



Coronavirus COVID-19

BC Centre for Disease Control | BC Ministry of Health



Provincial Guidance for Medical Imaging Services within British Columbia During the COVID-19 Pandemic Phases

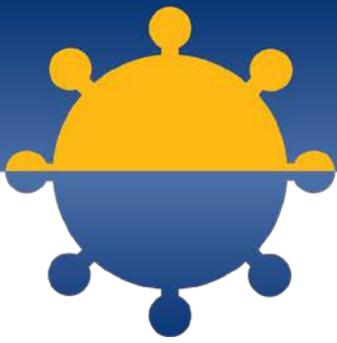
June 1, 2020



Ministry of Health



BC Centre for Disease Control



Authors:

This document represents recommendations the provincial Medical Imaging Advisory Committee of British Columbia (BC). MIAC membership consists of clinical and academic radiologists, Health Authority representatives, BC Radiological Society representatives, Ministry of Health representatives, primary care practitioners, a BC College of Physicians and Surgeons representative, and others who have historically worked together to assist in developing provincial imaging standards and optimizing the use of available resources.

Disclaimer:

The intent of this document is to provide guidance that is considered best evidence and current policies at the time of print. This document does not intend to substitute the advice or professional judgment of a health care professional; clinical judgment should always be the final arbitrator. In case of discrepancies between BC Centre for Disease Control guidance documents or B.C. Ministry of Health Policies and the information provided in this document, the former guidance documents and policies shall be considered the source of truth.



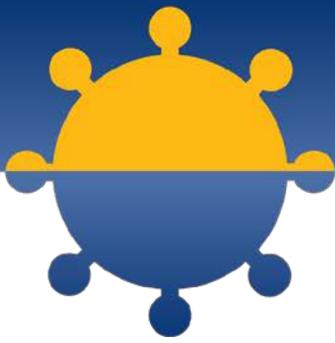
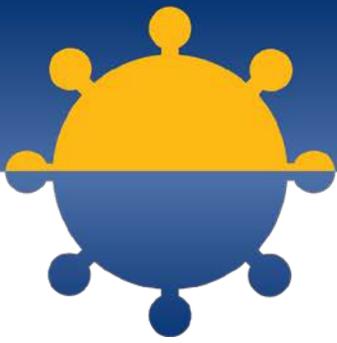


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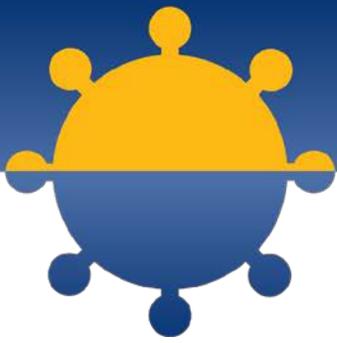
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Key Messages

Purpose

As we navigate the uncertain waters of the coronavirus (COVID-19) pandemic, this document aims to provide provincial guidance for medical imaging services within British Columbia.

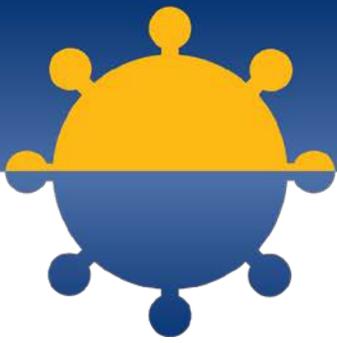
Role of Imaging in of COVID-19

- Imaging, and even conventional radiography should not be used for the diagnosis of COVID-19 infection. COVID-19 is a diagnosis made with a nucleic acid test on an appropriate respiratory sample.
- A negative chest X-ray does not exclude the possibility of COVID-19.
- The chest X-ray or chest CT should only be performed if the results are expected to influence patient management.

Prioritization of Incoming and Existing Requisitions

- Requisitions should be reviewed to ensure the right exam is done for the right patient at the right time. The aim is to ensure the selected test provides the required information and the actions are sufficient and efficient, neither excessive nor deficient.
- Appropriateness and accuracy of requisitions are very important regarding the prioritization of exams. To assist with this, referring practitioners are encouraged to continue to include clear and accurate histories and reasons for exams on requisitions to allow for the most accurate prioritization based on urgency.
- The prioritization of incoming requisitions with the backlog of existing requisitions will be based on urgency.
- It is expected that a referring practitioner with a patient whose health condition changes during the postponement period will escalate the urgency of referral by following their normal practices of reaching a radiologist either directly or through a Medical Imaging Department and ask to speak to a radiologist.
- To assist in the prioritization of requisitions:
 - For MRI, CT and ultrasound services: use the BC Radiological Society's Prioritization Guidelines.
 - For Breast Imaging – use the Canadian Association of Radiologists – Canadian Society of Breast Imaging Prioritization Guidelines.
 - For Interventional Radiology - use the Canadian Association of Radiologists Prioritization Guidelines.
 - For Nuclear Medicine, X-ray, and bone density – use case by case basis for urgency.
- General principles for the prioritization and booking of incoming and existing requisitions include:
 - All P1 and P2 exams should have the highest of priority for new bookings and re-bookings. There should be no P1 and P2 requisitions in the postponed cases.
 - All postponed P3s exams should have priority over new P3 exams.
 - All postponed P3 exams should have priority over P4 exams.





- Many P5 exams are precisely timed for medical/ logistical reasons. It is recognized there is considerable variation in the urgency of P5 patients and clinical judgement should be used in assigning relative priority levels. In general, P5 exams require additional vetting by radiologists to determine whether or not they should be prioritized ahead or behind scheduled P3 and P4 exams.
- All postponed P4 exams should have priority over new P4 exams.

Operationalizing the Resumption of Services

- Each site will need to determine available capacity. It is anticipated that in order to move through the backlog, hours of operation will be extended as required. Service volume increases will be dependent on the capacity of health human resources and will be limited by supplies (e.g., PPE, isotopes), the implementation of physical distancing, and the time to turn over a room due to enhanced cleaning and disinfecting requirements between patients.
- It is also important to ensure any new processes are sustainable over a longer period of time.
- The resumption of breast screening is dependent on active breast diagnostic services; screening cannot resume unless there is diagnostic capacity to manage arising abnormal cases.

Patient Journey

- Patient anxiety is a normal reaction. COVID-19 related anxiety can discourage patients from having their medical imaging service they need, based on fear of coming into the facility. Efforts should be made to reduce patient's anxiety and fear. Lack of attending an exam may result in a delay of a diagnosis and treatment, increasing harm to the patient.
- Patients should be screened prior to and at the time of their appointment, for COVID-19.

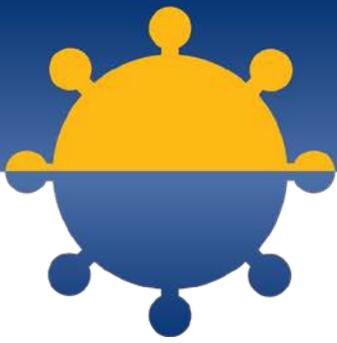
Application of Personal Protective Equipment

- A decision on using PPE must be made whenever a health care provider or staff has direct contact with a patient. Health care workers and staff who have direct contact with patients with symptoms suggestive of COVID-19 must follow droplet and contact precautions, which includes wearing a surgical / procedure mask, eye protection, gloves, and gown.
- PPE is not required for health care workers and staff who work more than 2 meters from patients at all times.

Medical Imaging Staff Well-Being

- The health, safety and well-being of all medical imaging staff is critical during these challenging and unprecedented times.
- It is important to manage stress, share information with empathy and optimism, use credibility to build trust, be honest and transparent, provide regular communications, provide a forum for feedback, and be a role model.
- It is important for support staff to take care of themselves, be cognizant of increasing workloads, and recognize that staff may need time off to maintain their own well-being.
- Encourage mutual support between staff as they may be coping with stress in different ways.





1. Overview

1a. Purpose

As we navigate the uncertain waters of the coronavirus (COVID-19) pandemic, this document aims to provide provincial guidance for medical imaging services within British Columbia (B.C.).

The scope of this document includes:

- Clinical imaging guidance for COVID-19 patients;
- Prioritization of existing and incoming requisitions during reduced / resuming service levels;
- Operationalizing the resumption of service volumes;
- The patient's journey during these times of a 'new-normal';
- The use of personal protective equipment (PPEs);
- Resources to assist with the Medical Imaging staff's well-being;
- Information for referring practitioners;
- Emerging technologies during these times.

1b. Guiding Principles

This document was developed using the following guiding principles:

- Safety first by containing possible spread of COVID-19, protecting both patients and staff from unnecessary infection exposure and implementing best-practice Infection Prevention and Control (IPAC) protocols;
- Ensuring patients, radiologists, staff and referring practitioners are provided with appropriate support and services as needed;
- Continually seeking opportunities for system improvement, while not deviating too far from normal practices to avoid confusion; and
- Encouraging appropriate utilization of imaging resources to help alleviate pressures on the health care system.

1c. Assumptions

This document was developed with the following assumptions:

- There is a need for flexibility in applying this guidance relative to differences in capacity and demands at the various facilities across the province. It is accepted that larger urban hospitals will have different capabilities and needs than the smaller rural hospitals and community imaging clinics.
- COVID-19 disease activity over time will likely occur in waves, requiring future service expansions and reductions. This will be coordinated through provincial direction, accounting for local variability.
- It is anticipated there will need to be a 'learn-as-we-go' approach, with opportunities to evaluate and adjust this guidance accordingly.





2. Background

2a. Timeline of Events

The B.C. Provincial Health Officer (PHO), Dr. Bonnie Henry and the Minister of Health, Adrian Dix, announced the first confirmed case of COVID-19 in B.C. on January 28, 2020. Since then unprecedented steps have been taken. By mid-March, a Public Health Emergency was declared by the PHO and a Provincial State of Emergency declared by the Minister of Public Safety and Solicitor General. The Ministry of Health took appropriate steps to ensure the safety of B.C. patients and ensure that sufficient capacity was maintained within our hospitals to address potential COVID-19 patient needs. A directive was given to health authorities to postpone all elective surgeries and other non-urgent health services. This included implementing a phased approach for medical imaging services (see Table 1 below). By March 23, 2020, all regulated health care professionals providing care in community and acute-care settings were expected to reduce all non-essential and elective services involving direct physical contact with patients, subject to allowable exceptions. The Registrar of the College of Physicians and Surgeons of BC echoed these statements in a letter to their registrants on March 24, 2020. During this time, the Medical Imaging Advisory Committee (MIAC) meet regularly to provide recommendations, advice and expertise during the crisis. On May 6, 2020, the Premier of B.C. announced B.C.'s Restart Plan; outlining the next steps to move B.C. through the pandemic. This included enhanced protocols for the resumption of non-urgent health services. Medical imaging services could commence as early as mid-May.

2b. Classification of Service Levels

As we move through this pandemic, different levels of medical imaging services are being performed based on a phased approach relative to disease activity. The service level is determined by the Ministry, in consultation with the health authority based on multiple factors. These include but are not limited to population-level statistics for COVID-19, the availability of PPE supplies and levels of health human resources. The levels do not have to be declared in a consecutive order; and certain levels may be skipped if warranted.

Table 1. Level of Pandemic Services for Medical Imaging

Level	Description of Service Level
1	Normal services levels operating at the same level pre-COVID pandemic (Status quo)
2	Only urgent* (priority 2) and emergent* (priority 1) services are performed
3	Only emergent* (priority 1) services are performed
4	No services are performed as the site is closed
5	Site is designated to perform only a specific type of service
6	All services are resuming from Level 2, 3 or 4 towards Level 1 status but with IPAC COVID-19 protocols still in effect (as per BCCDC guidance or Ministry of Health directive)

Note: * Urgent or emergent services are defined as those services which are necessary to diagnose and/or treat disease that is immediately threatening to a patient's health or would have a significant impact to future health if not performed as soon as possible.





3. Clinical Imaging Guidance for COVID-19 Patients

3a. Role of Imaging in of COVID-19

- **Advanced imaging, and even conventional radiography should not be used for the diagnosis of COVID-19 infection.** This has been reiterated by our Infectious Disease and Public Health leadership and supported in current medical literature; COVID-19 is a diagnosis made with a nucleic acid test (NAT) on an appropriate respiratory sample (e.g., nasopharyngeal swab).
- The Canadian Society of Thoracic Radiology (CSTR) and Canadian Association of Radiologists (CAR) recommend against the use of routine chest computed tomography (CT) for screening, diagnosis and surveillance of COVID-19 infection.¹
- The role of imaging should be reserved to help guide management of patients already diagnosed with COVID-19 where imaging is felt to be necessary to help guide medical and interventional decision making. There is a great deal of interest in social media as well as the number of publications highlighting the role of CT in the management of COVID-19. It should be clear that this applies to a small subset of patients that are acutely unwell and admitted to hospital with COVID-19 infection.
- For suspected or confirmed COVID-19 patients, minimize unnecessary imaging, reducing the potential spread of pathogen to other patients and staff.

