



Correct behavior for carrying out an ultrasound examination in this pandemic moment on:

➤ **Inpatient in a "promiscuous" hospital**

➤ **Outpatient with urgent priority class.**

Ultrasound is among the imaging techniques that involves the greatest interaction between doctor and patient. This has always been one of the strengths and major impact on diagnostics allowing continuous interaction and a profitable exchange of information between doctor and patient. Unfortunately, in this moment of emergency for the spread of the COVID-19 infection, what has always been the positive element of ultrasound becomes an important potentially negative element, determining, if performed unsafely, an increased risk of contagion among the doctor and patient. This is all the more dangerous the more it occurs inside hospitals, in emergency areas, where the patient is not yet fully framed and therefore determining conditions favoring diffusion. SIUMB, SIRM and FISM believe it is right, at this critical moment, to promote the correct information addressed to both operators and patients.

Remember that:

- ultrasound is an indispensable diagnostic service and which, in this moment of emergency, must be reserved for patients in whom the examination is theoretically capable of modifying the subsequent therapeutic behavior
- in this period all patients must be considered at risk of COVID-19 transmission.

Colleagues are invited to:

scrupulously verify the indications on the ultrasound examination, avoiding inappropriate, unsolicited and / or redundant examinations and adhering to established settings.

1. Outpatient setting on oncological / urgent outpatients

All patients should be considered at risk of COVID-19 transmission.

In the ultrasound waiting rooms only the patient and not the family members must be present; patients should be kept at least 1 meter apart.

As soon as they arrive at the doctor's office, they should be asked for their state of health. Patients with fever or respiratory symptoms (cough, cold, sore throat) should be invited to return to their home and contact their doctor.

The asymptomatic ones (most of them) should be invited to sanitize the hands, by the appropriate sanitizing gel dispensing devices, arranged at the entrance of the waiting room, and they are given a surgical mask (if not already in possession, because many already have masks).

If the nurse remains 1 meter from the patient, he/she may not put special devices, otherwise if he approaches the patient (as often necessary) the dressing is like that of the doctor.

The doctor who performs the ultrasound wears surgical mask, visor or glasses, disposable gown, disposable cap, disposable gloves.

The probe, covered with a probe cover or glove, must be sanitized, for each patient, with a suitable disinfectant gel.

2. Setting COVID under investigation (patients awaiting Test)

The patient wears a surgical mask.

The doctor who performs the ultrasound wears FFP2 mask, glasses, disposable gown, disposable cap, disposable gloves.

Must be implemented a cover of the ultrasound scanner and probe with washable keyboard cover or plastic film. The probe cover should be changed for each patient to prevent transmission of the infection.

Further sanitization of the probe and scanner should be carried out after undressing at the end of the procedure to be ready for the next dressing.

3. Setting COVID already verified

The patient wears a surgical mask.

The doctor who performs the ultrasound wears a FFP2 or FFP3 mask, glasses, disposable gown, disposable cap, disposable gloves.

Full coverage of the scanner and probe must be implemented.

The probe cover should be changed for each patient to prevent transmission of further infection.

Further sanitization of the probe and ultrasound should be carried out after undressing at the end of the procedure to be ready for the next dressing.

In cases where the patient cannot wear the surgical mask, the doctor must wear the FFP3 mask.

Even in these moments of great difficulty, an ultrasound examination can often be necessary to change the diagnostic and therapeutic orientation of the patients. We try, with responsible behavior, not to make it a further cause of contagion.

