

# Vital Role of Ultrasound in the Era of COVID-19: Arriving at the Right Diagnosis Real Time

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## ABSTRACT

Ultrasound has become an integral part for assessment of critically ill patients. It has helped in diagnosing and treating critically ill patients. The added advantage of ultrasonography is that it is a fantastic diagnostic tool that is easily available at the bedside, repeatable, more objective, and has a steep learning curve. It has become fifth vital assessment along with inspection, palpation, percussion, and auscultation. In the current scenario of COVID-19 pandemic, the disease caused by virus ranges from mild influenza-like illness to severe acute respiratory illness (SARI). Among the patients developing SARI, few require hospitalization and might need intensive care management. As a critical care specialist, we need to keep our antenna up to look for other causes for SARI due to non-COVID etiology as well. This article describes algorithmic approach and vital role of ultrasonography while managing patients with respiratory distress.

**Keywords:** COVID-19, Training, Ultrasonography.

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## INTRODUCTION

Ultrasonography, once questioned about its utility while assessing lung pathology, with further developments in this field, has made a great impact in critical care management.<sup>1-3</sup> In routine clinical assessment, it can be used for evaluating pathologies of lung, heart, abdomen, and venous system, which may contribute to the various causes for respiratory distress.<sup>1-5</sup>

COVID-19 pneumonia has characteristic ultrasonographic patterns, such as thickened pleura, subpleural consolidation.<sup>6</sup> Peculiarly, as described in the literature, pleural effusion is not the typical finding of COVID pneumonia. There is a possibility that the patient can have COVID with other pathologies or non-COVID illness presenting with respiratory distress.<sup>6</sup>

Stepwise approach can help the clinician to get the correct diagnosis. Thanks to Lichtenstein and colleagues who have designed different protocols in the management of critically ill patients.<sup>7-10</sup> One can follow bedside lung ultrasound evaluation and BLUE protocol integrated with Echocardiographic assessment.<sup>8</sup>

### Stepwise Approach Advised

- Lung Ultrasound
  - Look for pleural slide, lung point
  - Assessment of each lung zone—evaluate for A lines, B lines, A' and B' profile,
  - Look for the pleural effusion
  - If there are no significant lung findings or patient has 'A' profile with good pleural sliding, still patient is having respiratory distress, look for DVT.
  - If no DVT, then probably patient has bronchospasm or dynamic hyperinflation or AutoPEEP (positive end expiratory pressure).
- Use of echocardiography along with USG lung
  - Look for chamber size
  - Regional wall motion abnormality (RWMA)

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- LV filling pressure, E/e'
- Valves for any abnormality, clots
- RV strain and pericardial effusion or tamponade.

So majority of pathologies can be diagnosed with ultrasound.

This algorithm (Flowchart 1) shows stepwise approach to help in diagnosis. It starts with evaluation of pleural sliding.

