

# Proposed International Standardization of Use of Lung Ultrasonography in Patients With COVID-19 (2020)

## Italian COVID-19 Lung Ultrasound Database

This is a quick summary of the guidelines without analysis or commentary. For more information, go directly to the guidelines by clicking the link in the reference.

April 24, 2020

*The proposal for international standardization of the use of lung ultrasonography (LUS) for patients with COVID-19 was released on March 30, 2020, by an Italian team comprising physicians currently involved in the clinical management of COVID-19 and experts in ultrasound physics and image analysis.<sup>[1]</sup>*

In the setting of COVID-19, wireless transducers and tablets represent the most appropriate equipment for LUS. If such devices are unavailable, portable machines dedicated to exclusive use for patients with COVID-19 can be used, though maximum care for sterilization is necessary. In these cases, transducer and keyboard covers are suggested, and sterilization procedures are necessary.

## Acquisition Protocol

Scan 14 areas (three posterior, two lateral, and two anterior on the right and left) per patient for 10 seconds along the lines indicated here. Scans must be intercostal to cover the widest surface possible with a single scan.

Evaluate according to a standard sequence, using landmarks on chest anatomic lines. Echographic scans can be identified with progressive numbering starting from the right posterior basal regions. For a patient able to maintain the sitting position, the following anatomic landmarks should be used:

1. Right basal on the paravertebral line above the curtain sign
2. Right middle on the paravertebral line at the inferior angle of the shoulder blade
3. Right upper on the paravertebral line at the spine of the shoulder blade
4. Left basal on the paravertebral line above the curtain sign
5. Left middle on the paravertebral line at the inferior angle of the shoulder blade
6. Left upper on the paravertebral line at the spine of the shoulder blade
7. Right basal on the midaxillary line below the internipple line
8. Right upper on the midaxillary line above the internipple line
9. Left basal on the midaxillary line below the internipple line
10. Left upper on the midaxillary line above the internipple line
11. Right basal on the midclavicular line below the internipple line
12. Right upper on the midclavicular line above the internipple line
13. Left basal on the midclavicular line below the internipple line
14. Left upper on the midclavicular line above the internipple line

In critical care settings (eg, invasive ventilation) and for patients who cannot maintain the sitting position, the posterior areas may be difficult to evaluate. In such cases, try to obtain a partial view of the posterior basal areas, and start the assessment from landmark 7.

Use convex or linear transducers, according to the patient's body size.

Use a single–focal point modality (no multifocusing), setting the focal point on the pleural line.

Keep the mechanical index low (start from 0.7, and reduce it further if allowed by the visual findings).

Avoid saturation phenomena as much as possible; control gain; and diminish the mechanical index if needed.

Avoid the use of cosmetic filters and specific imaging modalities such as harmonic imaging, contrast, Doppler, and compounding.

Achieve the highest frame rate possible (eg, no persistence and no multifocusing).

Save the data in the Digital Imaging and Communications in Medicine format. If this is not possible, save the data directly in a video format.

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## Scoring Procedures

For each area scanned with LUS, a score is assigned, as follows:

- Score 0 - The pleural line is continuous and regular. Horizontal artifacts are present (generally referred to as A-lines).
- Score 1 - The pleural line is indented. Below the indent, vertical areas of white are visible.
- Score 2 - The pleural line is broken. Below the breaking point, small-to-large consolidated areas (darker areas) appear with associated areas of white below the consolidated area (white lung).
- Score 3 - The scanned area shows dense and largely extended white lung with or without larger consolidations.

At the end of the procedure, note for each area the highest score obtained (eg, quadrant 1, score 2; quadrant 10, score 1; and so on).

For more information, please go to [Coronavirus Disease 2019 \(COVID-19\)](#).

For more Clinical Practice Guidelines, please go to [Guidelines](#).

### References

1. Soldati G, Smargiassi A, Inchingolo R, Buonsenso D, Perrone T, Briganti DF, et al. Proposal for international standardization of the use of lung ultrasound for patients with COVID-19: a simple, quantitative, reproducible method. *J Ultrasound Med*. 2020 Mar 30. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/jum.15285>.

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