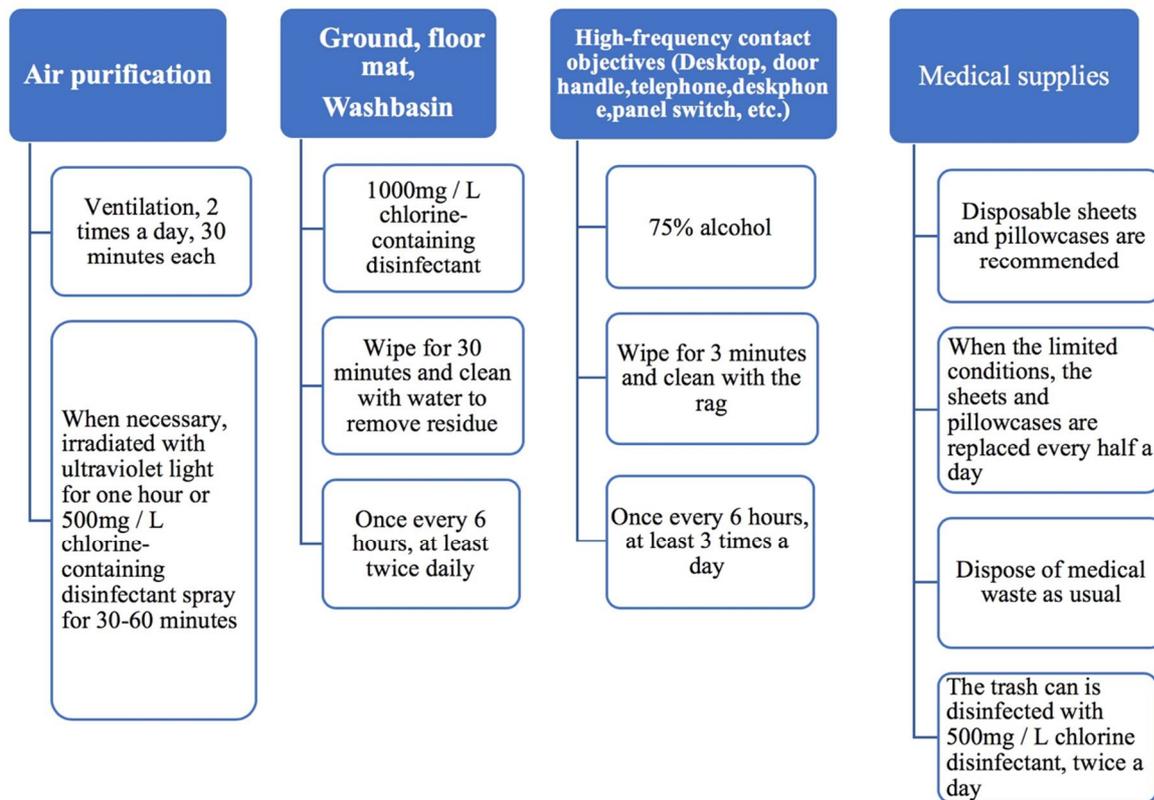
Environmental management

1) Ventilate the room twice a day, 30 minutes each time. When necessary, irradiate the room with ultraviolet light for one hour or 500mg / L chlorine-containing disinfectant spray for 30-60 minutes. The surfaces of objects (desktops, door handles, telephone bases, panel switches, etc.) that are frequently touched are disinfected with 75% alcohol every 6 hours, at least three times a day. After 3 minutes, wipe with a dry cloth. The ground, floor mat, washbasin is disinfected with 1000mg/L chlorine-containing disinfectant every 6 hours, at least twice a day. After 30 minutes, wipe with water.

2) The treatment of medical supplies is the same as the low exposure risk area. Medical institutions with conditions are advised to use disposable sheets and pillowcases.

3) With a suspected or confirmed case, the surface of the object would be wiped with 75% alcohol and the floor is sprayed and wiped with 1000mg / L chlorine-containing disinfectant after the patient is transferred. With an unmaned condition, the consultant room is disinfected with 500mg /L chlorine-containing disinfectant for 30-60 minutes, and irradiated with ultraviolet light for one hour. Then, the room is thoroughly ventilated for subsequent inspection [Figure 1].

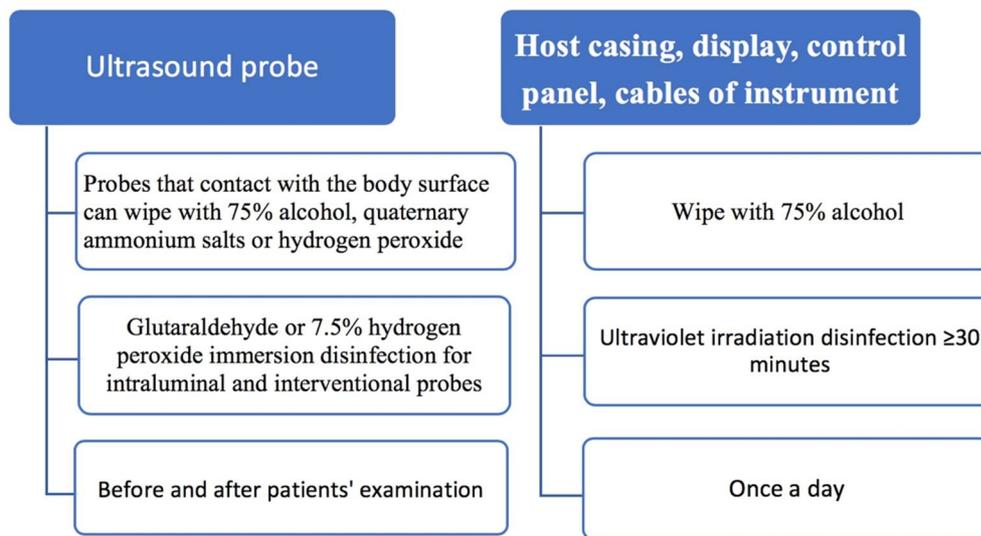
Figure 1 Environmental management for prevention and control of COVID-19



