

Frequently Asked Questions – Staff: Patient Shielding for Diagnostic Imaging

This document provides answers to questions you may have about the discontinuation of patient gonadal and fetal shielding. Included with each question is a “Talking Point” which may be helpful in communicating with patients.

Why was patient shielding first adopted?

The practice of shielding the gonads was adopted in the 1950's, soon after the atomic bombs were dropped on Hiroshima and Nagasaki. It was driven by concerns about possible reproductive effects, that sperm or eggs could be damaged by exposure to radiation, and that this damage might be passed on to future generations. We know now that there is no evidence for these concerns, particularly with the far lower doses used today compared with when shielding was first adopted. Shielding was not originally adopted because of concern about cancer risks.

Talking Point: Shielding was originally adopted because of worries about damage to the gonads. We know now that there is no evidence for these concerns.

Why will we no longer be routinely shielding patients?

This change in practice is evidence-based. Current scientific consensus is that routine use of gonadal and fetal shielding does not significantly reduce radiation risk for the patient or fetus. In the 70 years since patient shielding was first adopted, patient dose from a radiographic exam has been reduced by roughly 95% through improved technology. Over that same period, there has been no evidence of heritable genetic effects from radiation exposure in humans.

Placement of gonadal shields may be difficult due to the uniqueness of each patient's anatomy, and shields may obscure important anatomy or interfere with AEC function, leading to an increased likelihood of repeat exams. Any shielding, including that placed outside the collimated field, does nothing to reduce internal scatter, which is a major contributor to gonadal and fetal dose. The minimal potential benefits provided by patient shielding are outweighed by the potential disadvantages and risks.

Talking Point: There is no evidence that radiation from medical imaging exams causes damage to reproductive cells in humans. Shielding may cover the area that your doctor needs to see, which would mean the image may need to be repeated. Any shielding, including that placed outside the area of interest, does nothing to reduce internal scatter, which is a major contributor to gonadal and fetal dose.

Why is Shared Health adopting this change in practice now?

National and international scientific and professional bodies have carefully evaluated this evidence and have come out with position statements and guidance documents supporting and encouraging the discontinuation of patient shielding. After careful review of the available evidence, Shared Health has decided to adopt this change in practice for patient shielding. We, as medical radiation technologists, are committed to uphold best practice based on current scientific consensus.

Talking Point: Today, the effect of radiation on the body is better understood and this, along with advancements in imaging technology, is the reason for this change in practice.

Doesn't shielding help patients feel safer?

Clinical best practice is based on current scientific evidence. Although patients may expect shielding because of historical practice, and find it reassuring, it is our responsibility to explain to them that it provides negligible benefits and is no longer recommended, and in fact may compromise the exam. In circumstances where the patient is insistent or potentially refusing imaging due to anxiety about radiation exposure, technologists will use their best professional judgement. For example, if a pregnant trauma patient is refusing imaging unless shielding is used, the benefit of obtaining critical diagnostic information outweighs any potential risks due to shielding use.

Talking Point: I understand that shielding may help you feel safer, but there is no evidence that it reduces your risk in any meaningful way.

Doesn't gonadal shielding reduce the risk of infertility?

The dose from medical imaging exams would have to be 100 times greater than current levels to cause infertility.

Talking Point: The dose from medical imaging exams would have to be 100 times greater than current levels to cause infertility.

Doesn't gonadal shielding, especially for children, reduce the risk of heritable genetic effects?

There is no evidence that medical radiological exams produce heritable genetic damage in patients or their offspring. There have been no observed heritable genetic effects in humans from radiation exposure, even 3 to 4 generations after the atomic bombs were dropped in Hiroshima and Nagasaki in 1945. The tissue weighting factor for the gonads has dropped from 0.25 in 1977 to 0.08 currently.

Talking Point: Scientists have studied the effects of radiation in the offspring of those exposed to levels of radiation much higher than is used for medical imaging. No heritable effects have been observed in humans.

Doesn't shielding reduce the cumulative effects of radiation for patients who have had many x-rays over their lifetime?

Patient shielding was initially adopted due to concerns about reproductive and hereditary effects, and not to reduce cancer risk. Healthy cells have repair mechanisms that help to protect them after exposure to small doses of radiation, and they do not become more radiosensitive with repeated exposures. Radiation therapy takes advantage of this by splitting treatments up into multiple sessions, allowing healthy cells time to recover between doses. Shielding organs that are not particularly radiosensitive, or that receive minimal radiation dose to start with, will not meaningfully reduce cancer risk.

Talking Point: Shielding specific organs such as gonads or shielding outside the area of interest does not meaningfully reduce the already extremely low risk of developing cancer from diagnostic x-ray exams.

Should we still screen patients for pregnancy?

Yes. Determining pregnancy status is important for reasons beyond whether to use shielding or not. In consultation with the radiologist, the most appropriate imaging for the patient will be determined. Pregnancy may mean that injections of contrast media or other pharmaceuticals are contra-indicated, or that other risk assessments are warranted.

Talking Point: The dose associated with an x-ray exam is not the only reason the pregnancy question is asked. This will allow your technologist and physician to determine the most appropriate imaging protocols to follow.

Isn't shielding required for pregnant or pediatric patients?

The age, sex or pregnancy status of the patient should not dictate the use of fetal or gonadal shielding. In almost all cases, the dose from X-ray or CT examinations is far less than the dose that would pose a risk to the fetus.

Talking Point: With modern imaging technology, the fetal dose from almost all X-ray exams is far below the level that could cause harm. Shielding also does not meaningfully reduce risk for pediatric patients.

Do I still need to wear a lead apron at work?

Yes. *These guidelines pertain only to patients.* The patient receives a medical benefit from the exposure. As a technologist, you are receiving occupational radiation exposure on an ongoing basis without any medical benefit, so you will continue to wear an apron. This also applies to anyone who must remain in the room during an exam.

Talking Point (if patient should ask why staff are wearing shielding): The patient having the exam is receiving a benefit from the exam whereas others in the room are not. The physician ordering the exam has determined that the benefit outweighs the risk to the patient.

Any procedural questions not addressed in this FAQ should be directed to your manager.

Further resources: <https://sharedhealthmb.ca/services/diagnostic/patient-shielding/>