

Large C-Arm: Spacer Use

Purpose

To provide users of the Large Mobile C-Arm unit, the C-Arm X-Ray Tube spacer/cone use parameters.

Site Applicability

This guideline is applicable to Medical Imaging (MI) departments within Fraser Health (FH), Providence Health Care (PHC), Provincial Health Services Authority (PHSA) and Vancouver Coastal Health (VCH).

Practice Level

Profession:	Responsibilities:
Physicians	<ul style="list-style-type: none"> Comply with requirements to leave the C-Arm spacer in place
MRT	<ul style="list-style-type: none"> Ensure the C-Arm Spacer is in place on the C-Arm unit May remove the C-Arm Spacer if the spacer is identified as a risk of falling off into the sterile field
Site Radiation Safety officer (RSO)	<ul style="list-style-type: none"> For units where the Spacer attachment is faulty and may result in detachment into the sterile field, the RSO must be consulted to provide a letter stating the spacer can be removed

Need to Know

This guideline ensures:

- 1) Patient safety
- 2) Reduction of unnecessary radiation exposure to patient and staff
- 3) Adherence to regulatory bodies. See [Appendix A](#)

Guideline

Large Mobile C-Arm X-Ray tube spacer or cone should remain affixed to the unit when in use for an operating room (OR) procedure.

The use of a Large Mobile C-Arm without the spacer is only permissible if there is no possibility that the procedure can be performed with the spacer in place.

- a) The removal of the spacer must be documented, as per site specific procedures, as to why the spacer was removed.

Some Large Mobile C-Arm units have a poorly designed system for holding the spacer affixed to the unit and this may be a risk of the spacer falling into the surgical field.

- a) These units, with an identified risk of the spacer falling off, is certified with a letter stating the spacer can remain off during imaging by the Site Radiation Safety Officer (SRSO). The letter is kept on the site's share point site, accessible by all local and regional staff.
- b) This is prevalent among OEC 9800/9900 and 9900 Elite systems.
- c) The removal of the spacer must be documented, as per site specific procedures, in the patient record.

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References

College of Physicians and Surgeons of BC. Diagnostic Accreditation Program Standards (2020). Retrieved from: <https://www.cpsbc.ca/accredited-facilities/dap/accreditation-standards-DI>

[Health Canada. Safety Code 35](#): Safety Procedures for the Installation, Use and Control of X-ray Equipment in Large Medical Radiological Facilities. 2.5.3 -Radioscopic Equipment Requirements. Point 4 -Focal Spot-to-Skin Distance

[WorkSafeBC, Part 7 Division 3](#) – Radiation Exposure. Accessed August 8th, 2018

Appendices

- [Appendix A: Regulatory Requirements](#)

Appendix A: Regulatory Requirements

1. **Health Canada Safety Code 35** (HC SC35)^[1], radiation safety section 2.5.3 Radioscopic Equipment Requirements,
2. **College of Physicians and Surgeons of BC Diagnostic Accreditation Program** (DAP) Radiation Safety Section RS 4.1.7, "radioscopic equipment must be equipped with a device that limits the focal spot to skin distance,"
3. **WorkSafeBC** (Part 7, Division 3)^[3] has adopted HC SC35 as requirements for staff safety.

HC SC35 statement:

"The equipment must be equipped with a device that limits the focal spot to skin distance. The focal spot to skin distance must not be less than 30 cm for mobile equipment, 38 cm for stationary equipment, 20 cm for radioscopic equipment designed for special applications that would be impossible at 30 cm or 38 cm.

In the case of small-format, low-intensity radioscopic equipment, the minimum focal spot to skin distance is the distance at which the equipment is capable of delivering an air kerma rate of 50 mGy/min."

Focal spot to skin distance must not be less than:

- 1) 30 cm for mobile equipment,
- 2) 38 cm for stationary equipment,
- 3) 20 cm for radioscopic equipment designed for special applications.

DAP RS1.1.3: Direct radiation exposure of staff by the primary beam is not allowed.

The spacer's primary purpose is to protect the patient and surgeon from the x-ray tube coming too close to the skin.

The spacer on the x-ray tube reduces:

- 1) Patient skin entrance dose,
- 2) Occupational dose to the surgeons hands, and
- 3) Possible burns from extended fluoroscopy over the area of interest. (Please note: dose is considered cumulative within 60 days, so although the fluoroscopic dose per procedure *maybe* low, radiation exposure from before and after a c-arm procedure may increase the risk of a radiation burn).

The spacer's secondary purpose is to prevent surgical debris falling into the x-ray tube assembly resulting in equipment damage.

HC SC35 statement, it is the responsibility of the radiation worker to:

- 1) Minimize patient exposure to ionizing radiation,
- 2) Ensure protection of personnel operating x-ray equipment,
- 3) Ensure protection of other personnel and the general public where x-ray equipment is used.

The technologist is the on-site radiation protection specialist trained to minimize dose while attaining a high quality diagnostic study. The technologist's professional responsibility is to ensure the OR procedure and images are attained through proper positioning of the C-Arm with the spacer on the x-ray tube head.

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	1.0	15-DEC-2017	Initial Release Document # MIXR-171114-01	Annemarie Budau, GenRad Regional Practice Lead
	2.0	28-NOV-2023	Addition of where to store letter for approval of spacer removal Reformat and rewrite into guideline and SHOP format. Assign a SHOP number	Annemarie Budau, GenRad Regional Practice Lead

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