# POLICY FOR THE UNIVERSITY OF ARKANSAS

## PURPOSE

This policy concerns employees who become pregnant who, in the course of their duties, are occupationally exposed to ionizing radiation (X-rays, gamma rays, or radioactive materials). The purpose of this policy is (1) to provide information, training, and options to employees so that they can make informed decisions in the best interest of themselves and their fetuses; and (2) to provide a mechanism whereby the University of Arkansas (UA) can manage or implement appropriate safety practices. No employee shall be discharged, transferred, or otherwise have her employment affected without her agreement solely because she is pregnant. On the other hand, employees can be required to perform the essential functions of their positions as a condition of continuing their positions.

## PROCEDURE

1.This policy shall be invoked when employees (faculty and staff) or students in one of the following categories become aware of their pregnancy or state an intention of becoming pregnant in the near future:

A) Any employee who receives (as demonstrated by film badge reports), or is likely to receive (as determined by the Radiation Safety Officer's (RSO) evaluation of duties) a radiation dose in excess of 40 millirems per month, averaged over a nine month period. This is the "action" level dose, not the permissible dose.

B) Persons engaged in the following activities may be "at risk" as defined in (A) above:

Laboratory personnel working with radioactive materials or
X-ray generators.

2.Employees do not have to notify anyone of their pregnancy or intention of becoming pregnant. However, an employee who decides to notify the University of her pregnancy or intended pregnancy has the following responsibilities:

A) Notify her immediate supervisor OR the Radiation Safety Officer of her pregnancy or intended pregnancy.

B) Assist her supervisor and the RSO in evaluating the level of risk to a fetus from her particular working conditions and in evaluating the reasonableness of modifications to her working conditions to reduce risk. She shall sign a Female Radiation Exposure Declaration Form acknowledging that she has officially notified her supervisor of her pregnancy or intended pregnancy and knows the possible risks to her fetus from ionizing radiation exposure.

C) Notify her supervisor of any changes in her work or any problems in her pregnancy

which may relate to exposure to radiation.

3.Employee's options:

A) Resign from employment.

B) Continue in employment in her current position.

C) If the supervisor offers the employee an alternative position with less radiation risk, she may accept such position.

D) Take a leave of absence for a period of time not exceeding the duration of the pregnancy.

4.Supervisor's responsibilities:

A) Contact the RSO and schedule a conference with the employee.

B) Implement any modifications in working conditions which the supervisor deems appropriate.

C) Establish the duration and conditions of any leave of absence or transfer to another position allowed under other provisions of this policy.

D) Provide the employee with information furnished by the Radiation Safety Officer regarding the nature of potential radiation injury associated with in utero radiation exposure and the regulatory limits established by the National Council on Radiation Protection.

5.Radiation Safety Officer's responsibilities:

A) Develop information to be furnished to employees regarding the nature of potential radiation injury associated with in utero radiation exposure and the regulatory limits established by the National Council on Radiation Protection. (This information is provided later in this policy.)

B) Advise the supervisor regarding the nature, the magnitude, and appropriate preventive measures associated with the employee's exposure to ionizing radiation.

C) Provide dosimeters and keep the supervisor and employee advised of exposure readings.

ACKNOWLEDGEMENT OF TRAINING:

FEMALE RADIATION EXPOSURE DECLARATION

I understand that UA is obliged by applicable law to take the position that protection of the health of the embryo/fetus is the immediate and direct responsibility of the prospective parent(s). While the medical profession and the UA can support the parent(s) in the exercise of this responsibility, the UA cannot assume it for the parent(s) without, according to the courts, simultaneously infringing upon individuals' rights. I also understand that policies which, as a rule, inhibit a woman's activities in the workplace on the basis of fetal protection concerns, are improper under the law of the United States, unless a woman voluntarily requests more protective dose limits be applied to her or in cases in which sex or pregnancy actually interferes with the employee's ability to perform the job.

I have received training from UA concerning the radiological hazards of employment. I have also received training regarding the effects of radiation on an embryo/fetus (such as mental retardation and birth size, childhood cancer, radiation-induced genetic effects, and the radio-sensitivity of the embryo/fetus.)

I have had opportunity to ask questions concerning all aspects of the presentation.

