Discontinuing Routine Use of Protective Equipment: Gonadal and Fetal Lead Shielding for Patients

Purpose

To provide Medical Imaging (MI) Departments with a standard of practice for discontinuing routine use of gonadal and fetal radiation shielding for all x-ray medical imaging exams including: radiography, fluoroscopy, angiography and computed tomography. This document also includes resources for addressing patient concerns.

Site Applicability

This standard is applicable to all Lower Mainland Medical Imaging (LMMI) departments within Fraser Health (FH), Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH).

Practice Level

Profession	Basic Skill
Medical Radiation Technologists (MRT)	• Knowledge of radiation safety for patients
Radiologists	• Knowledge of radiation safety for patients

Need to Know

Gonadal and fetal shields are radiation protection devices placed on patients to attenuate radiation. These shields have been in use for over 70 years; however, new scientific evidence indicates this practice is no longer valid or valuable for the following reasons:

- Technological advancements has reduced the amount of radiation required to create an image.
- In the past, the main concern with radiation exposure to reproductive organs and cells (eggs, sperm and testes) or a fetus was an increase in childhood cancers, physical malformation and hereditary effects. New scientific evidence has shown radiation levels in diagnostic imaging exams are not large enough to cause damage to reproductive cells or a fetus.
- The main contributor of radiation to the reproductive area is internal scatter radiation. Superficial shields provide negligible, if any, radiation protection.
- Effective and accurate placement of the lead shield over the reproductive organs is vital to be useful. In females, it has been shown that ovary position is highly variable, meaning the ovaries may beexposed to radiation even if the shield is placed correctly due to normal patient variations.
- The lead shield may move between placement and exposure, leading to missed/clippedanatomy and potentially repeated exams.
- Lead shields can interfere with an Automatic Exposure Control Cell (AEC) function and, block the primary x-ray beam resulting in a longer exposure time and increased patient dose thereby degrading image or darkening the image.
- Lead shield use may increase infectious transmission by acting as a vector for viruses and microbes.

Position Statements and DAP Standard Changes

In April 2019, the American Association of Physicists in Medicine (AAPM) released a Policy Statement PP-32A which recommended the following:

"Patient gonadal and fetal shielding during X-ray based diagnostic imaging should be discontinuedas routine practice. Patient shielding may jeopardize the benefits of undergoing radiological imaging.
Use of these shields during X-ray based diagnostic imaging may obscure anatomic information or interfere with the automatic exposure control of the imaging system. These effects can compromise the diagnostic efficacy of the exam, or actually result in an increase in the patient's radiation dose. Because of these risks and the minimal to nonexistent benefit associated with gonadal and fetal shielding, AAPMrecommends that the use of such shielding should be discontinued."

This position statement is endorsed by the American College of Radiology (ACR), Australasian College of Physical Scientists and Engineers in Medicine (ACPSEM), Canadian Association of Radiologists (CAR), Canadian Organization of Medical Physicists (COMP), Canadian Association of Medical Radiation Technologists (CAMRT), Health Physics Society (HPS), Image Gently and the Radiological Society of North America (RSNA). As of January 1st, 2022, the Diagnostic Accreditation Program changed standards related use of gonad and fetal shields. These changes are listed in the Table below.

Standard	Prior Standard, v 1.6 prior to January 1st 2022	New Standard DAP v1.7, after January 1st, 2022
RS2.1.3	Shielding is used where appropriate, to limit the exposure of body tissues and when clinical objectives will not be compromised. *Intent: It is particularly important to protect sensitive body tissues and children. Appropriate use of specific area gonad shielding is advised when: the gonads lie within, or are in close proximity to, the X-ray beam; the patient is of reproductive age; and clinical objectives will not be compromised.* *Gonad shields are of sufficient size and shape to exclude the gonads completely from primary beam irradiation. Note: For CT breast shields, using some vendor scanners may increase patient dose. It is recommended to consult with manufacturers on the use of breast shielding.*	Lead shielding is not routinely provided. Guidance: If lead shielding is requested it may be used when clinical objectives will not be compromised.
RS2.2.4	When radiological examinations of the pelvic area or abdomen are required full use is made of gonadal shielding and other protective shielding if the clinical objectives of the examination will not be compromised	Standard removed

Equipment and Supplies

PPE: Gonadal and fetal lead shielding

Standard

It is recommended all technologists review the FAQ page provided by the AAPM CARES webpage (FAQs Patient Shielding v8.0 FINAL (aapm.org). The AAPM FAQ documents are, updated with questions and answers from patients, parents and health professionals across North America.

- Gonadal and fetal lead shielding is not required for Medical Imaging (MI) exams.
- It is standard practice for MI staff to provide patients undergoing a medical imaging exam with fetal or gonadal shielding *only when requested by the patient, parent or guardian as longas the clinical examination is not compromised*

- *If there are others in the room for the exam supporting or holding the patient, please refer to the medical imaging safety manual section on holding patients for radiological exams for guidance.*
- In modalities where gonadal and fetal shielding was used routinely, MI staff will explain to the patient, parent or guardian why shielding is no longer required *before* their exam

Documentation

- MRT must document"patient shielding used" in the patient medical record as per site-specific processes when lead shielding is used, as it is no longer standard practice.

Related Documents

- Patient Pamphlet ("Lead Shields – No Longer Routine") Catalogue #s: VCH/PHC #EC.230.R33,FH #267532
  - LMMI Regional Radiation Safety Manual-Safe Installation and Use of Medical X-Ray Equipment http://shop.healthcarebc.ca/MedicalImaging/ABCD-21-08-90177.pdf
  - Pregnancy Screening and Radiation Safety http://shop.healthcarebc.ca/MedicalImaging/ABCD-21-15-90182.pdf
  - Understanding Fetal Risk from Medical Imaging Examinations https://one.vch.ca/dept-project/lower-mainland-medical-imaging/Documents/MIPC-140501-01_Fetal%20Risk%20From%20Medical%20Imaging%20Examinations.pdf

References

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2. RadiologyInfo.org. March 29, 2020. Retrieved from: https://www.radiologyinfo.org/en/info.cfm?pg=safety-patient-shielding
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4. American Association of Physics in Medicine-Policies & Procedures-AAPM Position Statement on the Useof Patient Gonadal and fetal Shielding. Retrieved from: https://www.aapm.org/org/policies/details.asp?id=468&type=PP&current=true
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6. Diagnostic Accreditation Program of BC, 2022 v1.7 revision record. Retrieved from: https://www.cpsbc.ca/accredited-facilities/dap/accreditation-standards-DI

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