ISRRT – All Imaging and Radiation Therapy Departments

COVID-19 Pandemic - Quick Guide for Protection Measures

Extract summary from the ISRRT’s response publication - Appropriate and safe use of Medical Imaging and Radiation Therapy with infection control measures considered in addition to standard radiation protection procedures.

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General Checklist for All Imaging Procedures

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<th>Control of COVID-19 Check List</th>
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<tr>
<td>Preparation</td>
<td>Will the imaging procedure change patient management and/or could the procedure be delayed? Is mobile imaging (XR, US, CT or Gamma camera) an option for suspected and positive COVID-19 cases? Ensure Staff backup in case of AE-calls in the emergency situation. Staff risk evaluation (pregnancy, immune, mental health concerns etc. Don PPE with all appropriate steps – see appendix ‘A’</td>
<td>Is it needed now, or could this be delayed? Is mobile imaging possible? PPE during transfer to department when cannot be done mobile</td>
<td>Remove unnecessary equipment from imaging room Could the examination be performed as a mobile?? Cover equipment that cannot be moved with suitable plastic</td>
<td>Ensure infection prevention measures are employed when managing the imaging room and imaging equipment. This must be subject to regular cleaning consistent with local IPC guidance and cleaning schedules completed and signed and dated.</td>
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<tr>
<td>During</td>
<td>Appropriate PPE Employ “contaminated and non-contaminated radiographer /technologist” scenario Ensure single patient attendance to the Imaging department wherever possible to enable further imaging If this is required.</td>
<td>PPE, comfort, reassurance</td>
<td>Infection control and barrier precautions</td>
<td>Control access to imaging room or patient area during mobile radiography</td>
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<tr>
<td>Post procedure</td>
<td>Review of imaging by radiographer for suspicious features and organise additional imaging if required Appropriate staff ‘Doffing’ of PPE equipment – see Appendix A</td>
<td>PPE during patient transfer, rapid results to guide management</td>
<td>Appropriate decontamination including air exchange</td>
<td>Appropriate equipment decontamination. Where feasible, environmental decontamination should be performed when it is considered appropriate to enter the room or area without an N95/FFP2/FFP3 respirator. The imaging room may be closed up to two hours depending on the room air exchange rate. PHE, however, indicate that a single air change is estimated to remove 63% of airborne contaminants, after 5 air changes less than 1% of airborne contamination is thought to remain. A minimum of 20 minutes, that is 2 air changes, in hospital settings where the majority of these procedures occur is considered pragmatic (PHE 6.4.20)</td>
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Note: This checklist should complement any agreed standard ‘Infection Control’ protocols established at your Health Institution.
**Checklist Notes**
In addition to this check list remember that radiographers/radiological technologists are at the front line of the healthcare service so you must follow existing guidance/protocols:

- Ensure all routine initial key checks are performed i.e. the Imaging Request is justified, suitably protocolled and the patient identification procedures followed.
- When a patient is suspected or confirmed to have COVID-19 use barrier nursing techniques in pairs as required i.e. in mobile radiography procedures.
- Apply standard radiation protection and optimisation principles where relevant.
- Always ensure the image is diagnostic before leaving the patient – using Direct Digital Radiography (DDR) will enable this
- Always ensure the image is received and available in PACS ready for reporting.
- Always work within your scope of practice and job role.
- Separate cold/blue/clean from hot/red/contaminated areas.
- Decontamination of couches and other equipment is described in Appendix B

**Additional measures and considerations**

- Consider rescheduling all routine, asymptomatic screening mammography until community risk is minimal—triaging - same for all disciplines. However, it is important that time-sensitive procedures such as fetal anomaly screening is recommended to continue (RCOG). Hospital authorities may transfer imaging of these patients to community centres to reduce the traffic at busy hospitals.
- For Waiting rooms and work areas adapt international social distancing standards of 1 meter (3 feet) minimally or alternatively adopt local or national guidelines i.e. 2 meters (6 feet).
- Ensure the key screening questions performed as required for Outpatient procedures:
  - Has the patient recently or currently experienced a fever (37.8°C or above)
  - Persistent Cough
  - Shortness of Breath (Considering pre-existing medical conditions may be present)
  - NB in the acute setting for emergency admissions and in-patients this will be completed

- Expanding the wellbeing of the radiographers during the pandemic is a priority.
- Careful record keeping facilitating clinical audit and what we can learn for the future.