I understand that the National Council on Radiation Protection and Measurement has recommended a separate dose limit of 500 mrem (not to exceed 50 mrem/month) to the embryo/fetus from occupational exposure of the expectant mother for the term of the pregnancy. I understand that limiting the dose to the embryo/fetus for any Declared Fertile Female or Declared Pregnant Female, for the term of the pregnancy may result in lowering the occupational dose which I may receive. I understand that I must declare whether I wish to be considered a Declared Fertile Female (may become pregnant) or a Radiation Worker. As a Declared Fertile Female, under UA policy, I will be restricted to a radiation dose of 40 mrem/month. If I choose instead to be considered a Radiation Worker, my radiation dose will be the same dose limits applicable to male workers.

I understand that if I become pregnant, I have the option to formally choose to be considered a Declared Pregnant Female. If I make that choice, under UA policy I will be restricted to a radiation dose of 400 mrem for the entire gestation period, not to exceed 40 mrem per month. If I do not formally declare my pregnancy, my radiation dose limits will continue to be the same as they were before I became pregnant.

I understand that I may be excluded from certain jobs or tasks that would require high radiation exposure if I choose to be a Declared Fertile Female or a Declared Pregnant Female. I understand that these declarations and lower limits, however are strictly voluntary and will be

implemented by UA only upon request. I understand that I may change my declaration at any time by notifying my supervisor and signing a new declaration form.

Based on the above information, I believe I adequately understand the risks of radiation related to employment and the choices available to me.

CHOOSE ONE:

Initial yes for one of the classifications below; initial no for the other two classifications.

| | |
|---|---|
| _____ Yes _____ No | Radiation Worker. Based on the above information, I do want to be subject to the full occupational exposure limits which are 5000 mrem/calendar year. |
| _____ Yes _____ No | Declared Fertile Female. Based on the above information, I voluntarily elect to be considered a fertile female (may become pregnant) and to be subject to the lower dose limit of 40 mrem/month or 400 mrem/rolling quarter. |
| _____ Yes _____ No | Declared Pregnant Female. I currently am pregnant, and I voluntarily elect to be subject to the lower dose limit for pregnancy of 400 mrem for the gestation period, not to exceed40 mrem per month. |

Employee's Social Security No.

_____

Employee's Name

_____Date:_____

Please Print

Employee's Signature

_____

Signature

Supervisor's Name

_____Date:_____

Please Print

Employee's Signature

_____

Signature

Estimated date of Delivery

_____

IMPORTANT:

Upon signature of the employee this form must be hand-carried to the employee's supervisor.
Upon signature by the supervisor this form must be hand-carried to a Radiation Safety Officer.

UNIVERSITY OF ARKANSAS

INFORMATION FOR FEMALE EMPLOYEES & STUDENTS

UNDER 50 YEARS OF AGE

Possible Health Risks to Children of Women Exposed to Radiation During Pregnancy:

Some recent studies have shown that the risk of leukemia and other cancers in children increases if the mother is exposed to a significant amount of radiation during pregnancy. According to a report by the National Academy of Sciences, the incidence of leukemia among children under 10 years of age in the United States could rise from 3.7 cases in 10,000 children to 5.6 cases in 10,000 children, if the children were exposed to 1,000 mrem of radiation before birth (a "mrem" is a measure of radiation). The Academy has also estimated that an equal number of scientific studies have shown a much smaller effect from radiation. The University of Arkansas wants women employees to be aware of any possible risk so that the women can take steps they think appropriate to protect their offspring.

As an employee, you may be exposed to more radiation than the general public. However, the Arkansas State Health Department has established a basic exposure limit for occupationally exposed adults of 5,000 mrem per year. No clinical evidence of harm would be expected in an adult working within these levels for a lifetime. Because the risks of undesirable effects may be greater for young people, persons under 18 years of age are permitted to be exposed to only 10 percent of the adult occupational limits. (This lower limit is also applied to members of the general public.)

The scientific organization called the National Council of Radiation Protection and Measurements (NCRP) has recommended that because unborn babies may be more sensitive to radiation than adults, their radiation dose as a result of occupational exposure of the mother should not exceed 500 mrem. Other scientific groups, including the International Commission on Radiation Protection, have also stressed the need to keep radiation doses to unborn children as low as practicable.

Thus it is the responsibility of your employer to take all practicable steps to reduce your radiation exposure. Then it is your responsibility to decide whether the exposure you are receiving is sufficiently low to protect your unborn child. The advice of your employer's health physicist or radiation protection officer should be obtained to determine whether radiation levels in your working areas are high enough that a baby could receive 500 mrem or more before birth. If so, the alternatives that you might want to consider are:

A) If you are now pregnant or expect to be soon, you could decide not to accept or continue assignments in these areas.

