

BIRGIT ERTL-WAGNER, MD

Worldwide Implementation of Radiology Quality and Safety Programs

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INTRODUCTION

Over the past few decades, the utilization and availability of biomedical imaging have drastically increased, leading to better patient care worldwide [1]. At the same time, increased attention has been paid to the potential adverse effects of biomedical ionizing radiation exposure. In many countries, increasing demand for imaging studies coupled with a duty to minimize radiation exposure has created new challenges and responsibilities for radiologists.

The international radiology community has identified and implemented innovative programs and initiatives to promote more appropriate use, maximize the benefits, and minimize the risks of radiologic procedures [1-5]. National and societal guidance tools have been produced with the aim of improving appropriate use, quality, and safety of radiologic studies as well as reducing the number of unnecessary studies performed. Programs aimed at educating referring providers, such as clinical decision support and referral guidelines, have shown promise in decreasing duplicate and unnecessary studies [2]. Radiology quality, radiation safety, incident reporting, and accreditation programs are designed to ensure that radiology departments adhere to best practices. Meanwhile, programs and

training in dose optimization and the availability of diagnostic reference level (DRL) data allow radiology providers to lower the patient dose from examinations and compare their performance with that of their peers [3]. Additionally, an increasing number of countries are participating in the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) surveys, which gather data and release periodic reports on utilization and exposure to radiation from biomedical imaging procedures. Professional societies, regulatory authorities, health ministries, and United Nations agencies, such as the World Health Organization and International Atomic Energy Agency (IAEA), collaborate and play unique roles in the development and implementation of improvement actions. For example, the IAEA also has a number of initiatives aimed at reducing medical radiation exposure, including programs in mammography, conventional radiography, and CT dose reduction [4-6].

Although several well-publicized initiatives by the ACR, RSNA, and other organizations, including Image Wisely[®], Image Gently[®], and the ACR Appropriateness Criteria [7-10], are likely familiar to radiologists within North America, there are few available compiled data on the prevalence and role of similar

programs throughout the world. In this study, we aim to summarize the worldwide breadth and use of quality and safety programs.

METHODS

Surveys were distributed through the International Society of Radiology to its board members or other members representing national radiology societies and organizations. Additionally, personal contacts were approached for participation. Because of duplication of contacts on overlapping mailing lists and the delegation of participation, the response rate cannot be precisely calculated. Respondents answered questions about the adoption of programs addressing quality and safety, referral guidelines, clinical decision support, dose optimization, DRLs, incident reporting, and accreditation in their respective countries (Table 1). Respondents were also queried whether their countries participate in UNSCEAR surveys using web-based survey software (Typeform, Barcelona, Spain). A free-text field was provided for respondents to leave comments.

Responses were checked against published materials on radiology society websites where available, and any discrepancies were resolved by e-mailing respondents for clarification. In cases of multiple responses

Table 1. Survey questions

Your Name:
Your Email:
Country:
Are you providing information on behalf of your country's radiology society/organization?
Name of the society/organization:
Is there a national radiology quality and radiation safety program/campaign in your country?
If so, what is the name of the program/campaign?
How long has it been since the launch of the above program/campaign?
Are recommendations guiding referring practitioners toward an appropriate choice/use of radiological procedures (referral guidelines) available in your country?
If so, what is the name of the referral guidelines?
Is there a national program promoting the use of referral guidelines (procedure justification) in your country?
Is there a national program advocating the use of clinical decision support in your country?
Is there a national program promoting the optimization of CT, DR, fluoroscopy, and interventional procedures?
If so, what is the name of the program?
Is there a national program providing training in the optimization of CT, DR, fluoroscopy, and interventional procedures?
Is there a national program advocating the use of DRLs in your country?
Does your country participate in UNSCEAR surveys?
Is there a radiology incident reporting and learning system in your country?
If so, what is the name of the system?
Is there a national radiology accreditation/audit program in your country?
If so, what is the name of the program?
Is participating in the radiology accreditation/audit program mandatory?
Thank you very much for your responses. Please leave any additional comments about radiology education in your country.

Note: DR = digital radiography; DRL = diagnostic reference level; UNSCEAR = United Nations Scientific Committee on the Effects of Atomic Radiation.

from single countries, the responses were compared to ensure consensus. In the few cases of discordant responses, consultation of published materials and e-mail communication with respondents were used to clarify responses and reach consensus. Microsoft Excel (Microsoft, Redmond, Washington) was used to analyze and summarize data.

RESULTS

There was a total of 46 survey responses representing 40 distinct national entities (Table S1) (duplicate responses were submitted for 6 countries). Overall, responses included 6 countries from Africa (15%), 11 from Asia (27.5%), 4 from Central America and South America (10%), 15 from Europe (37.5%), 3 from North America (7.5%), and a combined response

from Australia and New Zealand (2.5%).

Radiology Quality and Radiation Safety Programs

More than half of the respondents (52.5%) reported that their countries had national radiology quality and safety programs or campaigns. Of these, 28.6% began in the past 2 years, while the remainder began either between 4 and 6 years ago (23.8%) or more than 8 years ago (48.6%).

Seventeen of 40 respondent countries (42.5%) have national incident reporting programs. The same number of countries have national radiology accreditation and/or auditing programs. Of the 17, 12 respondents indicated that participation in these programs is mandatory. Seventeen of 40 countries reported participation in UNSCEAR

surveys. Complete results are summarized in Table 2.

Radiation Dose Reduction/Optimization

Representatives from 14 of the 40 respondent countries (35%) indicated that their nations had national dose optimization programs for CT, digital radiography, fluoroscopy, and interventional procedures. Eight countries reported national programs that provided training in methods of dose optimization including five countries that have both dose optimization and training programs (China, Germany, Mexico, the United Kingdom, and the United States). Fourteen respondents indicated that their countries had national programs advocating the use of DRLs. Complete survey results are summarized in Table 3.

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