



**WEST PHYSICS<sup>®</sup>**

THE MEDICAL AND HEALTH PHYSICS EXPERTS



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## The Introduction

For the better part of the twentieth century, and continuing today, the safety mantra has stressed the use of “lead aprons” for staff and patients in diagnostic imaging. However, new research is supporting the idea that this may not be entirely necessary and may even be detrimental for patients in some cases. But this change comes as a shock to most people.

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## The Assumption

The assumption, leading to the recommendation to provide lead aprons for patients, was always that the patient will be in the primary beam of the x-ray machine, and that we should protect parts of their body which are not being imaged. While this thinking is reasonable, it assumes there will be radiation coming from the x-ray machine which will expose the patient unnecessarily. The fear, in the 1950s, was that this unnecessary exposure would cause reproductive harm.

*...the patient will be in the primary beam of the x-ray machine...we should protect parts of their body which are not being imaged.*

Continued research has shown this is not the case and the downside of shielding is that it can introduce artifacts into the image or obscure the field of view resulting in unnecessary retakes which increase patient exposure.

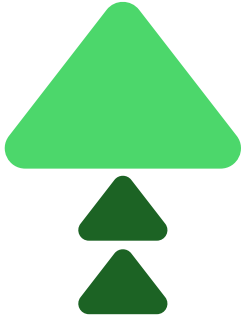
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*...the downside of shielding is that it can introduce artifacts into the image or obscure the field of view resulting in unnecessary retakes which increase patient exposure.*

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## The Question

Can shielding actually **increase** radiation exposure to the patient? Advances in technology and collimation mean there is very little external radiation exposure to the patient from the x-ray machine



outside of the primary beam. So external shielding in many cases is just not necessary. The patient's radiation exposure usually comes from internal scattered radiation as the primary beam interacts with the patient's tissues and bones. In many cases, this scattered radiation can actually be re-scattered back into the patient by lead apron shielding, thus **increasing** patient radiation dose.

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## The Risk

New technological advancements might be putting us at risk!

*...the recommendation to not provide them becomes clearer.*

Most radiographic units will automatically sense how much radiation output is necessary to create a successful image. If a shield is in place, the machine simply increases the amount of radiation in

order to image through the shield, rendering the shield pointless and increasing patient radiation dose.

Recently, the American Dental Association found no significant differences with regard to patient exposure to radiation whether the patient wore a lead apron or not. Balance this finding against the negative impacts that the shielding can have, and the recommendation to not provide them becomes clearer.

*...rendering the shield pointless and increasing patient radiation dose.*

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## The Caveat

There is, however, one caveat.

Although the National Council of Radiation Protection, the American Dental Association and the American Association of Physicists in Medicine have all championed changes to this practice, the general public is still ingrained with the mantra and fear of the 1950s. As a result, patients generally still expect to be provided a shield.

Patients may not even voice their concern but rather go away angry and afraid and express those feelings through negative reviews and customer service surveys. Many providers are still operating under the old shielding mantra as well and there is also the issue of State regulations. Many States still require shielding in certain situations despite the new recommendations.

Additionally, for the purposes of Joint Commission inspection, it will be important for organizations to update their internal policies to match industry practices and recommendations they intend to follow.



*...the general public is still ingrained with the mantra and fear of the 1950s.*

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## The Solution

The ultimate solution is education of patients, state regulators and accreditation body representatives.

No less than four websites for prominent dental practices across the United States now have articles explaining why they no longer believe patient shielding is a benefit to their patients.

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## The Solution (CONT'D)

The effort to educate the public along with gradual changes in Federal and State regulations will go a long way toward changing the public's general fear of radiation and establish a new general culture of understanding radiation in light of true risk.

*...establish a new general culture of understanding radiation in light of true risk.*

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## The Staff

Protecting staff, however, is an entirely different discussion. When it comes to worker protection, **there is no controversy**. The Health Physics Society, National Institutes of Health, Occupational Health and Safety Administration, American Board of Radiology, and other professional organizations continue to recommend the use of x-ray PPE for worker protection.

*The specific requirements vary by State, but generally speaking, for heavy use and higher risk clinics, 0.5mm of lead equivalence is recommended. In other applications of lower risk or light use, 0.25mm of lead equivalence or “light” and “super-light” versions of x-ray PPE can be used.*

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## The Equipment

While the specifics and naming conventions vary widely by manufacturer, it is important to note that many x-ray PPE garments, gloves, glasses, thyroid collars, etc. are no longer made with elemental lead but rather with alternative materials which provide equal protection. The benefit of this is that these garments and PPE are no longer hazardous to the environment. It's important to check the details when purchasing x-ray PPE to ensure the proper amount of protection is purchased as well as to understand any hazmat requirements.



The Occupational Health and Safety Administration requires, in general, that PPE “fit” and be comfortable for an employee so that they are willing to use it. X-ray PPE should therefore not be too large or too small for the individual wearing it and consideration should be taken to ensure the individual is covered from the knees to the neck.

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## The Conclusion

As one can see, the regulations, guidance and philosophies regarding patient shielding are in a state of change. Care must be taken to ensure that facility policies and procedures are up-to-date, compliant and optimal for safety.

Should you or anyone at your facility have any questions or want assistance in making sure your shielding policies and practices are **compliant and defensible**, please don't hesitate to contact us at West Physics toll-free by dialing **866-275-WEST** or go to our website at [www.westphysics.com](http://www.westphysics.com).