



Making Waves

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LUNG ULTRASOUND FOR RESPIRATORY PHYSIOTHERAPISTS

Interest in LUS is growing fast and the future of this powerful tool amongst adult and paediatric respiratory physiotherapists is promising. It is especially interesting to those working on critical care areas, acute respiratory/surgical wards, respiratory out-patients clinics and community respiratory teams

Alongside your current clinical assessment, LUS has the potential to guide, monitor and evaluate your respiratory treatment techniques in real-time. Once skilled in its use you will be able to assess the effectiveness of your treatments with a diagnostic tool that can outperform chest x-rays and auscultation in many lung pathologies.

Be more accurate in your diagnosis by visualising the status of the pleura, lungs and diaphragm. Choose treatment options that are more specific to the patients needs and give you a better chance of eliciting a positive outcome.

WHAT IS LUNG ULTRASOUND?

In the last 15 years, a new imaging application has emerged in the clinical arena: Lung Ultrasound (LUS). From its traditional assessment of pleural effusions and masses, LUS has moved towards the revolutionary approach of imaging the pulmonary parenchyma, mainly as a point-of-care technique. Although limited by the presence of air, LUS proved to be useful in the evaluation of many different acute and chronic conditions, from cardiogenic pulmonary oedema to acute lung injury, from pneumothorax to pneumonia, from interstitial lung disease to pulmonary infarctions and contusions.

It is especially valuable since it is a relatively easy-to-learn application of ultrasound, less technically demanding than other sonographic examinations. It is quick to perform, portable, repeatable, non-ionising and therefore suitable for meaningful evaluation in many different settings, both inpatient and outpatient, in both acute and chronic conditions.

Lung ultrasound can be very useful in neonates and children. All LUS signs and patterns described in adults are alike in paediatric patients in both normal and pathological conditions.

Lung ultrasound has a relatively brief learning curve that is significantly shorter than other sonographic techniques,

although it still requires proper training focused on the understanding of the ultrasound “signs” and the correct clinical interpretation of the LUS patterns. LUS is very suitable for a clinically driven, point-of-care assessment that should be tailored to the clinical suspicion and the setting.

In the next few years, point-of-care ultrasound (POCUS) is likely to become increasingly important in many different clinical settings and likely to establish itself as the standard of care in several acute and chronic conditions.

Adapted from Gargani, L. and Volpicelli, G. (2014) How do I do it: Lung Ultrasound. *Cardiovascular Ultrasound* 12:25

PROS

Real-time images

Performed serially

No radiation

Non-invasive

Portable

Bedside

Differential diagnosis

Outcome measure

Fast to perform

CONS

Surgical emphysema

Dressings

Wounds

Burns

Obesity

ENDORSEMENT

Professor Daniel Lichtenstein, whom many consider to be the pioneer of critical care POCUS including TUS, mentions in his book that physiotherapists;

“should deserve a whole chapter, especially those working in the ICUs. Ultrasound should change many aspects of the protocols, since the result can be seen on site”

(Lichtenstein 2016, p293).

RECOMMENDED READING

Le Neindre A, Mongodi S, Philippart F, Bouhemad B. **Thoracic ultrasound: Potential new tool for physiotherapists in respiratory management. A narrative review.** *Journal of Critical Care.* 2016;31:101-109.

Leech M, Bissett B, Kot M, Ntoumenopoulos G. **Lung ultrasound for critical care physiotherapists: A narrative review.** *Physiotherapy Research International* 2015;20:69–76.

Lichtenstein DA. **Lung Ultrasound in the Critically Ill: The BLUE Protocol.** Springer International Publishing. 2016:p293 ISBN 978-3-319-15370-4

See KC, Ong V, Wong SH, Leanda R, Santos J, Taculod J, Phua J, Teoh CM. **Lung ultrasound training: curriculum implementation and learning trajectory among respiratory therapists.** *Intensive Care Medicine.* 2016;42:63-71. DOI:10.1007/s00134-015-4102-9