Guidance for Diagnostic Imaging During the COVID-19 Pandemic

Approved: 4/23/20
Revision: 4/27/20 – updated tables 1-3 to include non-COVID-19 isolation status in guidance, revised ED PPE Guidance (page 4, #1), added Appendix with isolation status links
Revision: 7/21/20 - updated to reflect eye protection recommendation for all patient interactions
Revision: 8/11/20 – updated to include new "COVID exposed" flag, changes in N95/PAPR recommendations, and to include room management after imaging
Last Revision: 9/3/20 – updated to MRI imaging from ED in patients with COVID-19 flags without prior radiologist approval

Background: This document represents an update to prior guidance published 8/11/20. General information to be familiar with:

- Scope: This guidance document pertains to **diagnostic imaging performed without anesthesia**. For information regarding diagnostic imaging under anesthesia and any image-guided procedures, please see "Guidance for Image-Guided Procedures and Diagnostic Imaging Under Anesthesia During the COVID-19 Pandemic."

- Personal Protective Equipment (PPE) Preservation: Extended use and re-use guidance should be followed to preserve PPE.

- UCSF Health's testing algorithm for COVID-19: Asymptomatic patients undergo COVID-19 RT-PCR testing prior to planned admissions, prior to all surgeries and certain high-risk procedures, and upon admission from the emergency room. These patients are considered **asymptomatic patients with tests pending** and are placed under droplet isolation until test results return. This isolation status has some implications for room placement but does not affect PPE use, since droplet precaution-level PPE is now universally required for all patient interactions.

- APEX Chart Flags: COVID-19 flags in patient charts identify patients with confirmed or suspected COVID-19 infection and asymptomatic patients who have been in close contact with someone with PCR-confirmed COVID-19 infection in the past 14 days (see table below). The charts of asymptomatic, unexposed patients with tests pending are not flagged. COVID-19 flags are placed and removed in APEX in some cases automatically and in some cases manually by Hospital Epidemiology and Infection Prevention.

COVID-19 Flag	Interpretation
COVID-19 (Confirmed)	COVID-19 Infected Patient
COVID-19 (Pending)	Patient Under Investigation (PUI)
COVID-19 (Exposed)	Asymptomatic with test negative or not tested; Exposure to someone with PCR-confirmed COVID-19 w/i last 14 days

Key new information included in 7/21/20, 8/9/20, and 9/3/20 revisions:

- At minimum, healthcare workers are required to use eye protection for all direct, close patient interactions in addition to universal surgical masking at all times in healthcare facilities. Healthcare workers may choose to use eye protection when performing any non-patient facing duties in clinical buildings as well.

- Healthcare workers should use N95s + eye protection (or PAPRs) for interactions with any patients with suspected or confirmed COVID-19 infection or patients with recent (14 days) close contact with someone with PCR-confirmed COVID-19 infection.

- In ED patients and inpatients, imaging staff will need to identify if a patient with a COVID-19 chart flag is also under airborne precautions, i.e. undergoing continuous aerosol-generating procedures. This will determine whether the imaging suite should enter downtime following study completion. Such patients will have an "airborne" flag under their isolation status (see Tables 1-3).

- Radiologist review and approval is no longer required prior to MR imaging of ED patients with COVID-19 flags.

Guidance: Radiology worklists include columns indicating the presence or absence of COVID-19 flags on patients' charts and patients' isolation status. Radiology personnel should use this information and the patient location to determine appropriate actions and personal protective equipment use and to guide imaging suite management. This information is summarized in Tables 1-3.

STOP for safety. The guidance provided in this document is intended to maximize the safety of patient interactions. All faculty, staff, and trainees are encouraged and even expected to **STOP for safety**. If a healthcare worker is concerned that a situation is potentially unsafe, in most cases it is appropriate to refrain from entering this situation immediately. The healthcare worker should immediately escalate the situation to ensure the safest possible environment for healthcare workers and patients alike. Escalation should begin with the healthcare worker's supervisor.

