

Replay to the Letter: Are Doctors Exposed to Radiation Even When Wearing Protectors during Fluoroscopic Procedures?

Department of Anesthesiology and Pain Medicine, Konkuk University Medical Center, Seoul, Korea

Jae Hun Kim, MD

REPLY TO THE LETTER

I appreciate your interest in and comments on the article titled "Radiation Exposure of the Hand and Chest during C-arm Fluoroscopy-Guided Procedures" [1]. In this study, the distance from the center of the X-ray field to the physician was the distance from the axis between the tube and intensifier to the physician.

I am in total agreement with your comments. It is important for physicians to know their radiation exposure in spite of wearing several radiation-protective shields. In our study, dosimeters were located outside of the apron and radiation-protective gloves. Therefore, the exposure was not the same as the exposure inside the radiation protectors. In our pain clinic, physicians wear radiation-protective gloves and aprons, and their exposure may be lower than that reported in the study. A radiation-protective apron with 0.5 mm of lead-equivalent thickness attenuates over 90% of scattered X-rays [2,3]. Therefore, the exposure to physicians' chests may be less than 10% of the exposure reported in the study. However, it is difficult to find studies that address the radiation-protective effect of gloves. The radiation-protective gloves in our hospital have a lead-

equivalent optical density of 0.022 mm. Therefore, the radiation-protective effects of gloves may be lower than those of the apron. We have investigated the radiation-protective effects of gloves and hope to publish the results in the near future. Although the shielding power of gloves is low, they can reduce exposure to physicians' hands. For physicians who do not use radiation-protective shields, there is no guarantee of their radiation safety.

In our study, larger distances from the radiation source were related to low radiation exposures. Therefore, it is important for pain physicians to wear as many radiation-protective shields as possible and remain at a safe distance from the radiation source.

REFERENCES

1. Jung CH, Ryu JS, Baek SW, Oh JH, Woo NS, Kim HK, et al. Radiation exposure of the hand and chest during C-arm fluoroscopy-guided procedures. *Korean J Pain* 2013; 26: 51-6.
2. Schueler BA. Operator shielding: how and why. *Tech Vasc Interv Radiol* 2010; 13: 167-71.
3. Singer G. Occupational radiation exposure to the surgeon. *J Am Acad Orthop Surg* 2005; 13: 69-76.

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Correspondence to: Jae Hun Kim, MD

Department of Anesthesiology and Pain Medicine, Konkuk University Medical Center, 4-12 Hwayang-dong, Gwangjin-gu, Seoul 143-729, Korea

Tel: +82-2-2030-5470, Fax: +82-2-2030-5449, E-mail: painfree@kuh.ac.kr

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