

Peer Reviewed **Article of Interest**

GUIDELINES FOR INCLUSION OF RADIATION PROTECTION IN THE CURRICULA FOR UNDERGRADUATE MEDICAL, DENTAL, PHYSIOTHERAPY, AND NURSING STUDENTS IN SOUTH AFRICA

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ABSTRACT

The need to include radiation protection and safety in undergraduate programmes of relevant South African healthcare professionals who may request x-ray examinations is discussed. This paper addresses two actions listed in the Bonn Call for Action document in terms of the global campaign to reduce ionising radiation dose. The actions to strengthen radiation protection education and training of health professionals, and strengthen radiation safety culture in healthcare are discussed and proposed guidelines are presented.

Keywords: AfroSafe, justification, optimisation

LAY ABSTRACT

Healthcare practitioners need to understand the risks and benefits to patients when x-ray examinations are requested.

INTRODUCTION

In terms of the legislation a diagnostic radiographer performs imaging at the written request of a practitioner and, in the opinion of the radiographer the written request is based on good and sufficient grounds.^[1,2] The use of x-rays has grown exponentially over the years hence contributing to ionising radiation dose to patients with the result there is a worldwide campaign to reduce radiation dose to patients. Radiation health workers must attempt to reduce radiation dose by adhering to the principles of radiation protection and radiation safety.^[3] In 2012, at a congress on radiation safety by the World Health Organisation and the International Atomic Energy Agency (IAEA), the Bonn call for action was launched and includes 10 actions (IAEA).^[3] Two actions pertain to all healthcare professionals: strengthen radiation protection education and training of health professionals, and strengthen radiation safety culture in healthcare. Several studies report that physicians and medical interns are not aware of the effects of ionising radiation and isotopes.^[4-6] According to the Bonn call for action it is necessary to prioritise radiation protection and training for health professionals by targeting those using radiation in all medical and dental areas and to integrate radiation protection into the curricula of medical and dental schools. Currently there seems to be gaps in such curricula in South Africa. The focus of this paper is on guidelines for inclusion of radiation protection in the curricula for undergraduate medical, dental, physiotherapy, and nursing students.

REQUEST FOR MEDICAL X-RAY EXAMINATIONS

According to the Department of Health, Directorate: Radiation Control a medical practitioner, dentist and any other appropriately trained and registered healthcare professionals (e.g., physiotherapist, primary healthcare nursing staff/ occupational health and safety nursing staff) may request a medical x-ray examination.^[7] However, this requires that such healthcare professionals must have completed an education and training programme offered by an institution accredited by the HPCSA or any other professional council, such as the South African Nursing Council (SANC). Furthermore a healthcare professional making a request shall have performed a clinical examination of the patient, and must take into consideration the principles of justification and optimisation. This means that healthcare professionals requesting medical x-ray examinations must have knowledge of what these principles address to ensure that a patient is not exposed unnecessarily to ionising radiation as the latter does have harmful effects. It is important that South African healthcare professionals understand the radiation principle of keeping dose to all patients as low as reasonably achievable by limiting requests for imaging examinations that involve ionising radiation. They should understand the role and use of non-ionising imaging (ultrasound and magnetic resonance imaging) to reduce unnecessary radiation to patients. They should understand the legal requirements in the use of ionising radiation. As reported in the literature there seems to be lack of awareness of healthcare practi-

tioners of the risks and benefits of ionising radiation examinations.^[8-10]

CAMPAIGNS TO REDUCE IONISING RADIATION DOSE

There are several global campaigns to reduce dose.

- Image Gently^[11] and Image Wisely^[12] pertain to dose reduction campaigns in the United States of America. EuroSafe^[13] addresses dose reduction in Europe.
- The European Commission, for example, has radiation protection education and training programmes for non-radiology/radiography undergraduate healthcare students.^[14]
- The American College of Radiology provides appropriateness criteria in terms of a patient's clinical history so that referring clinicians can request the most appropriate imaging examination.^[15]
- In 2015 AFROSAFE^[16] was launched as a campaign to reduce dose in Africa. In April 2018 the AFROSAFE rad South Africa Chapter was officially established and endorsed by the Department of Health: Radiation Control South Africa.^[17]
- In order to implement Bonn call for action the Society of Radiographers of South Africa (SORSA), the South African Association of Physicists in Medicine and Biology (SAAPMB) and the Radiological Society of South Africa (RSSA) initially worked on spearheading AFROSAFE in South Africa. They identified the need for inclusion of a module in the respective undergraduate curriculums of medical, dental, nursing, physiotherapy, and chiropractic qualifications to prioritise radiation protection and training for health professionals by targeting those using radiation in all medical and dental areas and to integrate radiation protection into the curricula of medical and dental schools.

PROPOSED RADIATION PROTECTION MODULE GUIDELINES

A module to address the gap in undergraduate curricula of the above-mentioned healthcare professionals should include the radiation principle of keeping dose to all patients as low as reasonably achievable by limiting the request for imaging examinations that involve ionising radiation. The principle is in accordance with the rules and regulations laid down by the International Commission for Radiologic Protection (ICRP)^[18,19] and legislation in South Africa.^[20,21]

The module should include

- the effects of ionising radiation hence the need to reduce dose to patients
- justification and optimisation principles
- the effects of ionising radiation on cells in terms of absorbed dose
- the effects of isotope interactions and how this contributes to radiation dose to a patient

It may be beneficial, in terms of a pilot study by Sheng et al,^[22] to develop an interactive module. They used such a module because, according to them, "physician awareness of the risks of ionising radiation exposure related to medical imaging is poor. Effective educational interventions informing physicians of such risk, especially in emergency medicine (EM), are lacking." They reported that after participating in an interactive module the participants' knowledge of risks of ionising radiation exposure to medical imaging in EM improved and they were able to discuss these risks with patients.

CONCLUSION

There is a need for inclusion of nationally accepted guidelines on the risks and benefits of ionising radiation medical imaging examinations in undergraduate curricula of medical, dental, physiotherapy and nursing programmes. It is important that health practitioners know that every requested imaging examination must be justified to adhere to the principle as low as reasonable achievable (ALARA). The curricula should include the principles of optimisation and justification, the role and use of non-ionising radiation modalities to reduce ionising radiation dose to patients in keeping with Bonn call for action and global campaigns to reduce dose, and knowledge of most appropriate imaging technologies for a specific clinical condition.

CONFLICT OF INTEREST

None to declare.

CONTRIBUTIONS OF AUTHORS

LM and FP drafted and edited the paper.

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