

Fluoroscopy Education Requirements Present Practice Barrier: A Collaborative Solution

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ABSTRACT

Institutions are challenged to provide education in order to adhere to evolving practice requirements. In May 2013, the Iowa Supreme Court ruled that supervision of fluoroscopy by a licensed provider was within the scope of practice for advanced registered nurse practitioners. The Iowa Board of Nursing issued a ruling requiring advanced registered nurse practitioners supervising fluoroscopy to obtain education in radiation safety in 4 specific content areas. This article describes the development of an educational course in radiation safety for the supervision of fluoroscopy preventing a potential barrier to nurse practitioner practice.

Keywords: fluoroscopy, health policy, nurse practitioner

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The increased use of diagnostic and interventional medical imaging in the United States has led to increased exposure of ionizing radiation to the population. This increased exposure is highlighted in Report No. 160 from the National Council on Radiation Protection and Measurement (NCRPM), *Ionizing Radiation Exposure of the US Population*.¹ The NCRPM Report No. 160 led the Food and Drug Administration (FDA) to draft initiatives requiring the reduction of radiation exposure from medical imaging. These initiatives included expanding the principles of justification and optimization and improved the regulation of the production of fluoroscopy machines. The machine regulations required the reduction of ionizing radiation scatter produced by fluoroscopy machines.² As these machines have become safer, using fluoroscopy for multiple diagnostic, medical, and surgical treatment modalities has become prevalent. Because of the increasing use of medical imaging in treatment procedures, regulatory agencies are continually reviewing and requiring increased education in radiation safety for advanced practice providers. These education requirements are meant to improve patient and occupational safety but can be

a barrier to practice if the practitioner is unable to obtain the required education. This article describes the development of an online, asynchronous educational course in radiation safety for the supervision of fluoroscopy that resulted from the Iowa Board of Nursing (IBON) implementing additional education requirements. The engagement of interprofessional collaboration from departmental experts provided the course content, education methods, and a process to identify and track providers needing the radiation safety education required for credentialing and privileging.

BACKGROUND

In May 2013, the Iowa Supreme Court ruled that supervision of fluoroscopy by a licensed provider was within the scope of practice for advanced registered nurse practitioners.³ The term *advanced registered nurse practitioner* is synonymous with advanced practice registered nurse (APRN) in the state of Iowa. Although this court case was initially brought forth over certified registered nurse anesthetist (CRNA) scope of practice, the ruling affected all APRN practice of fluoroscopy in the state of Iowa. This ruling, although substantive in sustaining the scope of

practice of APRNs, also highlighted the need for additional education in radiation safety. The IBON issued a ruling (7.2[2]) requiring APRNs supervising fluoroscopy to obtain education in radiation safety in 4 specific content areas (Table 1). The ruling was issued in June 2014, and the audit process began in January 2015.⁴ APRNs in Iowa and their employers needed to identify sources of available radiation safety education and develop a process to make this education accessible to the providers for adherence to the new ruling.

DANGERS OF IONIZING RADIATION EXPOSURE

Fluoroscopy is an invaluable tool that provides real-time visualization of anatomy and anatomic function.⁵ Fluoroscopy is a form of ionizing radiation and has destructive potential to tissue. Ionizing radiation produces positively and negatively charged ions when passed through matter such as tissue. The transition of these ions through tissue can cause damage to normal tissue through the disruption of normal protein bonds at the molecular level.⁶ Harmful effects of ionizing radiation include damage to the skin, hair loss, cataracts, and cancer.⁷ Of the various forms of diagnostic imaging, fluoroscopy has the potential to expose the patient and health care provider to a relatively high radiation dose because the primary absorption medium of the ionizing radiation is tissue.^{5,6} The operator of the fluoroscopy machine must balance between adjusting the amount of energy from the fluoroscopy unit to obtain a quality image and minimizing the amount of energy to prevent patient and health care provider tissue damage.⁵ Health care practitioners using fluoroscopic imaging have a responsibility to promote

Table 1. Iowa Board of Nursing Supervision of Fluoroscopy 7.2(2)

An advanced registered nurse practitioner (ARNP) shall be permitted to provide direct supervision in the use of fluoroscopic X-ray equipment pursuant to:

- a. The ARNP shall provide direct supervision of fluoroscopy pursuant to the following provisions: (1) Completion of an educational course including content in radiation physics, radiobiology, radiological safety and radiation management applicable to the use of fluoroscopy, and maintenance of documentation verifying successful completion.

occupational and patient safety through remaining knowledgeable about the dangers of ionizing radiation and methods to safely control its use.⁸

Promotion of Decreased Radiation Exposure Through Education

In 2009, the NCRPM released Report No. 160, which showed that Americans are exposed to ionizing radiation from medical procedures 7 times greater than previously reported in the early 1980s.¹ According to this report, medical exposure constituted almost half of the total radiation exposure of the US population from all sources including natural radiation in soil, radon gas, and radiation from space. The NCRPM report has improved the information surrounding harmful radiation effects from medical imaging. In the early 1990s, the response to the NCRPM Report No. 160 combined with a spike in the reported harmful effects of radiation exposure led to the Initiative to Reduce Unnecessary Radiation Exposure from Medical Imaging by the FDA.² Through this initiative, the FDA outlined 2 principles of radiation protection to promote patient and occupational safety. These 2 principles include justification and dose optimization. The first principle of justification states that the imaging procedure will do more good than harm to the individual patient. The second principle of dose optimization adheres to the recommended practice of the As Low as Reasonably Achievable technique. The As Low as Reasonably Achievable technique states that medical imaging examinations should be adjusted to administer the lowest radiation dose that yields a quality image for diagnosis or intervention. The FDA initiative has brought to light the importance of educating all health personnel in these specific principles.

Education of Physician Operators of Fluoroscopy

The interventional radiology discipline has shown increasing education of physicians in the principles of justification, and optimization has decreased the total amount of fluoroscopy time. The decrease in fluoroscopy time is significant because the shorter time leads to a subsequent decrease in patient and health care provider radiation exposure.⁵ Other studies in interventional radiology have shown increasing education with mini—hands—on courses in

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