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Emergency Triage Assessement and Treatment plus admission

Using a Radiant Warmer & a Suction Machine

REPUBLIC OF KENYA
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KEMRI | Wellcome Trust
Keprecon
Kenya Paediatric Research Consortium

Objectives

- Describe the parts and correct use of the radiant warmer
- Outline the clinical use of the radiant warmer
- Describe the parts and correct use of the suction machine
- Outline oropharyngeal suctioning

Using the Radiant Warmer

The Radiant Warmer

Placing a newly born (who requires resuscitation) under a prewarmed radiant warmer uncovered;

1. Permits the radiant heat to reach the baby
2. Allows full visualization
3. Allows easy access to the baby without excessive heat loss

Bensouda B.; Mandel R.; Mejri A.; Lachapelle J.; St-Hilaire M.; Ali N.; (2018) Temperature Probe Placement during Preterm Infant Resuscitation: A Randomized Trial; Neonatology 113:27–32 DOI: 10.1159/000480537
Weiner GM, Zaichkin J, Kattwinkel J (eds): Textbook of Neonatal Resuscitation, ed 7. Elk Grove Village, American Academy of Pediatrics, 2016

The Radiant Warmer - Caution

All preterms require strict temperature regulation & monitoring while under the radiant warmer during resuscitation

For asphyxiated babies, switch off the heat of the radiant warmer & maintain room temperature

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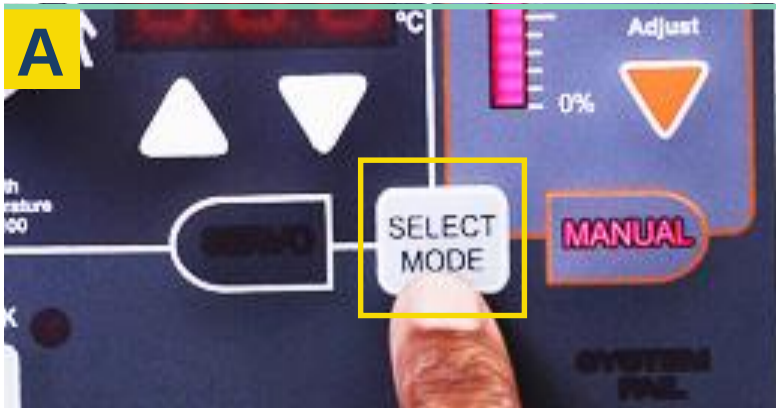
The Radiant Warmer

Control Panel

Wallaby radiant warmer user manual (2019) www.mtts-asia.com

The Radiant Warmer - Modes



1. **Prewarm (25% power): P**rovides constant low heat to warm cot bedding before placing baby on the device
2. **Automatic (Servo or baby mode):** Adjusts heating to maintain baby's temperature within normal range. Should always be used with a temperature probe.
3. **Manual:** Provided constant heat set by the user.

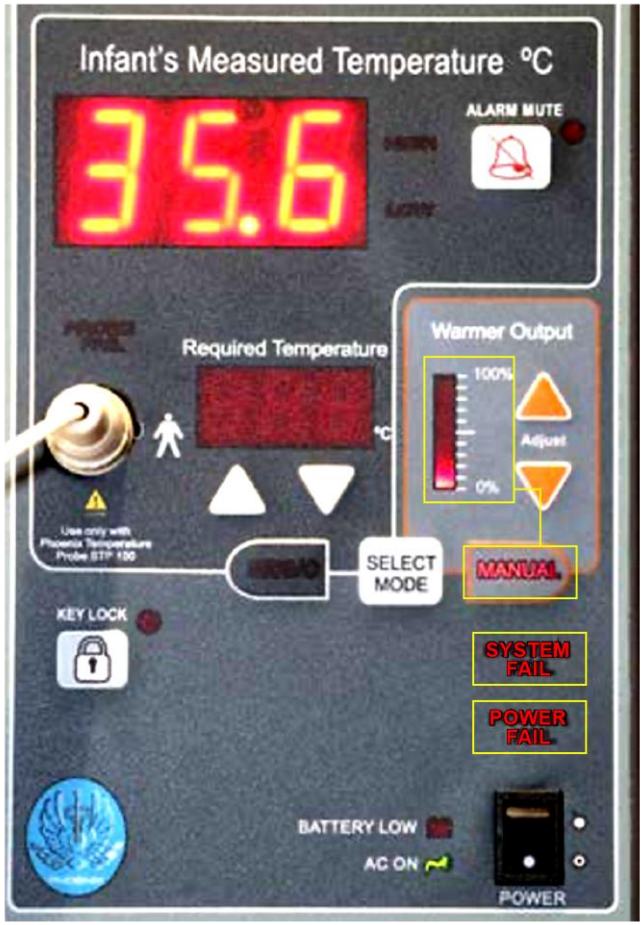
If **power failure alarm** is showing on display, check power switch, power source and cable

