Decontamination procedures

This circular contains expanded guidance on the action which should be taken in the event of an incident involving radioactive contamination. It expands on the information contained in RP 4/94B which is superseded by this guidance. Guidance is also given on the procedure for decontaminating minor spills on benches and spills.

This circular is issued following the recent RPS Up-date at which decontamination procedures was one topic. It is important that in the event of an incident involving contamination of either personnel or laboratory surfaces, that the correct action is taken to remove the contamination and to avoid spreading it. This is described in the following guidance which includes as an appendix a notice which should be posted in each radiation laboratory where unsealed sources are used.

Decontamination kit

A decontamination kit should be kept in an accessible position near to a radiation monitor. The number of kits needed per Department will vary according to its size and the geography of the building. One kit per suite of radioisotope laboratories kept ready to hand would normally be sufficient. The location of the kit should be indicated by a notice where it is kept and supplemented by an additional notice in each laboratory.

The decontamination kit should comprise the following items:

- Protective clothing
- Plastic overshoes
- Plastic aprons or disposable oversuit
- Box disposable gloves
- Disposable face masks
- Large red polythene bags and smaller specimen bags.
- Roll paper towel, paper tissues.
- Small forceps or remote handling tools.
- Adhesive radioactive warning tape and notice.
- Barriers, or ropes for demarking and separating affected area.
- Soap.
- Detergent (e.g. Decon).
- Soft nail brush.
- Eye wash.
- Notebook, labels and pen.

The kit should be inspected regularly to establish that the contents are complete. This inspection should be monthly and it is suggested that this task is delegated to a responsible member of staff in each area.

Personal decontamination

The over-riding consideration is that medical emergencies should take priority over decontamination procedures. In the event of contamination co-inciding with a serious medical condition, the medical condition should be treated without regard to the former

in so far as life saving action is required. The treatment should however be carried out whilst attempting to minimise the spread of contamination. Contamination of persons or areas arising out of such treatment should then be carried out after the emergency has been dealt with.

Skin contamination
Sites of contamination should be washed or scrubbed gently using warm water, soap and a soft nail brush. Do not break the surface of the skin or allow contamination to enter the blood stream. This is the significance of gentle scrubbing using nothing more abrasive than a soft nail brush. Uncontaminated cuts or sores should be covered with a waterproof dressing prior to washing. Washing can be carried out over an ordinary sink. Extensive skin contamination should be removed by washing in a shower.
Persistent skin contamination i.e. that, which cannot be removed as above, may be removed by a chemical decontamination procedure as follows: a 4% solution of potassium permanganate can be applied to the contaminated area and allowed to dry. The resultant brown staining may then be removed with a 5% solution of sodium metabisulphite.
After decontamination the skin should be dried and monitored with the procedure repeated if necessary.

Hair
Hair should be washed using ordinary shampoo taking care to limit the spread of contamination by shielding uncontaminated areas by using polythene, plastic aprons and disposable gloves etc. If the contamination is persistent the hair should be cut.

Finger nails
Under-nail contamination should be removed by washing using a soft nail brush. Persistent contamination can be removed by carefully cutting the nails. Calamine lotion may also be used. This should be applied, allowed to dry, and then removed by dry brushing using the soft nail brush with brush and fingers inside a plastic bag.

Eyes
Eyes should be washed copiously using normal 0.9% saline eye wash. If persistent, refer for medical attention.

Mouth
The subject should be advised not to swallow. If dentures are worn these should be removed. Decontamination should be removed by extensive mouth washing and brushing teeth.

Ears and nose
The subject should be referred for medical attention. Swabs and cotton buds can be used for decontamination, along with ear wash. Initial nose decontamination can be carried out by blowing the nose.

Open wounds
These should be irrigated with sterile water or saline.

Monitoring
With all the above, monitoring should be carried out at the end of the procedure to confirm whether decontamination has been achieved or whether the process needs repeating or the subject needs to be referred for further medical attention.

Medical attention
The Queen's Medical Centre is the closest hospital to the University designated for the reception of casualties contaminated with radioactivity. In the event of serious contamination or contamination coupled with a serious medical condition, an ambulance should be called and details of the contamination should be given to the ambulance staff who will telephone the information on to the Accident & Emergency Department where the person will be received.

Where the subject has received minor but persistent contamination they should also attend the Accident & Emergency Department of the Queen's Medical Centre.

Minor spills on benches and floors
The affected area should be demarked in order to warn others of the hazard. Where decontamination cannot be very quickly and easily dealt with, i.e. within a few minutes and without leaving the vicinity, then this should be done before following the steps below. However, if rapid intervention can minimise the spread of contamination, e.g. by stopping the flow or dropping absorbent material onto the spillage, without the risk of personal contamination occurring, then demarcation should be done after this initial action.

The extent of contamination should be minimised in the first instance by means of adherence to good laboratory procedure, e.g. the use of Benchkote and drip trays to prevent spillage. In the event of a spillage occurring the contamination should be contained in the first instance and then subsequently removed.

Action to deal with the spillage should only be taken where there is no risk of personal contamination occurring. If necessary disposable gloves and overshoes should be worn. These will need to be changed at intervals if they become contaminated. Disposable overshoes may wear through quickly and should also be changed before this occurs.

Paper tissues or towels should be dropped onto the affected area to limit the spread of contamination. Spilled material should then be mopped up working from the periphery inwards. The area should then be washed with the contaminated towels generated placed in plastic bags for disposal.

The surface affected should be monitored and the cycle repeated if necessary.

The incident should be reported to the RPS for an assessment of the amount of radioactive material involved and the cause of the incident. Where gross and persistent contamination has occurred this will also need to be assessed in order to determine what action will be necessary to deal with it. In some instances it may be feasible to isolate the area or cover the contamination with shielding material. Ultimately the contaminated surface may need to be removed, however this is an action of last resort.

Dr J A Sutherland
Safety & R P Officer

Appendix to RP 8/94A

Decontamination procedures

THE DECONTAMINATION KIT IS LOCATED.....

Personal decontamination procedures

Medical emergencies take priority over decontamination procedures.

Skin contamination Sites of contamination should be washed or scrubbed gently using warm water, soap and a soft nail brush. Do not break the surface of the skin or allow contamination to enter the bloodstream. Ensure uncontaminated cuts or sores are covered with a waterproof dressing prior to washing. Extensive contamination should be washed in a shower.

Persistent skin contamination Use 4% solution of potassium permanganate and allow to dry. Brown staining removed with 5% solution sodium metabisulphite. Dry and monitor. Hair Use ordinary shampoo. Limit spread. If persistent, cut hair.

Finger nails Use soft nail brush. Carefully cut nails. Calamine lotion may be used. Allow to dry and brush nails inside a plastic bag.

Eyes Normal 0.9% saline in eye wash.

Mouth Advise subject not to swallow. Remove dentures. Copious mouth washes and brush teeth.

Ears and Nose Obtain medical help. Swabs and cotton buds. Blow nose, use ear wash.

Open wounds Irrigate with sterile water or saline.

Minor spills on benches and floors

1. Demark the affected area.
2. Wear disposable gloves and overshoes if necessary. Change these at intervals if they become contaminated.
3. Drop paper tissues/towels on the affected area to limit the spread of contamination.
4. Mop up spilled material, working from periphery inwards. Wash affected area placing contaminated towels in plastic bags.
5. Monitor surface and repeat washing if necessary.
6. Report incident to RPS.

Assess amount and cause of accident.