

# Radiant Warmer

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

PURPOSE:  Teaching / Practice  
 Test Result: Pass / Fail / Retest

## Scenario Overview

The scenario is set in the newborn care ward where a radiant warmer has malfunctioned. Participants should assess and troubleshoot the device, implement needed repairs and return the device for use.

### Reminder to Facilitator

The facilitator team decides what is essential for participants' understanding. We suggest the team underline or mark these essential items in the **INFORMATION/RESULT** column before beginning the session to ensure these are highlighted throughout the practice.

**ALWAYS REMEMBER THE CANDIDATE SHOULD START WITH THE 4 Ss**

**Safety:** for you, the staff around you and the patient on the device

**Setting:** for possible checks and repairs to the devices

**Supplies:** adequate tools and spare parts for this device

**Shout:** for additional technical support if necessary

### Begin Scenario

**SETTING THE SCENE:** There has been a phone call from the nursery, asking for help. Sister is really worried. She has a premature baby in isolation under a radiant heater and the heater is not working. **WHAT DO YOU DO?**

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
1	Go to the ward and introduce yourself to the in-charge.	Sister Maria is glad to see you.	
2	Ask what the problem is.	The radiant warmer is turning on and reading the patient's body temperature, but isn't heating.	
3	Ask to see the device and check the current device settings.	The radiant warmer is in the isolation ward, plugged into an extension board with an oxygen concentrator. One patient is currently under the warmer. The radiant warmer is in servo/automatic mode and is registering a patient temperature of 33.5°C. The displayed heater output is at 100%.	
4	<p>Ask if it is okay for you to do some minor checks on the device where it is.</p> <p>As the patient's temperature is critically low, advise that the patient be moved to another, working radiant warmer whilst your checks are made.</p> <p>Advise the in-charge that radiant warmers should not be plugged into extension boards, especially when other devices are connected.</p>	Sister Maria is happy for you to do so in the ward and moves the patient to another warmer immediately.	
5	<p>Perform minor checks on the device.</p> <p>Turn off the radiant warmer and remove its plug from the extension board. Plug directly into the wall and turn on.</p> <p>Feel for heat output along the heating element.</p> <p>Change the setting from servo/automatic to manual. Set the heating output to 100% and again feel for heat output along the heating element.</p>	<p>The radiant heater is switched off, unplugged and replugged directly into a wall socket.</p> <p>The heating element is not producing any heat.</p> <p>The heating element is still not producing any heat.</p>	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
6	<p><b>Explain your findings to Sister Maria.</b></p> <p>The heating element for the radiant warmer appears to have a fault.</p>	<p>Sister Maria is unhappy as this is the second radiant heater that has stopped working.</p>	
7	<p><b>Explain next steps needed to prevent this from happening again.</b></p> <p>This issue happens with extended use over time but can also be aggravated with poor power quality. The radiant warmer should always be plugged into its own socket with an independent surge protector, if available.</p>	<p>Sister had not realised that an extension lead should not be used with a radiant heater.</p> <p>Sister Maria will orient her team on the appropriate power requirements for radiant warmers.</p>	
8	<p><b>Decide where to work on the radiant warmer (e.g., at the ward or in the workshop).</b></p> <p>The heating element for the radiant warmer will need replacement. Best practice is to remove from the ward to a larger space for further examination. Is the nurses' station sufficiently large to troubleshoot the device without removing to the workshop?</p>	<p>The nurses' station is sufficiently large, and Sister Maria is happy to have you work there as it means that the device will not be removed far from the ward.</p>	
9	<p><b>You move the radiant warmer to the nurses' station. What will you do next?</b></p> <p>Document device information and note all components received with the device.</p> <p>Plug in and turn on the device. Check the device control panel for any alarms.</p> <p>Make sure the device is removed from power and turned off. Put on gloves. Disinfect the device housing using 70% alcohol.</p>	<p>The radiant warmer has come to the nurses' station with power cable and a temperature probe.</p> <p>As you turn on the device at the nurses' station, the "System Failure" alarm comes on.</p> <p>The device housing is disinfected.</p>	
10	<p><b>Begin further troubleshooting of the device. Check the condition of the internal components.</b></p> <p>Remove device housing screws for the radiant warmer head and remove housing. Set aside screws in separate container.</p> <p>Visually check the condition of the heating element control circuit board.</p> <p>Use a multimeter to assess the resistance across the heating element.</p>	<p>Device housing is removed.</p> <p>The heating element control circuit board shows no visible damage.</p> <p>The resistance across the heating element approaches infinity.</p>	
11	<p><b>Interpret these results for the in-charge.</b></p> <p>The resistance across the heating element is very high, which confirms that the heating element has failed. It needs to be replaced. Confirm that you will check for a replacement part at the workshop and return to repair.</p>	<p>'Sister, I have done a check and the heating element isn't working. It needs to be replaced. I will need to find out if we have a replacement in the workshop.'</p>	
12	<p><b>Return to the Maintenance Unit and check for a spare heating element.</b></p>	<p>Three spare heating elements are available for this device model.</p>	
13	<p><b>Return to the Newborn Care Unit and replace the heating element.</b></p> <p>Disconnect the heating element leads from the heating element control board. Mark which leads go to which points on the control board. Remove any bracketing clips keeping the heating element in place, and then remove the element.</p> <p>Replace with spare heating element and reassemble.</p>	<p>The old heating element is disconnected and removed and replaced with the new element.</p>	

