MONASH University

Occupational Health and Safety
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SAI Global

PROCEDURES FOR PROTECTING THE UNBORN CHILD FROM THE EFFECTS OF IONISING RADIATION

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1. PURPOSE

The purpose of these procedures is to ensure that appropriate measures are taken to control the radiation exposure of any pregnant staff member or student working with ionising radiation at Monash University, in accordance with the requirements of the Radiation Act 2005, the Radiation Safety Regulations 2007 and the Occupational Health and Safety Act 2004.

2. SCOPE

The guidance, procedures and processes outlined in this document apply to staff, students, visitors and contractors at all the Australian campuses of Monash University and to Monash controlled entities.

3. ABBREVIATIONS

mSv millisieverts
OHS Occupational health & safety
OH&S Occupational Health and Safety branch
RPO Radiation Protection Officer
RSO Radiation Safety Officer
TLD Thermoluminescent dosimeter

4. DEFINITIONS

4.1 HEAD OF ACADEMIC/ADMINISTRATIVE UNIT

Head of academic/administrative unit is used to denote the head of the area that is undertaking the activity. For academic areas, this term includes head of faculty, department, school, institute or centre. For administrative areas, the term includes head of division, branch, centre or unit.

4.2 MONASH CONTROLLED ENTITY

Monash controlled entities (eg companies) include entities where Monash can control decision making, directly or indirectly, in relation to the financial and operating policies so as to enable the entity to operate with it in pursuing the objectives of Monash University.

For the remainder of this document, a Monash controlled entity will be referred to as a controlled entity.

4.3 OCCUPATIONAL EXPOSURE

Occupational exposure is exposure of a person to radiation that occurs in the course of that person's work or study.

4.4 RADIATION PROTECTION OFFICER

The Radiation Protection Officer is the OH&S staff member responsible for providing and coordinating radiation protection services at Monash University.

4.5 RADIATION SAFETY OFFICER

A radiation safety officer is a designated staff member in a unit responsible for approving and supervising the ionising radiation work and study of staff and students.

4.6 RADIATION WORKER

A radiation worker is a staff member or student who is occupationally exposed to ionising radiation source(s).

4.7 PREGNANT RADIATION WORKER

A pregnant radiation worker is a radiation worker who has declared their pregnancy or their intention to become pregnant to their supervisor, RSO, head of administrative unit/controlled entity or to a member/s of the OH&S branch.

4.8 SUPERVISOR

4.8.1 Supervisors are those who are responsible for overseeing:

- the work program of other staff;
- the study program of honours and postgraduate students; and
- undergraduate students in lectures, tutorial and practical classes and on field trips.

4.8.2 The supervisor of staff or students has a particular responsibility for safeguarding the occupational health and safety of those in their charge. The supervisor can delegate the supervision or training of a staff member or student to a suitably qualified and/or experienced person, as appropriate for the task. The supervisor is, however, responsible for ensuring that the staff member or student has received appropriate training and has gained sufficient competence to undertake the task.

5. SPECIFIC RESPONSIBILITIES

A comprehensive list of OHS responsibilities is provided in the document *OHS management at Monash University: Structure, functions, roles and responsibilities* (www.adm.monash.edu.au/ohse/documents). A summary of responsibilities with respect to these procedures is provided below.

5.1 HEAD OF ACADEMIC/ADMINISTRATIVE UNIT AND SUPERVISOR

The head of academic/administrative unit/controlled entity and supervisor are responsible for:

- providing this procedure to all women who may be exposed to ionising radiation and who begin work within the unit/entity;
- informing all pregnant radiation workers of the work options available to them during their pregnancy;
- keeping the details of any pregnancy confidential to the greatest possible extent, if requested by the pregnant worker.

5.2 RADIATION SAFETY OFFICER

The RSO is responsible for:

- providing any pregnant radiation worker with 4 weekly TLD monitoring for the duration of their pregnancy;
- assisting the pregnant radiation worker with implementing any agreed changes to their work environment or practices;
- working with the RPO to investigate the dose obtained by a pregnant radiation worker, if necessary.

