PA PSRS
Pennsylvania Patient Safety Reporting System

Patient Safety Advisory

Produced by ECRI & ISMP under contract to the Pennsylvania Patient Safety Authority

Patient Receives Shock During Defibrillator Operational Check

Defibrillators are routinely checked for proper operation by clinical staff typically at the beginning of each nursing shift. The check by the nursing staff is relatively basic compared to the more extensive inspection and preventive maintenance of the defibrillator performed by hospital clinical or biomedical engineering personnel. The operational check is performed to ensure that the defibrillator is performing as intended and properly supplied with the appropriate accessories (e.g., monitoring electrodes, conductive gel) in the event it is needed during a patient resuscitation attempt.

PA-PSRS received a report describing a patient receiving an unintentional shock of approximately 150 joules (J) during a daily bedside defibrillator check, but was reportedly uninjured during the event. According to the report, a nursing assistant (NA) was doing the check. The NA believed she was checking the defibrillator using the device's paddles, but didn't realize that electrodes (pads) were affixed to the patient at the time.

In some situations, clinicians may use a defibrillator, with physiologic monitoring capability, to monitor patient vital signs (ECG, SpO_2). This practice is sometimes used when no other monitoring option is available. However, a major disadvantage of this practice is that defibrillators do not allow for central alarm notification. Defibrillators do not incorporate any safety mechanisms to prevent unintentional energy discharges from occurring.

Regardless of whether a defibrillator is used as a physiologic monitor, operational checks should *never* be performed while the unit's electrodes are attached to anyone. Consider limiting the performance of operational checks to nurses or to equally qualified clinicians, rather than a nursing assistant or other non-qualified staff member who may not be intimately knowledgeable of the functions of a defibrillator and the dangers it can present.

Visual checks are typically performed daily and operational checks weekly. However, before revising any procedures, review the defibrillator manufacturer's recommended operational check procedure and frequency of testing. Also, some current defibrillator models perform automatic weekly or daily self-discharge tests, which may also impact the frequency of operational checks.

The visual check[1] typically consists of the following procedures but may vary among facilities:

- Ensuring that the defibrillator's chassis is intact, clean, free from spills, and void of any objects on and around the unit that may interfere with properly using the device.
- Verifying that all appropriate accessories such as monitoring electrodes are present and within the expiration date.
- Verifying that paddles are clean and not pitted and that they release from the defibrillator chassis easily.
- Inspecting cables and connectors for damage and that the connectors are securely attached.
- Verifying that the AC charger is plugged into a "live" electrical outlet and that the AC power and/or battery-charging indicators are illuminated.
- Verifying that a fully charged battery is in place.
- Verifying that all appropriate indicators and displays are functional.
- Verifying that the device has sufficient paper for ECG recording.

This article is reprinted from the *PA-PSRS Patient Safety Advisory*, Vol. 2, No. 3—Sept. 2005. The Advisory is a publication of the Pennsylvania Patient Safety Authority, produced by ECRI & ISMP under contract to the Authority as part of the Pennsylvania Patient Safety Reporting System (PA-PSRS).

To see other articles or issues of the Advisory, visit our web site at www.psa.state.pa.us. Click on "Advisories" in the left-hand menu bar.

Patient Receives Shock During Defibrillator Operational Check (Continued)

The operational check[1] typically consists of the following procedures but, again, may vary:

- Verifying proper operation of the pacemaker feature, if so equipped.
- Verifying proper operation by performing energy charge and discharge cycles during battery operation according to the manufacturer's recommendations.

Suggestions for mitigating shock hazards to patients and staff during defibrillator operational checks include:

- Providing education and training on the proper operation, operational check, and dangers associated with using or testing defibrillators.
- Allowing only qualified clinical staff to perform defibrillator operational checks.
- Consulting the defibrillator's user manual or contacting the manufacturer for directions on performing operational checks and the frequency of checks.
- If possible, avoiding use of a defibrillator as a physiologic monitor. If its use as a monitor is unavoidable, discontinue operational checks while the device is in contact with patients.

Notes

1. ECRI User Checklist for Defibrillator/Monitor/Pacemakers [Evaluation]. *Health Devices* 1993;22(5-6):292.

An Independent Agency of the Commonwealth of Pennsylvania

The Patient Safety Authority is an independent state agency created by Act 13 of 2002, the Medical Care Availability and Reduction of Error ("Mcare") Act. Consistent with Act 13, ECRI, as contractor for the PA-PSRS program, is issuing this newsletter to advise medical facilities of immediate changes that can be instituted to reduce serious events and incidents. For more information about the PA-PSRS program or the Patient Safety Authority, see the Authority's website at www.psa.state.pa.us.

ECRI is an independent, nonprofit health services research agency dedicated to improving the safety, efficacy and cost-effectiveness of healthcare. ECRI's focus is healthcare technology, healthcare risk and quality management and healthcare environmental management. ECRI provides information services and technical assistance to more than 5,000 hospitals, healthcare organizations, ministries of health, government and planning agencies, and other organizations worldwide.

The Institute for Safe Medication Practices (ISMP) is an independent, nonprofit organization dedicated solely to medication error prevention and safe medication use. ISMP provides recommendations for the safe use of medications to the healthcare community including healthcare professionals, government agencies, accrediting organizations, and consumers. ISMP's efforts are built on a non-punitive approach and systems-based solutions.