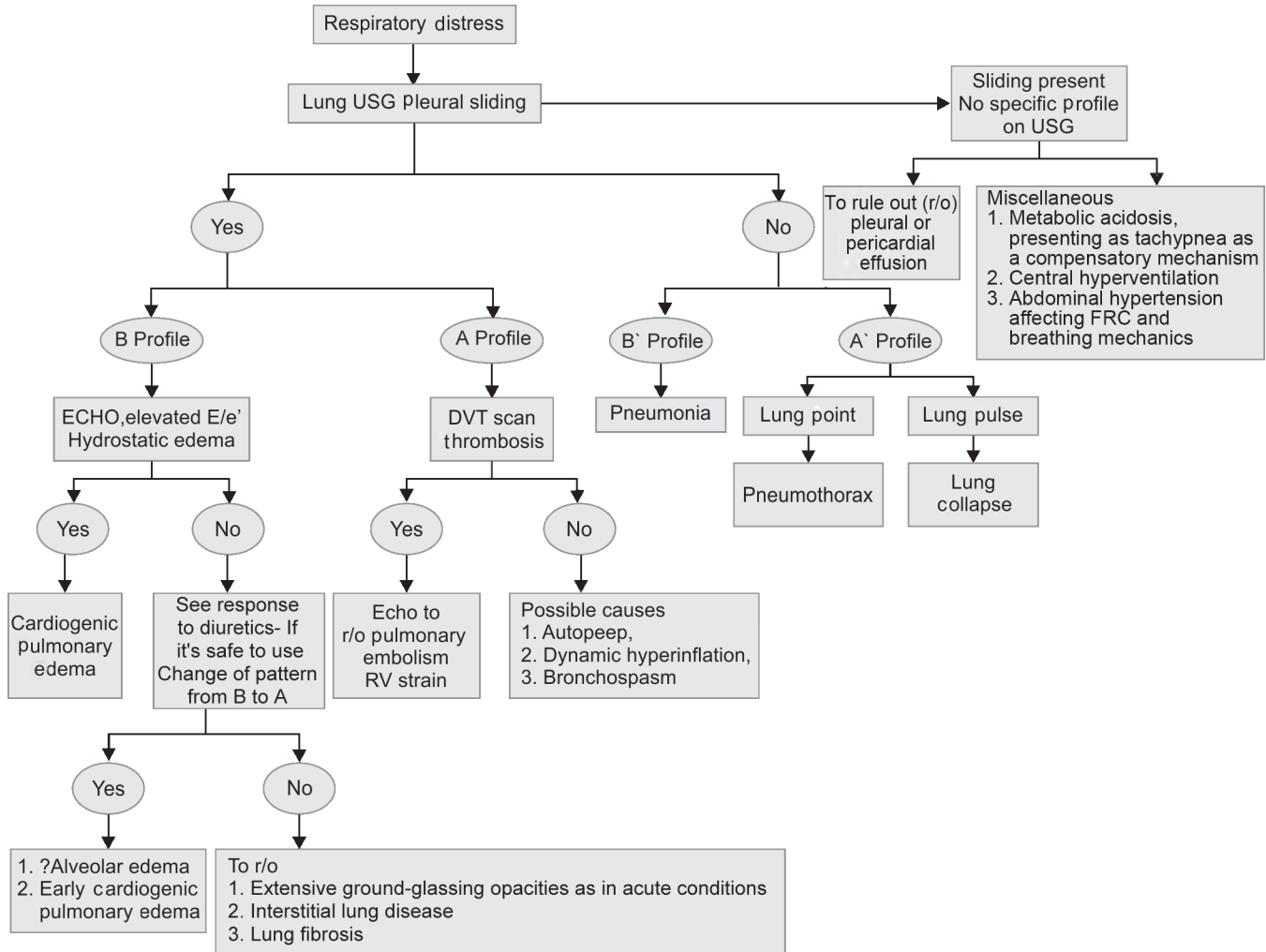
### Any Role of CXR

There is a possibility of error due to interobserver bias in interpretation. Chest X-ray may give some clue but it is not a specific tool.<sup>11</sup> So it's time to make ultrasonography as an integral part of training not only for emergency and critical care specialists but also for super-specialities.<sup>12</sup>

### Can We Use CT Scan?

Computed tomography (CT) scan might help in diagnosing underlying lung disease and various other etiologies. While using CT scan in COVID era, one should think about risk of transporting these sick patients, risk of exposure for healthcare worker, additional use of PPE's by CT room personnel, and strict adherence to surface cleaning and disinfection protocols.<sup>6</sup>

**Flowchart 1:** Simple algorithm for managing any patient with respiratory distress



**CONCLUSION**

While managing patients during pandemic we need to keep high probability of patients having COVID illness causing pneumonia, but it may not be always the case. Presence of respiratory or cardiac comorbidities will alter the clinical findings. Need to remember, eyes do not see what the mind doesn't know.

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