If in **manual mode**, make sure power setting is set to a value above 0%

If **system failure alarm** is showing contact your maintenance department

Wallaby radiant warmer user manual (2019) www.mtts-asia.com

The Radiant Warmer - Alarms



1. High temperature (>0.5oC difference)
2. Low infant temperature (<0.5oC difference)
3. Temperature probe failure
4. Heater/System failure
5. Power failure
6. Time out alarm (Manual mode automatic reduction of heater output
7. Manual mode alert alarm (every 15min)
8. Over temperature

Wallaby radiant warmer user manual (2019) www.mtts-asia.com

The Radiant Warmer - Preparation

1. Know the type of radiant warmer, its parts and how to use them

2. Assemble all necessary items for resuscitation

3. Lock the radiant warmer castors to secure it in place

4. Observe hand hygiene and wear PPE

5. Clean temperature probe with 70% alcohol and attach to warmer

6. Switch the warmer on and set Prewarm mode

Bensouda B.; Mandel R.; Mejri A.; Lachapelle J.; St-Hilaire M.; Ali N.; (2018) Temperature Probe Placement during Preterm Infant Resuscitation: A Randomized Trial; Neonatology 113:27–32 DOI: 10.1159/000480537 & Wallaby radiant warmer user manual (2019) www.mtts-asia.com

The Radiant Warmer Connecting to Peripherals

Connecting Temperature Probe

While plugging in the probe make sure the ridge is slotted in the groove of the port.

Connecting Power Cable

Plug in the power cable at the power port located at the backside of the warmer.

The Radiant Warmer – Function Check

- In order to verify the operation of auditory and visual alarms, perform the following procedure:
  1. Select Baby mode and unplug the temperature probe.
  2. Check for alarm on the display and an audible alarm sound.
  3. Switch off power from the wall socket.
  4. Check for power failure audible alarm sounds from the warmer.
- NB: If alarms are not activated while doing the above, the warmer is faulty and should not be used.

Wallaby radiant warmer user manual (2019) www.mtts-asia.com

The Radiant Warmer – Remember!

DO NOT;

- Cover the overhead unit when in use.
- Move the warmer while the brakes are engaged.
- Move the warmer by holding the side panels use the mounting arm.
- Pull the temperature probe in an attempt to unplug it, without engaging its latch.
- Pull the temperature probe cable while cleaning.
- Place anything beyond 5kgs on the side trays.
- Clean the infant radiant warmer's heating element.
- Operate the warmer where there is direct heat from the sun.