B) You could reduce your exposure, where possible, by decreasing the amount of time you spend in the radiation area, increasing your distance from the radiation source, and use

shielding.

C) If you do become pregnant, you could ask your employer to reassign you to areas involving less exposure to radiation. If this is not possible, you might consider leaving your job. If you decide to take such steps, do so without delay. The unborn child is most sensitive to radiation during the first three months of your pregnancy.

D) You could delay having children until you are no longer working in an area where the radiation dose to your unborn baby could exceed 500 mrem.

You may also, of course, choose to:

E) Continue working in the higher radiation areas, but with full awareness that you are doing so at some small increased risk for your unborn child.

The following facts should be noted to help you make a decision:

A) The first three months of pregnancy are the most important, so you should make your decision quickly.

B) At the present occupational exposure limit, the actual risk to the unborn baby is small, but experts disagree in the exact amount of risk.

C) There is no need to be concerned about sterility or loss of your ability to bear children. The radiation dose required to produce such effects is more than 100 times larger than the dose limits for adults.

D) Even if you work in an area where you receive only 500 mrem per three-month period, in nine months you could receive 1,500 mrem, which exceeds the full-term limit suggested by the NCRP. Therefore, if you decide to restrict your unborn baby's exposure as recommended by the NCRP, be aware that the 500 mrem limit applies to the full nine-month pregnancy.

The remainder of this document contains a brief explanation of radiation and its effects on humans. As you will see, some radiation is present everywhere, and the levels of radiation most employees of UA receive are not much larger than these natural levels. Because the radiation levels in the area where you will be working are required by law to be kept quite low, there is not considered to be significant health risk to individual adult employees.

## DISCUSSION OF RADIATION

The amount of radiation a person receives is called the "dose" and is measured in "mrems." The average person in the United States gets a dose of 1,000 mrem from natural sources (other than radon) every 12 years. The dose from natural radiation is higher in some states, such as Colorado, Wyoming, and South Dakota, primarily because of cosmic radiation. In these states the average person gets 1,000 mrem every eight years.

Natural background radiation levels are also much higher in certain local areas. A dose of 1,000 mrem may be received in some areas on the beach at Quarapari, Brazil, in only about nine days, and some people in Kerala, India, get a dose of 1,000 mrem every five months.

Many people receive additional radiation for medical reasons. The annual radiation dose averaged over the U.S. population from diagnostic X-rays is 40 mrem per year. The average dose from one chest X-ray is 10-20 mrem.

Radiation can also be received from natural sources such as rock or brick structures, from consumer products such as television and glow-in-the-dark watches, and from air travel. The possible annual dose from working eight hours a day near a granite wall at the Redcap Stand in Grand Central Station, New York City, is 200 mrem, and the average annual dose in the United States from TV, consumer products, and air travel is 2.6 mrem.

Radiation, like many things, can be harmful. A large dose to the whole body (such as 600,000 mrem in one day) would probably cause death in about 30 days, but such large doses result only from rare accidents. Control of exposure to radiation is based on the assumption that any exposure, no matter how small, involves some risk. The occupational exposure limits are set so low, however, that medical evidence gathered over the past 50 years indicates no clinically observable injuries to individuals due to radiation exposures when the established radiation limits are not exceeded. Thus the risk to individuals at the occupational exposure levels is considered to be very low. However, it is impossible to say that the risk is zero. To decrease the risk still further, licensees are expected to keep actual exposures as far below the limits as practicable.

The current exposure limits for people working with radiation have been developed and carefully reviewed by nationally and internationally recognized groups of scientists. It must be remembered that these limits are for adults. Special consideration is appropriate when the person being exposed is, or may be, an expectant mother, because the exposure of an unborn child may also be involved.

## PRENATAL IRRADIATION

The prediction that an unborn child would be more sensitive to radiation than an adult is supported by observations for relatively large doses. Large doses delivered before birth alter both physical development and behavior in experimentally exposed animals. A report of the National Academy of Sciences states that short-term doses in the range of 10,000-20,000 mrem cause subtle changes in the nerve cells of unborn and infant rats. The report also states, however, that no radiation-induced changes in development have been demonstrated to result in experimental animals from doses up to about 1,000 mrem per day extended over a large part of the period before birth.

The National Academy of Sciences also noted that doses of 25,000-50,000 mrem to a pregnant human may cause growth disturbances in her offspring. Such doses substantially exceed, of course, the maximum permissible occupational exposure limits.