3b. Role of Chest X-ray²

A negative chest X-ray does not exclude the possibility of COVID-19. The chest X-ray should only be performed if the results are expected to influence patient management. Chest X-rays are most useful when an alternative diagnosis is suspected that could explain the patient's presenting symptoms (e.g., pneumothorax, pulmonary edema, pleural effusion, lung mass, lobar atelectasis). A chest X-ray may also be useful in patients:

- with moderate to severe symptoms to determine whether there is a need for additional assessment in a hospital setting;
- who are immunocompromised or otherwise at high-risk for severe infection; or
- with clinically worsening symptoms but an initial negative NAT on an appropriate respiratory sample (e.g., nasopharyngeal swab). The likelihood of an abnormal chest X-ray increases with progressing symptoms. However, since a negative chest X-ray does not exclude the possibility of COVID-19, a low-dose CT may also be considered for those with high clinical suspicion.

Use of the Portable X-Ray:

The CAR and the American College of Radiology (ACR) recommends the use of a digital portable X-ray unit rather than fixed X-ray unit for COVID-19 patients. While chest X-rays are not recommended for the diagnosis of COVID-19, the role of a digital chest X-ray in monitoring the treatment of COVID-19 patients is well documented.³ The benefits of utilizing a digital portable x-ray unit over a fixed unit include: 1) immediate image review at the bedside, which may assist in reducing PPE usage, 2) easier to clean and





disinfect after possible contact with a COVID-19 patient, and 3) may avoid CT exams and the lengthy associated CT room disinfecting time (i.e., > 1 hour for cleaning and adequate air exchange).^{4,5} There are additional innovative techniques to isolate COVID-19 patients such as the use of negative pressure rooms containing X-ray unit with image viewing through a glass wall.⁶ This method also preserves PPE.

3c. Role of Chest CT²

A chest CT should only be performed if the results are expected to influence patient management, and where appropriate consider low-dose CT. A chest CT may also be helpful in patients:

- to detect for potential intrathoracic complications related to COVID-19 infection;
- who are immunosuppressed or high-risk with suspected respiratory infection after a negative chest X-ray; and
- who have ongoing high clinical suspicion or clinical deterioration after an initial negative; nasopharyngeal swab NAT and a negative chest X-ray. It has been noted that chest CT findings may be present even in asymptomatic COVID-19 patients.

3d. Role of Lung Ultrasound^{7, 8}

Lung ultrasound should not be used to diagnose or exclude COVID-19 pneumonia. Lung ultrasound can potentially be used to grade severity of lung involvement in patients with COVID-19 as an adjunct in clinical decision making at the bedside and potentially to reduce the use of both chest X-rays and CT. Protocols have been developed that allow assessment of different areas of the thorax and grading based on specific sonographic features such as Kerly B-lines and consolidation.

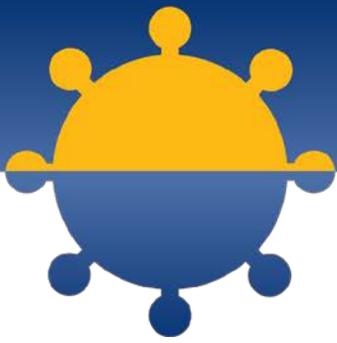
3e. Reporting Structures for Chest X-ray and CT

The CSTR-CAR proposes 3 categories of typical, nonspecific and negative for its recommended reporting structures for chest X-ray and chest CT. Proposed standard language is also provided based on these 3 categories.

Resources

- The **CSTR-CAR** provides guidance on the chest imaging and recommended standardized reporting structure in suspected and confirmed COVID-19 (May 8, 2020), link: <https://journals.sagepub.com/doi/10.1177/0846537120924606>.
- The **ACR** provides additional guidance on appropriate chest CT and chest X-ray imaging during the COVID-19 pandemic (March 11, 2020), link: <https://www.diagnosticimaging.com/coronavirus/acr-releases-ct-and-chest-x-ray-guidance-amid-covid-19-pandemic>.
- A B.C.-specific patient handout on **Medical Imaging During the COVID-19 Pandemic** on the role of imaging to diagnose of COVID-19, link: <https://bcpsc.ca/improve-care/medical-imaging/medical-imaging-during-covid-19/>.





4. Prioritization of Requisitions Between Levels

4a. Prioritization During the Reduction of Services (Level 1 to Level 2)

In mid-March 2020, Medical Imaging Departments and Community Imaging Clinics were directed to postpone elective / non-urgent exams. BC Cancer Agency's Screening Breast Program was also suspended, and all pre-booked exams were postponed. This was to increase patient surge capacity and to minimize potential staff or patient exposure.

Existing Requisitions:

Pre-existing and pre-booked requisitions were triaged by radiologists based on urgency, and all non-urgent and non-emergent exams were postponed. Medical Imaging Departments were expected to use the Non-urgent Exam Guidance by Modality document developed by the Lower Mainland Medical Imaging (LMMI) team and adopted by MIAC for provincial use. The most current version 7, is dated April 24th, 2020, and can be obtained from your health authority's Radiology Medical Lead or Operations Director.

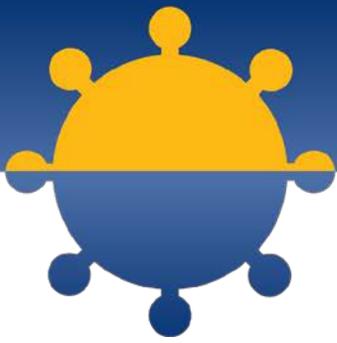
All non-urgent and non-emergent imaging was postponed on a rolling 4-week timeline. At the end of 4 weeks, the cohort of postponed requisitions were re-evaluated to determine which patients should be transferred into an urgent category. This process was repeated weekly.

Incoming Requisitions:

Referring practitioners were encouraged to continue the normal practice of sending in all radiology requisitions. **While it is always best practice to include clear, pertinent clinical history on radiology requisitions, referring practitioners were especially encouraged to be particularly diligent during the COVID-19 pandemic, and include as much historical detail as possible to assist the triaging / prioritizing of examinations and interpretation of images.** These incoming requisitions were triaged using the guidance document mentioned above. It is important to recognize that clinical judgment should always be the final arbiter. If either a referring practitioner or radiologist feels that a patient should be assigned a higher urgency category than that triaged using the guidance document, the patient should always be placed in that category. This ensures that any patient who requires urgent imaging will receive it.

The rationale for Medical Imaging Departments continuing to accept requisitions for non-urgent and planned investigations is twofold. First, to avoid the risk of a request not being entered into the system and potentially "falling through the cracks"; and secondly, so that the demand of services can be accurately determined once restrictions were lifted. With walk-in referrals (e.g., X-Ray), it was recommended that referring practitioners' offices call in advance to confirm whether walk-in patients are accepted or if an appointment booking option is available. Walk-in patients arriving at a facility





without advance notice were triaged on site for both infection control and assessment of urgency of the request.

Most Medical Imaging Departments have established a Radiologist-of-the-Day (ROD) contact to triage urgent requests or perform urgent reads. If a referring practitioner had any doubt, radiologists are ready to provide consultation in cases where there is uncertainty regarding urgency either at their local site or by utilizing the RACE line. Please note RACE is not involved in the scheduling of imaging exams and should not be used to ask questions about a patient's booking.

Change in Patient Urgency Level:

At the end of the initial 4-week postponement period, Medical Imaging Department staff will, to the best of their ability, review the cohort of postponed patients, and escalate requisitions from non-urgent to urgent status where appropriate. It is also expected that a referring practitioner with a patient whose health condition changes during this time will escalate their referral by following their normal practices of reaching a radiologist or calling the hospital's Medical Imaging Department and asking to speak to a radiologist.

4b. Prioritization During the Resumption of Services (Transition from Levels 2-5 to 6)

There are existing requisitions on file for exams that have been postponed from the initiation of the pandemic response. As services start to resume, the intention is to re-introduce postponed exams into departmental workflows and start re-booking postponed patients with prioritized urgency, mixing these requisitions with incoming requisitions, bearing in mind departmental and resource constraints. Incoming requisitions should be reviewed for appropriateness and prioritized using criteria listed below.

At all times, referring practitioners are encouraged **to continue to include clear and accurate histories and reasons for exams on requisitions** to allow for the most accurate patient triaging.

Appropriateness:

Requisitions should be reviewed to ensure the right exam is done for the right patient at the right time. The aim is to ensure the selected test provides the required clinical information and the actions are sufficient and efficient, neither excessive nor deficient.

Medical Imaging Departments will continue to screen for low-utility tests¹ using criteria from resources listed below with emphasis on the following clinical scenarios: low back pain, minor head injuries, uncomplicated headache, hip and knee pain in patients over the age of 40 years, and suspected pulmonary embolism.

¹ These five low-utility exams were agreed to by a provincial expert advisory group on Medical Imaging in 2016.





Inappropriate referrals should not be performed and will be referred back to referring practitioners. This is to reduce wait times, inefficient use of equipment and human health resources, avoidable costs, unnecessary exposure to radiation, and increased false-positives or incidental findings.

Resources

- **Essential Imaging** aims to reduce inappropriate medical imaging for five common situations among participating primary care and emergency teams. This includes leveraging the BC Guideline on Appropriate Imaging, promoting patient and public awareness, supporting provider education and providing decision support resources to increase medical imaging appropriateness, link: <https://bcpsqc.ca/improve-care/medical-imaging/https://bcpsqc.ca/improve-care/medical-imaging/>.
- **BC Guidelines.ca - Appropriate Imaging in Common Situations in Primary and Emergency Care** highlight evidence-based recommendations in the clinical scenarios in the five identified low-utility imaging tests, link: <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/diagnostics-imaging>.
- **CAR’s Diagnostic Imaging Referral guidelines**, link: <https://car.ca/patient-care/referral-guidelines>.
- **ACR’s Appropriateness Criteria guidelines**, link: <https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria>.

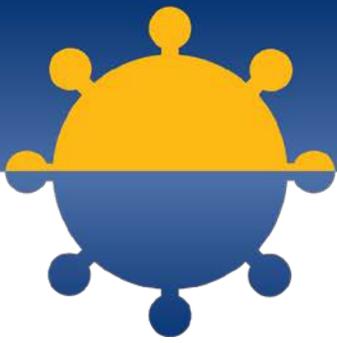
Prioritization:

The prioritization of incoming requisitions and the backlog of existing requisitions should be based on urgency (see Table 2 and 3 for prioritization levels). For prioritizing magnetic resonance imaging (MRI), CT and ultrasound services, please use the BC Radiological Society’s (BCRS) Prioritization Guidelines. These guidelines are not all-inclusive and the ultimate responsibility for prioritization rests with the attending radiologist after consultation with the referring physician. Reassessment of all postponed requisitions should be done by a team consisting of a radiologist and an administrative colleague on an ongoing basis to determine if there is any change in urgency, until postponed cases are cleared.

