

Outline:

Radiography and Gonadal Shielding

- Medical radiation (risk) is still relevant
- Radiography is frequent (and *of value*)
- There is evidence for current recommendations
- **Communication is essential**

**Fundamentally, the technologists are the
face of Radiology practice.**

Effective Communication

- **Interpersonal sensitivity:** affective behaviors that reflect the medical professional's attention to, and interest in, the parents' and child's feelings and concerns; **be sensitive**
- **Partnership building:** the extent to which the medical professional's invites the parents (and child) to state their concerns, perspectives, and suggestions during the consultation; **be engaging**
- **Informativeness:** quantity and quality of health information provided by the medical professional's. **be informed**

Towards Effective Communication for Gonadal Shielding

- **The effort is to move from standard/expected gonadal shielding during much of radiography**
- **Practice should, then, revise policy/guidelines to be current: all stakeholders should be involved in this**
- **Consistency is important across the practice/enterprise**
- **Talking points for technologists are helpful**



Patient Gonadal and Fetal Shielding in Diagnostic Imaging Frequently Asked Questions

Introduction

In April of 2019, the American Association of Physicists in Medicine (AAPM) released a position statement outlining reasons for limiting the routine use of fetal and gonadal shielding in medical imaging.¹ This position statement has since been endorsed by the American College of Radiology (ACR);² the Canadian Organization of Medical Physics (COMP);³ the Health Physics Society (HPS);⁴ the Canadian Association of Radiologists (CAR);⁵ the Australasian College of Physical Scientists and Engineers in Medicine (ACPSEM);⁶ and the Image Gently Alliance.⁷ Recognizing that removing patient shielding from routine use is a substantial shift in existing clinical practice, AAPM formed a committee to bring together stakeholders to discuss potential changes in the use of patient shielding. The committee includes representatives from many different societies and organizations with specialization in medical imaging and patient safety. The frequently asked questions (FAQs) and answers given in this document are the first part of this effort - Communicating Advances in Radiation Education for Shielding (CARES).

This document contains three sections, each with a different target audience. The first addresses questions and concerns of healthcare professionals, including, but not limited to, radiologic technologists, physicians, advanced practice providers, medical physicists, radiation safety officers, and nurses. This section also includes some suggested wording that can be used when discussing patient shielding with patients and parents or other caregivers of pediatric patients. The second section addresses common concerns among patients and is best suited for adult patient populations. The third section is intended for parents and other caregivers of pediatric patients.

The committee recommends that facilities that choose to limit the routine use of patient fetal and gonadal shielding use this document, in part or in whole, to help establish a guideline or policy that meets the needs of their individual practice. Such guidelines or policies are critically important so that any changes in practice are adopted in a consistent manner; inconsistency in the use of shields can imply to patients that not using a shield is a lapse of proper care when they have other exams where shields are used.

This document was developed by AAPM's Committee on Education and Implementation Efforts for Discontinuing the Use of Patient Gonadal and Fetal Shielding, which is a collaborative effort involving many different stakeholder organizations and individuals. The CARES committee would specifically like to recognize and thank the following contributors:

American Association of Physicists in Medicine
American College of Radiology, represented by Darcy Wolfman, M.D.
American Society of Radiologic Technologists
Association of Educators in Imaging and Radiological Sciences, represented by Nina Kowalczyk, Ph.D.
Canadian Organization of Medical Physicists
Conference of Radiation Control Program Directors
Health Physics Society
Image Gently
Image Wisely
Radiological Society of North America

Frequently Asked Questions

Target Audience: Healthcare Professionals

A1. Shouldn't we shield the gonads, especially for children, to minimize the risk of genetic damage to future generations?

Gonadal shielding was introduced into clinical practice over 70 years ago, when it was believed that exposing the gonads to radiation could damage reproductive cells such as sperm-producing cells and eggs, causing damage to patients' future offspring.⁸ However, these genetic effects have not been observed in humans, even 3 to 4 generations after the atomic bombings.⁹ International radiation protection organizations have lowered the risk weighting to the gonads in every successive revision of their tissue risk weighting factors since such factors were introduced in 1977.^{10,11}

Suggested Talking Point:

There is no evidence that radiation from medical imaging damages reproductive cells such as eggs or those that produce sperm.

A2. Shouldn't we continue to shield the gonads so that we don't increase the risk of infertility?

The amount of radiation required to cause infertility is more than 100 times the dose from a medical imaging exam.¹¹ For example, the gonadal dose to 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.¹² 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.¹¹

Suggested Talking Point:

The dose required to cause infertility is much higher than that used during a medical imaging exam.

A3. Why should we no longer shield patients routinely?

Any intended decrease in radiation exposure from shielding is negligible compared to the dose from radiation that is scattered within the patient's body. Shields do little or nothing to benefit the patient.^{13,17} As with other areas of medicine, the use of patient shielding should be evaluated from a risk-benefit perspective. For example, any time a shield is used, there is a risk that it will cover and obscure anatomy that is important for an accurate diagnosis.^{12,18,20} Since shielding can introduce these risks and provides little or no benefit to the patient, we should discontinue using shields as part of routine practice.

Suggested Talking Point:

Shields may cover up parts of your body that your doctor needs to be able to see. If this happens, we may have to repeat your image.

