

## ARTICLE: “RADIOLOGICAL RISKS TO THE HEALTH OF OCCUPATIONALLY EXPOSED FEMALE WORKERS: A GENDER PERSPECTIVE IN RADIATION PROTECTION”

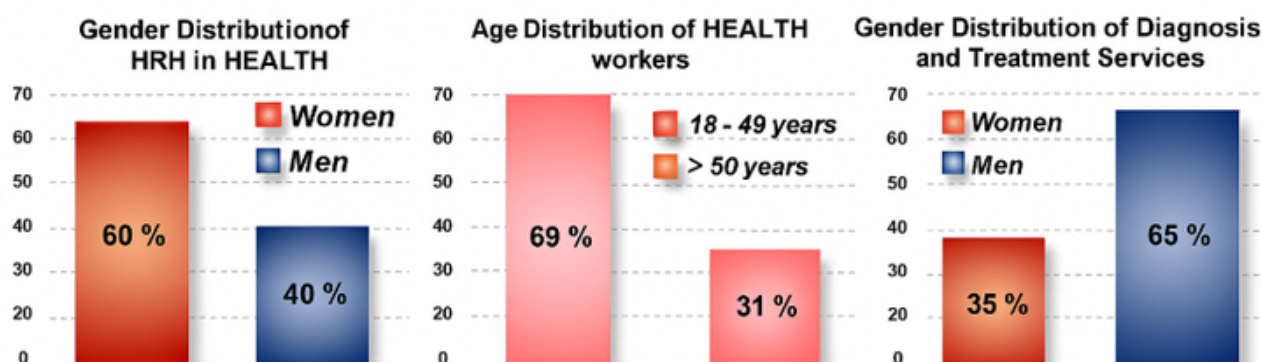
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Concerns about radiation health risks for women—particularly pregnant and breastfeeding workers—require appropriate preventive measures and a gender perspective in organizational practices.

In the healthcare sector, which has a large number of female workers at risk of exposure to ionizing radiation (IR), there is an excessive use of radiological examinations, especially in emergency care. In Argentina, 60% of the healthcare workforce is female, and 69.2% are of childbearing age.

However, services such as radiology, diagnostic imaging, radiotherapy, and nuclear medicine have a lower proportion of female workers (30–40%). In the case of women working in IR environments, special attention must be paid to this condition in order to comply with existing occupational dose limits and those applicable to the embryo/fetus or nursing infant, which are established for their protection.



*In 2018, more than 4.1 billion diagnostic imaging procedures and 40 million nuclear medicine procedures were reported worldwide, according to UNSCEAR. These figures reflect the widespread use of ionizing technologies and the resulting need to strengthen protection measures for the personnel involved.*

## FETAL PROTECTION AND WORKPLACE ADAPTATION

Regulations establish that, once pregnancy is declared, the fetal dose must be kept below 1 mSv throughout the entire gestational period, equivalent to the annual limit for members of the public. It is recommended that the dose to the abdominal surface not exceed 2 mSv, and that the intake of radionuclides not exceed 1/20 of the annual limit of intake (ALI) for the remainder of the pregnancy.

To ensure this, the employer must review exposure conditions through workplace assessments and consider three possible strategies:

- Maintain current tasks, provided that compliance with dosimetric limits is assured, prioritizing continuous monitoring and risk evaluations.
- Reassign the worker to lower-exposure areas, such as shifting responsibilities within the same department, reducing risk without affecting her professional role.
- Assign tasks not involving IR exposure, if preferred by the worker or if adequate protection cannot be guaranteed.

The decision should involve both the worker and institutional authorities, with clear and accessible information on the associated risks, limits, and rights.



### PREGNANT WORKER AND PRENATAL EXPOSURE

The risks from exposure to ionizing radiation are more significant during organogenesis and in the early fetal period.

**Pre-implantation stage:** Fertilization up to the first 10 days (2nd week). Mitosis without differentiation. “All or nothing” effect: implantation failure in the uterus or delayed death of the embryo, or normal continuation of the pregnancy. Experimental models: dose threshold of 100/200 mGy induces 1 to 2% lethality.



**Main organogenesis stage:** Weeks 3 to 8. Intense mitotic activity, cellular differentiation with migration. Malformations in animals: 500 mGy. In humans, no unequivocal causal relationships. Conservative criterion: threshold of 100 to 200 mGy.



**Fetal development stage:** Week 8 to term.

Early fetal period: Cell death of neuronal and glial precursors.

Radiation-induced Severe Mental Retardation (SMR):

- Weeks 8 to 15: 40% per Gy, dose threshold: 100/200 mGy;
- Weeks 16 to 25: 10% per Gy, threshold 500 mGy.

Other alterations: microcephaly, seizures, gray matter heterotopia, decreased size and weight of the newborn, or delayed growth and development.

