



The Canadian Association of Radiologists (CAR) and the Canadian Society on Thoracic Radiology (CSTR) Recommendations on COVID-19 Management in Imaging Departments

March 25, 2020

The purpose of these recommendations is to provide guidance and information to the radiology community regarding the safe conduct of imaging and image-guided intervention in patients with suspected or confirmed COVID-19 infection. For more information regarding image-guided procedures you can refer to specific guidelines issued by the CAIR and the CAR¹⁶. The recommendations included in this document are subject to change given the rapid evolution of the COVID-19 pandemic outbreak. Interim guidance on the COVID-19 pandemic has been issued by the [World Health Organization](#)¹ and by the United States' [Centers for Disease Control and Prevention](#).² Links to these and other related society guidelines are found elsewhere (['Society guideline links'](#)³).

The Canadian Association of Radiologists would like to acknowledge its Board of Directors who provided the direction for these recommendations.

1. Outpatient screening:

All Radiology front desk reception areas need to screen patients by asking standardized questions. These are hard stop questions **that must be answered** before registration is completed. The current COVID-19 criteria for persons under investigation include⁴:

- Fever or signs/symptoms of lower respiratory illness (cough/shortness of breath).
- Fever with severe acute respiratory illness (i.e. pneumonia, RDS) requiring hospitalization without explanatory diagnosis (i.e. influenza).
- Any person who has close contact with a laboratory confirmed COVID-19 patient(s) within 14 days.
- History of travel outside Canada.

If any of the first two criteria are met, the patient should be managed as a potential COVID-19 patient, given a mask and instructed to visit a testing center or the Emergency Department for appropriate laboratory testing. If only the last two criteria are met, the imaging should be postponed and the patient should be instructed to self-isolate at home for 14 days and return for imaging once this period has passed and they remain asymptomatic.

2. Inpatient and ED screening:

All patients with suspected or confirmed COVID-19 infection should be clearly identified on imaging requisitions.

3. Imaging findings and recommendations from the American College of Radiology (ACR)⁵, Canadian Association of Radiologist (CAR) and Canadian Society of Thoracic Radiology (CSTR)⁶:

- The Centers for Disease Control (CDC) does not currently recommend CXR or CT to diagnose COVID-19. **Viral testing remains the only specific method of diagnosis.**
- Confirmation with the viral test is required, even if radiologic findings are suggestive of COVID-19 on CXR or CT.
- **Generally, the findings on chest imaging in COVID-19 are not specific, and overlap with other infections.**⁷⁻⁹
- Imaging should only be conducted for those COVID-19 patients where imaging will impact management of the condition.
- **Facilities may consider deploying portable radiography units in ambulatory care facilities and or long-term care homes for use when CXRs are considered medically necessary.**^{4,10} **In hospitals including the Emergency Department, the use of portable radiography is recommended.** The surfaces of these machines can be easily cleaned, avoiding the need to bring patients into radiography rooms, thus minimizing the spread of infection in larger healthcare institutions.
- As an interim measure, until more widespread COVID-19 testing is available, some medical practices are using chest CT to inform decisions on whether to test a patient for COVID-19. The ACR and CAR strongly urges caution in taking this approach. **A normal chest CT does not mean a person does not have COVID-19 infection and an abnormal CT is not specific for diagnosis. A normal CT should not dissuade a patient from being quarantined when otherwise medically appropriate.** Clearly, locally constrained resources may be a factor in such decision making.
- If chest CT is performed, a non-contrast full dose diagnostic CT is recommended. For the most accurate assessment of the lung, contiguous thin (≤ 1.5 mm) axial lung or bone algorithm reconstructions, axial maximum intensity projections (lung window) and coronal and sagittal reformats should be performed. Expiratory imaging is not necessary. A contrast-enhanced CT would be useful to detect complications such as empyema and/or lung abscess.
- For CXR and Chest CT reporting, radiologists are encouraged to use wording such as “findings are non-specific and include inflammatory conditions and atypical infections such as those caused by the COVID-19 virus” rather than “consistent with or diagnostic of COVID-19 infection”. If the chest CT is normal, radiologists are encouraged to state “A negative CT does not exclude the presence of COVID-19 infection.”