**Note**
- **Mobile radiography** in this document is defined as imaging outside of the main department but within the healthcare setting.

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**Personal Protective Equipment (PPE) - COVID–19 Considerations**

Imaging and Therapy departments will play a vital role in managing patients during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) COVID-19 pandemic. Radiographers and Radiological Technologists in particular are crucial patient-facing staff that will play a key role. Guidance and recommendations are fluid and rapidly changing as evidence emerges and evolves. It is essential that imaging departments - including radiographers, radiologists and support staff - are kept up to date. This is a shared responsibility between management and individuals. Local policy should be adapted and consistent with national and international guidance. Infection control, especially hand hygiene, will be central to mitigation. In order to protect themselves, colleagues and patients, it is critical that radiographers have access to - and training in - the safe use of personal protective equipment (PPE). Updated PPE guidance has been issued in response to the increasing prevalence of COVID-19 cases. Different Government bodies offer advice and one example Public Health England (PHE) advice is for in all secondary care/acute hospital settings that do not involve non-aerosol generating contact, staff should wear a surgical mask, eye protection, disposable apron and disposable gloves.

Specific guidance on PPE for imaging departments has been provided, reinforcing the key role that radiographers are playing, particularly with chest radiograph (CXR) acquisition forming a pivotal role in diagnosis. Surgical mask and eye protection should be worn for a ‘session’ (e.g. mobile ward round). This is consistent with World Health organisation (WHO) guidance and supported by a recent single centre case report from Singapore and a meta-analysis.

Health organisations should have clear policies in place for imaging staff in relation to suspected or confirmed COVID-19 patients and systems in place to ensure these are regularly updated and as disease prevalence increases. Current PHE guidance indicates that all emergency/acute imaging referrals should be treated as potential COVID-19 cases. Polices should include:

- Decontamination of imaging equipment (CT and MRI gantries, ultrasound probes) and any surface that may have come into contact with respiratory droplets
- Clean techniques for imaging, including dual working where possible
- Mobile imaging wherever possible avoiding transfer of the patient
- Transfer of patients to imaging departments when mobile imaging is not appropriate

Radiographers should receive an update on the safe application and removal of PPE relevant to the level of potential exposure – see appendix A. Fit testing for FFP3/N95 masks should occur for key staff likely to be involved in aerosol generating procedures. Recent research suggests SARS-CoV-2 (coronavirus causing COVID-19) can persist on steel and plastic surfaces for up to 72 hours, reinforcing the need for appropriate barrier precaution (for example detector covers) and decontamination of imaging equipment and rooms.
Masks, Respirators and Eye and Face protection

- Surgical/Medical Masks
These are worn when dealing with patients suspected or confirmed COVID-19. – WHO guidance

- Respirators – used for COVID-19
WHO advises to use a particulate respirator at least as protective as a US National Institute for Occupational Safety and Health-certified N95, European Union standard FFP2, or equivalent, when performing or working in settings where aerosol-generating procedures, such as tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy are performed. PAPR respirators are also recommended for specific situations. FFP3 respirators are recommended by Public Health England.

| N95/FFP2/FFP3 | N95 respirators filter at least 95% of airborne particles, FFP2 at least 94% and FFP3 at lease 99% airborne particles. The HSE states that all staff who are required to wear an FFP3 respirator must be fit tested for the relevant model to ensure an adequate seal or fit (according to the manufacturers’ guidance). Fit checking (according to the manufacturers’ guidance) is necessary when a respirator is donned to ensure an adequate seal has been achieved. |
| PAPR | Powered air Purifying respirator (PAPR) is a type of personal protective equipment used to safeguard workers against contaminated air. PAPR’s consist of a respirator in the form of a hood, or full-face mask, which takes ambient air that is contaminated with one or more type of pollutant or pathogen, actively removes (filters) a sufficient proportion of these hazards, and then delivers the clean air to the user’s face. |