Table 2. BCRS Prioritization Levels and Time Interval Benchmark

Priority Level	Description	Time Interval Benchmark
P1	Emergent: An examination immediately necessary to diagnose and/or treat life-threatening disease or injury.	Immediately to Maximum 24 hours
P2	Urgent: An examination necessary to diagnose and/or treat disease or injury and/or alter treatment plan that is not immediately threatening to life or limb.	Maximum 7 calendar days
P3	Semi-urgent: An examination necessary to diagnose and/or treat disease or injury and/or alter treatment plan, where provided clinical information requires that the examination be performed sooner than the P4 benchmark period.	Maximum 30 calendar days
P4	Non-urgent: An examination necessary to diagnose and/or treat disease or injury, for long-range management or for prevention.	Maximum 60 calendar days
P5	Follow-up: The exam appointment date requested by the referring practitioner for the purpose of disease surveillance.	No time interval as they have a specified procedure date





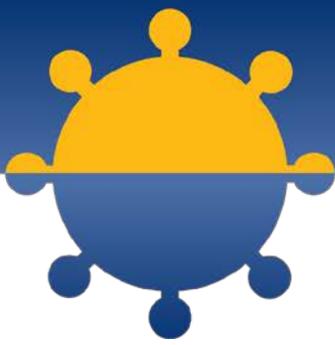
General principles for the prioritization and booking of incoming and existing requisitions include:

- All P1 and P2 exams should have the highest of priority for new bookings and re-bookings. There should be no P1 and P2 requisitions in the postponed cases.
- All postponed P3 exams should have priority over new P3 exams.
- All postponed P3 exams should have priority over P4 exams.
- All postponed P4 exams should have priority over new P4 exams.
- Many P5 exams are precisely timed for medical / logistical reasons. It is recognized there is considerable variation in the urgency of P5 patients and clinical judgement should be used in assigning relative priority levels. In general, P5 exams require additional vetting by a radiologist to determine whether or not they should be prioritized ahead of behind scheduled P3 and P4 exams. For example,
 - P5 CT scan to evaluate cancer treatment post cycle #2 of chemotherapy should occur with high priority within a 7 day window potentially 2 weeks form when the requisition was received. This would be prioritized ahead of a P3 patient and could be triaged as: “P5 – urgent – please book between June 5th and 12th, 2020.”
 - 12-month follow-up MRI for hereditary cancer screening could reasonably be done within a 1 month window 1 year away, and would be prioritized to occur after P4 requisitions were booked. This could be triaged as: “P5 – routine follow-up screening 12-month.”

Ethical Framework:

For cases that requires further guidance in prioritization than the above guidelines, please use the province’s COVID-19 Ethical Decision-Making Framework. This framework supports medical imaging teams in making challenging decisions in prioritizing patients during this pandemic. This framework does not provide detailed instructions for responding to ethical dilemmas on a case-by-case basis. Instead, it identifies the ethical principles and values that should guide ethical decision-making, strategies, and processes. Health authorities are encouraged to use this provincial framework, and consult with their local Ethics Service, to inform communicable disease pandemic planning and response activities, as well as any applicable health authority framework.





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Table 3. Prioritization Criteria and Methodology based on the Modality

MODALITY	PRIORITIZATION CRITERIA	PRIORITIZATION METHODOLOGY	REVIEW OF EXISTING REQUISITIONS
MRI CT Ultrasound	Use existing BCRS prioritization criteria (P1 – P5).	<p>P1 and P2:</p> <ul style="list-style-type: none"> Highest priority for new booking and re-booking. <p>P3:</p> <ul style="list-style-type: none"> All postponed P3 exams get priority over new P3 exams. P3 requisitions beyond the 30-day window will receive priority. <p>P4:</p> <ul style="list-style-type: none"> All postponed P4 exams get priority over new P4 exams. P4 wait times will be extended beyond the priority window. Scheduled P4 exams should be pushed back to create more space for P3 and P5 exams, if appropriate. <p>P5:</p> <ul style="list-style-type: none"> Many P5 exams are precisely timed for medical/logistical reasons. It is recognized there is considerable variation in the urgency of P5 patients and clinical judgement should be used in assigning relative priority levels. In general, P5 exams require additional vetting by a radiologist to determine whether or not they should be prioritized ahead or behind scheduled P3 and P4 exams. 	No secondary review of protocolled requisitions needed.
Breast Imaging - Diagnostic	Use the CAR-CSBI prioritization (P1-4).	<p>P1 and P2:</p> <ul style="list-style-type: none"> Highest priority for new booking and re-booking. <p>P3:</p> <ul style="list-style-type: none"> All postponed P3 exams get priority over new P3 exams. P3 requisitions beyond the 30-day window will receive priority. <p>P4:</p> <ul style="list-style-type: none"> All postponed P4 exams get priority over new P4 exams. 	Secondary review and re-prioritized as per the CAR-CSBI prioritization.
Breast Imaging – Screening Mammography	Consider the CAR-CSBI prioritization (P1-4).	<ul style="list-style-type: none"> At shared service site (concurrent diagnostic and screening on same machine): screening considered P4. At sites with dedicated screening equipment to resume operating in parallel with diagnostic stream. 	Postponed patients will be prioritized.
Interventional Radiology	Use case by case basis for urgency. May use the CAR prioritization (P1-4).	<ul style="list-style-type: none"> Discretion should reside with each individual site’s department. Other considerations when prioritizing patients is availability of radiopharmaceuticals, as some health authorities are experiencing delivery delays due transportation issues. In the event of a disruption in the supply of isotopes, use the CADTH-MIIMAC’s tool that helps prioritize the use of technetium-99m-based imaging procedures. 	Secondary review and re-prioritize as necessary, based on urgency.
Nuclear Medicine	Use case by case basis for urgency.	<ul style="list-style-type: none"> Discretion should reside with each individual site’s department. 	Secondary review and re-prioritize as necessary, based on urgency.
X-Ray Bone Density	Use case by case basis for urgency.	<ul style="list-style-type: none"> Discretion should reside with each individual site’s department. 	No secondary review of protocolled requisitions needed.





Resources

- **BCRS' Prioritization Guidelines** for MRI (2013), CT (2013) and Ultrasound (2016), link: <https://bcradiology.ca/>.
- For the **CAR-Canadian Society of Breast Imaging (CSBI) Breast Imaging Wait Time Benchmarks – Appendix G**, link: https://car.ca/wp-content/uploads/2020/05/CAR-Radiology-Resumption-of-Clinical-Services-Report_FINAL.pdf.
- For the **CAR Interventional Radiology Prioritization Guidelines – Appendix I**, link: https://car.ca/wp-content/uploads/2020/05/CAR-Radiology-Resumption-of-Clinical-Services-Report_FINAL.pdf.
- **BC Guidelines.ca**: Ultrasound Prioritization Guidelines for Referring Practitioners (2018), link: <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/diagnostics-imaging>
- Canadian Agency for Drugs and Technology in Health (CADTH) / Medical Isotopes and Imaging Modalities Advisory Committee (MIIMAC)'s **Supply Management Application to Rank Uses of Technetium-99m** (The "S.M.A.R.T." Tool), link: <https://www.cadth.ca/SMART-Tool>.
- BC's **COVID-19 Ethical Decision-Making Framework** (March 28, 2020), link: https://www2.gov.bc.ca/assets/gov/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/covid-19/ethics_framework_for_covid_march_28_2020.pdf.

5. Operationalizing the Resumption of Services

5a. Quantify the Backlog of Services

Each site is asked to quantify the backlog of services to determine the capacity required to reach pre-pandemic levels and work towards achieving wait time targets. Every effort will be made to safely re-establish workflows and address backlogs, and there will be a lag time in the ability of departments to achieve wait time targets.

5b. Determine Available and Identify Potential Capacity

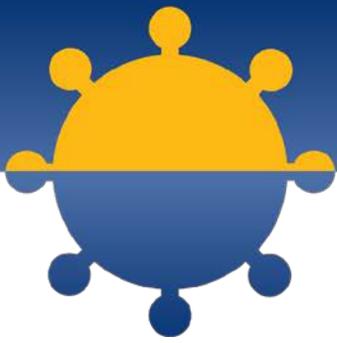
In order to move through the backlog, hours of operation will be extended when possible. Service volume increases will be dependent on the capacity of health human resources and will be limited by supplies (e.g., PPE, isotopes), the implementation of social / physical distancing protocols and the time to turn over a room due to appropriate cleaning and disinfecting protocols. It is also important to ensure any new processes are sustainable over a longer period of time. Staff are currently experiencing fatigue due to frequent change, intense communications and increased stress levels both on a professional and a personal level.

Health Human Resource Capacity:

Each site will need to determine health human resource capacity, including:

- Clerks, nurses, porters, housekeeping staff and technologists by modality, including those that are part time and casual;
- Radiologists, including those cross site or cross health authority options; and





- Physicians from other departments that are accessible to oversee contrast injections if no radiologist is onsite.

In order to extend operating hours, health authorities will need to:

- Identify staff that can transition from part time to full time;
- Determine overtime capacity, from the perspective of sustainability and fiscally feasibility;
- Proceed with clinical placements for technologists to increase the supply of technologists;
- Develop a local plan for moving staff between sites²; and
- Ensure that any site and shift schedule changes are in alignment with Health Employers Association of BC (HEABC), human resource and union processes.

Supply Capacity:

It is recognized that PPEs will be one of the main limiting factors for service volume increases. Each site will need to determine if there are enough supplies to meet planned increased services volumes, including:

- PPEs supplies as per health authority guidelines; and
- Imaging-specific supplies – such as isotopes, contrast agents and Interventional Radiology supplies, as delays due to transportation issues are being experienced.

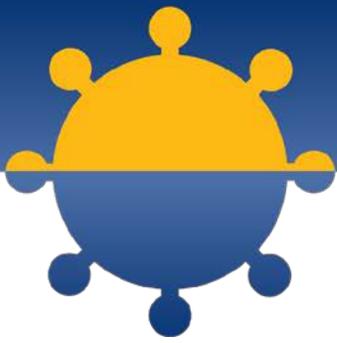
Physical Distancing:

It is recognized that maintaining physical distancing within Medical Imaging Departments results in a reduction in patient throughput. While each site will have a different approach to achieving this, considerations include:

- Dispersing services and staff shifts/ breaks throughout the day, including providing services in early mornings, evenings, nights and weekends to reduce the number of people in the Medical Imaging Department at one time;
- Scheduling appointments with more time to allow patients to be spaced further apart;
- Minimize the number of caregivers and other non-staff individuals who are not patients entering the department, as much as is practical to do so;
- Designating an exam/ procedure room closest to the entrance for patients with respiratory symptoms to allow for rapid isolation and assessment;
- Where physical distancing cannot be maintained, other physical barriers should be considered (e.g. plexiglass or plastic film partitions at reception and other areas);

² The current Order of the Provincial Health Officer: Long-Term Care Facility Staff Assignment Order (April 15, 2020) limits the movement between long-term care facilities and private hospitals only, link: <https://www2.gov.bc.ca/assets/gov/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/covid-19/covid-19-pho-order-long-term-care-facility-staff-assignment.pdf>





- Air circulation (exchanges) and ventilation in patient areas should be increased where possible (e.g. open windows, heating, ventilating and air conditioning (HVAC) systems to circulate air);
- If more than one scanner on-site, stagger start times to reduce the number of patients in the department at any one time;
- Dedicate a set time period each day for inpatients to maintain separation between inpatients and outpatients;
- Consider scheduling older patients or those with chronic illnesses as the first appointment of the day, and at times separate from COVID-19 suspected patient exams, if exam rooms cannot be separated; and
- Develop an approach to disperse walk-in X-rays by allowing patients to come on certain dates or times based alphabetically on their last name, postal code or type exam; or develop a process to be able to schedule X-rays appointments to control flow.

Equipment Cleaning and Disinfection Turnover Time³:

It is acknowledged that exam times will need to be lengthened to allow cleaning and disinfection between patients which will reduce patient throughput. Estimated times for equipment cleaning and disinfection were calculated during a quality project conducted by the LMMI team for provincial standardized times (see Table 4). The actual time to turn over a medical imaging room will vary based on equipment used during the exams, the condition of the patient (e.g., use of mobility aids), the type of product used and the number of staff available to support cleaning and disinfection. It is also noted that aerosol generating medical procedures (AGMPs) will require room air exchange time for suspected and confirmed COVID-19 patients. Environmental cleaning and disinfection of the area should be done after the required air clearance time has passed. Where possible, consider maintaining designated portables or rooms for suspected and confirmed COVID-19 patients. Each site is encouraged to consult their health authority IPAC teams for instructions on how to low level disinfect non-critical equipment/devices and equipment/environmental cleaning standards.

Table 4. The Provincial Estimated Cleaning Times by Modality (in minutes)

MODALITY	1-PERSON	2-PERSON
MRI	15	10
CT	5	3
Mammography	5-7	-
X-Ray	3-4	2-3
Interventional Radiology	15	10
Ultrasound, including echo	10-15	5-10
Nuclear Medicine	7	4
Bone Density	5	3

³ Procedure rooms should be emptied of all but essential equipment and all sterile / clean supplies should be kept in closed cabinets / containers to minimize the risk of contamination.





