



Thoracic Ultrasound Vital in the ICU



Thoracic ultrasound (TUS) is vital for differential diagnosis in the ICU, and has many advantages, say the authors of a recently published review of the technique.

The potential clinical applications of bedside thoracic ultrasound are explored in an article published in the *World Journal of Radiology*. The artifacts shown on ultrasound assist in improving accuracy and safety in the diagnosis and treatment of various pulmonary pathologic diseases, whether “water-rich” or “air-rich”, according to the review’s authors.

Antonello D’Andrea, MD, PhD, Chair of Cardiology, Second University of Naples, AORN “dei Colli”, Monaldi Hospital, Naples, Italy, and colleagues outline the techniques of thoracic ultrasound as well as the indications, contraindications, advantages and disadvantages.

They provide an explanation and images for ultrasound normal appearance and terminology, pulmonary involvement in cardiac diseases requiring ultrasound and echocardiography, for pleural effusion, pneumothorax, diaphragmatic function as well as [Dr. Daniel Lichtenstein’s](#) bedside lung ultrasound in emergency (BLUE) protocol.

See Also: [Six Steps to Implement Bedside Ultrasonography in Critical Care: A Roadmap to Rapid Improvements in Patient Safety](#)

Advantages

TUS has several advantages, that include speed, cost, reliability, flexibility, availability at the bedside and repeatability, write D’Andrea and colleagues.

They detail other advantages:

- No limitation with setting, patient position, or clinical conditions
- Differential diagnosis (e.g., chest pain, pulmonary oedema, exacerbation of chronic obstructive pulmonary disease, subpulmonary effusion, subphrenic fluid accumulation, and tumours)
- Diagnose presence and nature of pleural effusions
- Guide invasive procedures (e.g., thoracentesis, chest tube placement, and biopsy)
- Diagnose diaphragm paralysis
- Diagnose localised pleural tumors or pleural thickening, assess invasion

- of the pleura and chest wall
- Diagnose pneumothorax, drainage, or verify lung expansion
- Few limitations in ventilated patients

Limitations

D'Andrea and colleagues note that limitations of thoracic ultrasound include interobserver variability and time spent until acquisition of the images. Users require training to acquire expertise and ability. Patient limitations include wound dressings, reason for mechanical ventilation, obesity and chronic obstructive pulmonary disease. Disease limitations include the location of pulmonary disease and lesions.

They conclude: "TUS performed by the clinician in charge of an ICU looks to be one of the most promising skills for respiratory and therapeutic monitoring, as well as assisting with the prevention of any kind of delay in the management of [critically ill] patients."

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