

# A holistic approach to radiation safety

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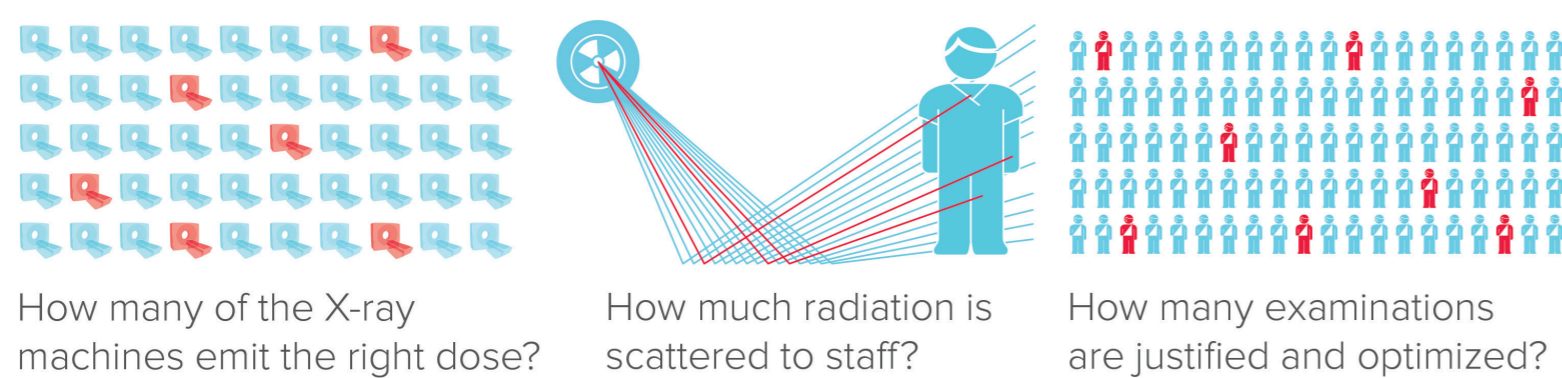


Unfors RaySafe AB

## Introduction

Each year approximately 3.6 billion x-ray examinations are performed worldwide<sup>1</sup> leading to earlier and more accurate diagnosis of medical diseases. However, considerable concern has been voiced regarding the stochastic and even deterministic impact on both patients and medical staff<sup>2</sup>. Authorised bodies have therefore emphasised the importance of ensuring the proper performance of x-ray equipment and of keeping the dose to medical staff and patients as low as reasonably achievable. This suggests that a holistic approach is required to ensure overall radiation safety.

3 600 000 000  
X-ray examinations each year



## Central aspects of radiation safety

One central aspect of radiation safety is the regular quality assurance and servicing of diagnostic x-ray equipment<sup>3</sup>. Only when equipment complies with legal regulations, can it be assumed that it emits only the selected dose during diagnostic x-ray applications. To ensure accurate measurements and dependable results, the measurement devices used for the quality assurance of diagnostic x-ray equipment need to be precise and easy to handle.

Safety awareness among medical staff working with the equipment who are exposed to scattered radiation represents another important aspect affecting radiation safety. As empirical studies indicate a causal relationship between x-ray dose exposure in interventional radiology and an increased risk of severe diseases such as brain tumours<sup>4</sup> and cataracts<sup>5</sup>, wearing the legally-required badge might not be enough. In order to avoid unnecessary radiation exposure, it is recommended that medical staff should be able to monitor their exposure to scattered radiation during interventional procedures in real-time. In this regard, ICRP<sup>6</sup> recommends a second dosimeter worn outside the lead apron to better monitor personal dose exposure.

A third central aspect of radiation safety concerns the dose to the patient. When it comes to best practices in radiation safety for patients, some basic guidelines are widely referenced<sup>7</sup>: Medical imaging examinations should only be performed if medically justified (Justification) and if so, patients should receive an optimal x-ray dose which is as low as reasonably achievable (ALARA) while maintaining sufficient image quality to meet the diagnostic need (Optimisation). Comprehensive systems for patient dose management have been identified as valuable means of supporting these guidelines<sup>8</sup>.