Maximizing Capacity

There are several identified strategies to maximize capacity, including:

- Reviewing all scanning protocols, and where possible truncating protocols without compromising diagnostic yield appropriate to the exam. Abbreviated protocols reduce both the scanning time and the time required for interpretation.
- Expanding operating hours to improve access while respecting infection prevention and control's best practice.
- Improving access by referring practitioners to radiologist consultation to help inform test selection and appropriateness. Enhanced consultation can be provided at the local sites (contacts may be found on Pathways) or by utilizing the RACE (Rapid Access to Consultative Expertise) line and eCASE (electronic Consultative Access to Specialist Expertise).
- Streamlining the check-in process via electronic (text/call) means if possible.
- Minimize patient no-shows by implementing an electronic patient-friendly patient notification system or having clerical staff provide phone reminders. While it is acknowledged that this would likely result in more work for clerical staff, every missed appointment is a wasted spot for another patient.

Resources

- **RACE (Rapid Access to Consultative Expertise)** is a telephone consultation line for select specialty services available to all referring practitioners. Contact your local RACE line first to see if radiology is offered, if not, please contact the Vancouver Coastal Health Region/Providence Health Care RACE line at 1-877-696-2131, link: <http://www.raceconnect.ca/>, or using their App, link: <http://raceapp.ca>. Please note RACE is not involve in the scheduling of imaging exams and should not be used to ask questions about a patient's booking.
- **eCase (electronic Consultative Access to Specialist Expertise)** that enable referring practitioners to ask a radiologist a non-urgent question through a text-based system, attaching any clinical documents that may aid the specialist in making an informed recommendation (test results, images, patient history etc.). The specialist will respond within one week, link: <http://www.raceconnect.ca/ecase/>.
- **Pathways** is an online resource that allows primary care practitioners and their office staff to quickly access current and accurate referral information, consultation services and wait times for specialists and specialty clinics, link: www.pathwaysbc.ca.

6. Provincial Subspecialty Imaging Institutions

The Medical Imaging Departments at BC Children's Hospital and BC Cancer Agency are provincial resources serving unique populations of patients throughout the province. Each institution has specific requirements for the resumption of services.





6a. BC Children's Hospital

Increased resources for coordination of multiple visits:

Approximately 60% of outpatient imaging studies at BC Children's Hospital are performed in conjunction with patient visits to subspecialty pediatric ambulatory clinics. Patients and their families travel from throughout B.C. for coordinated medical imaging and ambulatory clinic appointments. Rescheduling of postponed medical imaging studies for patients travelling to the Lower Mainland from elsewhere in B.C. must be coordinated with rescheduled ambulatory clinical appointments whenever possible.

Increased Anesthesia / Sedation Resources:

Sedation is often required for imaging studies such as MRI and CT that require the child to remain still for the length of the exam. Approximately 30% of MRI studies performed on children at BC Children's Hospital require sedation. Anaesthesia resources for sedation in the Medical Imaging Department are limited. Rescheduling of Pediatric medical imaging studies requiring sedation must take into account availability of anaesthesia resources.

Additional staff resources due to special physical distancing precautions:

Medical imaging appointments at BC Children's Hospital must consider not only the child but the family member(s) accompanying the child for their appointment. This adds time to each imaging exam which must be mitigated through increasing staffing resources.

Prioritization and scheduling of postponed medical imaging exams at BC Children's Hospital during the resumption of services will consider medical urgency of the exam, date exam was initially scheduled, availability of anaesthesia for sedation and coordination with on-site subspecialty pediatric ambulatory clinic appointments.

6b. BC Cancer Agency

First-Contact Cancer Imaging Diagnostics and Staging Exams:

A large subset of imaging exams and image-guided biopsies used to initially diagnose head and neck, lung, gastrointestinal, genitourinary, neuro, gynecologic, breast, prostate and lymphomatous cancers were suspended during the pandemic because the initial symptoms produced by most early cancers would not be classified as "urgent". As services resume, it is essential to re-establish both imaging and biopsy volumes for patients with suspected cancer diagnoses as soon as possible, and assign such patients a high priority level re: obtaining their imaging tests.

Imaging Used to Guide Cancer Treatment:

When a cancer patient is put on treatment, medical imaging is used to assess how well treatment is working. For example, a patient may receive 2 cycles of chemotherapy for lung cancer, and then imaged. If the tumor is shrinking, treatment is continued, otherwise it is stopped. When imaging is not available,





the oncologist will usually ‘give the patient the benefit of the doubt’, administer another 2 cycles of chemo, and wait for the next available imaging test. The latter approach has serious drawbacks. If the chemo is not working, the patient has just received 2 cycles of ineffective, often toxic treatment when they could have been switched to a better, effective treatment.

As services resume, rapidly re-establishing imaging resources to guide cancer treatment, and triaging oncology patient imaging to high priority, will avoid large immediate and long-term health care costs associated with ineffective treatment and most importantly, help our oncology patients live longer and happier lives.

Cancer Surveillance:

Similar human and healthcare cost impacts occur when recurrent cancers are missed due to unavailability of post-treatment cancer surveillance imaging. Although surveillance imaging is important, first-contact diagnosis / staging, and cancer treatment imaging should be initially triaged ahead.

7. Breast Imaging and Screening Program

7a. Diagnostic and Screening Breast Imaging

CAR-CBSI has released a new prioritization approach for breast imaging, which provides the clinical indications based on the P1 – P4 time interval benchmarks. Within this prioritization scheme, a screening mammogram is considered P4 (to occur within 60 days of the due date determined by the individual’s screening interval). **The resumption of breast screening is dependent on active breast downstream diagnostic services. Therefore, screening centres should consult with their Fast Track facilities to ensure there is diagnostic capacity to manage arising abnormal cases prior to resuming services.** Capacity planning for downstream diagnostic services may be based on program historical abnormal screening statistics (see Table 5 for statistics).

Table 5. Diagnostic Procedures Received by Breast Screening Program Participants With "Abnormal" Screening Mammograms: 2018⁹

Following Screening Mammograms:
<ul style="list-style-type: none"> • 9% of women will require additional imaging: <ul style="list-style-type: none"> ○ 94% will have additional diagnostic mammographic views ○ 70% will also have breast ultrasound
<ul style="list-style-type: none"> • Of the above 9% of abnormal screens, ~ 18% will go on to have a core (16%) or open (2%) biopsy
<ul style="list-style-type: none"> • Of the above 9% of abnormal screens, 6% will be positive for cancer

Health authorities and Community Imaging Clinics will need to collaborate with BC Cancer Breast Screening Program to assess regional surges and demands. The screening program will facilitate prioritization of participants for both sites utilizing a shared screening/diagnostic unit, and a dedicated screening unit. The former will be assigned a P4 designation but note that the majority of returning





participants will already have exceeded the 60-day benchmark at time of resumption and should be prioritized as best possible. As provision of screening is a contracted service within each site, the targeted proportion of appointment slots assigned to screening in a shared unit (relative to other P4 studies) should be at least that used in the pre-pandemic setting.

To maximize breast imaging capacity, it is recommended:

- 1) To extend hours of operation to perform screening exams outside of regular business hours (i.e., weekends, evenings). Sites with dedicated screening equipment and staff could operate in parallel with diagnostic stream.
- 2) To complete the diagnostic examination at the same visit, by performing the mammogram and ultrasound on the same day. If BIRADS 5 case proceed to biopsy on the same day.
- 3) To immediately divert capacity to procedures to decrease biopsy waitlists.
- 4) To divert cases from sites with high waitlists to other another site, if possible.

7b. Reintroducing Screening Appointment Bookings

The Breast Screening Program has maintained a list of all appointments that were put on hold as a result of the screening suspension. Centres will be contacted and asked to review and modify their appointment booking templates to align with provincial requirements to minimize the number of individuals on site at any given time, and to provide time for adequate cleaning and disinfection in between cases.

Screening will resume by first contacting those women on hold and rebooking them. Prioritization will occur as follows:

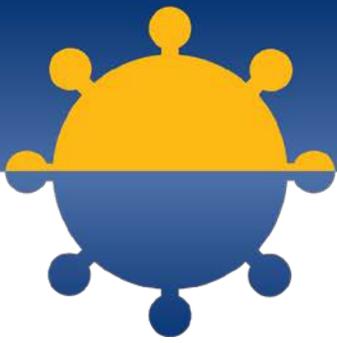
1. Initial screens, women ages 50-74 (invasive cancer detection rate of 9/1000 vs 4/1000 for subsequent screeners); and
2. Remaining women to be triaged as best possible by greatest time since last screen (e.g., comparing percent of months since last screen divided by screening interval in months).

Once these postponed appointments have been re-scheduled the program will begin to reintroduce the recall notices. Once the program reintroduces recall notices it is anticipated that waitlists would grow for a period of time. Sites would then need to add additional appointments into their templates in order to bring the waitlists back down to under the recommended wait time. Clinic preparation, including: updating appointment booking templates, recall of furloughed staff, adjust staffing schedules, and rebooking of patients, will require approximately three weeks.

7c. Use of Mobile Services

There are 3 mobile units that provide a subset of screening mammograms performed annually. Currently the mobile service goes to many small communities for as little as one day at a time. Mobile planning is being revisited to identify catchment areas for mobile screening stops - women will be asked to travel to the closest mobile stop in their catchment area to limit the number of communities that the





mobile needs to travel to. As part of the planning process health authorities will be contacted to determine if there are areas that are not ready for a mobile screening visit.

Health authority medical imaging directors will be engaged to discuss the mobile schedule and provide guidance on availability of downstream diagnostic services. The mobile service could potentially be available to support communities that are unable to manage their fixed site screening at this time, however there would need to be a plan in place to manage any resulting abnormal screens.

Resources

- For the **CAR-CSBI Breast Imaging Wait Time Benchmarks** – Appendix G, link: https://car.ca/wp-content/uploads/2020/05/CAR-Radiology-Resumption-of-Clinical-Services-Report_FINAL.pdf.
- **BC Cancer’s Breast Screening Program**, link: <http://www.bccancer.bc.ca/screening/breast>.

8. Patient Journey

It is acknowledged that steps for the patient’s journey will vary between the Medical Imaging Department. However, the similar environmental (e.g., physical distancing, frequent cleaning and disinfection), administrative (e.g., scheduling to decrease density of individuals), personal (e.g., hand hygiene) and personal protective equipment (e.g., gloves, masks) measures will be implemented.

8a. Patient Booking

At the time of booking, patients should be:

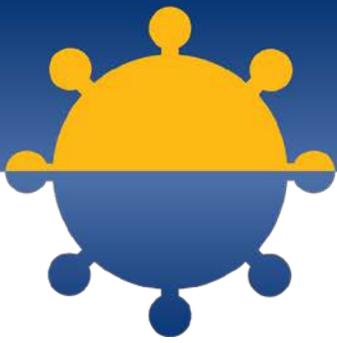
- Provided with instructions for exam preparation;
- Provided with information about any safety measures specific to the site;
- Informed the importance of showing up on time for appointments – not early or late; and
- Provided with instructions on who they should reach if they have any follow-up questions or need additional guidance.

Between 24 and 72 hours the appointment, patient should be called to:

- Remind them of their appointment to reduce the likelihood of a ‘no-shows’; and
- Be screened for COVID-19, consider using the Patient Risk Assessment Form (see Appendix A).

If the patient is categorized as high-risk according to the assessment, see if the appointment can be safely re-booked after 10 days from the onset of symptoms or until symptoms resolve, whichever is longer. If the appointment cannot be re-booked due to the urgency of the exam, ensure the patient and staff are provided with the proper direction on PPE usage and IPAC protocols.





8b. Patient Visit

Arrival:

Patients are requested to arrive the time that was provided during booking instructions (e.g., 5 minutes before the appointment). It is important to show up on time for appointments – not early or late – to ensure adequate physical distancing and reduce the number of people in the Medical Imaging Department. At some sites, patients might be asked to check-in via telephone or text and wait in their cars or designated waiting areas until they are called to come in.

Upon arrival to the hospital, the patient (and any companions)⁴ will be screened for COVID-19 using the Patient Risk Assessment Form (see Appendix A). Immediately identify those who are considered high-risk and ensure proper IPAC protocols are implemented.

All individuals will be required to wash their hands with soap and water or use an alcohol-based hand rub containing at least 70% alcohol, as they enter, and regularly during their visit. It is recommended that all individuals wear a face mask (surgical or home-made) while within the facility; however, at this time no face masks will be provided by the hospital to non-suspected COVID-19 patients (see Section 9 for more information). This is in order to conserve PPE.

Waiting and Scanning Rooms:

Physical distancing will be assisted by using tracks or stickers on the floor for guidance. If the site layout permits, use one-way traffic movement through hallways in the departments to reduce potential exposures. In the waiting room, restrict the availability of seats to ensure 2 m distancing and remove all non-essential items (e.g., magazines, pamphlets).

