PORTABLE ELECTRICAL APPLIANCES
Code of Practice
August 2004

Royal Free Hampstead NHS Trust
&
Royal Free & University College Medical School,
Hampstead Campus
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1. SUMMARY OF REQUIREMENTS

1) All electrical systems must be inherently safe, so far as is reasonably practicable.

2) All electrical systems and equipment must be maintained in a safe condition, so far as it is reasonably practicable (see Appendix 1).

3) All electrical equipment must be suitable for the purpose intended and be designed for the environment in which it is used.

4) Work involving electrical equipment needs to be risk assessed.

5) The primary responsibility for day-to-day safety of portable equipment when in service lies with the user(s).
2. INTRODUCTION

This Code of Practice explains how the general duties of managers and employees, as set out in the Trust Health and Safety Policy, apply to portable electrical equipment.

Visitors, outside organisations and contractors are responsible for the electrical safety of any equipment that they bring onto Trust and School premises.

The requirements listed in this code are taken mainly from the Electricity at Work Regulations 1989\(^{1}\) but also include requirements of other related legislation \(^{2,3}\) such as risk assessment and work equipment. In addition, requirements and guidance from the Department of Health \(^{13,14}\) have been taken into account.

Work involving electricity and electrical equipment needs to be risk assessed\(^{2}\). Significant risk assessment findings and any associated precautions need to be documented.

In general, any portable equipment operating at any voltage is covered by this code, including equipment used or located off site such as that used in the community.

For the purposes of this code, the term portable means that the item of electrical equipment receives its electricity supply via a plug and socket.

3. RESPONSIBILITIES

3.1 In law the employer (Trust or UCL for the Medical School) is ultimately responsible for electrical safety. General duties are allocated by the Safety Policy to individual managers and staff. This code shows how these duties apply to the use of portable appliance.

3.2 Directors and General Managers are responsible for ensuring that Heads of Department and Service and other managers within their area of control are aware of the requirements of this code and that sufficient funding is allocated to ensure that equipment is maintained in a safe condition. They are also responsible for ensuring that lists of all portable appliances are provided to the Director of Projects, as required.

3.3 Heads of Department / Unit and Service Managers are responsible for ensuring compliance with the requirements as listed in section 4 for all areas that they control.

3.4 The Director of Projects is responsible for ensuring that the electrical supply and installation for all new buildings complies with IEE\(^{4}\) Regulations as a minimum. The Director is also responsible for the maintenance of the electrical supply in all Trust buildings. The Director of Works Operations has day-to-day responsibility for the maintenance and safety of existing electrical systems.

3.5 The General Manager - Information Systems is responsible for ensuring that any computer system, including leads, installed and managed in the Trust by his / her Directorate is also maintained in a safe condition.

3.6 Employees and Students have a responsibility to adhere to safe systems of work laid down by the Trust and Medical School. They are also required to report any accidents or faults to their manager or tutor. They are responsible for the electrical safety of any appliances they bring onto Trust or School premises. They must be able to provide evidence that their portable appliances are safe.
3.7 Patients, visitors, outside organisations and contractors are responsible for the electrical safety of any equipment that they bring onto Trust and School premises. They must be able to provide evidence that their portable appliances are safe.

4. SPECIFIC REQUIREMENTS

The Heads of Department / Managers are responsible for areas that they control (section 3.3) which specifically includes the following:

- Reporting of faults and accidents & encouraging staff to report same (Section 6),
- Carrying out risk assessments and implementing precautions (Section 4.1),
- Ensuring that maintenance testing and inspection are carried out at the specified frequency (Section 4.2),
- Ensuring that equipment meets minimum standards,
- Provision of training and information (Sections 4.1. & 4.6) and where relevant, instructions,
- Ensuring that equipment brought in by patients is safe, (Appendix 3)

4.1 RISK ASSESSMENT

The use of all electrical equipment must be assessed. This includes any equipment brought onto Trust or Medical School property from outside. This also includes privately owned equipment as well as anything that may be on loan or hire. Part of the assessment process includes visual inspection and a review of the test certification (Appendix 1).

Where the findings are significant, the assessment will need to be completed in writing. The trust’s Work Equipment Code of Practice\(^{(5)}\) contains a suitable assessment form and checklist.

