SAFETY ACTION NOTICE
By arrangement with the NHS in Scotland, Management Executive

BATTERIES USED IN CRITICAL CARE DEVICES

SUMMARY

Problems have been reported with batteries used in predominantly, but not exclusively, critical care devices. Some batteries have failed without warning during the transfer of acutely ill patients including neonates, and others such that audible alarms have been rendered inactive. Advice is given on battery care, maintenance and replacement.

BACKGROUND

1. Reports have been received in which critical care medical devices have failed due to battery faults, including:
   - failure of batteries in three infusion pumps accompanying a patient in an ambulance,
   - failure of an infusion pump to alarm and alert staff to overinfusion,
   - failure of audible alarms in enteral feeding pumps.

2. The reports were all associated with unsatisfactory battery maintenance, including:
   - faulty batteries that could not be charged,
   - total absence of battery checks, maintenance and replacement,
   - failure to keep devices on charge during storage.

3. Where batteries are intended to be routinely changed by the user, the use of incorrect or inappropriate batteries may result in poor performance and risk of overheating and fire. Examples include:
   - rechargeable batteries used in medical devices designed for use with disposable batteries only,
   - substitute batteries of slightly smaller size failing to make proper electrical contact or being inserted with reversed polarity.

ACTION

4. This notice should be brought to the attention of all appropriate managers, staff and users.
5. Managers should ensure that in house care and maintenance programmes are in place and include periodic battery checks by appropriately qualified personnel in line with Health Equipment Information (HEI) 98. Such programmes should include identification of the type of batteries in any new device and attention to the manufacturer’s product specific guidance on the care, expected lifetime and recommended replacement time for the batteries.

6. Where instructions on battery maintenance are absent, unclear or insufficiently detailed (e.g. method of testing battery capacity) the manufacturer should be contacted directly. The absence of such guidance or failure to follow it could result in premature battery failure and risk to patients.

7. Users should be aware of manufacturer’s instructions to carry out routine checks to confirm correct alarm and/or battery functions.

8. Replacement batteries for medical devices should be as recommended by the manufacturer. The use of unauthorised alternatives may result in poor performance and/or risk of overheating and fire.

9. Medical devices with integral batteries should be readily identifiable by serial or hospital reference number and a system put in place to ensure that they are routinely charged and replaced as per the manufacturer’s or local medical physics’ instructions and as appropriate to the device’s designated use. A similar system should apply to batteries which are stored and charged separately from the device (e.g. some defibrillators).

10. Consideration should be given to the purchase or redesignation of devices to be used exclusively for interhospital transfers of neonate or acutely ill patients.

REFERENCES

HEI 98, “Management of Medical Equipment and Devices”, Medical Devices Directorate, Nov 1990

“Premature failure of battery-powered syringe pumps”, A Tatman et al., Anaesthesia, Vol 51, Number 11, November 1996

“Adverse incidents occurring during interhospital transfer of the critically ill”, Archives of Diseases of Children, 1994, 71: 8-11