Instrument disinfection

- 1) It is recommended to use a special consultation room or bedside examination in the emergency department, and the equipment is not recommended for other consultation areas to prevent cross-infection. After each bedside examination, the machine needs to be disinfected.
- 2) Wear gloves, goggles, and caps for the disinfection of instruments. Turn off the power before disinfecting the main unit, and avoid directly using the spray type to prevent the disinfectant from entering the panel gap or probe jack.
- 3) Disinfection of ultrasound equipment: Previous conventional disinfectant (ethanol alcohol disinfectant) is not recommended for the disinfection of host monitors, touch screens, cables, probe cables and probe sound-sensitive parts. There is still controversy about choosing the appropriate disinfectant. Previous studies have shown that the novel coronavirus is sensitive to alcohol. Since the rapid volatilization of alcohol, it is advisable to sterilize the ultrasonic instrument with 75% alcohol. It is recommended to use disinfection paper towels to wipe the sensitive parts of the probe after disinfection. This protocol is used during the novel coronavirus outbreak [Figure 2].

Figure 2 Instrument disinfection for prevention and control of COVID-19



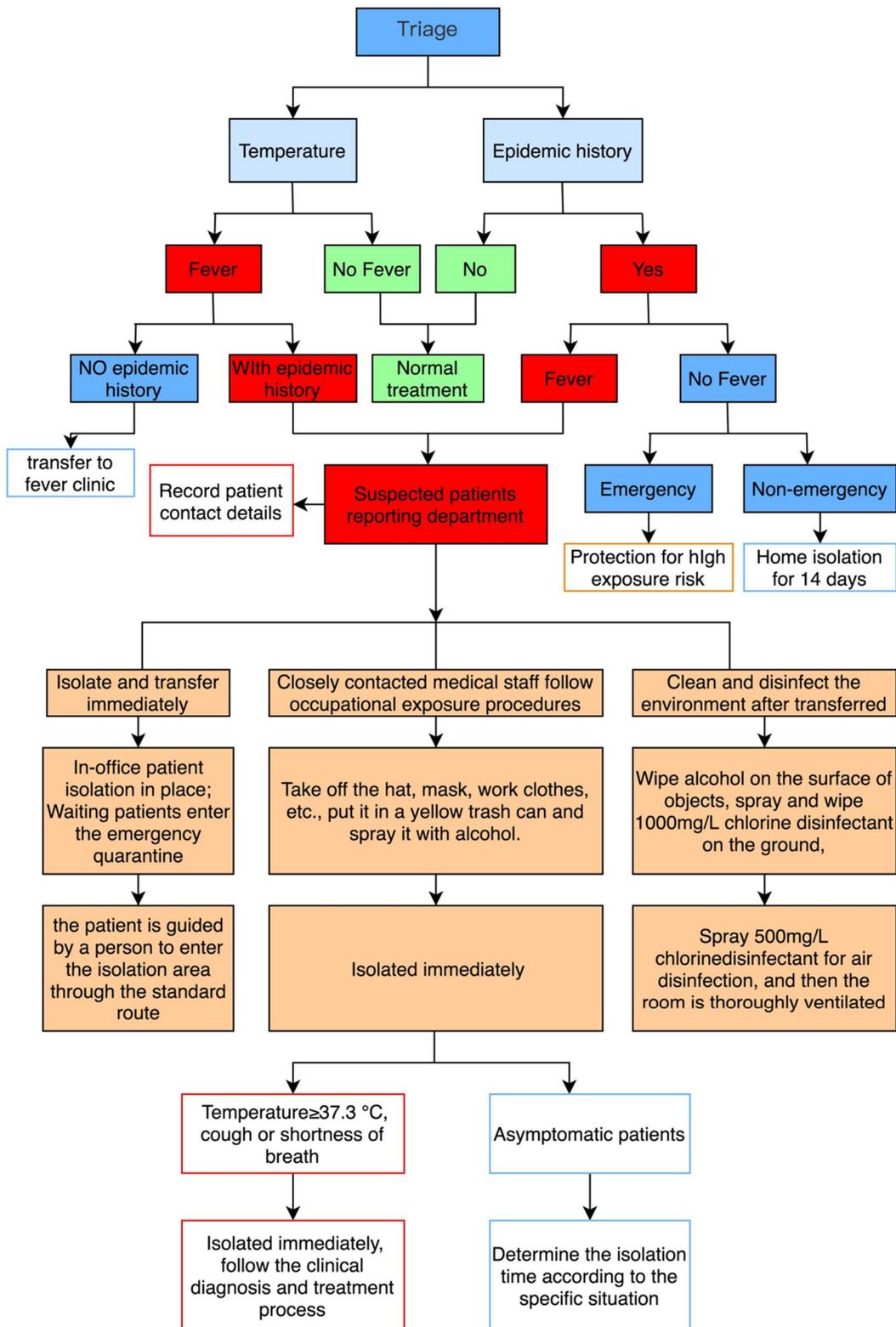
Emergency plan

Ultrasound department is recommended to have a pre-examination triage area for rapid temperature monitoring and epidemiological history inquiry, to screen suspicious patients. For those with epidemiological history, fever ≥ 37.3 °C, and no other cause is confirmed, should be immediately reported to the department and initiate an emergency plan. Epidemiological history includes: (1) travel or residence history to communities with case reports within 14 days before the onset of illness; (2) exposure to the patients with novel coronavirus infection within 14 days before the onset of illness; (3) exposure to the patients with fever or respiratory symptoms from Wuhan and surrounding areas or other communities with case reports within 14 days before the onset of illness; (4) clustered onset.

Isolate the patient immediately, and the patient is guided by a person to enter the isolation area through the standard route. After the patient is transferred, the environment of the clinic is cleaned and disinfected. Wipe alcohol on the surface of objects, spray and wipe 1000mg/L chlorine disinfectant on the ground, spray 500mg/L chlorine disinfectant for air disinfection, and then the room is thoroughly ventilated.