Part of the risk assessment for medical equipment will be carried out by Medical Physics as part of their acceptance testing process. This covers the basic integrity of equipment, however the user will need to assess the effects of the environment and the way the equipment is used etc.

Assessment Process

The equipment needs to be assessed taking the following points into consideration.

- **Strength and Capability.** Is the equipment designed for the task for which it is to be used?
- **Environment.** Is the equipment designed to work in the environment where it is to be used. E.g. wet conditions or explosive atmosphere. In general, equipment used in such special conditions needs to meet the relevant IEC or British Standard.
- **Work Activities** That all activities with electrical equipment do not put the persons involved in danger.
- **Competence and Training** That those people operating electrical equipment are competent to do so and, if necessary, have received training.
- **Electrical Supply** That the mains supply can in an emergency always be easily cut off. For example equipment must be positioned in such a way that the ON/OFF switch is
easily accessible.

- **Persons who may be affected** In addition to deciding on the type of person that may be affected, the person making the assessment needs also to establish the frequency and circumstances of exposure.

- **Any other additional precautions** that may be required.

### 4.2 Maintenance Testing and Inspection

All portable appliances must be maintained in a safe condition. This should be in accordance with instructions or advice issued by the manufacturer, supplier or professional advisory body (e.g. HSE, Department of Health, IEE, NHS Estates).

All portable appliances must be visually inspected and most equipment tested at regular intervals using dedicated test equipment. The intervals for equipment are laid down in Appendix 1 which also gives the minimum standards to which such inspection and/or testing are to be carried out.

These may be carried out:

- within the Trust or Medical School by the Works Department
- within the Trust or Medical School by the Medical Physics Department
- within the department by a competent person\(^{(A)}\)
- by an outside contractor from the approved list.

Visual inspections will need to be done by the department.

Maintenance, testing and inspection of Medical Equipment, including mains leads, will be carried out as agreed by Medical Physics.

#### 4.3 Medical equipment and equipment for use on patients and / or volunteers.

All portable appliances to be connected to patients irrespective of whether it is purchased by the Trust, Medical School or any other organisation, shall be tested before use by Medical Physics. All such equipment, including mains leads, shall then be tested at intervals by Medical Physics or the maintenance contract.

This requirement for testing also applies to electrical equipment to be used on normal volunteers.

#### 4.4 Equipment brought in from outside the Trust or Medical School

Any portable appliances brought in from home or outside will need to comply with the same requirements as those for Trust and Medical School. For equipment brought into residential accommodation see Appendix 2.

New electrical equipment and electrical equipment on loan from other institutions or commercial companies which is to be connected to patients or volunteers must also be tested by Medical Physics before use. For loan or trial equipment an indemnity form should also be completed by the supplier. (See also Appendix 3).

#### 4.5 Means of Cutting Off Supply

Where any portable equipment is connected to mains electricity, it is a legal requirement to

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\(^{(A)}\) Competence may be through training or relevant experience
ensure that it is easy to cut off the power supply. If equipment is arranged so that there is no immediate access to the power socket or switch, then a secondary power switch will need to be provided.

4.6 Provision of Information
Information on safe methods of working is to be provided to staff and others (e.g. students), who may be exposed to electrical hazards. Provision of such information should be in writing.

5. SAFE USE OF ELECTRICAL EQUIPMENT

**Damage.** Equipment should not be used if the mains power cable, mains plug or casing of the equipment are damaged.

Sockets should not be used if they are cracked or broken or if the socket shows signs of overheating damage. Defects are to be reported immediately to the Works Department.

**Batteries.** Portable equipment which contains batteries should be treated with caution even when unplugged from the mains supply. Battery driven equipment can generate high voltages (e.g. resuscitation equipment) and cause shocks or high currents (e.g. vehicle batteries) which can cause fires or burns.

**Mains plugs.** Some equipment is capable of storing electrical charges. It is therefore possible to receive an electric shock by touching the pins of a plug that has been disconnected from a socket. To comply with the British Standard the voltage should have decayed to a safe level within 10 seconds. Mains connectors not standard to the UK must only be used with adapters or transformers that have been designed for that purpose.

**Adapters and Extension Leads.** Mains adapters directly plugging into a socket must not be used under any circumstances.

The use of extension leads is discouraged. It is preferable to use a separate socket for every piece of mains operated equipment. Application for additional sockets should be made to Works.