X-ray equipment



Medical staff



Patient

## Unfors RaySafe

Unfors RaySafe is a Swedish medical engineering company that offers solutions for quality assurance of diagnostic x-ray equipment, for real-time dose monitoring and for patient dose tracking. Our mission is to help people avoid unnecessary radiation exposure and establish a better radiation safety culture wherever technicians, medical staff and patients encounter x-ray radiation.

A public medical radiation safety campaign raising awareness of the issue among multiple stakeholders supports our mission to help all people in the medical imaging workflow reduce unnecessary radiation.

## A Holistic Approach to Radiation Safety

We at Unfors RaySafe believe that only a holistic approach to radiation safety can effectively reduce unnecessary radiation exposure to patients and medical staff. Therefore, our RaySafe offer targets several central aspects of radiation safety.

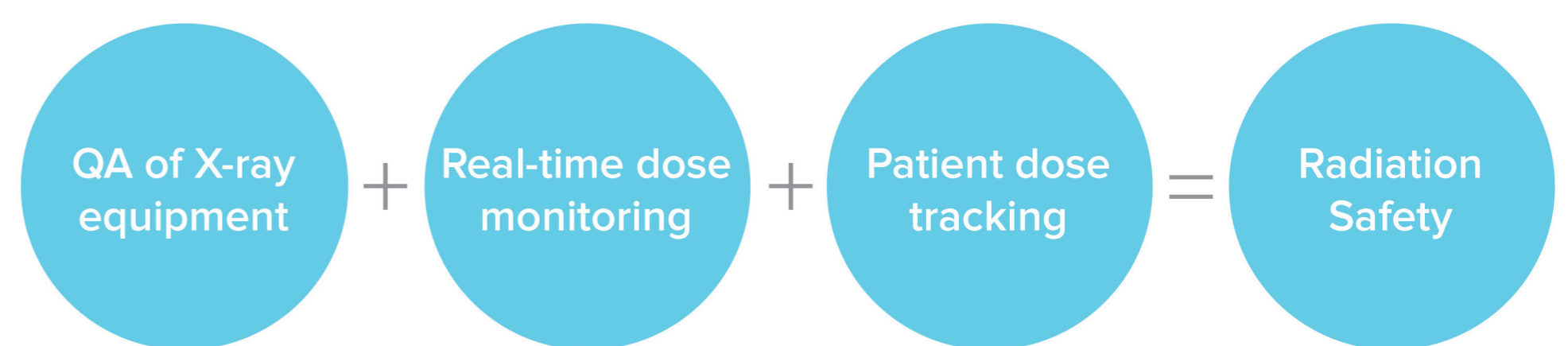
Unfors RaySafe has established a market-leading position in the field of quality assurance and service of diagnostic x-ray equipment. Our measurement devices combine technological precision with user friendliness. From close partnerships with x-ray manufacturers and medical physicist communities we know that our devices help ensure the performance of x-ray equipment in an accurate, yet comfortable way.

With regard to occupational dose, our real-time dose monitoring system enables medical staff to monitor their exposure to scattered radiation during interventional procedures in real-time. Studies indicate that the use of this real-time monitoring system raises awareness and compliance among medical staff and encourages an increased use of radiation protection utilities<sup>9</sup>. Overall, a dose reduction for medical staff of up to 45% has been observed<sup>10</sup>.

In addition, our comprehensive patient dose-tracking software helps justify, optimise and control the dose to patients. By providing role-based support in the form of valuable exam and dose information to different individuals in the medical imaging workflow, our software solution helps healthcare institutions reduce patient dose, improve process quality and increase productivity in the imaging workflow while reducing cost.

## Conclusion

The information above supports the initial suggestion that a holistic approach is required to ensure overall radiation safety. Therefore, we at Unfors RaySafe continue to pursue our mission to help people avoid unnecessary radiation exposure. Our RaySafe offer targets central aspects of radiation safety and help not only to ensure the performance of diagnostic x-ray equipment but also to optimise the dose to medical staff and patients.



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