A COVID-19 Toolkit for Interventional Radiologists

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is a novel Coronavirus that has quickly spread across the globe causing Coronavirus disease 2019 (COVID-19), with cases rapidly increasing in the United States. On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic. Given the importance of protecting healthcare workers during the pandemic, the SIR is releasing information and guidance for Interventional Radiologists to plan for the management of COVID-19 patients. This is a rapidly changing situation, and information will be updated as new information is released.

The average incubation period is currently estimated to be 5-6 days, with 97.5% of patients presenting with symptoms within 11.5 days of exposure. Currently, 80% of cases are considered mild to moderate based on a WHO study of the initial outbreak in China. However, the same study demonstrated a 21.9% crude fatality ratio (CFR) in laboratory confirmed cases in those 80 year of age or older, and a 3.8% CFR in confirmed cases overall. Patients with pre-existing medical conditions such as cardiovascular disease (13.2% CFR), diabetes (9.2% CFR), hypertension (8.4% CFR), and respiratory disease (8.0% CFR) also had a higher mortality risk. In addition, healthcare providers (HCP) remain at significant risk of developing COVID-19, with 1,716 providers becoming infected out of over 72,000 patients in China as of February 11, 2020. More recent estimates are over 3,000 HCP. However, many of these cases occurred early in the outbreak, and infection to HCP can be reduced or eliminated with adoption of recommended precautions. Thus, it is clear that the high-risk groups are elderly, those with certain pre-existing medical conditions, and healthcare providers. Planning should therefore take these factors into consideration.

There is no available data for the role of IR in management of COVID-19 patients and persons under investigation (PUI). Nonetheless, IR has a critical role in the management of patients within the healthcare system, and could conceivably be called to assist in the management of a COVID-19 positive patient. IR suites may also be located near radiology services where COVID-19 patients may undergo imaging. Proper, and early, preparation is therefore crucial to reduce exposure to health care workers and other patients in IR.

Planning:

- Regardless of the number of COVID-19 patients at the facility, we recommend immediate plans be put in place to screen and/or manage COVID-19 patients
- We recommend IR teams be involved with their local COVID-19 response teams, or equivalent. Early involvement can help to streamline the flow of patients and minimize unnecessary patient and healthcare provider exposure.
- Develop plans with guidance from local resources, including infection control
- Emphasize to staff and visitors that CDC recommendations to protect yourself and others must be followed
- Staffing models should be discussed to take into account minimizing exposures and working with reduced staffing
Personal Protective Equipment (PPE):

- Refer to [CDC](https://www.cdc.gov) and [WHO](https://www.who.int) guidelines for appropriate use of PPE and ensure local policy is followed
- **Conservation of PPE through training and appropriate use is critical during the COVID-19 pandemic as the CDC is reporting “increased volume of orders and challenges in meeting order demands”**
- **Advice on mask use** and **hygiene** outside and within the healthcare setting is described by WHO

Based on [CDC guidance](https://www.cdc.gov/coronavirus/2019-ncov/hcp/caring-for-patients.html) as of March 15, 2020, the following recommendations are being made in the pre-procedure setting which incorporate CDC recommendations, including **infection prevention in the healthcare setting**:

<table>
<thead>
<tr>
<th>A. Geographic Areas Currently Identified as Low Risk</th>
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<tbody>
<tr>
<td><strong>Outpatient Centers and Outpatient Based Labs (OBL)</strong></td>
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| **Inpatient** | **Ensure adequate PPE is available on-hand and securely stored, proper usage is defined with staff, and education on usage is provided** |
| | **Integrate local policy into all precautions and plans** |
| | **Begin plans on routing of patients to minimize exposure to other patients and HCP, including implementation of engineering controls** |
• Identify **air negative rooms** for procedures (if available) or designate rooms to be used for procedures on COVID-19 patients
• Develop plans for terminal cleaning with **EPA-approved disinfectants** of procedure rooms used to treat COVID-19 patients, if not already available. Planning should be done with **environmental services** to ensure supplies are readily available.
• **Ensure N95 masks are available in a secure location** for all procedures where there is a risk of aerosol generating procedures. Additional local policies for N95 masks should be followed.
• Ensure **powered, air-purifying respirators (PAPR)** are available and proper training is performed per local policies
• Categorize all procedural offerings as elective, urgent, and emergent – these categories are subjective and definitions should be agreed upon by local leadership/policy
• Develop list of urgent and emergent procedures that can be offered for COVID-19 patients
• Determine procedures that can be delayed/re-scheduled in case of worsening local infection rates
• Develop work plan to minimize HCP involved in care of COVID-19 patients whenever possible
• Ensure **proper cleaning supplies** are available for re-usable eye protection (e.g. leaded glasses) and lead/lead-alloy/alloy aprons
• For centers with medical trainees, develop or incorporate plans to limit trainee exposure in accordance with local policy

### B. Geographic Areas Currently Identified as Minimal to Moderate Risk

| Outpatient Centers and Outpatient Based Labs (OBL) | • In addition to those in Table A, consider more aggressive screening including temperature/symptom checks and earlier triage in parking lots
• If staffing shortages are present, consider allowing exposed, asymptomatic HCP to work while wearing a facemask |
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<tr>
<td>Inpatient</td>
<td>• Implement plans discussed in Table A, per local policy</td>
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- Limit visitor movement, per local policy
- If staffing shortages are present, consider allowing exposed, asymptomatic HCP to work while wearing a facemask per local policy

### C. Geographic Areas Currently Identified as Substantial Risk

| Outpatient Centers and Outpatient Based Labs (OBL) | • Cancel all elective and non-urgent procedures  
• Consider requiring all HCP to wear a facemask when in the facility depending on supply  
• Minimize HCP and staffing exposure |
| Inpatient | • Follow local policy regarding cancellation of procedures  
• Follow local policy regarding allowing HCP to work while asymptomatic or mildly symptomatic  
• Restrict or limit visitors per local policy |

Resources:

**WHO:**
- Rolling updates on COVID-19
- COVID-19 Situation Dashboard – updates on number of cases and locations
- Rational use of PPE for COVID-19
- Q&A on infection prevention and control for healthcare workers caring for patients with suspected or confirmed 2019-nCoV

**CDC:**
- Visual alert - Generic
- Print/Poster Resources for COVID-19
- Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings
- Implementation of Mitigation Strategies for Communities with Local COVID-19 Transmission
- What Healthcare Personnel Should Know about Caring for Patients with Confirmed or Possible COVID-19 Infection

**EPA:**
- SARS-CoV-2 disinfectant list

**COVID-19 Maps:**
- JHU COVID-19 Map
- New York Times COVID-19 Map
References: