



## Patient Shielding: Frequently Asked Questions for Parents

There are several reasons why we are not using patient lead shielding:

- The shield may hide important organs or body parts that the doctor needs to see. If this were to happen, we would have to take another x-ray, which would increase the total amount of radiation used for the exam.
- Modern x-ray systems like the ones used at Lurie Children's have built in sensors that automatically determine how much radiation is needed to take a good picture. A lead shield may get in the way of the sensor and possibly cause the machine to deliver more radiation than needed.
- We also know more about how radiation affects the human body and that some parts of the body - like the testicles and ovaries - are not at risk by the levels of radiation used in modern x-ray systems.

In fact, for patient safety, the Food and Drug Administration (FDA) and other experts on x-rays agree that patient shields should not be used for x-ray exams.

### 1. Could radiation to my child's gonads harm their future children?

Many years of research have shown that the radiation levels used in x-ray exams do not lead to these kinds of hereditary risks. This means there is **No** data that shows x-ray exams can cause radiation damage or harm a patient's eggs or sperm.

### 2. Could radiation to my child's gonads increase risk of infertility?

The amount of radiation required to cause infertility is more than 100 times the dose from a medical imaging exam.<sup>3</sup> For example, the gonadal dose of an x-ray of the pelvis is less than 0.8 mGy for a teenage boy and less than 0.3 mGy for a teenage girl. Gonadal doses for newborns receiving medical imaging is about 90% lower than this.<sup>4</sup> In comparison, male fertility is not affected below an acute dose of 150 mGy. Permanent sterility does not occur in males below 3500 mGy. Female fertility is not affected below 2500 mGy.<sup>3</sup>

### 3. Can you still shield my child?

Yes, we will shield your child if it is possible to do so without compromising the quality of the exam. We understand that a shield can be comforting and ease fear or anxiety about the x-ray exam. However, we want you to know that shielding itself carries the risk of using more radiation than not using shielding, and there are some exams that can never be done using a lead shield because it could cover a body part that the doctor needs to see.

### 4. Why was patient shielding used in the first place if it has no benefit to the patient and carries a risk of using more radiation?

Patient shielding was first recommended in 1976 by the FDA. At that time, patient shielding was thought to protect patients from hereditary risks. Now after more than 50 years of research, we know that is not true. In addition, modern x-ray machines use ~96% less radiation than the machines used when the recommendations to shield patients were made.

### 5. Why do I have to wear a lead apron, but my child does not?

Our goal is to image your child. We need x-rays to make the image so it's important that we don't block any x-rays by placing a lead apron on your child. However, when we take the x-ray, a small amount of the radiation may bounce off your child and hit you. We want to protect you from these stray x-rays by having you wear a lead apron. The lead aprons protect you from needless radiation. It is our hospital's policy to keep the levels of radiation exposure to the patient's family and our staff as low as possible.



**6. My child receives routine x-ray exams. Is my child at greater risk of harm from radiation?**

There is no evidence to suggest that risk from multiple exams over a patient's lifetime adds up. To ensure safety and quality, our radiation safety team performs risk reviews on patients that receive multiple x-ray exams in a short period of time to see if added radiation may be harmful. Our team is happy to answer any questions or concerns you may have about the amount of radiation your child is receiving.

**7. How does the x-ray equipment at Wentworth Douglass Hospital ensure the lowest levels of radiation to my child?**

Wentworth Douglass' Imaging Department only uses the latest x-ray digital imaging technology. This technology means the least amount of radiation is used to produce high quality x-ray exams for pediatric patients of all sizes. We also train our technologists on low radiation imaging practices. Our imaging team also includes medical physicists that routinely review patient radiation exposure and make sure that the radiation used for our x-ray exams is among the lowest in the country.

**8. Can you provide shielding for my child's body parts that are outside of the imaging field?**

The radiation exposure to the patient areas outside of the imaging field is extremely small. Shielding these areas provides negligible benefit. Since there is a possibility that the shield could move into field if the patient moves, we recommend not to do it. However, if requested, we will shield other body parts outside of the image field. We understand that a shield can be comforting and ease fear or anxiety about the x-ray exam

**9. What if my child is pregnant? Can you shield her belly?**

We take extra precaution when imaging pregnant patients and have imaging protocols designed to deliver very low radiation to the fetus. However, if we place a lead shield over the patient's belly, it can reduce the quality of the exam and in some cases increase the overall radiation to the fetus. Since shielding the pregnant patient's belly has no benefit to the fetus, it is better not to do it.

**10. What exams will be done with patient shields?**

No patient shields will be used during x-ray, CT or fluoroscopy exams. This includes the discontinuation of fetal, gonadal, lap, thyroid, or breast shields both in and out of the field of view.

**11. Is my child radioactive after an x-ray exam?**

No, your child does not become radioactive as a result of their diagnostic x-ray exam.

**12. Will patient shields be eliminated for all x-ray imaging?**

Modern x-ray, fluoroscopy, and CT machines used at Lurie Children's have sensors that automatically determine how much radiation to use based on the part of the body being imaged. If a shield gets in the way of these sensors, the machine could deliver more radiation than necessary. The shield also has the potential to reduce the quality of these exams. For these reasons, we will not shield patients during x-ray, fluoroscopy, and CT exams.



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