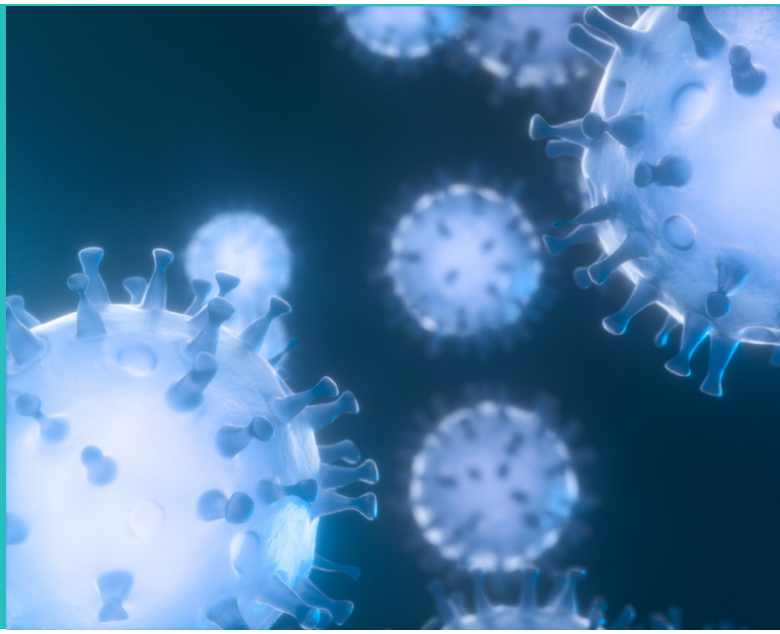
Infection prevention for point of care ultrasound (POCUS) in COVID-19

Critical Summary

- Coronavirus disease 2019 (COVID-19) is caused by the novel coronavirus SARSCoV-2.[1] Associated clinical syndromes may include viral pneumonia and acute respiratory distress syndrome.[2]
- Point of care ultrasound (POCUS) is a front-line triage and monitoring tool in the management of COVID-19 as it is portable, rapid to deploy, does not emit ionising radiation, and can provide actionable clinical data.[3,4]
- Users of POCUS need to consider the best way to disinfect probes used in facilities managing patients with COVID-19.



Diagnosis and management of COVID-19 using ultrasound

The World Health Organization (WHO) have identified pneumonia, severe pneumonia, and acute respiratory distress syndrome (ARDS) as COVID-19 associated clinical syndromes that may be investigated using medical imaging.[2] **Ultrasound has been identified as a primary tool for the management of COVID-19.**[3,4] Procedures may include lung ultrasound, transthoracic echocardiography and in severe cases central venous access and thoracentesis to manage pleural effusion (Table 1). **Ultrasound has several advantages over CT and MRI including greater scalability, easy and rapid deployment at point of care and no ionizing radiation.**[3]

Ensuring the safety of patients and staff during the management of COVID-19

The high transmissibility of SARS-CoV-2 means infection control practices are essential for preventing hospital acquired COVID-19. During patient care, ultrasound probes may become contaminated with SARS-CoV-2. Generally speaking, the Spaulding classification would be applied to determine the level of disinfection required based on the next use (Table 1).[5,6]

During the COVID-19 outbreak, facilities may decide to perform a higher level of disinfection than that required by Spaulding (Table 1). Recent guidelines have suggested some settings could perform more frequent HLD of ultrasound equipment.[7,8] This includes ICUs since the patient population is typically immunocompromised and more predisposed to infection.[7]

Table 1. Disinfection of ultrasound probes used in the management of COVID-19.

Ultrasound Procedure	Description	Spaulding Classification	Minimum Disinfection%	Higher level of disinfection
Lung ultrasound (LUS)	Probe scans upper, middle and lower lung. Shown to provide high diagnostic accuracy.	**Non-critical,** probe contacts intact skin.*	LLD	HLD#
Transthoracic echocardiography	Probe is placed on chest to visualize the beating heart.	**Non-critical,** probe contacts intact skin.*	LLD	HLD#
Ultrasound guided vascular access	Required for ICU patients. Includes central access (CVC, PICC) and peripheral IVs.	**Critical,** probe risks contact with sterile tissue, puncture, needle.	HLD + sterile sheath OR Sterilization^	
Ultrasound guided thoracentesis	Treats pleural effusion; excess fluid is removed by inserting a needle into the pleural space.	**Critical,** probe risks contact with sterile tissue, puncture, needle.	HLD + sterile sheath OR Sterilization^	

