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CLINICAL SUMMARY

INTRAOPERATIVE RADIATION EXPOSURE OF ORTHOPAEDIC SURGEONS – MISMATCH BETWEEN CONCERNS AND PROTECTION

By: Joeris A, Goldhahn S, Kalampoki V, Gebhard F

BACKGROUND

Fluoroscopic imaging is becoming increasingly common in trauma and orthopedic surgery, driven by the development of less invasive approaches. This trend has raised concerns about increased radiation exposure to surgeons from scatter and, to a lesser extent, the primary beam.

Surgeons often lack knowledge about how to protect themselves from unnecessary radiation exposure. The authors reported that the highest levels of radiation exposure occur during spinal and intramedullary procedures. Additionally, surgeons' hands are particularly vulnerable, as they often place them in the direct beam to position patients during fluoroscopy.

The duration of fluoroscopic imaging is influenced by the surgeon's technique and experience, as well as the distance and position of the radiation source. However, current standards of practice for radiation safety do not strongly reinforce the use of protective shielding for the hands during fluoroscopy procedures, which leads to inconsistencies in the use of radiation attenuation gloves (RAGs).

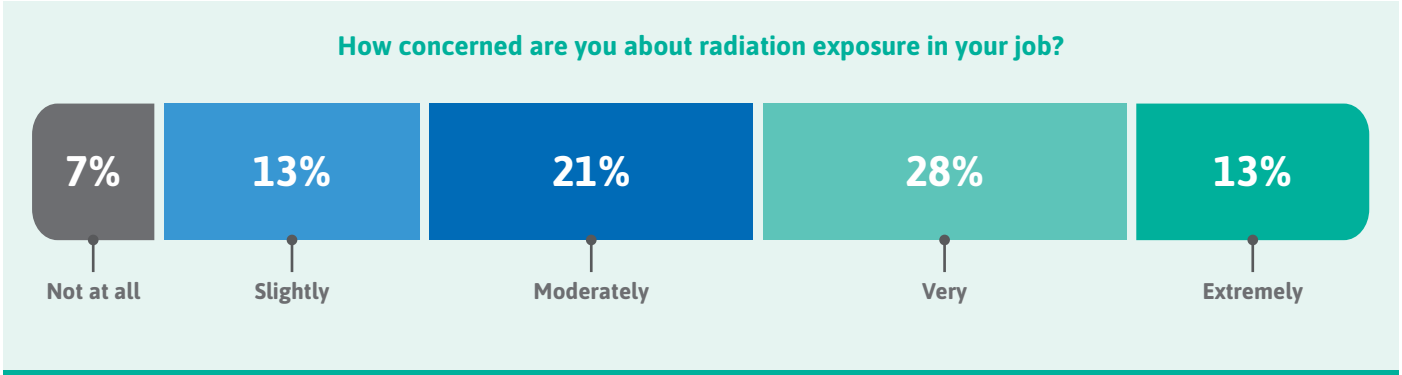
OBJECTIVES AND METHODS

This study aimed to evaluate the use of radiation protection among orthopedic and trauma surgeons, as well as document their concerns about radiation exposure, knowledge of safety guidelines, and use of intraoperative radiation monitoring and protection.

A voluntary survey was conducted, and 531 surgeons participated, of whom 88.5% (469) were between 25 and 54 years old. Most surgeons worked in a university hospital (49.9%) or other hospitals (35%), with a minority working in private practice (12.2%). Of the surgeons, 25.7% (136) had less than 5 years of surgery experience. The most common subspecialties were lower extremity (34.7%), upper extremity (18.8%), spine (17.5%), and pelvic (12.6%).

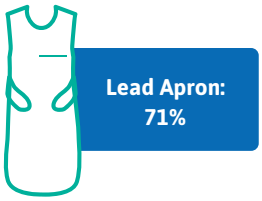
RESULTS

More than 42% of surgeons expressed extreme to very high concern about their radiation exposure, and about 49% expressed slight to moderate concern. Despite these concerns, the use of personal protective equipment varied widely among surgeons.



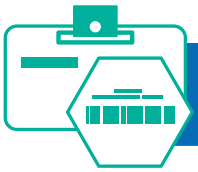
Surgeons' concerns about occupational radiation exposure (n=524)

Most surgeons (71%) always wear a lead apron, but only 35.5% and 24.5% wear a thyroid collar and dosimeter, respectively. Additionally, surgeons who are not aware of existing safety guidelines are less likely to always wear a lead apron (66.7%).



Lead Apron: 71%

Thyroid Collar: 35.5%



Dosimeter: 24.5%

Finally, surgeons who were aware of the responsible person for radiation safety were more likely to use radiation protection. However, nearly 40% of surgeons stated that radiation safety has never been covered in training at their institution.

50% Indicated awareness of the responsible person

40% Stated the issue has never been the subject of training at their institution

CONCLUSION

Despite concerns about radiation exposure, most surgeons do not have adequate knowledge or radiation protection measures. The survey also found that surgeons who received safety instructions were more likely to wear dosimeters and use other safety measures.

Nearly half of the participants did not wear dosimeters at all, and only 56.2% of those who did wear them received feedback on their radiation exposure. This suggests that individual radiation exposure is likely underestimated and that dosimeters are of limited value if they are not regularly checked, and surgeons do not receive feedback.

Notably, less than 5% of surgeons reported always wearing lead gloves or glasses during surgery, even though the hands are the most exposed part of the body.

These findings indicate that there may be clear deficits in regular safety instructions, but also that even some instructions have a positive impact. A policy that requires surgeons to wear dosimeters and report their radiation exposure may increase awareness and lead to better protection.

Ultimately, the key to better protection against radiation exposure is awareness and education. Measures at the hospital level are necessary to reinforce both.

APPLICATION FOR PRACTICE

1. 

Initial and annual radiation safety training in addition to regular dosimeter dosing feedback

2. 

Establish and follow organizational radiation safety policies and guidelines

3. 

Use products to reduce radiation exposure including: dosimeters, lead apron, thyroid shield, lead glasses, and gloves

Note: This clinical summary is written by clinicians at Ansell Healthcare Products LLC. Please refer to the actual study for full text information.

Joeris A, Goldhahn S, Kalampoki V, Gebhard F (2018) Intraoperative Radiation Exposure of Orthopaedic Surgeons – Mismatch Between Concerns and Protection. Occup Med Health aff 2018; 6(2) 1-6.

Full text article available at: https://www.omicsonline.org/peer-reviewed/intraoperative-radiation-exposure-of-orthopaedic-surgeonsmismatch-between-concerns-and-protectionp-101233.html

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