Exit:

Once the appointment is completed, the patients will be asked to perform hand hygiene and again when they arrive home. If possible, there may be separate exit route for patients to separate them from the patients arriving.

8c. Patient Anxiety

It is acknowledged that patient anxiety is a normal reaction. COVID-19 related anxiety can discourage patients from having their medical imaging service they need, based on fear of coming into the facility.

⁴ The Family and Visitor section in the current Infection Prevention and Control for Novel Coronavirus (COVID-19) (May 19, 2020) states: effective immediately, health authorities **shall** restrict visitors to essential visits only (including, but not limited to): visits: for compassionate care (e.g., end of life, critical illness), paramount to patient/client care (e.g., feeding, mobility, communication assistance), existing volunteers, visits to move belongings in / out of a client's room, or police, correctional officers and peace officers, link: <https://www2.gov.bc.ca/assets/gov/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/reports-publications/covid-19-infection-prevention-control.pdf>





Efforts should be made to reduce patient's anxiety and fear. Lack of attending an exam may result in a delay of a diagnosis and treatment, increasing harm to the patient. If a patient misses an appointment out of fear, that is also a missed opportunity to scan another patient.

It is recommended that when staff connect directly with patients for booking and/or pre-screening, they provide some reassurance regarding the safety of having a medical imaging test. To assist, it is suggested that clerks have a script ready for addressing patients' concerns and the safety measures specific to the site of the patient's appointment. This may include new protocols in place such as cleaning and disinfection, extensive use of staff PPE and other protective measures to reduce potential transmission of COVID-19. A B.C.-specific patient handout is electronically available that may help in ensuring patient safety in the Medical Imaging Departments (see below in Resources section).

If the patient continues to express fear, staff should reassure patients that some anxiety is normal and to consider the following options to reduce their anxiety level:

- *Media:* Limiting media exposure regarding COVID-19; only use trusted BC specific sites for updates.
- *Connect with Community:* Stay connected with family and friends, and if comfortable, talk about their anxieties regarding going to the hospital for a non-COVID-19 reason.
- *Self Care:* Looking after one's self; eating well, exercising regularly, getting enough sleep, making time for hobbies, trying meditation or mindfulness techniques. This includes having their medical imaging test.

If a patient refuses to come in, staff are advised to connect with the referring practitioner to discuss options.

Patient Quality Improvement Project:

MIAC and the BC Patient Safety & Quality Council (the Council), are partnering to conduct a quality improvement project to understand patient anxiety preceding their medical imaging exam. Participating Medical Imaging Departments will distribute a link to the electronic patient questionnaire along with other patient materials in advance of their appointment. By using the electronic survey, the Council will immediately have access to the data. The Council will aggregate the questionnaire data by health authority and will share it back to MIAC to inform local improvements in care and patient communication.

Resources

- A B.C.-specific patient handout on **Plan Ahead: Ensuring your safety in the Radiology Department** provides information to patients coming to the hospital for medical imaging, link: <https://bcpsqc.ca/improve-care/medical-imaging/medical-imaging-during-covid-19/>.





- **Centre for Evidence Based Medicine's** Practical Tips for Clinicians Helping Patients with COVID-related Anxiety/Distress, link: <https://www.cebm.net/covid-19/practical-tips-for-clinicians-helping-patients-with-covid-related-anxiety-distress/>.
- **Canadian Mental Health Association**, BC Division, provides information and resources on COVID-19 induced anxiety, link: <https://www.heretohelp.bc.ca/infosheet/covid-19-and-anxiety>.
- **Patient Quality Improvement Survey**: Returning to Normal: Understanding Your Concerns, link: <http://survey.bcpcsqc.ca/Checkbox/Returning-to-Normal-Medical-Imaging.aspx>.
- **BCCDC** is the best source of information on COVID-19, link: <http://covid-19.bccdc.ca/>.

9. Application of PPEs

Where there is low incidence and prevalence of COVID-19, additional PPE over and above that required for normal precautions is not required.

9a. Patient Risk Assessment

A patient should be pre-screened 24 – 72 hours before their appointment (consider using the COVID-19 Patient Risk Assessment Form⁵, see Appendix A) on the phone by staff and then repeated in person when the patient arrives at the hospital on the day of their appointment. Based on the assessment, a patient's risk can be categorized.

Performing a patient risk assessment to determine whether PPE is necessary is important to ensure appropriate level of protection and avoid misuse or waste. Over-reliance on PPE may result in a false sense of security. Incorrect use and doffing of PPE can expose health care providers to infectious agents and contaminate the environment.

9b. Staff

A decision on using PPE must be made whenever a health care provider or staff has direct contact with a patient. Health care workers and staff who have direct contact with patients with symptoms suggestive of COVID-19 must follow droplet and contact precautions, which includes wearing a surgical / procedure mask, eye protection, gloves, and gown. An N95 respirator, eye protection (i.e., goggles, face shield), gloves and gown should be used for AGMPs for patients with suspected or confirmed COVID-19. Hand hygiene should be immediately performed if a mask or eye protection requires adjustment or is touched. PPE should be appropriately donned and doffed when leaving the patient care area (e.g., at the end of a shift or during a break).

PPE is not required for health care workers and staff who work more than 2 meters from patients at all times.

⁵ Adapted from the B.C. Emergency Prioritization in a Pandemic Personal Protective Equipment (PPE) Allocation Framework, available online at: <http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/infection-control/personal-protective-equipment>





9c. Patient

Patients presenting in-person with symptoms suggestive of COVID-19 should be given a surgical / procedure mask, if available and medically tolerated. The exam / procedure room closest to the entrance should be designated for patients with respiratory symptoms in order to allow rapid isolation pending formal assessment.

Patients (and companions) are recommended to wear a face mask (surgical or home-made) while within the facility. However, at this time no face masks will be provided to patients by the facility unless they have been identified as suspected or confirmed COVID-19 patients.

Resources

- **BCCDC and Ministry of Health's** COVID-19: Infection Prevention and Control Guidance for Community-Based Allied Health Care Providers in Clinic Settings (May 15, 2020), link: http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19_IPCGuidelinesCommunityBasedAlliedHCPsClinicSettings.pdf
- **BCCDC and Ministry of Health's** COVID-19: Infection Prevention and Control Guidance for Community-Based Physicians, Nursing Professionals and Midwives in Clinic Settings (May 15, 2020), link: http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19_IPCGuidanceCommunityBasedHCPsClinicSettings.pdf.
- **BCCDC and Ministry of Health's** COVID-19: PPE Framework, link: <http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/infection-control/personal-protective-equipment>

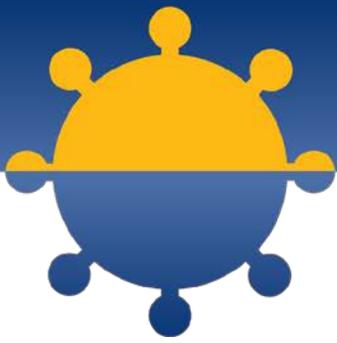
10. Medical Imaging Staff Well-Being^{10 - 13}

The health, safety and well-being of all medical imaging staff is critical during these extremely challenging and unprecedented times. Fear and anxiety are not just the experience or concern of patients, and it is normal for all staff to experience fear, anxiety and stress during this time. You are not in this alone, we are all in this together.

Potential sources that may impact a staff's well-being, include:

- 1) Stress, fatigue and burnout as demand for services increases with workforce shortages or increased operating hours;
- 2) Being exposed to COVID-19 at work and taking the infection home;
- 3) Access to childcare during increased work hours and school closures;
- 4) Support for other personal and family needs as work hours and demands increase;
- 5) Experiences of stigmatization of being a health care provider and a deterioration of the social networks that they rely on for support;
- 6) Access to appropriate PPE;
- 7) Being able to provide competent medical care if deployed to a new area; and





- 8) Lack of access to up-to-date information or staying informed of constantly changing information.

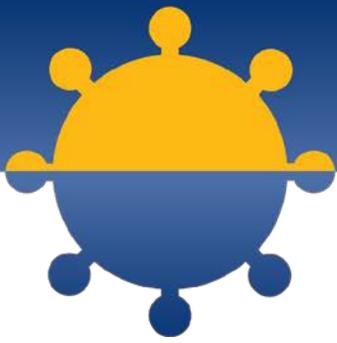
As leaders and managers, it is important to manage stress, share information with empathy and optimism, use credibility to build trust, be honest and transparent, provide regular communications, provide a forum for feedback, and be a role model. It is important to support staff in taking care of themselves, cognizant of increasing workloads and recognize that staff may need time off to maintain their own well-being and encourage mutual support between staff as they may be coping with stress in different ways. It is also important to take care of yourself, as you are not immune from stress and its effects on your health and well-being.

As health care professionals, it is important to acknowledge that COVID-19 may cause high levels of stress. Worries and anxieties are normal and should be expected. Managing stress and emotional self-care is as important as managing physical health. It is encouraged to adopt positive coping such as getting enough sleep, engaging in physical activity, and staying in contact with family and friends; and avoiding using unhealthy coping strategies such as increased substance use. Everyone experiences stress and copes with it differently. Reaching out to a confidential support outlined in the Resources section below may be helpful and help you learn new ways of coping.

Resources

- **BCCDC's Health Care Provider Support** page provides information on how to support health care staff with well-being tools, link: <http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/health-care-provider-support>.
- **Care for Caregivers** provides daily coping strategies, information and supports for mental health of health care providers, link: <https://careforcaregivers.ca/>.
- In recognition of these trying times and the worries essential workers have in health care the **Canadian Psychological Association** has gathered a list of psychologists willing to donate their time to help frontline workers ease anxieties, link: <https://cpa.ca/corona-virus/psychservices/#BritishColumbia>
- **Doctors of BC's Physician Health Program** provides access to counsellors by phone or videoconferencing for physicians and physician trainees feeling overwhelmed and needing support with issues affecting their health and well-being during these stressful times, link: <https://www.doctorsofbc.ca/resource-centre/physicians/physician-health-program-php>.
- **Canadian Association of Medical Radiation Technologists** has a Mental Health Resource Hub with self-care resources for technologists, link: <https://www.camrt.ca/mrt-profession/professional-resources/mental-health-resource-hub/>.





11. Referring Practitioner

11a. Resuming Non-Urgent Medical Imaging Exams

As services resume, Medical Imaging Departments will be performing exams based on highest urgency using robust prioritization criteria. Postponed exams will be re-introduced into departmental workflows and patients with the highest urgency will be re-booked first, all while continuing to book incoming requisitions based on their prioritization. At this time, it is challenging to predict how long postponements may last and when examinations will occur. Medical Imaging Departments will continue to work towards notifying referring practitioners which exams have been postponed. This is dependent on available resources and remains a work in progress.

Referring practitioners should continue to send in radiology requisitions through the normal process. Some referring practitioners that are seeing patients virtually have reported issues with providing requisitions directly to patients or without having a fax machine to send directly to a facility. To overcome this, the Doctors of BC's Doctors Technology Office is supporting physicians in applying for eFaxing capabilities and is also working with electronic medical records (EMR) vendors to support the development of a unique electronic signature by way of digital pen or mouse.

Requests that do not require appointments (i.e., X-ray) will be accepted. In some facilities, walk-in patients will be triaged on site for both infection control and assessment of urgency of the request. Other facilities have starting piloting scheduled X-ray exams to control the number of people in the Medical Imaging Department.

Once imaging exams are undertaken, they will be reported in the usual fashion. For more information on resumption of services, please see Medical Imaging Discussion Guide for Referring Practitioners in Appendix B.

11b. Prioritization and Appropriateness

With appropriateness, requisitions will be reviewed to ensure the right exam is done for the right patient at the right time. Inappropriate referrals will not be performed and will be referred back to referring practitioners. This is to reduce wait times, inefficient use of equipment and human health resources, avoidable costs, unnecessary exposure to radiation, and increased false-positives or incidental findings.

Appropriateness and accuracy of requisitions are very important. To assist with triaging, referring practitioners are encouraged to include clear and pertinent clinical history, reasons for exams and a suggested priority level (based on Table 2) on requisitions to assist in the triaging of examinations or interpretation of images. This will allow for the service to have the most accurate prioritization based on urgency.