5.3 RADIATION PROTECTION OFFICER

The RPO is responsible for:

- providing technical advice on ionising radiation safety issues to the pregnant radiation worker and routinely inspecting their workplace;

- examining the 4 weekly TLD results and instigating investigation when needed.

5.4 PREGNANT RADIATION WORKER

The pregnant radiation worker must follow the procedures outlined below, as it applies to them, for the duration of their pregnancy.

6. PROCEDURES FOR PROTECTING THE UNBORN CHILD FROM THE EFFECTS OF IONISING RADIATION

6.1 HEAD OF ACADEMIC/ADMINISTRATIVE UNIT/CONTROLLED ENTITY AND SUPERVISOR

The head of academic/administrative unit/controlled entity and supervisor must:

6.1.1 Ensure that all people who work with ionising radiation, particularly women, understand the requirements of this procedure.

6.1.2 Ensure that women who work with ionising radiation feel comfortable declaring their pregnancies or their intention to become pregnant at an early time.

6.1.3 Ensure an environment where there is not impediment to career progression or continuation due to pregnancy or interruption of work involving ionising radiation.

6.1.4 Ensure that pregnant radiation workers can choose whether or not they continue working with radiation during their pregnancy (subject to satisfaction on the part of Monash University that the unborn child and the mother are not at significant risk). Monash University strongly encourages and supports pregnant radiation workers to seek alternative duties at Monash while they are pregnant.

6.1.5 Ensure that both male and female co-workers and supervisors understand the special needs of a pregnant woman's unborn child in relation to ionising radiation safety. Co-workers or supervisors of the pregnant woman must not engage in work practices that may endanger her unborn child e.g. expecting the pregnant woman to carry her normal share of duties in relation to disposal of radioactive waste.

6.1.6 Ensure that the special needs of women who choose to continue to work with ionising radiation during their pregnancy are considered, and in conjunction with her supervisor, the RPO and the Occupational Health Physician, any additional measures to protect the unborn child are put in place without delay. If satisfactory control measures cannot be put in place from the declaration of pregnancy, then the woman must be provided with suitable, alternative duties until they can.

6.1.7 In the event that the pregnant radiation worker elects not to continue working with ionising radiation, make arrangements to modify the pregnant woman's duties so that essential ionising radiation related work normally performed by the pregnant woman can be continued by other radiation workers in the unit.

6.1.8 Make every effort to place the pregnant woman in a job of similar status, and standing and with similar pre-requisites of training and experience within the University.

6.2 RADIATION SAFETY OFFICER

The RSO must:

6.2.1 determine whether or not the pregnant radiation worker's internal and external exposures to ionising radiation might exceed the relevant dose limits, and if so, modify her duties in order to maintain exposures below those limits.

6.2.2 review intended work practices with the pregnant radiation worker at least once per month for the duration of the pregnancy.

6.2.3 monitor the pregnant radiation worker's exposure to ensure her external and internal exposures to ionising radiation do not exceed relevant dose limits during her pregnancy. This shall include a 4 weekly change of her TLD badge rather than the routine 12 weekly change.

6.2.4 examine dose results, investigate any quantifiable dose and communicate the findings to the RPO and the pregnant radiation worker.

6.2.5 assist the supervisor and pregnant radiation worker to implement improved work practices to ensure ionising radiation doses remain as low as practicable.

6.3 RADIATION PROTECTION OFFICER

The RPO must:

6.3.1 maintain a copy of all 4 weekly dose results.

6.3.2 offer to visit the workplace of a pregnant radiation worker continuing to work with ionising radiation, on a 4 weekly basis for the duration of their pregnancy, or when requested to do so.

6.4 RADIATION WORKER

A radiation worker who is pregnant or intends to become so, is encouraged to declare their pregnancy or their intention to be come pregnant to their supervisor, RSO, head of administrative unit/controlled entity or the Occupational Health & Safety branch at the earliest possible time, on the understanding that the matter will be kept as confidential as possible.