The Radiant Warmer - Preparation

1. Know the type of radiant warmer, its parts and how to use them
2. Assemble all necessary items needed for the procedure to be performed
3. Lock the radiant warmer castors to secure the warmer in place
4. Perform hand hygiene and wear appropriate PPE
5. Clean the temperature probe using a swab soaked in 70% alcohol and attach it to the temperature probe port
6. Switch on the machine
7. Test that the probe is working well - bring the sensor close to the heater elements and checking change in temperature
8. Select the mode to use – Prewarm, baby/servo mode
9. Adjust the examination light

Bensouda B.; Mandel R.; Mejri A.; Lachapelle J.; St-Hilaire M.; Ali N.; (2018) Temperature Probe Placement during Preterm Infant Resuscitation: A Randomized Trial; Neonatology 113:27–32 DOI: 10.1159/000480537 & Wallaby radiant warmer user manual (2019)

The Radiant Warmer – Probe Use

After resuscitation;

1. Attach and secure the temperature probe at the correct position
    - **Locate the right mid-clavicle and draw an imaginary vertical line downwards**
    - **Locate the xiphisternum and draw an imaginary horizontal line towards the right side**
    - **Where the 2 lines meet at 90^0 (over the liver), place & secure the temperature probe skin sensor**
2. Switch from Prewarm Mode to Baby mode/Servo mode/Automatic mode
3. Maintain Temperature between 36.5^0C – 37.5^0C

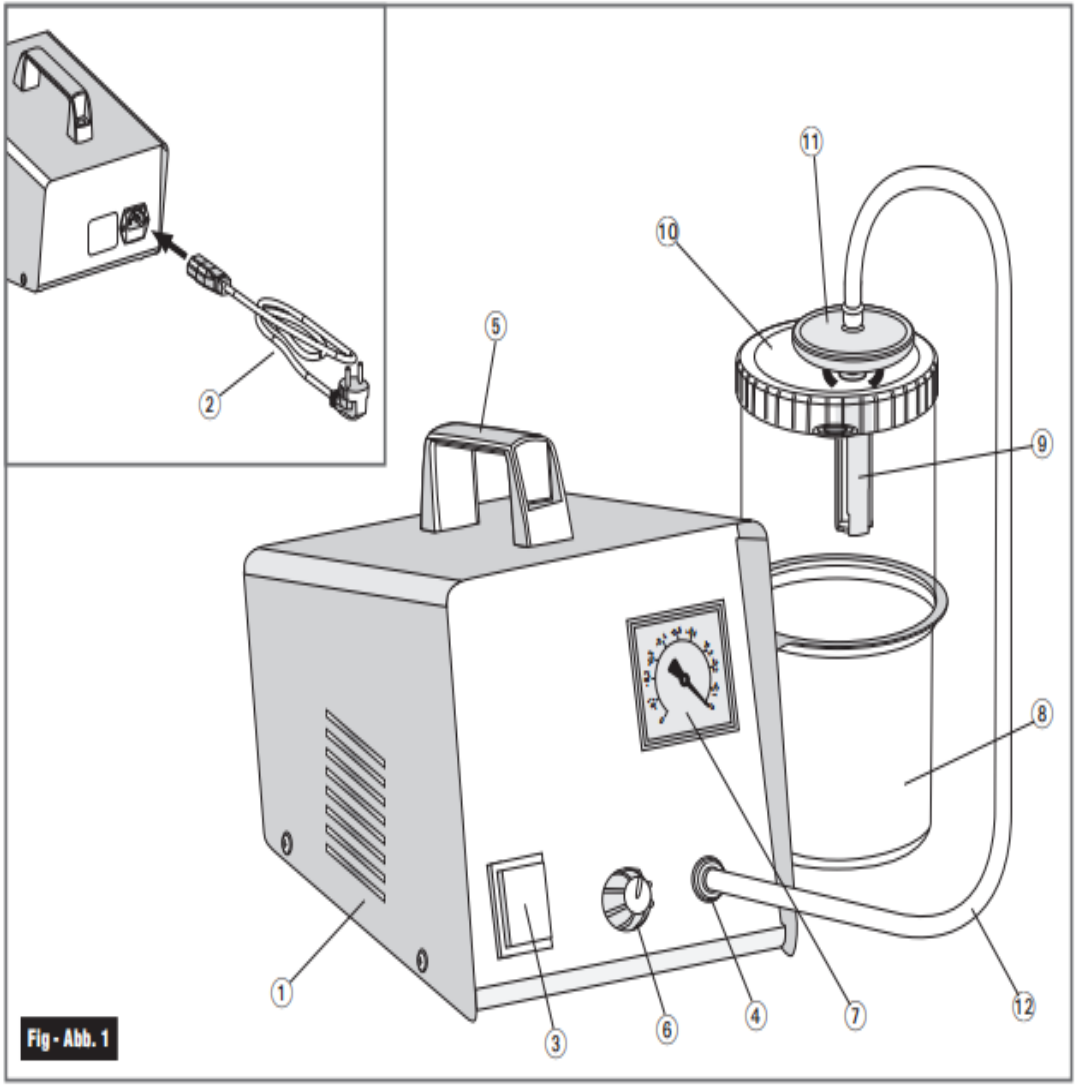
Bensouda B.; Mandel R.; Mejri A.; Lachapelle J.; St-Hilaire M.; Ali N.; (2018) Temperature Probe Placement during Preterm Infant Resuscitation: A Randomized Trial; Neonatology 113:27–32 DOI: 10.1159/000480537; Weiner GM, Zaichkin J, Kattwinkel J (eds): Textbook of Neonatal Resuscitation, ed 7. Elk Grove Village, American Academy of Pediatrics, 2016