Special attention will be directed towards reducing five identified low-utility exams, including:

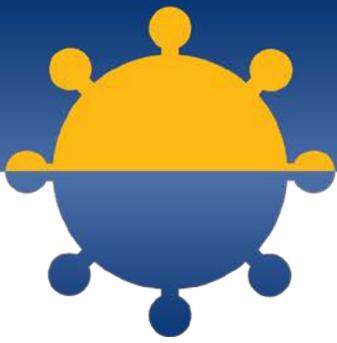
- 1) Imaging for low back pain unless red flags are present;
- 2) CT head scans in adults and children who have suffered minor head injuries unless positive for a head injury clinical decision rule;
- 3) Imaging for uncomplicated headache unless red flags are present;
- 4) MRIs of hip or knee joints in patients with co-existent pain and osteoarthritis unless red flags are present; and
- 5) Chest CT for suspected pulmonary embolism in low-risk patients with a normal D-dimer result.

In addition to completed requisitions and following recognized guidelines for low-utility exams, Clinical Decision Support tools have also proven an effective strategy in providing appropriateness guidance. These tools incorporate clinical guidelines, specific indications for an exam, are informed by large data sets, and are designed to enhance decision making for medical imaging referrals. Clinical Decision Support software along with Clinical Provider Order Entry is an effective approach to delivering the **best first test** to the patient. During this time of a backlog of postponed exams, the necessity for Clinical Decision Support has never been greater, and the implementation of such software to help address the backlog of exam referrals should be considered.

Resources

- **BC Guidelines.ca**, link: www.BCGuidelines.ca
 - To assist with the prioritization of ultrasound, please refer to BC Guidelines.ca: **Ultrasound Prioritization Guidelines for Referring Practitioners** (2018), link: <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/diagnostics-imaging>.
 - To assist with evidence-based appropriate referrals for the above clinical situations, please refer to BC Guidelines.ca: **Appropriate Imaging in Common Situations in Primary and Emergency Care** (2020), link: <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/diagnostics-imaging>.
 - The Guidelines and Protocols Advisory Committee, who publish BC Guidelines.ca, is in the process of developing similar guidelines for MRI and CT prioritization with an expected publication date of Fall 2020.
- **Essential Imaging** aims to reduce inappropriate medical imaging for five common situations among participating primary care and emergency teams. This includes leveraging the above BC Guidelines for Appropriate Imaging, promoting patient and public awareness, supporting provider education and providing decision support resources to increase medical imaging appropriateness, link: <https://bcpsqc.ca/improve-care/medical-imaging/https://bcpsqc.ca/improve-care/medical-imaging/>.





11c. Radiology Consultation for Referring Practitioners

If the referring practitioner is in doubt of the triaged urgency and / or the appropriateness of an imaging referral, they are encouraged to consult with a radiologist. Radiologists are available to provide consultation for cases either in local medical imaging departments or by utilizing the RACE line.

Resources

- **RACE (Rapid Access to Consultative Expertise)** is a telephone consultation line for select specialty services available to all referring practitioners. Contact your local RACE line first to see if radiology is offered, if not, please contact the Vancouver Coastal Health Region/Providence Health Care RACE line at 1-877-696-2131, link: <http://www.raceconnect.ca/>, or using their App, link: <http://raceapp.ca>. Please note RACE is not involved in the scheduling of imaging exams and should not be used to ask questions about a patient's booking.
- **eCase (electronic Consultative Access to Specialist Expertise)** that enable referring practitioners to ask a radiologist a non-urgent question through a text-based system, attaching any clinical documents that may aid the specialist in making an informed recommendation (test results, images, patient history etc.). The specialist will respond within one week, link: <http://www.raceconnect.ca/ecase/>.
- **Pathways** is an online resource that allows primary care practitioners and their office staff to quickly access current and accurate referral information, consultation services and wait times for specialists and specialty clinics, link: www.pathwaysbc.ca.

11d. Talking to Patients about their Anxiety

Patient anxiety is a normal reaction. However, it may have a negative impact, in which the patient may fear coming into the facility to receive the medical imaging service they need. Efforts should be made to reduce their anxiety and fear to ensure they show-up for their appointments.

If a patient expresses concern over going into a facility for a medical imaging service, the referring practitioner can provide some reassurances of the new protocols in place such as cleaning and disinfection between patients, what to expect when visiting the Medical Imaging Departments (i.e., staff in PPE) and other protective measures in place to reduce any potential transmission of COVID-19. A B.C.-specific patient "handout" is available that may explain to the patient the safety measures put in place (see below in Resources section).

If the patient continues to express fear, the referring practitioner could reassure the patient that some anxiety is normal and to consider the following options to reduce their anxiety level:

- **Media:** Limiting media exposure regarding COVID-19; only use trusted BC specific sites for updates.
- **Connect with community:** Stay connected with family and friends, and if comfortable, talk about their anxieties regarding going to the hospital for a non-COVID-19 reason.





- Self-care: Looking after one's self such as eating well, exercising regularly, getting enough sleep, making time for hobbies, trying meditation or mindfulness techniques. This includes having their medical imaging test.

Resources

- A B.C.-specific Patient "handout" on **Plan Ahead: Ensuring your safety in the Radiology Department** provides information to patients coming to the hospital for medical imaging, link: <https://bcpsqc.ca/improve-care/medical-imaging/medical-imaging-during-covid-19/>.
- **Centre for Evidence Based Medicine's** Practical Tips for Clinicians Helping Patients with COVID-related Anxiety/Distress, link: <https://www.cebm.net/covid-19/practical-tips-for-clinicians-helping-patients-with-covid-related-anxiety-distress/>.

12. Emerging Technologies

Technologies are emerging to help the medical imaging community cope with COVID-19, for example through enhancing IPAC or by installing electronic systems that enable safe and efficient patient queuing, distancing and flow. Emerging technologies will be monitored for their effectiveness.

12a. CT Scanners and Decontamination System

Canon Medical Systems has recently introduced a CT scanner with an integrated rapid decontamination feature. The decontamination system is an automated UV-C technology that significantly reduces bacteria, spores and viruses and is effective against a variety of advanced viral infectious diseases. The system incorporates multiple automated UV-C emitters that work together to provide decontamination of the room in minutes to help improve patient flow.¹⁴ The system consists of an Aquillion Prime scanner which can be configured in a modular or mobile footprint with the rapid decontamination function. This is designed to help isolate and decontaminate the CT for rapid and safe imaging workflows.

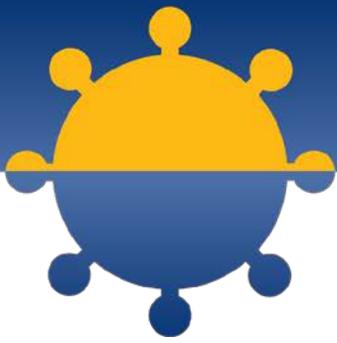
12b. Texting Systems/ Paging Systems for Check-in

Physical distancing restrictions impose a challenge on maintaining flow patient reception and waiting areas. To address this challenge, medical imaging can transition to a customer-based model, similar to retail queuing methods for services. Patient Paging Systems or Texting systems may enable some patients to wait for their exam in a designated "overflow" areas nearby, or possibly even outside the hospital (e.g., in their own car).

There are several patient texting systems under exploration within this province, such as:

- 1) WaitWhile, a web-based subscription-based queuing solution which appears to be affordable and used widely in the service industry.¹⁵
- 2) App developers are bringing their innovation with solutions to support safe practices within our hospitals. An app from Advanced Radiology provides an appointment reminder text, typically





the day before the appointment, then alerts staff when a patient arrives, and then staff send a text for when they are to come inside the facility.¹⁶

- 3) More advanced systems also exist and are under investigation such as Memora Health. This solution integrates with EMR, enables patient follow ups and reminders.¹⁷ This solution is more involved and possibly a longer-term solution.

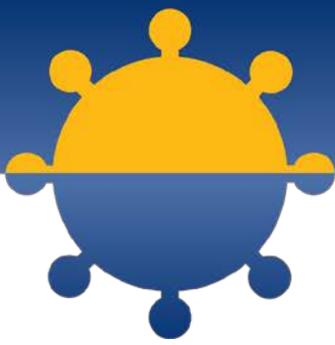
13. Next Steps and Moving Forward

We acknowledge that these have been unprecedented times; especially given the recent COVID-19 related decision to reduce all non-essential and elective medical imaging services. This has been challenging for everyone across our healthcare system and most of all our patients. Medical Imaging Departments across the province are working hard to keep patients safe through multiple initiatives, for instance by implementing COVID-19 specific medical imaging triaging processes or by implementing enhanced infection preventative and control measures in partnership with our Public Health and IPAC colleagues. We will continue to do so.

When drafting this document, we accept that this will need to be a 'learn-as-we-go' approach. This is a living document; providing opportunities to improve care as we continually enhance and adjust this guidance. MIAC is committed to serving our patients both through lessons learned from past and new innovation in the future. This will be especially important given the predicted biological behaviour of COVID-19; new waves are expected in the upcoming months.

Every great health care crisis we face provides opportunities to improve our system and enhance care for our patients; often in ways that were either unavailable before the crisis or impossible to achieve outside the crisis. We are seizing these opportunities and will use them to improve the future delivery of medical imaging care to B.C. patients.





Appendix A: Patient Risk Assessment for Personal Protective Equipment (PPE)

1. Does the patient have a risk factor for COVID-19 exposure? In the last 14 days has the patient:

- Returned from travel outside of Canada? Yes No
- Been in close contact with anyone diagnosed with lab confirmed COVID-19? Yes No
- Lived or worked in a setting that is part of a COVID-19 outbreak? Yes No
- Been advised to self-isolate or quarantine at home by public health? Yes No

2. Does the patient have new onset COVID-19 like symptoms in the last 14 days?

- | | | | |
|------------------------|--|-----------------------------------|--|
| Fever | <input type="checkbox"/> Yes <input type="checkbox"/> No | Runny nose/nasal congestion | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Cough | <input type="checkbox"/> Yes <input type="checkbox"/> No | Sore throat or painful swallowing | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Shortness of breath | <input type="checkbox"/> Yes <input type="checkbox"/> No | Loss of sense of smell | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Diarrhea | <input type="checkbox"/> Yes <input type="checkbox"/> No | Loss of appetite | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Nausea and/or vomiting | <input type="checkbox"/> Yes <input type="checkbox"/> No | Chills | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Headache | <input type="checkbox"/> Yes <input type="checkbox"/> No | Muscle aches | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Fatigue | <input type="checkbox"/> Yes <input type="checkbox"/> No | | |

3. Does the patient have new onset COVID-19 like symptoms that cannot be explained otherwise?

- COVID-19 like symptoms that cannot be explained by another medical or surgical diagnosis? Yes No Unknown

4. Has the patient had a COVID-19 test since these symptoms started?

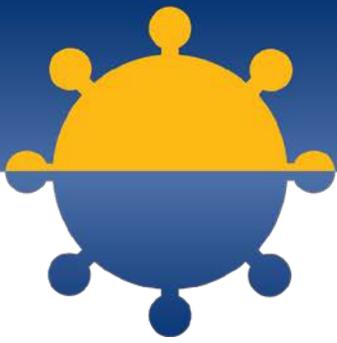
- COVID-19 test result: Positive Negative Pending Not done

If patient has not had a test but has symptoms suggestive of COVID-19 wherever possible arrange for a test to be done as soon as possible.

COVID-19 Risk Factors	COVID-19 Symptoms	COVID-19 test result	COVID-19 Risk Category
NO	NO	NOT REQUIRED	NO
NO	YES	NEGATIVE	NO
YES	NO	NEGATIVE	NO
YES	YES	NEGATIVE	NO
YES	UNKNOWN	NEGATIVE	NO
YES	UNKNOWN	PENDING/NOT DONE	YES
NO	UNKNOWN	PENDING/NOT DONE	YES
YES	YES	PENDING/NOT DONE	YES
NO	YES	PENDING/NOT DONE	YES
YES	NO	PENDING/NOT DONE	YES
-	-	POSITIVE	YES

*COVID-19 risk requires PPE for Droplet and Contact precautions: Surgical or procedure mask, gloves, gown, eye protection (an N95 is only required for AGMP).





Appendix B: Medical Imaging Discussion Guide for Referring Practitioners

Resumption of services

In response to COVID-19 pandemic, community imaging clinics and health authorities postponed all non-urgent medical imaging services in mid-March. FAQs published on April 29, 2020 were developed by the B.C. Medical Imaging Advisory Committee (MIAC) to help guide referring practitioners ordering medical imaging (MI) examinations during that time.

