.	Ensure sufficient monitoring and observation of the client during the procedure.	To detect signs of oxygen de-saturation and deterioration.
4.	Wash hands thoroughly.	• To minimise the risk of cross infection.
5.	Apply alcohol gel to hands leave to dry before touching equipment.	To reduce risk of infection.
6.	Ensure all equipment is available as above.	To enable the task to be completed.
7.	Explain the procedure to the client & family.	To provide reassurance cooperation and consent.
8.	Prior to changing the circuit, assess the client to ensure they are adequately ventilated/oxygenated by other means (e.g. Self-inflating resuscitation bag/alternative ventilator and circuit/ oxygen mask/ Thermovent).	• To ensure adequate ventilation/ oxygenation is maintained throughout the procedure.
9.	Ensure sufficient monitoring and observation of the client during procedure.	To detect signs of oxygen desaturation and deterioration.

10.	Switch humidifier and ventilator off - beware of the heating element on the humidifier which will be hot and remove circuit to be replaced.	• To prevent burns and scalds. • To allow clean circuit to be assembled. **NB:** if you disconnect the circuit prior to turning of the ventilator there is a risk of becoming showered in the water from the humidifier.
11.	Wash hands and apply alcohol gel to hands, leave to dry before touching equipment.	To ensure correct assembly of circuit and prevent risk of cross infection.
12.	Assemble the clean circuit and check it.	To ensure correct assembly of equipment.
13.	Protect all endings and avoid contamination (minimal handling of ends, using a clean technique).	To minimise risk of infection and prevent contamination.
14.	Wipe all equipment with a clean damp cloth & clean the airway temperature probe in accordance with manufactures guidelines.	To minimise risk of infection and prevent contamination.
15.	Connect the new system to the ventilator and humidifier.	To ensure correct assembly of equipment.
	Perform learn circuit if required/available on vent.	•
16.	Switch humidifier and ventilator on and check prescribed setting (ensure face mask and tracheostomy settings are checked) – ensure pressures are achieved prior to the client by occluding the swivel elbow or attached to the false lung (green bag). **NB**: The tubing must be positioned downwards to prevent water entering the tracheostomy.	• To ensure the ventilator is working and the prescribed pressures are being achieved.
17.	Attach the ventilator to the client and ensure client is comfortable. If the client has been placed on a secondary ventilator for the circuit change, offer to swap the ventilator. Check the client has equal chest expansion, check their colour and oxygen levels are within the normal limits as documented in the Care Plan.	• To resume ventilation. • To enable client to rest and recover from the procedure. 6.
18.	Clean ventilator circuit according to manufactures guidelines, or discard disposable circuits used in accordance to the waste disposal policy (this will be documented in the clients Care Plan).	• To ensure circuit is ready for next change. • To ensure the disposable circuit is disposed of safely and in line with Acacium Group waste disposal policy. 1. To prevent waste becoming dislodged in the client's tracheostomy.

	NB: Ensure that you have removed all waste so that it does not compromise the client's safety.	
19.	Record procedure in Record of Respiratory Management or the client's weekly packs as appropriate.	• To ensure continuity of care and ensure events are recorded.

Assembling a ventilator circuit: (dry circuit)

Picture below is an example of a dry circuit.



	Action	Rationale
1.	Establish the need to change the ventilation circuit (increase frequency if circuit contaminated with secretions). This will be indicated on the client's Care Plan or on the ventilation checklist.	• To ensure task needs to be undertaken.
2.	Establish whether the client need to be transferred to a spare ventilator, this will depend on the client's dependency on the ventilator, i.e. whether they are able to breathe off the ventilator or require continuous assistance. This will be documented in the clients Care Plan.	• To ensure the safety of the clients throughout the procedure.
3.	Ensure sufficient monitoring and observation of the client during the procedure.	To detect signs of oxygen de-saturation and deterioration.
4.	Wash hands thoroughly.	• To minimise the risk of cross • Infection.
5.	Ensure all components are available as above.	To enable the task to be completed.
6.	Explain the procedure to the client & family.	• To provide reassurance and gain the client's cooperation and valid consent.

7.	Prior to changing the circuit, ensure the Client is appropriately ventilated/ oxygenated by other means (e.g. Self-inflating resuscitation bag / alternative ventilator and circuit/oxygen mask/Thermovent).	To ensure adequate ventilation / oxygenation is maintained throughout.
8.	Switch the ventilator off.	• To allow the dry circuit to be changed.
9.	Wash hands and apply alcohol gel to hands, leave to dry before touching.	• To minimise the risk of cross Infection
10.	Assemble the circuit.	• To ensure correct assembly of circuit and prevent risk of cross infection.
11.	Protect all endings and avoid contamination.	To minimise the risk of cross infection and prevent contamination.
12.	Check prescribed settings and switch ventilator on – ensure pressures are achieved when the swivel elbow is occluded, or the circuit attached to a false lung (green bag).	To ensure the ventilator is working and pressures are achieved.
13.	Perform learn circuit if required/available on vent	•
14.	Attach the circuit to the client and ensure they are comfortable If the client has been placed on a secondary ventilator for the circuit change, offer to swap the ventilator, Check the client has equal chest expansion and that their colour and oxygen levels are within normal limits as documented in the care plan (ensure face mask and tracheostomy settings are checked) – ensure pressures are achieved prior to the client by occluding the swivel elbow or attached to the false lung (green bag).	• To resume ventilation. To enable the client to rest and recover from the procedure.
15.	Document completion of the task in the Record of Respiratory Management, or the clients weekly pack as appropriate.	To ensure continuity of care and ensure events are recorded.
16.	Clean ventilator circuit according to manufactures guidelines, or discard disposable circuits used in accordance to the waste disposal policy (this will be documented in the clients Care Plan). NB: Ensure that you have removed all waste so that it does not compromise the client's safety.	• To ensure circuit is prepared for next change. • To ensure the disposable circuit is disposed of safely and in line with Acacium Group waste disposal policy. To prevent waste becoming dislodged in the client's tracheostomy.

7. Associated Policies / SOPs

Policies
CLIN 02 Assisted Ventilation Policy
CLIN 06 Consent 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 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 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 (Adult & Child)
SOP VENT 27 Nebuliser Therapy

8. References

- Michael S Niederman Dec 2018 In Clinics in Chest Medicine
- Hull University Teaching Hospital - Home Ventilation Information for Patients – reviews just keeping equipment clean

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