

GUIDELINES FOR SONOGRAPHIC IMAGING OF COVID-19 POSITIVE PATIENTS AND PATIENTS UNDER INVESTIGATION (PUI)

This document was also approved by CCOC.

Purpose: To establish guidelines for sonographic imaging of COVID-19 positive patients and patients under investigation (PUI).

Background: Portable ultrasound (US) is performed for all COVID-19 positive or suspected patients to prevent travel of these patients into the radiology department. Portable US requires transport of an US machine into the patient's negative pressure room and donning of personal protective equipment (PPE) by the sonographer. The sonographer performing the study experiences prolonged exposure (up to 45 minutes) to the patient at a very close distance (arm's length or less). Furthermore, the ultrasound service is vulnerable to personnel shortages due to exposure and quarantine. Therefore, guidelines are required to minimize staff exposure while providing necessary patient care. Without such guidelines in place, the ultrasound service is at risk of staffing shortages which will impact patient care, including adequate daytime staffing and overnight coverage.

General Procedure: For portable US to be performed on a COVID-19 positive patient or PUI, the following criteria should be met:

1. In a patient presenting with acute symptoms such as ovarian or testicular torsion or possible ruptured ectopic pregnancy, no direct communication between the patient's provider and the radiologist is necessary as these examinations are time sensitive.
2. For other ultrasound examinations, a direct communication should occur between the patient's provider and a radiologist to discuss the necessity of the study, including any possible alternative examinations.
 - a. When the US study is ordered, it will be assigned to a sonographer. That sonographer will then discuss the case with the ultrasound radiology attending.
 - b. If there are questions about the study, the radiologist will contact the ordering clinician to discuss the case.
 - i. While an attending-to-attending clinical discussion is highly encouraged, communication with a senior resident/fellow can suffice. If a resident level discussion occurs and there remains uncertainty about the necessity or appropriateness of the exam(s), then an attending-to-attending discussion must occur.
 - c. During discussion of the case, appropriate clinical information should be elicited from the clinician so that *the least time-intensive, most targeted* ultrasound study can be performed (preferably 20 minutes or less).
 - i. Clinical discussion should include factors that may significantly affect diagnostic utility of the study, particularly body habitus, immobility, overlying bandage material, NPO status, and patient cooperation.

Specific Clinical Scenarios:

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1. It is now well-documented that elevated liver function tests are seen in a significant proportion of COVID-19 patients (1-3). The role of routine hepatobiliary ultrasound imaging in these patients is unclear. Unless there is strong clinical suspicion of an actionable entity (e.g. acalculous cholecystitis), clinicians are urged to order right upper quadrant ultrasounds judiciously in these patients, as even limited examinations take at least 20 minutes to perform and findings may not contribute to clinical management.
2. Acute kidney injury is a common inpatient diagnosis typically necessitating renal ultrasound as part of workup in order to exclude an obstructive process. For patients known or suspected of COVID-19 infection, clinicians are encouraged to use point-of-care ultrasound where available to exclude obvious hydronephrosis prior to requesting formal renal ultrasound.
3. A pelvic ultrasound for evaluation of ovarian torsion in a young, thin patient. If the endometrium and ovaries are normal with a transabdominal (TA) duplex ultrasound, then no transvaginal (TV) exam necessary.

Summary: In order to minimize ultrasound technologist exposure risk to COVID-19 and provide appropriate, necessary imaging, we recommend:

1. Direct ordering physician to radiologist discussion of the most appropriate imaging modality.
2. Adjustment of imaging protocol to limit duration of patient contact.

References:

1. Bangash M, Patel J, Parekh D. COVID-19 and the liver: little cause for concern. *Lancet Gastroenterol Hepatol*. March 20, 2020.
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4. Mossa-Basha M, Medverd J, Linnau K, et al. Policies and guidelines for COVID-19 preparedness: experiences from the University of Washington. *Radiology*. Apr. 8, 2020.