As of mid-May, non-urgent medical imaging services are expected to resume as long as it is safe to do so for patients and staff, and in alignment with guidance provided by the BC Centre for Disease Control (BCCDC), Provincial Health Officer and Infection Prevention and Control (IPAC). These FAQs are to help guide referring practitioners with patients requiring MI services during the resumption of services:

1. What medical imaging examinations and modalities were impacted?

All non-urgent acute and non-urgent routine follow-up imaging exams, across all modalities (X-rays, CT, MRI, ultrasounds, PET and nuclear medicine) were postponed, while exams triaged as clinically emergent or urgent were performed.

Medical imaging exams that were triaged as emergent or urgent clinically were performed. Urgent or emergent services are those which are necessary to diagnose and/or treat disease that is immediately threatening to a patient's health or would have a significant impact to future health if not performed as soon as possible.

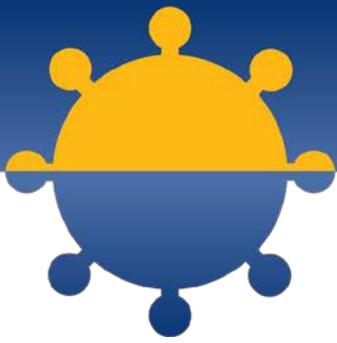
During this time, MI Departments continued to accept referrals for non-urgent, planned investigations rather than risk a request not being entered into the system and potentially "falling through the cracks." Requisitions were triaged by a radiologist based on urgency and were scheduled / postponed by staff.

2. What imaging examinations are now being performed?

All medical imaging exams and modalities are being restored and referring practitioners should continue the normal practice of sending in all requisitions. This includes requests that do not require appointments (i.e., X-rays). It is recommended that referring practitioners' offices continue to call in advance to confirm whether walk-in patients are accepted and if an appointment booking option is available.

Some referring practitioners that are seeing patients virtually have reported issues with providing requisitions directly to patients or not having a fax machine to send directly to a facility. To overcome this, the Doctors of BC's Doctors Technology Office is supporting physicians in getting eFaxing capabilities and is also working with EMR vendors to support the development of a unique electronic signature by way of digital pen or mouse. For more information, visit: <https://www.doctorsofbc.ca/resource-centre/physicians/doctors-technology-office-dto/health-technology-resources#tab-0-2>.





3. What happens now to previously postponed and new requisitions?

MI Departments will be performing exams based on highest urgency using robust prioritization criteria. Postponed exams will be re-introduced into departmental workflows. Re-booking of these patients will start based on prioritized urgency, mixing these requisitions with incoming requisitions, bearing in mind departmental and resource constraints.

At this time, it is challenging to predict how long postponements may last and when examinations will occur. Based on your clinical judgment, if you feel the urgency of a postponed exam needs escalation, please contact your local MI Department and speak with a radiologist. It is also expected that a referring practitioner with a patient whose health condition changes during this time will escalate their referral by following their normal practices of reaching a radiologist or calling the hospital’s MI Department and ask to speak to a radiologist.

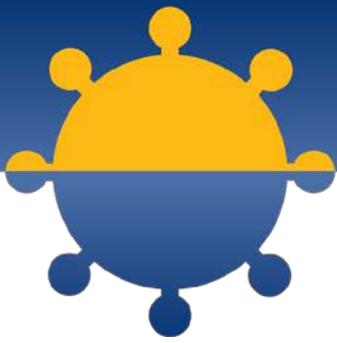
4. How can the referring practitioner help with the triaging and prioritization?

Appropriateness and accuracy of requisitions is very important. **While it is always best practice to include clear, pertinent clinical history on the requisition, please be particularly diligent to include as much historical detail as possible to assist the triaging and prioritizing of examinations.** You are encouraged to suggest the priority level as per the table below that you feel is required as this will assist in the triaging of examinations and interpretation of images.

Priority Level	Description	Time Interval Benchmark
P1	Emergent: An examination immediately necessary to diagnose and/or treat life-threatening disease or injury.	Immediately to maximum 24 hours
P2	Urgent: An examination necessary to diagnose and/or treat disease or injury and/or alter treatment plan that is not immediately threatening to life or limb.	Maximum 7 calendar days
P3	Semi-urgent: An examination necessary to diagnose and/or treat disease or injury and/or alter treatment plan, where provided clinical information requires that the examination be performed sooner than the P4 benchmark period.	Maximum 30 calendar days
P4	Non-urgent: An examination necessary to diagnose and/or treat disease or injury, for long-range management or for prevention.	Maximum 60 calendar days
P5	Follow-up: The exam appointment date requested by the referring practitioner for the purpose of disease surveillance.	No time interval as they have a specified procedure date

If in doubt of the triaged urgency and / or the appropriateness of an imaging referral, you are encouraged to consult with a radiologist. Radiologists are available to provide consultation for cases either in local medical imaging departments or by utilizing the RACE line.





Radiology Consultation Services:

- **Rapid Access to Consultative Expertise (RACE):** a phone or app to connect with specialists for consult on patient care. This is not for scheduling appointments. Website: <http://www.raceconnect.ca/>
- **Electronic Consultative Access to Specialist Expertise (eCase):** a text-based system to connect with specialists for consult on patient care. This is not for scheduling appointments. Website: <http://www.raceconnect.ca/ecase>
- **Pathways:** an online resource that allows primary care practitioners and their office staff to quickly access current and accurate referral information, consultation services and wait times for specialists and specialty clinics. Website: www.pathwaysbc.ca

To assist with the prioritization of ultrasound, please refer to:

- **BC Guidelines.ca: Ultrasound Prioritization Guidelines for Referring Practitioners (2018)**, link: <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/diagnostics-imaging>.
- The Guidelines and Protocols Advisory Committee, who publish BC Guidelines.ca, is in the process of developing similar guidelines for MRI and CT prioritization with an expected publication date of Fall 2020.

5. What medical imaging exams are considered inappropriate?

Requisitions will be reviewed to ensure the right exam is done for the right patient at the right time. Inappropriate referrals will not be performed and will be sent back to referring practitioners. This is to reduce wait times, inefficient use of equipment and human health resources, avoidable costs, unnecessary exposure to radiation, and increased false-positives or incidental findings.

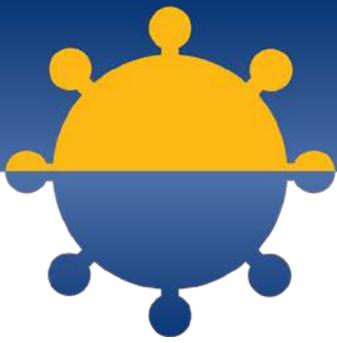
Special attention will be directed towards reducing five identified low-utility exams, including:

- 6) Imaging for low back pain unless red flags are present;
- 7) CT head scans in adults and children who have suffered minor head injuries unless positive for a head injury clinical decision rule;
- 8) Imaging for uncomplicated headache unless red flags are present;
- 9) MRIs of hip or knee joints in patients with co-existent pain and osteoarthritis unless red flags are present; and
- 10) Chest CT for suspected pulmonary embolism in low-risk patients with a normal D-dimer result.

To assist with evidence-based appropriate referrals for the above clinical situations, please refer to:

- **BC Guidelines.ca: Appropriate Imaging in Common Situations in Primary and Emergency Care (2020)**, link: <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/diagnostics-imaging>.
- **Essential Imaging:** a newly-launched campaign that aims to reduce inappropriate medical imaging for five common situations among participating primary care and emergency teams. This includes providing patient and public awareness resources, and supporting provider education and providing decision





support resources to increase medical imaging appropriateness, link: <https://bcpsqc.ca/improve-care/medical-imaging/https://bcpsqc.ca/improve-care/medical-imaging/>.

6. Will practitioners be notified regarding which patients have had imaging tests postponed?

MI Departments have been and will continue notifying impacted patients directly. When notified of their postponement, patients have been and will be directed to contact their referring practitioner if they have concerns, especially if their health status changes.

MI Departments are working towards notifying referring practitioners which exams have been postponed; this is dependent on available resources and remains a work in progress. Notifications may increase as options are being investigated and will be implemented when time allows.

7. Should I order imaging to help diagnose COVID-19?

No. Imaging, and even conventional radiography, should not be used for the diagnosis of COVID-19 infection. A negative chest X-ray does not exclude the possibility of COVID-19. COVID-19 can only be definitively diagnosed with a nasopharyngeal swab nucleic acid test. The role of imaging should be reserved to help guide management of patients already diagnosed with COVID-19 (and typically hospitalized) where imaging is felt to be necessary to help guide medical and interventional decision making.

There are some clinical scenarios in which imaging is indicated if there are initial negative lab results but ongoing high clinical suspicion or clinical deterioration. If in doubt that an imaging referral is warranted, you are encouraged to consult with a radiologist. Radiologists are available to provide consultation for cases either in local medical imaging departments or by utilizing the RACE line.

8. What can patients now expect when they go for their exam?

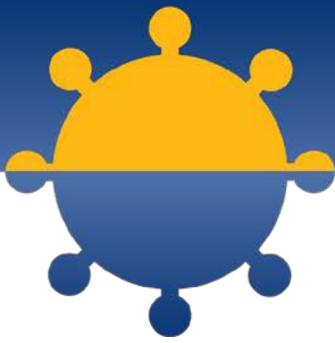
It is acknowledged that steps in the patient's journey will vary between different facilities. However, the similar environmental (e.g., physical distancing, frequent cleaning and disinfection), administrative (e.g., scheduling to decrease density of individuals), personal (e.g., hand hygiene) and personal protective equipment (e.g., gloves, masks) measures will be implemented.

At the time of booking, the patient will be provided with instructions for exam preparation, information about site-specific safety measures, and instructions on how to reach the site if they have any follow-up questions. Please express to the patient the importance of showing up on time for their appointment – not early or late – to ensure appropriate physical distancing and reduce the number of people in the Medical Imaging Departments.

Patient Handouts

- **Medical Imaging During the COVID-19 Pandemic:** A BC specific patient handout on the role of imaging to diagnose of COVID-19. Website: <https://bcpsqc.ca/improve-care/medical-imaging/medical-imaging-during-covid-19/>





- **Ensuring Patient Safety in the Radiology Department:** provides information to patients coming to the hospital for medical imaging. Website: <https://bcpsqc.ca/improve-care/medical-imaging/medical-imaging-during-covid-19/>

9. What if the patient expresses anxiety about going for their exam?

It is acknowledged that patient anxiety is a normal reaction. COVID-19 related anxiety can discourage patients from having the medical imaging service they need, based on fear of coming into the facility. Efforts should be made to reduce patient's anxiety and fear. Lack of attending an exam may result in a delay of a diagnosis and treatment, increasing harm instead of preventing it. If a patient misses an appointment out of fear, that is also a missed opportunity to scan another patient.

If a patient expresses concern over going into a facility for a medical imaging service, the referring practitioner can provide some reassurances of the new protocols in place such as increased cleaning, what to expect when visiting the MI Departments (i.e., staff in PPE) and other protective measures in place to reduce any potential transmission of COVID-19. A patient "handout" is available that may help in ensuring patient safety in MI Departments, which may help alleviate some anxiety.

Resources for Patient Anxiety

- **Centre for Evidence Based Medicine:** Provides practical tips for clinicians helping patients with COVID-related Anxiety/Distress. Website: <https://www.cebm.net/covid-19/practical-tips-for-clinicians-helping-patients-with-covid-related-anxiety-distress/>
- **Canadian Mental Health Association, BC Division:** Provides information and resources on COVID-19 induced anxiety. Website: <https://www.heretohelp.bc.ca/infosheet/covid-19-and-anxiety>

Disclaimer: The intent of this document is to provide guidance that is considered best evidence and current policies at the time of print. This document does not intend to replace or substitute for the advice or professional judgment of a health care professional; clinical judgment should always be the final arbitrator. In case of discrepancies between BC Centre for Disease Control (BCCDC) guidance documents and this document or B.C. Ministry of Health policies, the BCCDC guidance documents and policies shall be considered the source of truth.