- Eye and face protection
Eye and face protection provide protection against contamination to the eyes from respiratory droplets, aerosols arising from AGPs and from splashing of secretions (including respiratory secretions), blood, body fluids or excretions. Eye and face protection can be achieved by the use of any one of the following:
  - surgical mask with integrated visor
  - full face shield or visor
  - polycarbonate safety spectacles or equivalent
Regular corrective spectacles are not considered adequate eye protection.

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Personal Protective Equipment (PPE) – COVID-19 Considerations

Summary or Use

Summary of use COVID-19 PPE equipment

<table>
<thead>
<tr>
<th>General Contact with confirmed or possible COVID-19 cases</th>
<th>Aerosol Generating Procedures or High-Risk Areas</th>
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<tbody>
<tr>
<td>Eye protection to be worn on risk assessment</td>
<td>Eye protection eye shield, goggles or visor</td>
</tr>
<tr>
<td>Fluid resistant surgical mask</td>
<td>Filtering face piece respirator</td>
</tr>
<tr>
<td>Disposable apron</td>
<td>Long sleeved fluid repellant gown</td>
</tr>
<tr>
<td>Gloves</td>
<td>Gloves</td>
</tr>
</tbody>
</table>

**Important Actions**
- Clean your hands before and after patient contact and after removing some or all of your PPE
- Clean all the equipment that you are using according to local policy guidance
- Use the appropriate PPE for the situation you are working in (General / AGPs or High-Risk Areas)
- Put on (Don) and take off (Doff) your PPE safely.
- Take breaks and hydrate yourself regularly

**CDC (Centre for Disease Control - USA)** ([link here](#), diagrams [here](#))
- Suspected / known COVID-19
  - Preferred gloves, gown, N95, eye protection
  - Acceptable gloves, gown, facemask, eye protection
- AGPs gloves, a long-sleeved FR gown or apron, fit-tested FFP2, eye protection.

**ECDC (European Centre for Disease Control - EU & UK)** ([link here](#))
- Suspected / known COVID-19 gloves, a long-sleeved gown or apron, fit-tested FFP2, eye protection.
- AGPs gloves, a long-sleeved FR gown or apron, fit-tested FFP2/3, eye protection.

**PHE (Public Health England)** ([link here](#))
- Radiology – all pts gloves, plastic apron, FRSM, eye protection
- AGPs gloves, FR gown, FFP3, eye protection


See also RCR and SCoR posters based on the PHE visual guide: ‘Personal protective equipment advice for imaging departments and teams Appendix F’ and ‘Personal protective equipment advice for oncology departments and teams Appendix G’

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Imaging Departments Guidance for Consideration during COVID-19

