

Specific recommendations for ultrasound areas during the COVID-19 outbreak

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Coronaviruses may generate different clinical conditions, from a flu-like condition to the common cold to a severe acute respiratory syndrome (SARS). The new virus is a strain of the coronavirus not previously reported in humans (SARSCoV-2). The virus is transmitted from person to person when droplets containing viral particles from a patient or an asymptomatic carrier come into contact with mucous membranes in the mouth, nose or eyes of healthy individuals.

Among the main measures for preventing contamination are the social isolation, avoiding close or direct contact with other individuals, keeping social distance (between 1.5 m and 2.0 m); avoid touching the face; careful washing the hands often with soap and water or application of alcohol gel on the hands.

However, during ultrasound examinations, the proximity to the patients is inevitable, since the doctor/sonographer needs to touch the patient with the transducer for acquiring diagnostic images. On the other hand, safety health agents shouldn't be

Omitted, even in times of health crisis like this we are facing.

Thus, the Brazilian College of Radiology and Diagnostic Imaging (CBR), in line with other societies took the initiative to produce and divulgate this document, emphasizing the importance of carrying out ultrasound examinations with maximum safety.

A safety examination/procedure in an US starts with the proper indication of the exam. Patients and/or health care teams shouldn't be expose to unnecessary risk or occupy with tests that will not add relevant information to the patient's management.

Check-up exams as well as several "routine" exams can be postponed to more opportune moments. This simple attitude reduces the risk of contamination for individuals, who will not head to services, and allows medical teams to focus their time and effort to take care for those who really need it, in this epidemy.

We encourage ultrasound studies directed to the patient's main complaint or focused on the suspected diagnosis by the requesting physician.

At the US facility, a health worker should carry on a triage, asking for upper respiratory tract symptoms, in the last 7-10 days. When positive, this patient should be considered suspected of having COVID, regardless of the original indication for the exam. This patient should use a surgical mask, during the whole period in the ultrasound office.

With all these concepts in mind, some protective measures must be implemented according to two different scenarios:

SCENARIO 1: ULTRASOUND EXAMINATION PERFORMED ON A PATIENT IN OR OUTPATIENTS **WITHOUT RESPIRATORY SYMPTOMS**

The patient does not need to wear a mask. Also, the use of personal protective equipment (PPE) is not formally recommended for those who perform the ultrasound examination. But, may be used at doctors/sonographer's discretion.

SCENARIO 2: ULTRASOUND EXAMINATION PERFORMED ON A PATIENT AMBULATORY **WITH RESPIRATORY SYMPTOMS**

The patient must wear a mask with minimum filtration equivalent to PFF1, like surgical masks since his/her identification at the triage.

For the doctor/sonographer, it is indicated:

- Use of a mask with minimum filtration equivalent to PFF2 - N95;
- Disposable, non-sterile gloves;
- Long sleeve waterproof apron, preferably disposable and;
- Goggles or full-face shield.

For procedures, like biopsies and ultrasound-guided drainages, proceed as scenario 2.

CLEANING AND DISINFECTION OF ULTRASOUND ROOM, EQUIPMENT AND TRANSDUCERS

Another point is the cleaning and disinfection of the ultrasound equipment, including the probes. The coronavirus is surrounded by a lipid capsule which makes it particularly sensitive to disinfectants used in routine cleaning process. There is evidence that the virus is effectively inactivated with the appropriate procedures that include the use of common disinfectants in diagnostic clinics and in hospital settings. The World Health Organization (WHO) suggests that "the complete cleaning of the surfaces of the environment with water and detergent, followed by the application of disinfectants commonly used at the hospital level "are effective and sufficient procedures to inactivate the new coronavirus".

Common cleaning of the appliance can be done with a tissue soaked in 70% alcohol. For cleaning the transducers, disinfection must be effective for any transmissible pathogen, which can be done with some products:

- Based on sodium hypochlorite as the Dakin liquid (solution of 0.5% active sodium hypochlorite);
- Based on quaternary ammonia (QUAT), taking care that the total concentration for use must be less than 0.8%;
- Based on hydrogen peroxide accelerated to a maximum of 0.5%;

- Based on alcohol or alcohol and quaternary ammonia (QUAT). The content of alcohol cannot exceed 70%;

It must be taken into account that not all cleaning solutions are compatible with transducers. Therefore, it is recommended to consult the maintenance and cleaning manuals for each appliance, which contain the information on which products can be used to ensure patient safety without damaging the equipment.

For cases without suspected COVID-19 and without respiratory symptoms, the room should be cleaned as usual and could be immediately released for other exams.

For patients with high suspicion and/or with COVID-19 confirmed, it will be necessary to proceed with the previously recommended disinfection and the room can be used again afterwards, if the patient has all the recommended PPE.

However, if the aerosols had been produced and/or there was release of any organic secretion from the patient, after the described disinfection, there is a two-hour period before re-use of the room.

CONDUCTIVE GEL

To avoid contamination of the ultrasound gel, it is recommended to cover the flask, tube or oilseed after each use. When applying the gel, do not allow the gel container to touch the patient's skin or the transducer surface.

READING ROOMS

Proper cleaning of countertops, keyboards and mouse in the report rooms can be made with common products, including 70% alcohol.