Table 1: Diagnostic Imaging in ED Patients

COVID-19 Flag	Isolation Status	Action	PPE
Any COVID-19 Flag	Novel Respiratory **+/- Airborne***	Consult radiologist for appropriateness of examination**; Proceed if approved	N95 + Face Shield (or PAPR) + Gown + Gloves
None	None or Droplet +/- non COVID-19 related isolation	Confirm with bedside RN that patient should not be under COVID-19 isolation; Proceed with imaging study	**In ED:** N95 + Eye Protection (or PAPR) + Gown + Gloves **In Department:** Mask + Eye Protection + Gown + Gloves + any non COVID-19 related isolation precautions
* For patients under airborne precautions, 1 hour imaging suite downtime should be instituted after patient departure, followed by routine cleaning. For patient NOT under airborne precautions, routine cleaning should occur immediately following patient departure without downtime.			
** Chest x-ray, CT, and MR imaging do not require radiologist approval in ED patients			

Table 2: Diagnostic Imaging in Inpatients (Without Anesthesia)

COVID-19 Flag	Isolation Status	Action	PPE
Any COVID-19 Flag	Novel Respiratory **+/- Airborne***	Consult radiologist for appropriateness of examination**; Proceed if approved	N95 + Face Shield (or PAPR) + Gown + Gloves
None	None or Droplet +/- non COVID-19 related isolation	Proceed with imaging study	Mask + Eye Protection + any non COVID-19 related isolation precautions
* For patients under airborne precautions, 1 hour imaging suite downtime should be instituted after patient departure, followed by routine cleaning. For patient NOT under airborne precautions, routine cleaning should occur immediately following patient departure without downtime.			
** Chest x-ray does not require approval in inpatients			

Table 3: Diagnostic Imaging in Outpatients (Without Anesthesia)

COVID-19 Flag	Isolation Status*	Action	PPE
Any COVID-19 Flag	N/A	Consult radiologist for appropriateness of examination; If approved, imaging should follow department outpatient PUI/COVID-19+ imaging workflows	N95 + Face Shield (or PAPR) + Gown + Gloves
None	N/A	Proceed with imaging study	Mask + Eye Protection
*Isolation status is not functional in APEX for outpatient encounters			

Additional Notes:

1. Imaging of Emergency Department patients:
   a. Based on prior potential exposure events and at the direction of the Patient Safety Committee, we have instituted minimum droplet **+ contact** PPE for radiology personnel when imaging ANY ED patient.
   b. Because aerosol-generating procedures (e.g. nebulizer treatments) are not always well-delineated in the ED, we recommend all radiology personnel don N95 masks and eye protection (or PAPR when appropriate) when present in the ED, following UCSF guidelines for extended use and re-use.
   c. For post-intubation x-rays, N95 masks (+ eye protection and gown and gloves) are considered safe and sufficient protection per UCSF Health policy. However in situations where all ED providers involved in a patient's care are have donned PAPRs, x-ray technologists may choose to don a PAPR. One PAPR is continuously available to x-ray technologists in the ED. The first technologist to use the PAPR per shift should take the remainder of post-intubation x-rays during that shift and should follow UCSF guidelines on safe re-use of PAPR face shields.

2. Imaging patients with confirmed or suspected COVID-19 at UCSF Health sites
   To minimize exposure risk for our patient-facing staff, imaging studies should only be performed on COVID-19 patients and patients under investigation (PUIs) when the results of the study are reasonably expected to alter a patient's management during the acute phase of illness. Exceptions to this guidance include chest x-rays on inpatients and chest x-rays, CT scans, and MRIs in ED patients. The expected workflow is as follows:
   - Clinical team places order for radiology diagnostic imaging study in APEX on COVID-19 confirmed or suspected patient
   - Radiology technologist receives order and brings it to the appropriate radiology service attending or trainee MD for review
   - Radiologists should take one of three actions:
     - Approve the study as the indication meets the criteria set forth above, OR
     - Initiate discussion with the referring team to discuss the clinical scenario and jointly determine if the imaging study and indication meet the criteria set forth above, OR
     - Escalate the decision-making to an appropriate radiology attending MD

APPENDIX A: Isolation Status Links

CONTACT ISOLATION:
https://infectioncontrol.ucsfmedicalcenter.org/sites/g/files/tkssra4681/f/Contact_Isolation.pdf

DROPLET ISOLATION:
https://infectioncontrol.ucsfmedicalcenter.org/sites/g/files/tkssra4681/f/Droplet_Isolation.pdf

AIRBORNE ISOLATION:
https://infectioncontrol.ucsfmedicalcenter.org/sites/g/files/tkssra4681/f/Airborne_Isolation.pdf

ENTERIC CONTACT ISOLATION:
https://infectioncontrol.ucsfmedicalcenter.org/sites/g/files/tkssra4681/f/Enteric_Contact_Isolation.pdf