Retractable extension leads must not be used under any circumstances. The use of multiple extension leads i.e. an extension lead plugged into another extension lead, is not permitted.

6. REPORTING OF ELECTRICAL FAULTS AND ACCIDENTS

**Faults:** All electrical faults must be reported to the relevant person (telephone numbers listed in Appendix 4). Where there is danger of electric shock or a fire developing, then this equipment must not be used until it has been declared safe.

**MEDICAL EQUIPMENT:** This should be reported to Medical Physics in the first instance. If Medical Physics are not available or the matter is urgent, then the report should be made to the Works Department if the equipment cannot be isolated.
PAS and other COMPUTERS: Information Systems Engineer

ALL OTHER EQUIPMENT & INSTALLATIONS: Works via the requisition phone extension 3254. (Out of hours problems are dealt with by shift engineer, Bleep 7-1111).

Electric shocks and burns
Any equipment causing an electrical shock must be disconnected immediately (if safe to do so) and the problem reported to the Works Department or Medical Physics for medical equipment as soon as possible. An incident report form must be completed. If the person loses consciousness or is severely burnt, then this is reportable under RIDDOR[^8], (See Trust / Medical School arrangements in H & S Policy Folder or Web Sites). Shock from static electricity discharge may occasionally be generated particularly in rooms with a dry atmosphere. If there is any doubt about the cause of the shock then these occurrences should also be reported to the Works Department.

See also Appendix 4 (Telephone numbers for reporting faults).
APPENDIX

INSPECTION AND TESTING OF NON MEDICAL EQUIPMENT

1. Introduction
This guidance has been taken from that produced by the HSE\(^{(7)}\) and the Institution of Electrical Engineers (IEE)\(^{(7)}\). The intervals are for guidance and may be adjusted by Works or Medical Physics. Inspections and Inspections combined with testing shall be carried out as specified in Tables 1 & 2. Frequencies may need to be increased according to equipment use.

Test intervals for ward, theatre and clinic or other equipment are listed in the document Safety of Electromedical Equipment produced by Medical Physics\(^{(9)}\).

2. Computer and Microprocessor Controlled Equipment
No electrical tests shall be carried on this equipment other than visual inspections unless it has been constructed to British Standard BS EN 60950\(^{(10)}\). Frequency of visual inspections shall be carried out as specified in Table 2.

3. Visual Inspection
The minimum requirements involve the inspection of the following:

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Checklist of points requiring inspection</th>
</tr>
</thead>
</table>
| **Extension Leads, Plugs & Sockets** | o Wires securely held  
o Outer insulation gripped within plug (where applicable)  
o No signs of overheating  
o No cracks or significant chipping  
o Undamaged outer insulation |
| **Cable** | o No damage to insulation (including heat) |
| **Equipment Casing** | o No damage exposing electrical components  
o All securing screws or fixtures present  
o Correct vents unblocked (where applicable)  
o Connecting socket (where present) undamaged  
o Dry (no evidence of ingress of liquids)  
o Suitable for the environment where used |

4. Electrical Testing
This consists of testing insulation and, where present, earth bonding. For the majority of equipment the minimum standards are the following.

Specialist equipment may require higher testing standards.

- **Insulation** (when tested at 500 Vdc)
  - Class 1 (earthed) - 2 M (or more)
  - Class II (double insulated) - 4 M (or more)
  - 7 M (hand held tools)

- **Earth Bond** (test current 1.5 times the fuse rating but not exceeding 25A)
  - All earthed equipment - 0.2 (or less)

**Note**: Other types of tests are not normally required or recommended.
TABLE 2 EXAMPLE FREQUENCIES FOR ELECTRICAL INSPECTION AND TESTING

<table>
<thead>
<tr>
<th>TYPE OF EQUIPMENT</th>
<th>VISUAL INSPECTION BY USER</th>
<th>FORMAL VISUAL INSPECTION MONTHS</th>
<th>TESTING FREQUENCY YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Technology</td>
<td>Weekly</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Medical</td>
<td>Before use</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Scientific</td>
<td>Before use</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Kettles</td>
<td>Before use</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Fridges &amp; Freezers</td>
<td>Yearly</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>Microwaves</td>
<td>Weekly</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>Kitchen Equipment</td>
<td>Weekly</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Workshop</td>
<td>Before use</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Floor Cleaners</td>
<td>Before use</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Vacuum Cleaners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>Before use</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>RCD’s</td>
<td>Before use</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Equipment &amp; Extension Leads (incl. IEC)</td>
<td>Before use</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Guidance should be sought from the Works department for any item not specifically listed in Table 2 above.

