

The Effort for Radiation Protection Increases the Value of Interventional Radiology

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Abstract

Radiation protection is one of the most essential efforts for radiologists. The newest update of medical radiation protection in Japan focused on the field of interventional radiology. In this situation, it is required to choose for interventional radiologists to participate in it reluctantly or proactively. To enhance the value of interventional radiology in society, our effort of commitment to learning, collaborating, and assuming our awesome responsibility is requested. We will contribute to the safety of medical facilities and society.

Key words: Radiation protection, Interventional radiology, Diagnostic reference level

(Interventional Radiology 2022; 7: 37-39)

There have recently been extensive revisions and changes implemented where medical radiation protection and safety are concerned. These updated changes have led to numerous actions taken by every medical facility and, as may be expected, considerable activity and stress on the part of medical facilities' radiation safety officers and radiation safety directors. Where interventional radiology is concerned, specific considerations include dose control, besides mindfulness regarding the dose limit of the crystalline lens. These directed efforts are currently underway. The publication of the National Diagnostic Reference Levels in Japan -Japan 2020, or DRLs2020 [1], is useful information as a guideline for reasonable and achievable dose control while also providing guidelines for radiation safety where medical staff are concerned. This reference resource helps direct attention to exposure control of the crystalline lens and serves as a guide for medical staff education while facilitating the work of radiation protection administrators [2]. The International Atomic Energy Agency distributed posters and leaflets in the Radiation Protection of Patients project, which were translated into Japanese [3, 4]. This information is useful as a practical and readily available and usable resource.

“As Low As Reasonable Achievable” has been the guiding principle of thoughtful radiation utilization. Simultane-

ously, there are also cost-considerations where radiation utilization is concerned. Just as we recognize the need to promote medical safety, we similarly realize the need to be responsible where the financial effects to our hospitals and health systems are concerned. As part of this work, we must also consider implementation processes and by extension governance considerations. Much of this work underlines the realization that these efforts are an attempt to address prior failures, including the challenges that were not fully appreciated or effectively addressed by radiation safety managers and radiation safety administrators. Radiation safety requires time, attention, and financial investment. Additional processes and costs are borne by such elements as the introduction and maintenance of dose monitoring systems, incremental costs for additional glass badges, the added new cost for eye dosimeters, the installation and expansion of protective equipment, the purchase of protective goggles, the renewal and increase of protective aprons, and finally the cost of updating the large and expensive radiation capital equipment such as computed tomography and digital subtraction angiography (DSA). The cost of such safety measures becomes additive and undeniable. Reducing unnecessary radiation should be considered to be an obligation of hospitals and every single individual who uses radiation.

Received: January 24, 2022. Accepted: February 2, 2022.

doi: 10.22575/interventionalradiology.2022-0002

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The new legal requirements have resulted in the urgent need to advance these efforts. Despite this urgency, we tend to rely on scientific evidence when faced with such a need for forceful action. The International Commission on Radiological Protection (ICRP) verbalizes their recommendations and stance as ICRP Statements and ICRP Publications, which each country relies on for implementation. In this current instance as well, Japan has promoted the optimization of radiation protection in medical treatment, and part of the outcome will be an even stricter dose limit than before on the crystalline lens. The implementation and practical application of these measures will be individually undertaken by each medical institution and individual medical staff. Similarly, radiologists specifically involved in IVR will need and want to create effective measures and approaches for each medical institution. ICRP Publication 138 is titled "Ethical Foundations of the System of Radiological Protection" [5]. A Japanese translation has also been published by the Nuclear Regulation Authority. It has been shown that there ordinarily exists an ethical foundation justifying evidence-based policies. I highly recommend that each of us review this ICRP publication, which helps explain the ethical and philosophical connections with our actions. Ethics alone cannot solve problems, although ethics has the power to guide science in the right direction. As we utilize this ethical basis for solution finding, we move on to the next problem, address it, utilize our learning opportunity to create an educational process, and then pass it on to the next generation. In the process of solving such problems, the Interventional Radiologists taps into their own experience, initiative, ingenuity, and creativity. It is naturally expected that doctors who work in high-radiation environments such as the Interventional Radiologists will and must have specialized knowledge and experience regarding radiation, including its effective management. A radiologist need essentially to oversee education and serve as a central communication resource with other doctors, medical staff, and patients, as all of these groups work together to gain an understanding of medical radiation, ultimately leading to their cooperation in the utilization of radiation for medical treatment. Given the need for such a unified approach, it is also essential to involve radiological technologists. Let us, as radiologists, demonstrate our willingness to contribute to radiation safety and administration of the facility to which we belong as we become the driving force of radiation safety to collaborate with and empower the staff, so they will be proud of their contributions in solving the issues. Let us visibly increase our value in each medical facility and society at large.

Proper wearing of personal dosimeters in planned exposure situations is the first step in self-help protection that healthcare professionals should do, and we should set an example in this regard. If we see individuals neglecting to demonstrate their compliance with such obligations, we should share wisdom [Wisdom] to help them transform into having appropriate autonomy [Autonomy]. Given that the information on the individual dose limit returns is collected

in intervals and is not obtained in real-time, we should create observation systems that allow us to utilize precautionary principles, therefore allowing us to take proactive actions. At my facility, I will warn individuals who demonstrate doses exceeding 1 mSv every month on the eye monitoring system and I will elevate the level of observation. Let us review the IVR protocols regularly regarding the radiation dose of the DSAs. Let us refer to DRLs2020 as we consider the individual medical staff doses. By grasping the scientific basis over time and implementing systems that respect the considered legal measures, let us take the initiative to prevent the unfortunate complexities caused by the careless use of radiation. When the effects of radiation are suspected, commit to addressing such issues by doing good deeds [Beneficence] and acting with caution [Prudence].

The deep and fundamental involvement of interventional radiologists in the formation of a radiological protection culture is inevitable not only for the well-being of our patients but also for the well-being of our healthcare professionals. We communicate to healthcare professionals around us that we have learned by appropriately performing so that our colleagues, our patients, and our society can benefit from our acquired knowledge. Hence, we must continue to learn about radiation protection. Finally, an interventional radiologist is exemplary at incorporating novelty and innovation and realizing ideas; this is exactly what we do with our many devices and techniques. It is my personal desire that every interventional radiologist collaborates with radiation technologists and nurses to create new methods of radiation protection [6]. As a result of our commitment to learning, collaborating, and assuming our awesome responsibility, we will contribute to the safety of medical facilities and society, as we further enhance the value of interventional radiology in society.

Conflict of Interest: None

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