Late fetal period: Depletion of hematopoietic system cells.

## **BEYOND DOSIMETRY: PSYCHOSOCIAL RISKS AND OCCUPATIONAL HEALTH AND SAFETY COMMITTEES (CYMAT)**

Risks are not only physical. Emotional overload, stress, fear of job loss, discrimination, and the lack of institutional support or information contribute to a psychological burden that affects the overall health of female workers. This impact is heightened when pregnancy is not recognized in a timely manner or when institutions fail to take preventive action.

In this regard, it is proposed to consider comprehensive workplace risks, including:

- Physical risks (temperature, noise, lighting, ventilation),
- Ergonomic and biomechanical risks (physical strain, forced postures),
- Biological and chemical risks, especially relevant in hospital services.

The approach of Occupational Health and Safety Committees (CyMAT) and Psychosocial Work-Related Risks (RPST) enables a joint assessment of these factors, contributing to safer and healthier work environments.

## **STRATEGIC PROPOSAL**


This work promotes a participatory action model within the Occupational Health and Safety Management System (OHSMS), incorporating a gender perspective and addressing:

- Institutional training and awareness-raising,
- Effective communication and open dialogue channels,
- Involvement of all stakeholders (workers, employers, safety professionals, unions),
- Integration of national and international regulations ratified by Argentina (ARN, IAEA, ILO, WHO, etc.),
- Access to information on rights, regulations, exposure limits, and task options.

## **FINAL REFLECTION**

This work aims not only to improve the radiological protection of pregnant workers, but also to promote a cultural shift within organizations. Integrating a gender perspective paves the way toward more equitable work environments, where health protection goes hand in hand with the respect for labor and reproductive rights.

## ARGENTINA: ARN OPENS REGISTRATION FOR THE BASIC COURSE ON RADIATION PROTECTION

 DATE: SEPTEMBER 1 TO NOVEMBER 14, 2025

 VIRTUAL

The Nuclear Regulatory Authority (ARN) of Argentina has opened registration for the Basic Course on Radiation Protection, a fundamental training program designed for those interested in acquiring essential knowledge about the principles and practices of radiation protection.

This course is aimed at professionals, technicians, and students involved in the use of ionizing radiation in medicine, industry, research, or education. No prior experience in the field is required. It will be delivered in a virtual format, allowing access from anywhere in the country and the region.

The course consists of 10 thematic modules and a total workload of 60 hours. A certificate of completion will be awarded upon successful completion of the course.

**REGISTRATION IS OPEN UNTIL JULY 25, 2025, AND SPOTS ARE LIMITED.**

👉 For more information and to register, visit: <https://www.argentina.gob.ar/noticias/la-arn-abrio-la-inscripcion-para-el-curso-basico-de-proteccion-radiologica-0>




## IX CONGRESS OF THE MEXICAN FEDERATION OF MEDICAL PHYSICS ORGANIZATIONS

 DATE: NOVEMBER 14 TO 17, 2025

 VENUE: MÉRIDA, YUCATÁN, MEXICO

The IX Congress of FMOFM will bring together medical physics professionals, with a special focus on radiotherapy, imaging, nuclear medicine, and radiation protection. It represents a unique opportunity to:

- Exchange scientific advances and clinical cases.
- Strengthen regional collaboration networks.
- Update knowledge on regulations and best practices for radiological hygiene and safety in Latin America.

 Who will participate and what activities will take place?

- Professionals, technicians, and students in the medical and radiological hygiene fields.
- Oral and poster presentations on research and practical experiences.
- Workshops and training sessions focused on measurement techniques, dosimetry, and quality control.
- Commercial space with suppliers of equipment and protection and monitoring solutions.

From REPROLAM, we invite our members to:

- Submit abstracts (oral or poster) before July 31, 2025 (date subject to official confirmation).
- Attend the event to strengthen the presence of the Latin American community in radiological hygiene topics.
- Coordinate post-congress publications, sharing lessons learned or recommendations upon returning to the network.

More information: <https://fmofm.org.mx/>



## **WORLD CONGRESS ON MEDICAL PHYSICS AND BIOMEDICAL ENGINEERING (IUPESM 2025)**

SEPTEMBER 29 TO OCTOBER 4, 2025

ADELAIDE CONVENTION CENTRE, AUSTRALIA



The World Congress on Medical Physics and Biomedical Engineering (IUPESM 2025) will take place from September 29 to October 4, 2025, at the Adelaide Convention Centre, Australia. This event, organized by IOMP, IFMBE, and IUPESM, will bring together international experts to explore topics such as artificial intelligence in healthcare, precision medicine, and patient safety. With a diverse scientific program including keynote lectures, symposia, and workshops, the congress promises to be the largest global gathering of medical physicists and biomedical engineering professionals of the year.

More information at:

[www.wc2025.org](http://www.wc2025.org).