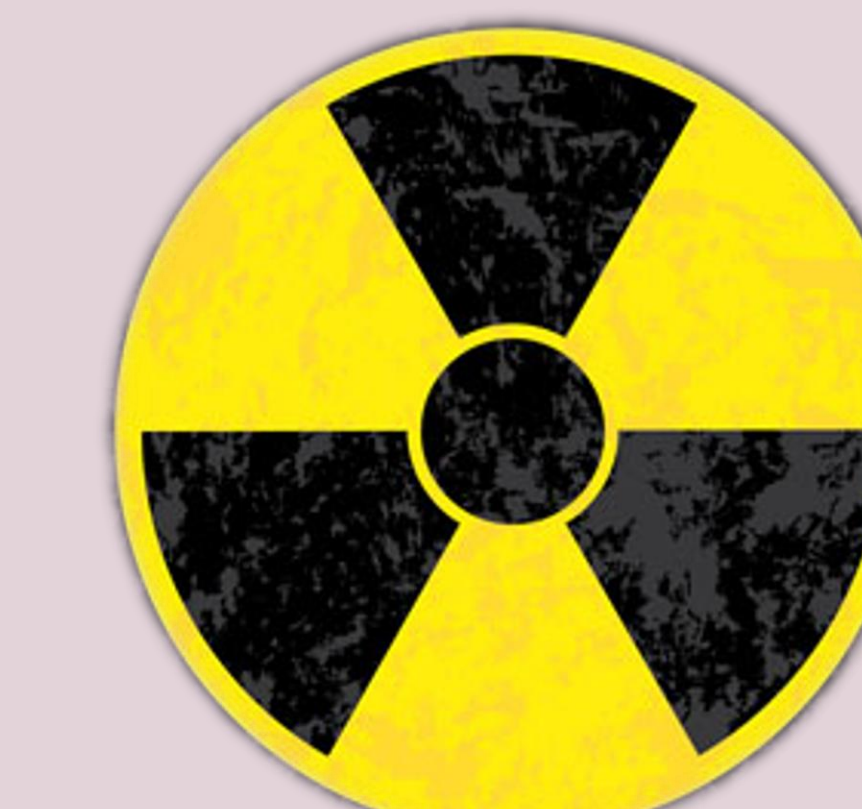




# S4 Radiation Protection: Shielding



Objectives:

1. What is radiation shielding?
2. Why is gonadal shielding no longer recommended?

## What is Radiation Shielding?

Shielding is defined by the United States Nuclear and Regulatory Commission (NCRP) as placing an absorbing material between any radioactive source and a person, work area, or radiosensitive device to reduce the likelihood of possible harm.

Shielding was first recommended in diagnostic X-ray procedures to protect cells from being damaged by ionizing radiation and those damaged cells from being passed down to different generations.

Shielding is one of the three components of radiation safety: time, distance, and shielding. Shields are typically made of lead, as it's a very absorbent material of x-rays and gamma rays.



Flat Contact Shield



## Different types of shielding:

- Flat contact shield
  - Made of lead strips (1mm thick), sits directly over the patient, most effective for recumbent positioned radiographs
- Shadow shield
  - Radiopaque material that is suspended from above the beam-defining system
  - Casts a shadow in the primary beam over the patient's reproductive organs
  - Good for gonadal protection in a sterile field
- Shaped contact shield
  - 1 mm of lead that is contoured to enclose the male reproductive organs
- Clear lead shield
  - Transparent lead acrylic device impregnated with 30% lead by weight
  - Replaces the older style shadow shields and contoured shields



Shaped Contact Shield

On January 12, 2021, the ASRT Board of Directors released a statement recommending the discontinuation of using gonadal shielding during abdominal and pelvic shielding.

## Why is gonadal shielding no longer recommended?

- Today's equipment produces high-quality images with very small radiation doses. The equipment used today is highly advanced in picking the right amount of radiation, otherwise known as using automatic exposure control (AEC) for the chosen exam. Having a shield may interfere with AEC and increase the dose to compensate.
- Research has shown since the 1950's the amount of radiation has decreased by over 95%
- Shielding may cover up important parts of anatomy during an exam, which may cause the images to be repeated, essentially increasing the amount of radiation the patient is receiving



Shadow Shield



Clear lead shield