Parts and correct use of the suction machine

Aspeed Suction Machine – How it works

- The suction machine has a pump that generates negative pressure which creates a vacuum in the reservoir jar, hence suction is achieved.

Aspeed Suction Machine – Parts



NO	FEATURES
1	ASPIRATOR
2	POWER CORD
3	POWER BUTTON
4	SUCTION PORT
5	HANDLE
6	SUCTION REGULATING KNOB
7	PRESSURE GAUGE
8	SUCTION JAR
9	ANTI OVERFLOW VALVE
10	SUCTION JAR LID
11	BACTERIAL FILTER
12	SILICON TUBING

Aspeed Suction Machine – Function Check

- Fully assemble the suction machine for use.
- Turn on the machine.
- Check whether there is a humming sound from the pump.
- Occlude the patient tubing briefly.
- Check whether the pressure gauge pointer rises to at least -0.85pa/80mm/Hg, while adjusting the regulator knob.

NB: If there is no humming sound and/or the pressure gauge pointer does not rise. The machine is faulty, call the biomed.

Aspeed Suction Machine – Trouble shooting

- The Machine does not turn on:
  - Check the power cable connection.
  - Check whether there is power at the wall socket.
- No suction:
  - The suction regulator is fully closed, open it by turning the knob.
  - The suction jar lid is not properly fitted on the jar.
  - Damaged suction jar.
  - Faulty overflow valve.
- Excessive running noise:
  - Blockage/kinked tubing.
  - Damaged pump.

Aspeed Suction Machine – Cleaning

- Turn off the suction machine and disconnect the power cable.
- Remove the silicone tubing, empty the suction reservoir and dispose the bacterial filter after use.
- Clean and autoclave the silicone tubings, suction lid and suction reservoir at 121 degrees.
- Wipe the suction machine with 70% alcohol.
- Dry the device naturally in a ventilated cool environment.

Oropharyngeal suctioning

Oropharyngeal Suctioning

Penguin Sucker

Bulb Sucker

Manual Suction using a bulb or penguin sucker

Suction Machine

Wide bore sucker (yankheur)

Suction catheters

Suction using a suction machine attached to a wide bore sucker (yankeur) or a suction catheter

Wear Appropriate PPE

Image source: NEST Clinical Modules – www.NEST360⁰.org

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Performing Suctioning

- Talk to the mother (parents) about the procedure.
- Put the baby in a slightly extended position
- For manual suctioning using the penguin/bulb sucker;
  1. Squeeze the sucker and introduce it into the mouth
  2. Release the sucker while in the mouth to create negative pressure
  3. Suck the secretions out and pour the secretions on a gauze.