Appendix C: Medical Imaging Resources

General resources for COVID-19

- **BC Centre for Disease Control:** is the best source for COVID-19 health information for patients and health care professionals. Website: <http://covid-19.bccdc.ca/>
- **Office of the Provincial Health Officer / Ministry of Health:** provides all orders, notices and guidance from the Provincial Health Officer. Website: <https://www2.gov.bc.ca/gov/content/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/current-health-topics/covid-19-novel-coronavirus>

Resources for Medical Imaging departments

Clinical Guidelines

- **CSTR and CAR guidance on the chest imaging and recommended standardized reporting structure in suspected and confirmed COVID-19** (May 8, 2020). Website: <https://journals.sagepub.com/doi/10.1177/0846537120924606>
- **ACR guidance on appropriate chest CT and chest X-ray imaging during the COVID -19 pandemic** (March 11, 2020). Website: <https://www.diagnosticimaging.com/coronavirus/acr-releases-ct-and-chest-x-ray-guidance-amid-covid-19-pandemic>.

Prioritization Guidelines

- **Prioritization Guidelines for MRI (2013), CT (2013) and Ultrasound (2016):** Provided by the BC Radiological Society. Website: <https://bcradiology.ca/>
- **Breast Imaging Wait Time Benchmarks – Appendix G:** Provided by the Canadian Association of Radiologists and Canadian Society of Breast Imaging. Website: https://car.ca/wp-content/uploads/2020/05/CAR-Radiology-Resumption-of-Clinical-Services-Report_FINAL.pdf
- **Interventional Radiology Prioritization Guidelines – Appendix I:** Provided by the Canadian Association of Radiologists. Website: https://car.ca/wp-content/uploads/2020/05/CAR-Radiology-Resumption-of-Clinical-Services-Report_FINAL.pdf
- **Diagnostic Imaging Referral guidelines:** provided by the Canadian Association of Radiologists. Website: <https://car.ca/patient-care/referral-guidelines>.
- **Appropriateness Criteria guidelines:** provided by the American College of Radiology. Website: <https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria>.





- **Supply Management Application to Rank Uses of Technetium-99m (The “S.M.A.R.T.” Tool):** From the Canadian Agency for Drugs and Technology in Health / Medical Isotopes and Imaging Modalities Advisory Committee. Website: <https://www.cadth.ca/SMART-Tool>.
- **BC’s COVID-19 Ethical Decision-Making Framework** (March 28, 2020). Website: https://www2.gov.bc.ca/assets/gov/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/covid-19/ethics_framework_for_covid_march_28_2020.pdf

Staff Well-being Resources

- **Health Care Provider Support:** information from the BCCDC to support health care staff with well-being tools. Website: <http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/health-care-provider-support>.
- **Care for Caregivers:** includes daily coping strategies, information and supports for mental health of health care providers. Website: <https://careforcaregivers.ca/>.
- **Canadian Psychological Association:** psychologists willing to donate their time to help frontline workers ease anxieties. Website: <https://cpa.ca/corona-virus/psychservices/#BritishColumbia>
- **Physician Health Program:** A Doctors of BC program that provides access to counsellors by phone or videoconferencing for physicians and physician trainees feeling overwhelmed and needing support with issues affecting their health and well-being during these stressful times. Services for physical or mental health, addictions, relationship issues, workplace stress and burnout. Website: <https://www.doctorsofbc.ca/resource-centre/physicians/physician-health-program-php>
- **Mental Health Resource Hub:** From the Canadian Association of Medical Radiation Technologists. Website: <https://www.camrt.ca/mrt-profession/professional-resources/mental-health-resource-hub/>

Patient Handouts

- **Medical Imaging During the COVID-19 Pandemic:** A BC specific patient handout on the role of imaging to diagnose of COVID-19. Website: <https://bcpsqc.ca/improve-care/medical-imaging/medical-imaging-during-covid-19/>
- **Ensuring Patient Safety in the Radiology Department:** provides information to patients coming to the hospital for medical imaging. Website: <https://bcpsqc.ca/improve-care/medical-imaging/medical-imaging-during-covid-19/>
- **Essential Imaging:** A BC initiative to reduce inappropriate medical imaging for five common situations among participating primary care and emergency teams. Website: <https://bcpsqc.ca/improve-care/medical-imaging/><https://bcpsqc.ca/improve-care/medical-imaging/>
- **Patient Quality Improvement Survey:** Returning to Normal: Understanding Your Concerns. Website: <http://survey.bcpsqc.ca/Checkbox/Returning-to-Normal-Medical-Imaging.aspx>





Resources for Referring Practitioners

Radiology Consultation Services

- **Rapid Access to Consultative Expertise (RACE):** a phone or app to connect with specialists for consult on patient care. This is not for scheduling appointments. Website: <http://www.raceconnect.ca/>
- **Electronic Consultative Access to Specialist Expertise (eCase):** a text-base system to connect with specialists for consult on patient care. This is not for scheduling appointments. Website: <http://www.raceconnect.ca/ecase>
- **Pathways:** an online resource that allows primary care practitioners and their office staff to quickly access current and accurate referral information, consultation services and wait times for specialists and specialty clinics. Website: www.pathwaysbc.ca

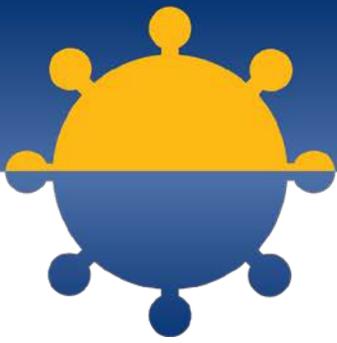
Appropriateness and Prioritization Guidelines

- **Essential Imaging:** A BC initiative to reduce inappropriate medical imaging for five common situations among participating primary care and emergency teams. Website: <https://bcpsqc.ca/improve-care/medical-imaging/><https://bcpsqc.ca/improve-care/medical-imaging/>
- **Appropriate Imaging for Common Situations Primary and Emergency Care Guideline:** Provides evidence-based recommendations in the clinical scenarios of five low-utility imaging tests. Website: <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/appropriate-imaging>
- **Ultrasound Prioritization Guideline:** provides referring practitioners guidance on priority levels for ultrasound requisitions. Website: <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/ultrasound-prioritization>
- **Diagnostic Imaging Referral guidelines:** provided by the Canadian Association of Radiologists. Website: <https://car.ca/patient-care/referral-guidelines>.

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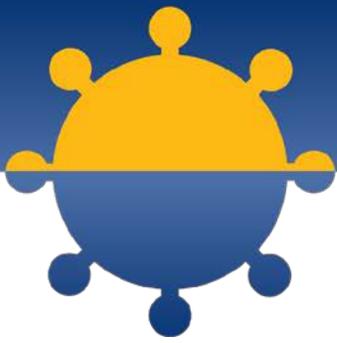




Resources for Patient Anxiety

- **Centre for Evidence Based Medicine:** Provides practical tips for clinicians helping patients with COVID-related Anxiety/Distress. Website: <https://www.cebm.net/covid-19/practical-tips-for-clinicians-helping-patients-with-covid-related-anxiety-distress/>
- **Canadian Mental Health Association, BC Division:** Provides information and resources on COVID-19 induced anxiety. Website: <https://www.heretohelp.bc.ca/infosheet/covid-19-and-anxiety>





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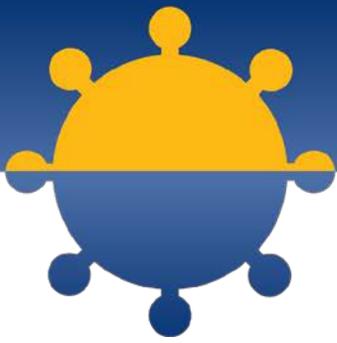
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Abbreviations

ACR	American College of Radiology
AGMP	Aerosol Generating Medical Procedures
B.C.	British Columbia
BCCDC	BC Centre for Disease Control
BCRS	BC Radiological Society
BI-RADS	Breast Imaging Reporting and Data System
CADTH	Canadian Agency for Drugs and Technologies in Health
CAR	Canadian Association of Radiologists
COVID-19	Coronavirus 2019
CSBI	Canadian Society of Breast Imaging
CSTR	Canadian Society of Thoracic Radiology
CT	Computed Tomography
eCASE	Electronic Consultative Access to Specialist Expertise
EMR	Electronic Medical Record
HEABC	Health Employers Association of BC
IPAC	Infection Prevention and Control
LMMI	Lower Mainland Medical Imaging
MIAC	Medical Imaging Advisory Committee
MIIMAC	Medical Isotopes and Imaging Modalities Advisory Committee
MRI	Magnetic Resonance Imaging
NAT	Nucleic acid test
P	Priority
PHO	Public Health Officer
PPE	Personal Protective Equipment
RACE	Rapid Access to Consultative Expertise
ROD	Radiologist of the day or Radiologist on duty
UV-C	Ultraviolet C





References

1. Canadian Association of Radiologists & Canadian Society of Thoracic Radiology. (March 26, 2020). The *CSTR and CARs' Statement on COVID-19*. Available from <https://car.ca/news/canadian-society-of-thoracic-radiology-and-canadian-association-of-radiologists-statement-on-covid-19/>
2. Dennie C, Hague C, Lim RS, *et al*. Canadian Association of Thoracic Radiology/Canadian Association of Radiologists Consensus Statement Regarding Chest Imaging in Suspected and Confirmed COVID-19. *Can Assoc Radiol J*. 2020 May 8. <https://doi.org/10.1177/0846537120924606>
3. The First Affiliated Hospital, Zhejiang University School of Medicine. (March 2020). *Handbook of COVID-19 Prevention and Treatment*. <https://www.iau-aiu.net/Zhejiang-University-Handbook-of-COVID-19-Prevention-and-Treatment>
4. Canadian Association of Radiologists (CAR) & Canadian Society of Thoracic Radiology (CSTR) (March 2020). *The CAR and CSAR Recommendations on COVID-19 Management in Imaging Departments*. <https://car.ca/wp-content/uploads/2020/03/CAR-CSTR-COVID-19-Recommendations-En.pdf>
5. Mossa-Basha M, Meltzer CC, Kim DC, *et al*. Radiology Department Preparedness for COVID-19. *Radiology*. 2020 Mar 16. <https://doi.org/10.1148/radiol.2020200988>
6. Mozdy M. (April 8, 2020). *Safer, PPE-Conserving X-Rays for Patients at University Hospital: University of Utah Health*. Available from <https://medicine.utah.edu/radiology/news/2020/04/x-ray-through-glass.php>
7. Vetrugno L, Bove T, Orso D, *et al*. Our Italian experience using lung ultrasound for identification, grading and serial follow-up of severity of lung involvement for management of patients with COVID-19. *Echocardiography*. 2020;37(4):625-627. <https://doi.org/10.1111/echo.14664>
8. Poggiali E, Dacrema A, Bastoni D, *et al*. Can Lung US Help Critical Care Clinicians in the Early Diagnosis of Novel Coronavirus (COVID-19) Pneumonia? *Radiology*. 2020 Mar 13. <https://doi.org/10.1148/radiol.2020200847>
9. BC Cancer. (September 2019). *BC Cancer Breast Screening 2018 Program Results*. http://www.bccancer.bc.ca/screening/Documents/082019_Breast%20Annual%20Report2019_V20191025.pdf
10. Shanafelt T, Ripp J, Trockel M. Understanding and Addressing Sources of Anxiety Among Health Care Professionals During the COVID-19 Pandemic. *JAMA*. 2020 Apr 7. doi:10.1001/jama.2020.5893
11. BC Centre for Disease Control. *Health Care Provider Support*. Available from <http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/health-care-provider-support> [Accessed: May 2020].
12. Canadian Association of Radiologists. (May 2020). *Radiology Resumption of Clinical Services*. https://car.ca/wp-content/uploads/2020/05/CAR-Radiology-Resumption-of-Clinical-Services-Report_FINAL-2.pdf
13. American Psychological Association. (March 20, 2020). How leaders can maximize trust and minimize stress during the COVID-19 pandemic. *APA News*. Available from <http://www.apa.org/news/apa/2020/03/covid-19-leadership>
14. Canon Medical Systems USA. (April 29, 2020). Press release: *Canon Medical Launches CT solution to Quickly and Safely Image Patients with Viral Infectious Diseases*. Available from <https://us.medical.canon/news/press-releases/2020/04/29/3336/>
15. Waitwhile. *Waitlist everyone with ease*. Available from <https://waitwhile.com/> [Accessed: May 2020].
16. Stempniak M. (May 4, 2020). *Radiology provider uses mobile app to let patients wait in their cars for appointments: Radiology Business*; Available from <https://www.radiologybusiness.com/topics/care-delivery/radiology-mobile-app-wait-car-covid-19-pandemic>.
17. Memora Health Inc. *Same Workflow. Improved Efficiency*. Available from <https://www.memorahealth.com/solutions> [Accessed: May 2020].