continue to the following page 

#	ACTION REQUIRED	INFORMATION / RESULT	COMMENTS:
14	<p><b>Test the device to see if the repair has been successful.</b></p> <p>Turn on the radiant warmer and set it to Manual mode at 100% heater output. Check for the "System Failure" alarm indicator.</p> <p>Feel for heat output along the heating element.</p>	<p><b>Test the device to see if the repair has been successful.</b></p> <p>The "System Failure" alarm indicator does not come on.</p> <p>Heat can be felt emanating from the heating element.</p>	
15	<p><b>Return the radiant warmer to the ward.</b></p> <p>Go through repair and maintenance steps taken with the in-charge. Ask her to turn on and verify that the device is working well.</p>	<p>Sister is told that the old heating element has been replaced with a new one.</p> <p>Sister Maria is happy to receive back the device. She plugs in and turns on the device. It appears to function well.</p>	
16	<p><b>Return to the Maintenance Unit with the broken heating element.</b></p> <p>Decommission heating element by disposing of ceramic parts appropriately. Remove reusable wires and wire clips and test for continuity before placing in Spare Parts storage and labelling with device model, ward location and repair details.</p> <p>Document corrective activities taken and next steps in maintenance &amp; repair records.</p>	<p>The maintenance and repair records are filled and the decommissioned element stripped of any useful wiring and then disposed of. The wiring and clips are labelled and stored correctly.</p>	

## THANK YOU

### **i** REMIND PARTICIPANTS

Radiant warmers are usually used for short periods of time before a baby is placed in a warmer cot or an incubator or when a baby is having a procedure done that is difficult to do in an incubator or cot. In Obstetrics/Labour Ward, a radiant warmer provides an area post-delivery to prevent hypothermia. The radiant warmer should be clean, working and already warm when the baby arrives. All emergency treatment equipment that could be needed should be at hand.

### **A** INFECTION PREVENTION AND CONTROL

Be sure to wash your hands thoroughly and to put on gloves before handling any equipment. After every use, remember to disinfect all consumables and equipment before using them again.

**Scenario end**

# Disclaimer

Newborn Essential Solutions and Technologies–Education Technical Scenarios

**This series reflects the work of the NEST360° team. Some rights reserved.**

**This work is available under the Creative Commons Attribution–**

**NonCommercial–NoDerivatives 4.0 International license**

**(CC BY–NC–ND 4.0; <https://creativecommons.org/licenses/by-nc-nd/4.0/>).**

Under the terms of this license, you may copy and redistribute the work for non-commercial purposes, provided the work has not been modified, and it is appropriately cited as indicated below. In any use of this work, there should be no suggestion that NEST360° endorses any specific organisation, products, or services. The unauthorized use of the NEST360° names or logos is not permitted. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: *“This translation was not created by Newborn Essential Solutions and Technologies (NEST360°). NEST360° is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition”.*

## **SUGGESTED CITATION**

NEST360°. *Newborn Essential Solutions and Technologies–Education – Technical Scenarios: Radiant Warmer.* (February 2021). License: CC BY–NC–ND 4.0.

## **RIGHTS AND LICENSING**

For queries on rights and licensing, see the full legal code for the Creative Commons Attribution–NonCommercial–NoDerivatives 4.0 International Public License (<https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode>).

## **THIRD–PARTY MATERIALS**

If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

## **GENERAL DISCLAIMERS**

All reasonable precautions have been taken by NEST360° to verify the information contained in this publication. The mention of specific companies or of certain manufacturers’ products does not imply that they are endorsed or recommended by NEST360° in preference to others of a similar nature that are not mentioned. The published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall NEST360° or affiliated partner institutions be liable for damages arising from its use.

The authors have made every effort to check the accuracy of all information. As knowledge base continues to expand, readers are advised to check current product information provided by the manufacturer of each device, instrument, or piece of equipment to verify recommendations for use and/or operating instructions.

In addition, all forms, instructions, checklists, guidelines, and examples are intended as training resources to meet national and local health care settings’ needs and requirements.