



Radiation Safety and Radiologist Working Hours in Uzbekistan

Yulduz Khodjibekova^{1,2*}, Lalita Yunusova^{1,2*}

¹Department of Oncology and Medical Radiology, Tashkent State Dental Institute, Tashkent, Republic of Uzbekistan

²Uzbekistan Radiology Society, Tashkent, Republic of Uzbekistan

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Radiation Safety

According to the Public Health 2030 strategy, Uzbekistan intends to increase the early detection rate of diseases to 70%. This is in response to the annual identification of cardiovascular disease, diabetes, and chronic obstructive pulmonary disease—the most prevalent diseases among the 6.7 million people aged 40 years or older in Uzbekistan. Furthermore, 3 million people will be screened annually to identify diseases in their early stages. Consequently, there has been an increase in the number of radiological studies conducted.

The classification of radiation objects based on guaranteed danger applies to X-ray diagnostic and X-ray therapy rooms [1]. The radiation exposure for objects in Category IV is limited to premises where radiation sources are used. The practical implementation of three fundamental measures is essential to ensure radiation safety during medical X-ray examinations; this is crucial for maintaining systemic radiation safety during these examinations. Using an X-ray machine requires that a person be at least 18

years old and possess a document confirming completion of required training, including instruction and testing of knowledge of safety rules, procedures, and protocols in effect at the institution. Programs that encompass the Radiation Safety section are implemented to train specialists involved in X-ray research. A license for educational activities must be obtained from the institution that provides training. The training is repeated every five years. To ensure compliance with radiation safety standards and requirements, the administration of the medical institution must organize production controls. Category A medical examinations are conducted by the building administration on a preliminary and annual basis, in accordance with the order of the Ministry of Health of the Republic of Uzbekistan. The application of conventional parameters for handling sources of ionizing radiation is delayed until the necessary results are achieved. Individuals enrolled in training courses to work in surgical rooms must satisfy the same requirements.

Systematic radiation monitoring includes:

1) Monitoring the effectiveness of measures at personnel workplaces, on the premises, and the territory corresponding to the procedures of the X-ray room.

2) Monitoring the technical condition and protective effectiveness of movements and applying radiation protection measures (this is conducted at least once every two years).

3) Individual radiation monitoring of Category A personnel that is carried out continuously with the registration of measurement results once a quarter.

4) Individual dosimetric monitoring of persons, which is periodically carried out during special X-ray examinations (surgeons, anesthesiologists, etc.) and in the same manner as for Category A personnel.

5) Control of dose supplies to patients (it is carried out

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*These authors contributed equally to this work.

Corresponding author: Lalita Yunusova, MD, PhD, Department of Oncology and Medical Radiology, Tashkent State Dental Institute, Uzbekistan Radiology Society, 103 Muxtumkuli street, Yashnabad district, Tashkent 100047, Republic of Uzbekistan

• E-mail: lolikaziz118590@gmail.com

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during every X-ray examination).

For workers (personnel), the average allowable daily effective dose is 20 mSv, and the effective dose over the period of working activity (50 years) is 1000 mSv. Exposure to an annual effective dose of up to 50 mSv is allowed, such that the average annual effective dose calculated for five consecutive years does not reach 20 mSv.

During X-ray examinations that involve manipulations not performed by X-ray room personnel, specialized healthcare professionals (such as dentists, surgeons, urologists, assistant surgeons, traumatologists, and others) responsible for patient exposure are trained in safe working practices, including ensuring the radiation safety of the patient and completing training [2]. Anesthesiologists serve in both the anesthesia and intensive care departments and are responsible for working in the CT and MRI rooms to conduct contrast studies and X-ray surgical procedures under tomographic control. Nurse anesthesiologists typically serve in the department of anesthesiology and resuscitation and are assigned the same tasks. A radiologist cannot operate two or more mechanical X-ray machines simultaneously regardless of whether the control panels are located in the same room. The final decision on support and a thorough visual examination is made by the radiologist.

If the referral for an X-ray examination is deemed unjustifiable (e.g., due to lack of relevant diagnosis or condition), the radiologist may decline to conduct the X-ray examination. Prior to this, they must inform the attending physician and document the refusal in the patient's medical record. When a patient is discharged from a hospital or after an X-ray examination at specialized treatment and preventive institutions, the radiation dose-load value is recorded in the discharge document [3]. The determination and accounting of radiation dose loads are performed using approved methods, measurement techniques, and measuring instruments. To prevent the unnecessary re-exposure of patients at all stages of medical care, the results of previously conducted X-ray studies and the doses received during the year are taken into consideration. When a patient is referred for an X-ray examination, consultation, or inpatient treatment or when a patient is transferred from one hospital to another, the results of the X-ray examination (conclusions and images) are transferred along with an individual card. The time standards for conducting X-ray examinations are determined by the medical organization, depending on the volume and structure of the examinations being performed as well as the technological capabilities of

the equipment used.

Radiologist Working Hours

The workload of a radiologist is determined by the estimated time standards established by the medical organization for conducting X-ray examinations. Individual workload standards for department employees are established by the heads of healthcare institutions in agreement with the trade union committee. These standards are based on specific working conditions, and employees are required to participate in collective work discussions. Radiologists devote 80% of their working time to performing their main task (with a 5-day working week totaling 4 h 48 min each day). Radiologists spend the remaining time before the full work shift (20% of their working time) outside of areas with X-ray radiation (such as consultations, medical rounds, conferences, pathological autopsies, analysis of activities, and drawing up conclusions) in accordance with their functional responsibilities. Healthcare staff often work the same number of hours during night shifts as that during day shifts. Emergency rooms are typically staffed in 12-hour shifts. Emergency room operating hours remain consistent even on holidays.

CONCLUSION

It is worth noting that according to this model, radiology institutions in Uzbekistan currently implement a phased training approach for specialists. Overall, the structure of modern radiology represents a veritable empire that is continually expanding.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

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ORCID IDs

Yulduz Khodjibekova

<https://orcid.org/0000-0002-0058-5905>

Lalita Yunusova

<https://orcid.org/0000-0002-7807-9463>

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