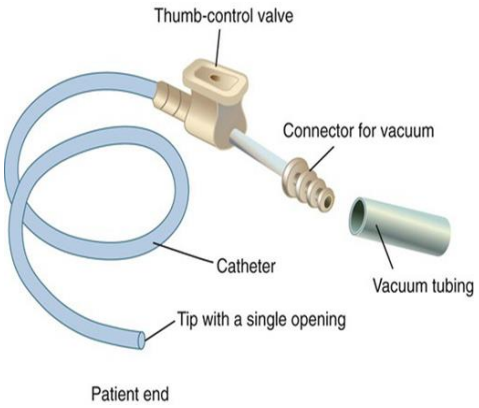
     Repeat

Performing Suctioning with a wide-bore sucker

1. Connect the wide bore sucker to the suction machine
2. Set the pressures at 80 – 100mm/Hg
3. Only suck what is visible in the mouth
4. For very thick secretions add 2 drops of normal saline in the mouth.
5. Rinse the sucker in sterile water then repeat

Performing Suctioning using a Suction Catheter

1. Select the appropriate suction catheter to use (Fr Gauge 6 or 8) & attach catheter to the suction machine
2. Turn on machine and Set a pressure of 80 - 100mm/Hg



Performing Suctioning using a Suction Catheter

3. Measure the distance from the side of the nose to the lower lobe of the ear.
4. With the thumb control valve open and patient in sniffing position, gently insert the catheter into the patient's mouth or nostril to the point marked by the tape/marker.

Performing Suctioning using a Suction Catheter

5. Occlude the thumb control valve on the catheter and slowly & gently withdraw the catheter from the mouth or nostril
    - Use a 360^0 rotation (spiral) motion until the catheter is completely removed
6. Rinse catheter by suctioning sterile water and repeat the procedure
7. Suction for 10 seconds then allow the baby 30 seconds to breath.

Performing Suctioning using a Suction Catheter

- Insert suction catheter to marked depth
- Do not suction too vigorously.
- Do not suction too long!
- Observe suctioned contents carefully
- Empty suction machine reservoir if ¾ full.

Infection Prevention & Control

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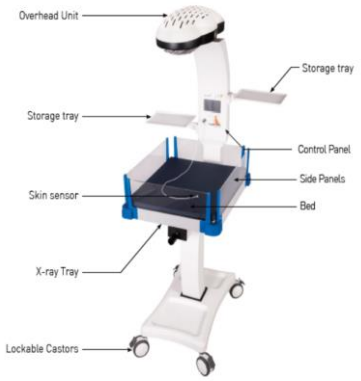
Infection Prevention & Control

Non-critical patient care items

- Items which come in to contact with **patient's intact skin**
- Low level disinfection with 0.05% sodium hypochlorite - Non metallic items of the radiant warmer
- High level disinfection with 70% alcohol - Metallic parts of the radiant warmer



Semi-critical patient care items

- Items which come in to contact with **patient's mucosa and non intact skin (non sterile body parts)**
- Discard suction catheter, bulb sucker
- High level disinfection with 0.5% sodium hypochlorite - Suction machine reservoir & its tubings
- Autoclave - Penguin suckers, BVM

Trevor Duke (2014) CPAP: a guide for clinicians in developing countries, Paediatrics and International Child Health, 34:1, 3-11, DOI: 10.1179/2046905513Y.0000000102
Anna M. Bonner & Petra Davidson (2020) Infection Prevention: 2020 Review and Update for Neurodiagnostic Technologists, The Neurodiagnostic Journal, 60:1, 11-35, DOI:10.1080/21646821.2020.1701341

Questions

Summary

1. Correctly assemble and use the suction machine and radiant warmer
2. When using a suction catheter, suction using a pressure of 80 - 100mm/Hg
3. Place and secure the temperature probe sensor over the liver