5. Detachable Equipment Leads & Extension Leads
Where it is possible to separate leads from equipment and this is the normal practice, then each lead needs to be tested and inspected separately.

   **Inspection**
   As specified in section 3 above.

   **Testing**
   Insulation to be tested and pass at 2M , (500V dc test voltage).

   The earth bond should pass at 0.2 using a piece of equipment that has already passed to this standard.

6. Failures
   Equipment that fails a visual inspection or test shall be immediately removed from use and advice should be sought from the Works Department.

   Mains adapters and retractable extension leads are not permitted and will be deemed to have failed.

   A piece of equipment or extension lead may occasionally fail an earth-bonding test because the lead is too long. Advice should be sought from the Works Department on this matter.

   Any equipment that has failed needs to be labelled as **FAILED** and must NOT be used.

   If there is a serious risk of shock or fire then the equipment must be locked up or the plug disconnected and taped up if there is a possibility that it may be used.
7. **Labelling**

All equipment that has **passed** an inspection test should have a label which bears the following information:

- **TESTED or PASSED** Colour coded:  
  - Green – Medical  
  - Blue – Non-medical
- Date of test
- Department or person carrying out testing
- Signature or initial

The test label should be attached on an outside panel where it is easily visible. If the mains lead is non-removable then the information may be attached to the lead.

Detachable leads should have their own permanent label, which should be fixed to the lead. The label should indicate that the label refers only to the lead and not the whole equipment.

**Failed** equipment, where the fault cannot be rectified immediately, should bear the following information:

- **FAILED** (Colour coded: red)
- Date
- Department or person carrying out the test
- Signature or initial

The test label should be attached on an outside panel where it is easily visible and the lead physically removed from the equipment. If the mains lead is non-removable then the information may be attached to the lead.

Detachable leads should have their own permanent label which should be fixed to the lead. The label should indicate that the label refers only to the lead and not the whole equipment.

Equipment examined and tested by the Works Department or Medical Physics will also be given a unique ID number. (This may be in the form of a bar code.)

9. **Documentation**

9.1 **Central Records**  
Works and Medical Physics shall keep records of all equipment tested by their respective staff.

9.2 **Department / Directorate / Division Records**

Each manager responsible for their area shall keep a written record of each piece of equipment tested. The information should include the following:

1. Equipment Type  
2. Model  
3. Unique ID  
4. Date tested  
5. PASS / FAIL

Those departments carrying out their own tests or arranging to have them carried out by an outside contractor must also keep the following information

Test ……………………… earth bonding Û, insulation Ü, test voltage V.  
Visual Inspection … any comments  
Overall result ……. PASS / FAIL

10. **Service Agreement**

Some of the equipment owned or leased by the Trust and School is maintained by outside companies. The Head of Department or responsible manager needs to ensure that the servicing includes a check for electrical safety. The standard of safety check needs to be that specified in section 3 of this Appendix.

Both equipment and power leads need to be included in the inspection and testing programme.
APPENDIX 2

ELECTRICAL SAFETY IN RESIDENTIAL ACCOMMODATION

1. Electrical equipment provided by the Trust as part of let.

This will need to be inspected and tested in accordance with the guidelines laid down in Appendix 1.

2. Electrical equipment brought in by the resident

2.1 It is one of the terms of the letting conditions that any equipment brought into Trust or School premises must be safe and certificated.

2.2 Any equipment that is to be taken into the workplace will need to be inspected, tested and labeled in the same way as if it were work equipment.

2.3 Within the Trust, all mains powered electrical equipment brought in by residents must be tested prior to being switched on.

2.4 Within the School, where staff regularly enter a resident’s room, all mains powered electrical equipment will be tested at the start of residence. Thereafter newly brought in equipment will be tested at the start of the spring and summer terms.

2.5 Electrical equipment owned by a resident that is to be used in a communal area, such as a kitchen, will need to be inspected and tested. This will need to be arranged by the Hall Manager.

