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\* ADDENDUM \*  
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HACKETTSTOWN REGIONAL MEDICAL CENTER

Division of Nursing

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Addendum: #8  
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**TITLE: ELECTRICAL SAFETY FOR PATIENTS AND NURSES**

OBJECTIVES

1. To provide an electrically safe environment through application of basic electrical principles and associated precautions.
2. To identify nursing responsibilities associated with the safe and effective use of equipment.
3. To utilize clinical engineering in an effective equipment control program to conduct periodic testing, maintenance, calibration, and pre-equipment use inspection, plus consultation during equipment procurement and staff education.

RESPONSIBILITIES OF CRITICAL CARE NURSE INCLUDES UNDERSTANDING OF:

1. Why the device is being used; what it does; and its clinical function.
2. The basic operating principle and mechanics of the device – how it works and how it is applied.
3. The device's unique problems and hazards, appropriate precautions necessary to avoid adverse effects and how to recognize its failures.
4. One's own limitation, especially of how and when to request help, training or service assistance.

ACTIONS

1. Use electrically operated equipment that has been inspected for safety within the last six months. The sticker on the device should indicate the date of the last inspection

RATIONALE

This helps to avoid using hazardous equipment that is malfunctioning or deteriorating. Equipment can still operate with unobservable defective ground connections.

ACTIONS

RATIONALE

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| 2. Inspect equipment for electrical hazards such as:<br>a. Cracked or frayed line cords and cables.<br>b. Inadequate strain relief.<br>c. Broken or defective connectors, knobs, and switches.<br>d. Damaged or lack of UL listed three-prong plugs. | This is done in order to identify, remove from service, label, and report hazardous equipment.                    |
| 3. Insure that all equipment is plugged into properly grounded receptacles that are tested at least annually to insure adequate ground connection.   | This protects the patient from hazards associated with leakage current.   |
| 4. Remove discontinued and unused electrically operated equipment from bedside.  | This decreases the possibility of accidental damage or failure, resulting in electrical hazards.                  |
| 5. Avoid the use of ungrounded, patient-owned electrically operated equipment (i.e., razors, radio, hair dryers, etc.)   | This eliminates the risk of introducing unsafe equipment into the patient's environment.                          |
| 6. Turn equipment to "off" position before unplugging.   | This prevents arcing (sparks) which may cause fires or a secondary startle reaction.                              |
| 7. Remove plug from wall outlet by grasping plug rather than line cord, pull steadily and straight out.  | This prevents unobservable and potentially dangerous damage to the line cord and plug.                            |
| 8. When introduction of new electrical equipment is done, there is education of that new equipment by unit manager, Staff Development, or company salesperson.   | This promotes a continuing awareness of the safe use of complex electrical equipment in the clinical environment. |

ELECTRICAL SAFETY PRECAUTIONS FOR PATIENTS WITH DIRECT CONDUCTION PATHWAYS TO MYOCARDIUM

Objective:

To establish optimal essential precautions that reduce electrical hazards to patient with direct cardiac conductors.

ACTIONS

RATIONALE

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|---|---|
| 1. Wear gloves when working with conductive pathways to myocardium. | Temporary pacemaker catheters and saline filled central venous pulmonary artery catheters provide low resistance current pathways to the myocardium |
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## ACTIONS

2. Avoid contact with conductive ends of catheters while touching electrical equipment or metal parts of bed.
3. Use only properly grounded equipment in vicinity of these patients.
4. Ensure that defibrillation equipment is immediately available.
5. Provide continuous monitoring of patient with direct cardiac conductors.
6. Provide special attention to the following for temporary transverse pacemaker catheter.
  - a. Use battery powered rather than line operated devices when being connected to pacemaker terminal.
  - b. Protect pacemaker, catheter, and connections from moisture.

## RATIONALE

- Minute alternative current levels can induce ventricular fibrillation.
- This reduces the risk of leakage current that may be conducted directly to the myocardium.
- There is a potential risk for stimulating the myocardium in the vulnerable period of the cardiac cycle which could product ventricular fibrillation.
- This permits observation and determination of dysrhythmias and their appropriate treatment.
- This reduces the possibility of transmitting leakage current.
- Moisture or fluid may cause malfunction of the pacemaker.

## PRECAUTIONS

1. Avoid:
  - a. Use of equipment that fails inspection.
  - b. Use of extension cords.
  - c. Use of non-grounded adapters.
  - d. Use of equipment that shocks, sparks, or smokes.
  - e. Ungrounded equipment in the patient's environment.
  - f. Use of patient-owned appliances in the patient's environment.
  - g. Storage and spillage of liquids on electrical equipment.
  - h. Dangling or kinking patient cables and power cords.
  - i. Draping power cords on pipes or plumbing or laying them on a wet surface.
2. Do not depend upon equipment failure to warn you of hazardous currents.
3. Identify and remove equipment causing 60 cycle interference on cardiac monitors.