Closely contacted medical staff should follow the occupational exposure process. Take off hats, masks, work clothes, put them in a yellow garbage bag, spray with alcohol, and seal it, and then they are observed. For those with symptoms (such as temperature ≥ 37.3 °C, cough or shortness of breath), should be isolated immediately, follow the clinical diagnosis and treatment process [Figure 3].

Figure 3 Emergency plan during the outbreak of COVID-19



Precautions

(1) After the bedside examination, the instrument is returned to the designated area. The medical staff in the isolation ward is recommended to rotate regularly. After the work in the isolation area, they must be isolated and observed for 14 days.

(2) Recommend antifogging treatment on the goggles to be worn, which will greatly reduce the interference of fog on the clarity of the visual field and improve the diagnostic quality. Antifogging treatment methods: Pretreatment with iodine volts, dishwashing liquid, anti-fog agents for glasses, alcohol, etc.

(3) Ultrasound-guided interventional procedures should be strictly sterile and pay attention to patients' blood and body fluids.

(4) Try to reduce performing bedside ultrasonography immediately after the patient performs operations such as nebulizing inhalation, suctioning, and tracheotomy.

Psychological support of medical staff

During the novel coronavirus outbreak, medical staff is undertaking high-load medical work, and psychological pressure that they are also suffering cannot be ignored. Psychological support helps alleviate the psychological pressure of medical staff, and ensure that the medical work runs smoothly and effectively.

1. Reasonable scheduling: Group scheduling to reduce the risk of cross-infection.

2. Abundant supplies: Abundant protective equipment is required, and a person is responsible for managing protective equipment to ensure that the medical staff has sufficient PPE.

3. Optimize the process: Make coordinated arrangements for the needs of bedside ultrasound. The emergency department is given priority, first visit the non-infectious department, then the infectious department.

4. Psychological care: Active communication, timely discussion, and sharing of feelings and experiences will help reduce stress.