A4. Why are we doing this now?

Advances in medical imaging technology, such as better detectors, have greatly reduced the amount of radiation required to create a quality image. However, some of the features of modern imaging equipment (such as automatic exposure control) do not perform as intended when lead shielding is in the path of the beam.²¹ As the medical imaging community continues to deepen its understanding about how radiation affects the body, we are recognizing that the risk for the majority of imaging exams is either too small to be determined or may even be zero. These advances have made patient shielding a practice that introduces more risk than benefit.

Suggested Talking Point:

The change in practice is due to improvements in imaging technology and a better understanding of how radiation might affect the body.

CARES@aapm.org

Twitter: @aapmCARES
AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE

Facebook: aapmimgCARES

Frequently Asked Questions

Target Audience: Healthcare Professionals

A1. Shouldn't we shield the gonads, especially for children, to minimize the risk of genetic damage to future generations?

Gonadal shielding was introduced into clinical practice over 70 years ago, when it was believed that exposing the gonads to radiation could damage reproductive cells such as sperm-producing cells and eggs, causing damage to patients' future offspring.⁸ However, these genetic effects have not been observed in humans, even 3 to 4 generations after the atomic bombings.⁹ International radiation protection organizations have lowered the risk weighting to the gonads in every successive revision of their tissue risk weighting factors since such factors were introduced in 1977.^{10,11}

Suggested Talking Point:

There is no evidence that radiation from medical imaging damages reproductive cells such as eggs or those that produce sperm.

A2. Shouldn't we continue to shield the gonads so that we don't increase the risk of infertility?

The amount of radiation required to cause infertility is more than 100 times the dose from a medical imaging exam.¹¹ For example, the gonadal dose to 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.¹² 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.¹¹

Suggested Talking Point:

The dose required to cause infertility is much higher than that used during a medical imaging exam.

Towards Effective Communication for Gonadal Shielding

**Part of effort for current recommendations is the
National Council on Radiation Protection and
Measurements (NCRP) SC 4-11 Committee Statement :
work in progress**

Target: end of 2020

Plan to release with a communication piece

Must Recognize

- **This will take time**
- **Will need dialogue with other service lines**
- **Recommendations are for radiography only but may have application across other modalities**
- **Differing professional practice with shielding (e.g., shielding during dental radiography)**
- **And....**

Don't forget the (other) basics...



Back to Basics

Acordați atenție mi se potrivește tutușor.
Nu ești laibăci, Bănel-ă ne spui că salăta vine
cu apă! De la cine trebuie să ceri, de la cine
Căpșor ești cum vinești în mărțor? Căpșor ești cum
se reflectă pe apă sau în apă? Apă, apă ești din
norușor, să facă norușor lașor.

"Măi măi" de ce ești "măi bun".
Când se electană radiograful este necesar de:

1. Măsurat greutatea pacientului pentru
prescrierea "dosisurilor" de contrast
2. Fumatul și hrana pe care o mănâncă
până la examen și greutatea lui încă
de la 10-12 ore.
3. În cazul femeii atenția trebuie să se acorde și cu
concepția și sarcina
4. Verificarea parametrilor de expunere și calitatea imaginii.

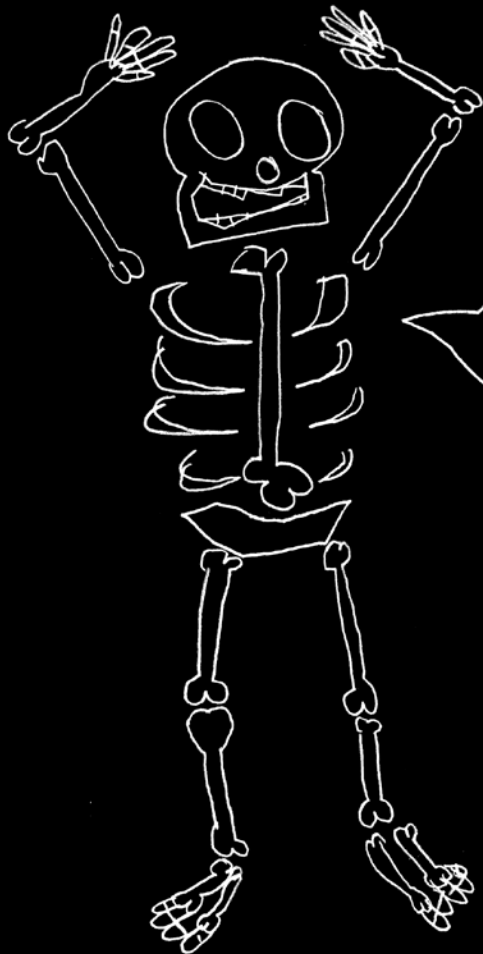
image gently

Pentru mai multe informații despre siguranța radiologică în pediatrie, vizitați www.imagegently.org

The "chabdomextremity" film

Summary

- There is an evidence basis for the current recommendations
- Evidence is not founded in poor professional practice
- It is challenging to change ingrained expectations for all involved
- Frontline engagement using thoughtfully designed communication is essential



THANK
YOU !!!
!!!!!!
!!!!!!
!!!!!!