2.6 It is the responsibility of the Hall Manager to ensure that the resident receives electrical safety information.
APPENDIX 3

NEW EQUIPMENT AND EQUIPMENT BROUGHT IN FROM OUTSIDE THE TRUST OR THE MEDICAL SCHOOL (ROYAL FREE CAMPUS)

INTRODUCTION
Any equipment brought into the Trust or the Medical School must be electrically safe. It will also need to be safe in other respects. This includes employee / student owned equipment, equipment from other institutions, equipment on loan from companies and equipment brought in by patients.

This section also applies to outside organisations that may be working within the Trust or Medical School as well as contractors.

New Equipment
\[\text{Trust.}\] All new medical electrical equipment must be checked by Medical Physics prior to first use. If medical equipment is not obtained through Supplies, it is the responsibility of the purchaser to ensure that the equipment is checked by Medical Physics.

Non-medical equipment purchased by the Supplies Department, Works Department or the Directorate of Information Systems will be tested by the Works Department. If equipment is obtained through some other route, then the person responsible must ensure the equipment is checked.

\[\text{Medical School.}\] All electrical equipment which may be connected to patients or normal volunteers must be tested by Medical Physics prior to being used on site.

Employee’s and Student’s Personal Equipment
Anyone bringing electrical equipment into the workplace will need to have it inspected and tested in accordance with the requirements listed in Appendix 1 of this document.

Patient equipment
Any electrical equipment belonging to a patient that is brought onto a ward for their own use must be inspected by ward management before it is switched on. It must also be tested as soon as is reasonably possible.

Equipment on loan or being tried out
Any electrical equipment brought into the Trust or Medical School must not be used until a ‘Loan Indemnity Form’ has been completed and permission obtained from Medical Physics for medical equipment and the Works Department for non-medical. The form is available from Supplies (Trust) or the Medical School (Assistant Head of Administration (Estates & Facilities)).

Contractor’s Equipment
All contractors coming on site must give a written guarantee that their electrical equipment is safe and provide confirmation of test reports. For outdoor work only 110V equipment is to be used unless the risk assessment indicates that this is not necessary.
APPENDIX 4

TELEPHONE NUMBERS FOR REPORTING OF ELECTRICAL FAULTS

(Trust, Medical School and other organisations)

Works Department

Royal Free Hospital 3254 8am to 5pm, Monday to Friday
4106 out of hours bleep 7-1111
Queen Mary’s Hospital 3057
RNTNE 3254
Coppett’s Wood Hospital 3057
Other sites 3057

Medical Physics (RFH)

Ext. 3197 (020 7830 2417), 4509, 3209, 3198
Bleeps 1090, 1579, 1062, 2356 (via RFH, 020 7794 0500)

RNTNE – Air Call 262

Medical Physics operates 9 am to 5 pm, Monday to Friday.

Information Systems 3056
ANNEX

ARRANGEMENTS FOR THE ROYAL FREE CAMPUS OF THE ROYAL FREE AND UNIVERSITY COLLEGE MEDICAL SCHOOL.

Introduction
Much of the work of the Campus is integrated to that of the Trust. It is therefore sensible to work similar standards, particularly in relation to electrical safety.

Responsibilities
In accordance with the University College Health and Safety Policy, the Head of Department or Unit is responsible for the area that they control. This includes electrical safety.

The Vice Dean for the Campus has an overall health and safety co-ordinating function which deals with issues that may involve a number of departments.

Work involving patients
Any patient related work would normally be regarded as coming under the control of the Trust. Therefore any UC – Campus owned equipment that is to be used with patients, must comply with the standards required for this type of work. Any queries in relation to this issue need to be directed to the Head of Medical Electronics, Medical Physics.

Maintenance and Inspection of portable electrical equipment
Inspection and testing is carried out on this Campus by the Trust Works Department. Additional visual inspection should be carried out by the department.

Any testing carried out by other persons needs to comply with the standards as set out in Appendix 1.
REFERENCES


5. Work Equipment – Code of Practice; 2004; Freenet


10. BS EN 60 950 (or BS 7002), 1989. Specification for safety of information technology equipment including business equipment. BSI Publication.

11. Electricity at work: safe working practice; HS(G)85, HSE Books, 2003

12. Electricity Safety Quality and Continuity Regulations 2002
