What is the Issue?

Several times each year Radiation Protection Services (RPS) receives calls from concerned practitioners in the radiology field regarding a female patient who received a series of routine diagnostic x-ray procedures (usually a combination of radiographic and fluoroscopic examinations) was subsequently found to be pregnant. In response to each situation, RPS staff have carried out an estimation of the dose received by the embryo, based upon the technique factors for the x-ray procedures used. In addition, information concerning the effects of radiation exposure to the embryo was provided to assist in the understanding of the significance of the dose received with respect to possible adverse health effects to the development of the embryo and other risks, such as cancer, in later life.

RPS staff conducted a review of previous requests received over a ten year period, with respect to the types of procedures involved and the resultant estimates of embryo dose in all cases. The results showed that for typical diagnostic procedures involving radiographic examinations and 3-4 minutes of fluoroscopy close to or directly over the area of the uterus, the doses received by an early embryo are typically in the range 5 to 15 milligray (0.5 to 1.5 rad). Procedures not involving the abdominal region usually result in doses to the embryo typically 10 to 100 times lower than those involving the area over the uterus.

What are the Findings?

Published information on the biological effects of radiation on the developing embryo has shown no increase in observable effects at doses below 100 milligray (10 rad). The additional risk of cancer within the lifetime of a person who was exposed (in utero) to 10 milligray of radiation is estimated to be at most around 1 in 1000. This can be compared with a lifetime risk of developing cancer in the general public of around 1 in 3. Therefore, RPS no longer carries out estimations of the embryo dose received during routine diagnostic x-ray procedures since the doses are well below the levels where effects can be expected.

The following information describes the known effects of ionizing radiation on the embryo and associated dose information. This information may be distributed to interested staff and patients, as appropriate.

**NOTE:** Items in [ ] in the following have been added for clarity and are not in the original text of the publication.