All Departments - General Advice

- Screening questionnaire for COVID-19 prior to patient examination at scheduling, entrance to facility (hospital or free-standing clinic)
- Specific isolation room for patients that answer ‘Yes’ to screening questions at entrance of facility
- Door signage warning for coronavirus symptoms
- Display current guidance on the entrance door
- Be clear about who may/may not enter the area
- Where possible have entrance and exit doors within the department
- Imaging on COVID-19 patients only when imaging will impact management of patient’s care, mobile radiography whenever possible
- Increasing scheduling intervals or appointment times to allow adequate time to clean equipment as needed, this must also include radiation protective aprons and devices
- When transporting COVID-19 patients or suspected COVID-19 patients ensure that the patient wears an appropriate mask and that a clean sheet is placed over the patient for the journey to the radiology department and the patient’s examination room. Ensure that the patient wears mask throughout his/her visit in the department and during the imaging procedure according to CDC guidelines
- Adhere to standardized protocols for decontaminating imaging rooms including typical passive air exchange of up to 2 hours between patients (or based local practice recommendations) before cleaning if a COVID-19 patient takes off their mask and coughs in the imaging room. This time frame will depend on the type of ventilation and air exchange inside the room.
- Radiology leadership work within the hospital response plan to ensure plan meets changing situation as it arises
- Develop a dedicated team in radiology leadership to coordinate and standardize the protocols for patient care and operational workflow and address concerns from departments, staff and physicians
- Hold daily electronic briefing to determine access status and concerns from leadership in each department, communicate important daily changes and determine overnight incidents
- Leadership - create a list of staff’s additional skills or certifications for training and redeployment consideration of staff during peak of COVID-19
- Management - communicate regularly with Providers and Staff on updated Clinical Practice Guidelines as well as with general updates and status information related to the COVID-19 pandemic
- Adhere to the WHO safety distance standard of 1 meter (3 feet) or where possible best practice countries recommendations of 2 metres (6 feet) between individuals in waiting rooms and work areas as much as feasible
• When possible with two facilities make one facility the COVID-19 facility and have the other non COVID-19 facility, also if more than one piece of equipment is available, designate one for COVID-19 and the other for non COVID-19
• Work with Supply chain and Vendors to ensure enough PPE (Personal Protective Equipment) available.
• Centralize PPE supplies and accurately manage stock levels, monitoring demand, so as not to over or under stock essential items. Allocate based on clinical need and store securely to prevent theft.
• Wear appropriate PPE for the examination and always wear single use gloves, a mask and wear a face shield when appropriate and disinfect per facility policy
• Decrease in person consultations in reporting rooms with referring physicians; implement video or phone consultation on patient cases
• Avoid crowding in imaging console areas, examination rooms and rest areas, only necessary persons involved in the procedure to be present.
• Use telemedicine whenever possible

**Consideration for Pregnant Radiographer / Radiological Technologist workers.**
• Pregnant radiographers should not provide direct patient care to the patient under investigation (PUI’s) for suspected COVID-19 or confirmed COVID-19 positive patients
• Pregnant radiographers should wear a surgical mask at work throughout the duration of their shift
• Pregnant radiographers should not perform direct patient care procedures in the last two weeks prior to the anticipated delivery i.e. no later than 37 weeks (protect the radiographer / technologist from risk of becoming PUI or COVID-19 Patient at delivery.

• Front desk staff are to ask patients the appropriate triage questions including have you a new or recent presentation of fever, persistent cough or shortness of Breath.
  o Inform all clinics, departments and outpatients to wear a mask before entering the radiology departments
  o Request that patients wash their hands with antibacterial specific gel/soap before entering department
  o Set up the waiting room to incorporate social distancing
  o Accompanying person with patient only if the patient needs assistance i.e. for memory concerns
  o Reschedule non urgent tests
  o Limit access by visitors and relatives to the radiology facility to an absolute minimum. If visits by vendor representative or other support personnel is needed, they should be wearing same PPE as staff. Vendors tend to visit multiple departments and may easily spread virus in the process. Vendors that are essential to patient care operations are permitted to have limited access to areas in the radiology department. Vendors that have third-party contracted work are subject to same procedures and
protocols that employees are following. Examples of such types of vendors are construction services, cleaning companies and technical services.

- Organize refresher training:
  - Hand Hygiene
  - Donning and Doffing of Personal Protective equipment (PPE) properly
  - N95/FFP2/FFP3 mask fitting session for all staff and needed visiting support/vendor personnel.
  - Powered Air Purifying Respirator (PAPR) training all staff that perform
- Have staff wear PAPR when performing all Aerosolized procedure (Airborne/Contact precautions)

Waiting rooms

Remove as considered source of infection

- Remove magazines as they may be considered a source of infection and can make hard surface cleaning difficult
- Remove disposable cups
- Remove coffee makers or tea pots makers and coffee/teas cups and condiments
- Maintain the WHO social safety distance or where possible 2 metres (6 ft.) between individuals in waiting rooms
- Patient-facing staff in the waiting room and imaging rooms should wear a facemask at all times, if available