6.5 PREGNANT RADIATION WORKER

6.5.1 Available evidence suggests that unborn children may be more susceptible to the effects of exposure to ionising radiation than the mother. The unborn child is particularly susceptible in the first trimester of pregnancy. Where pregnancy or the intention to become pregnant is declared early by the woman concerned, there is the greatest opportunity to protect her unborn child and to reduce the possibility of any ill-effect occurring.

6.5.2 During pregnancy the unborn child should be afforded the same level of protection as is required for a member of the public. The external dose should be measured by a TLD worn on the abdomen and limited to the member of the public limit of 1mSv/annum[1]. Badges should be changed on a four weekly basis.

6.5.3 Intakes of radioisotopes into the mother's body may also result in harm to an unborn child. Monash University strongly discourages pregnant radiation workers from continuing any radiation work that may carry significant risk of

inhalation or ingestion of radioisotopes e.g. iodination where the iodine is in a volatile form.

6.5.4 In the case where a pregnant radiation worker does continue work that may result in radioisotope intake a risk assessment must be completed in consultation with the supervisor, RPO and the Occupational Health Physician. Control measures including ensuring that the pregnant radiation worker will receive no more than 50 microsieverts for all the radionuclides to which she is exposed for the duration of the pregnancy[2] must then be implemented.

6.5.5 In electing to risk internal exposure to radionuclides, it must be remembered that internal doses are not as easily measured as an external dose. Hence, pregnant women need to take particular care to minimise the risk of inhaling or ingesting any radioactive material. The pregnant worker has the option to request the involvement of the RPO or members of the Occupational Health & Safety branch at any time during their pregnancy.

6.5.6 The pregnant radiation worker should minimise their dose by complying with all agreed alterations to their work practices.

6.5.7 The pregnant radiation worker must report immediately any suspected unplanned exposure to their RSO, supervisor, the Occupational Health & Safety branchor the RPO.

6.5.8 The pregnant radiation worker should contact their supervisor, RSO, the Occupational Health & Safety branch or the RPO with any concerns they may have about working with ionising radiation.

6.5.9 Pregnant women can elect to have the Monash University Occupational Physician consult with their attending physician.

7. RECORDS

Record to be kept by	Records	To be kept for:
Academic/administrative unit/controlled entity	Surveys of laboratories for contamination	5 years
OH&S	Personal TLD results	50 years
OH&S health team (confidential files)	Bioassay and internal exposure results (where collected by OH&S)	Indefinitely

8. REFERENCES

8.1 LEGISLATION

Radiation Act 2005
Radiation Safety Regulations 2007

1 Dose as measured at the surface of the abdomen provides a conservative estimate for the dose to the foetus, as it does not take into account the shielding provided by the mother's abdominal area.

2 The determination of internal dose in equivalent units of microsievert is a process that must consider the pharmacokinetics and target organ/s of the specific radioisotope. Any pregnant radiation worker who is at risk of inhaling or ingesting radioisotopes should discuss this with their RSO in the first instance. The 50 microsievert limit is based on protecting the foetus to 1/20th of the maximum allowed internal intake for a member of the public (ICRP 60, 61 and 68).

8.2 CODES OF PRACTICE AND RELATED DOCUMENTS

Code of Practice for the Exposure of Humans to Ionizing Radiation for Research Purposes (2005)
Recommendations for Limiting Exposure to Ionizing Radiation (Printed 1995 - Republished 2002) and National Standard for Limiting Occupational Exposure to Ionizing Radiation (Printed 1995 - Republished 2002)

8.3 MONASH UNIVERSITY OHS DOCUMENTS

(http://www.adm.monash.edu.au/ohse/documents/#policies)

Disposal of liquid radioactive waste
Disposal of low level solid radioactive waste
Guidelines for the development of safe work instructions
Ionising radiation dosimetry procedures
Manual for users of ionising radiation
Occupational health and safety management at Monash University: Structure, functions, roles and responsibilities.
Ionising radiation sources: Purchase and licensing procedures
Radiation Safety Manual
Training records
Using ionising radiation at Monash University

8.4 AUSTRALIAN STANDARDS

AS 2243.4:1998 Safety in Laboratories: Ionizing radiation