4. Infection prevention during imaging and intervention:

The novel COVID-19 is highly contagious and is believed to transmit mostly through respiratory droplets. Much less commonly, **the virus can be transmitted by touching a surface or from an item that is contaminated.**¹⁵

The recommendations are ⁴ (*Consult Figures 1 and 2*):

- Standardized operating procedures should be implemented for radiological imaging and intervention for patients with known or suspected COVID-19 infection.
- Imaging should be performed at a location with less foot traffic and with fewer critically ill patients. When possible portable chest radiography and/or ultrasound is preferred.
- The waiting and reading rooms should be adapted to preserve social distancing and cleaned on a regular basis.
- Appropriate use of personal protective equipment (PPE) when managing COVID-19 patients is required.
- Ensure proper cleaning supplies¹² are available for re-usable eye protection (e.g. lead glasses) and lead aprons, and for proper cleaning of the room and equipment.
- For non-aerosol generating procedures, as defined by your institution, the staff and physicians should wear the following PPE at minimum: gowns, gloves, surgical mask and eye protection (goggles or face shield).¹⁰
- For aerosol generating procedures, as defined by your institution, the staff and physicians should wear the following PPE at minimum: gowns, gloves, N95 or equivalent respirator and eye protection (goggles or face shield).^{5,10}
- The use of N95 respirators/masks should also be considered when managing COVID-19 patients with at least one criterion of severe disease.¹⁴
- N95 respirators/masks must be properly fitted to provide maximum protection. Use of an improperly fitted N95 mask is strongly discouraged.

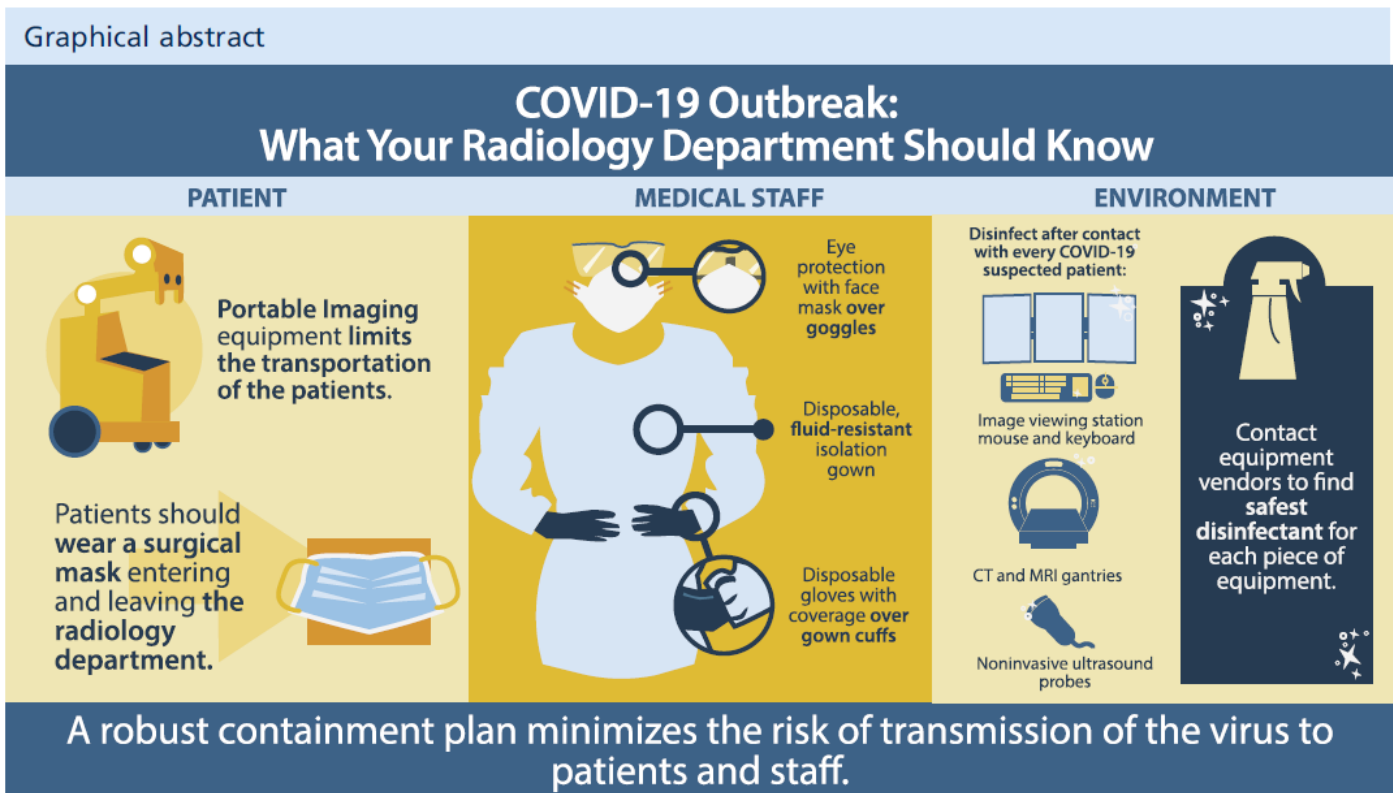
5. Disinfection after imaging:

- Standardized disinfection protocols for decontaminating imaging rooms, including CT and MR scanners should be followed after caring **for all confirmed or suspected COVID-19 patients.**⁴
- Depending on the air exchange rates, rooms should be unavailable for a period of time, allowing decontamination following imaging/procedures performed on suspected or confirmed COVID-19 patients (in concordance with hospital regulations). Air circulation in rooms can be tested in advance to determine this period of time.⁵

- In addition to environmental cleaning and decontamination of rooms occupied by a patient with suspected or known COVID-19 infection, it is recommended that proper protective equipment be worn also during decontamination. ¹¹
- Remote reading should be preferred whenever possible.
- Droplet prevention is critical (no food, drinks in disposable containers only) (Also in Figure 2).

Figure 1

(From ref 7: J Am Coll Radiol. 2020 Feb 19. pii: S1546-1440(20)30150-21440)



(For droplet protection, we recommend using a facial mask with an integrated transparent shield to prevent projection in the eyes. Goggles can also be worn with facial masks over goggles. For aerosol generating procedure, the N95 mask must be fitted, and goggles should be worn over the mask.)

Figure 2

(Infographic provided courtesy of Vancouver General Hospital's Emergency Department)



6. Prioritization of imaging examinations:

The imaging department should follow the principle of social distancing required by local authorities and minimize non-urgent, elective diagnostic or interventional imaging.

- Critical and Non-Critical screening for breast imaging should be postponed. The Canadian Society of Breast Imaging (CSBI) and CAR **recommend that all average risk and**

high-risk screening mammography, ultrasound and breast MRI be discontinued temporarily (6-8 weeks) with immediate effect.¹³

- Elective and non-urgent elective imaging examinations should be avoided during the pandemic.
- Particular attention should be given to immunocompromised patients who are more susceptible to develop severe disease.

Summary:

The recommendations provided are based on preliminary information that has been gathered from available literature and scientific and medical societies involved in the management of this outbreak. These recommendations can become obsolete if and when more evidence is available in the future. The CAR and the CSTR will continue to update these recommendations when new information becomes available. We believe this exercise is useful to help our members in guiding their decision making. We are facing challenging times and must deliver the best care to our patients, while protecting our colleagues and all the staff involved in patient care. We also need to collect all relevant information from you to improve our policies. Do not hesitate to share information provided by your institution, provincial association and based on your own experience. Working together and exchanging information can save lives and keep everyone safe.

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