

Patient Shielding

At Cleveland Clinic, our patient's safety is our top priority. Thanks to advances in technology and scientific understanding, we're no longer placing lead shields over our patient's body during x-ray based imaging exams, including x-ray, CT and fluoroscopic exams.



Patient shielding:

- › is not effective,
- › can cover a body part that the doctor needs to see and may lead to repeated exams,
- › can cause the x-ray equipment to use more radiation than necessary.

Imaging and radiation safety experts agree that the best way to image a patient is to not use any shield.

Answers to Frequently Asked Questions

Q: I had a lead shield on me during my previous imaging exams. Why do you not offer it anymore?

A: Patient shielding was first introduced about 70 years ago, soon after the atomic bombing in Japan. At that time, people had enormous fear about radiation, but limited understanding of how it affected the human body. Lead shielding was introduced at that time to shield the reproductive organs in the hope that little or no radiation damage would be passed onto the future generations.

After 70 years of studying radiation effects closely, we now know that the reproductive organs are not as sensitive to radiation as we once thought. In fact, its effects on future generations (the so called "heritable effects") have never been seen in the human population. This is true even for people who were exposed to much larger amounts of radiation than what is used in medical imaging.

Nowadays, we also have much better imaging equipment that uses 5% or less of the radiation that previous equipment used when patient shielding was first introduced.

Finally, modern imaging equipment operates differently. They can automatically determine how much radiation to use based on the part of the body being imaged. If a shield gets in the way, it could mean an increase in radiation dose. Even with careful

Answers to Frequently Asked Questions *continued*

positioning, shielding may cover up parts of the body that the doctor needs to see. If this happens, the exam may need to be repeated.

For the above reasons, we have followed the latest recommendation from professional organizations to discontinue routine use of patient shielding during x-ray based imaging exams.

Q: *Doesn't shielding make me safer?*

A: When the reproductive organs are far away from the part of the body being imaged, they receive little to zero radiation dose. There is no benefit from using shielding.

When the reproductive organs are in the part of the body being imaged, shielding has also been shown to offer little to no benefit. This is because the locations of the reproductive organs change quite a bit from one patient to the next. As such, it is difficult to position the shield accurately to make sure the reproductive organs are covered. Studies have found that when x-ray exams of the belly are performed, lead shielding was misplaced 50-90% of the time.

Even when shielding is positioned accurately, it still offers limited protection because radiation can bounce off the nearby tissues and reach the reproductive organs.

For these reasons, patient shielding offers little to no benefit.

Q: *But what's the harm in shielding?*

A: While shielding was initially introduced for the purpose of protecting the patient, we now know that it can do more harm than good. Shielding may cover a body part that the doctor needs to see. If this happens, the exam may need to be repeated. Shielding may also cause the x-ray equipment to use more radiation than needed. Imaging and radiation safety experts agree that the best way to image a patient is to not use any shield.

Q: *What if I'm pregnant?*

A: Even when we are healthy and do not need an imaging exam, all of us receive some radiation from our natural environment (e.g., Radon gas, cosmic rays, soil and rocks, and food such as bananas). This is also true for an unborn baby.

When imaging is performed outside of the belly, the radiation dose received by the unborn baby (without fetal shield) is less than what the baby is already receiving from our natural environment during the course of the pregnancy. So the risk of harm from the imaging exam is very small or zero.

When imaging is performed for the belly, fetal shielding cannot be used. However, even in this situation, the radiation dose to the baby is low enough that its risk is considered negligible compared to the normal risks of pregnancy without an x-ray based imaging exam. It's also insignificant compared to the risks of missing a diagnosis for your symptoms.

Your doctor believes this exam is important for determining the course of your medical care, and of course, your health is important to the health of your baby.

We will keep your exposure to radiation as low as possible to provide the necessary information. After the exam, our radiation experts can perform a radiation dose evaluation to confirm that the risk is indeed negligible. They will also add a letter to your medical record to document their assessment. Please let your provider know if you would like such an assessment to be performed.

Q: *Will you still shield me if I want you to?*

A: We do not recommend using lead shielding during imaging exams. Some exams can never be done using a shield because the shield would cover up parts of the body the doctor needs to see. But, if you insist that we use a shield, we will honor your request if it is possible to do so without compromising the diagnostic quality of the exam.

Q: *Why is my child not shielded if I am required to wear a lead apron while I'm in the imaging exam room with them?*

A: Your child's doctor needs an image so that he or she can better see what is going on inside your child's body. This exposes your child to a little bit of radiation. Your doctor has thought about the benefits and risks to your child. He or she has decided that the benefit of the exam is much greater than the risk from the radiation, which is very small or zero. Because you aren't being imaged, there is no benefit for you from the radiation. So we give you an apron to wear for protection.

Answers to Frequently Asked Questions *continued*

Q: *I understand that radiation dose from one x-ray exam is very small, but my health condition requires me to have many x-ray exams. Shouldn't I be concerned about the risk to my future generations or even the possibility of not being able to have a baby in the future?*

A: We understand your concern. We have known from scientific studies that the cells in our body have the ability to repair themselves. This protects them against small doses of radiation. The time between one x-ray exam and the next gives time for the cells to recover. For this reason, the risk from multiple low-dose exams actually do not add up.

The amount of radiation needed to cause infertility (failure to conceive a baby) is more than 100 times the dose from a medical imaging exam.

While there may be a small risk from having to take many x-ray exams, your doctor decided that the benefits of these exam are much greater than any potential risk.

If you have any questions or concerns about your imaging exam, feel free to ask your radiologic technologist or your doctor.

Additional Resources:

Scientific Resources

- [American Association of Physics in Medicine \(AAPM\) - Communicating Advances in Radiation Education for Shielding \(CARES\)](#)
- [National Council on Radiation Protection and Measurements \(NCRP\) - Recommendations for Ending Routine Gonadal Shielding During Abdominal and Pelvic Radiography](#)

Clinical Resource

- [Fetal and Gonadal Shielding](#)

News Reports

- [Why You Should Ditch That Lead Apron In The X-Ray Room \(Forbes\)](#)
- [Some hospitals say using lead aprons for X-rays does more harm than good. Lurie will stop using the shields this spring. \(Chicago Tribune\)](#)
- [That Lead Apron in the X-Ray Room? You May Not Need It \(The New York Times\)](#)
- [Some hospitals are ditching lead aprons during X-rays \(ABC News\)](#)