HLD: high level disinfection. LLD: low level disinfection. %Minimum disinfection level is based on the Spaulding classification.[5,6] *Patients presenting to emergency departments may have unexpected lesions or dermatitis around the scanning area which would render the probe semi-critical, requiring HLD before use. **#While not mandated by the Spaulding classification, facilities may decide to use a higher level of reprocessing for a greater margin of safety. ^Sterilization is required for critical probes; HLD with use of a sterile sheath is acceptable if sterilization is not possible.[6]**

The benefits of HLD against SARS-CoV-2

As SARS-CoV-2 is a novel enveloped virus, disinfection efficacy tests have generally not been performed against this virus to date. By definition, HLD inactives all microbial life, except for some bacterial spores within a standard cycle.[6] This efficacy spectrum includes enveloped viruses. Enveloped viruses are considered the most susceptible group of organisms to inactivation by disinfectants.[5,6]

Benefits of automation to clinical workflows

Manual disinfection methods are inherently variable, the effects of which may become amplified under high clinical workload. Using an automated and validated disinfection process means that critical parameters (e.g., contact time, temperature, concentration) are controlled and all surfaces of the probe head and handle are disinfected.

When managing the use of ultrasound with COVID-19 patients, an automated HLD system delivers verified efficacy allowing you to focus on critical clinical tasks to deliver optimal patient care.

Some facilities are electing to use automated HLD with trophon® to support their management of COVID-19 risks.[9,10] The trophon family includes the trophon EPR and trophon2 devices, which share the same core technology of sonically-activated hydrogen peroxide.

Contact us today for your specific needs on point-of-care reprocessing, understanding when to HLD or for an educational session at your facility.

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References 1. World Health Organization (WHO). Naming the coronavirus disease (COVID-19) and the virus that causes it. Date accessed: 30/03/2020. Accessible here: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it **2.** World Health Organization (WHO). Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected: Interim guidance V 1.2. Date accessed: 30/03/2020. Accessible here: https://apps.who.int/iris/bitstream/handle/10665/331446/WHO-2019-nCoV-clinical-2020.4-eng.pdf?sequence=1&isAllowed=y **3.** Peng QY, Chinese Critical Care Ultrasound Study Group (CCUSG), et al. Findings of lung ultrasonography of novel coronavirus pneumonia during the 2019–2020 epidemic. Intensive Care Med. Published online 12 March 2020. DOI : https://doi.org/10.1007/s00134-020-05996-6 **4.** Buonsenso D et al. Lancet Respir Med. Published online 20 March 2020. DOI: https://doi.org/10.1016/S2213-2600(20)30120-X **5.** Spaulding EH. Chemical disinfection of medical and surgical materials. In: Lawrence C, Block SS, editor. Disinfection, sterilization, and preservation. Philadelphia (PA): Lea & Febiger; 1968. p. 517-31. **6.** Centre for Disease Control and Prevention (CDC) 2008. Guideline for Disinfection and Sterilization in Healthcare Facilities. **7.** Costello C et al. Prevention of pathogen transmission during ultrasound use in the Intensive Care Unit: Recommendations from the College of Intensive Care Medicine Ultrasound Special Interest Group (USIG). Published online 26 March 2020. DOI: https://doi.org/10.1002/ajum.12205 **8.** The International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) Safety Committee Position Statement: safe performance of obstetric and gynecological scans and equipment cleaning in the context of COVID-19. Date accessed: 30/03/2020. Accessible here: https://www.isuog.org/resource/isuog-safety-committee-position-statement-safe-performance-of-obstetric-and-gynecological-scans-and-equipment-cleaning-in-the-context-of-covid-19.html **9.** Wessner CE et al. Journal of Diagnostic Medical Sonography. September 2020. doi:10.1177/8756479320959035 **10.** Sheth S et al. Guidelines for Ultrasound in the Radiology Department During the COVID-19 Pandemic. Ultrasound Quarterly. September 2020;36(3):200-205.

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