

# Integration of Diagnostic Lung Ultrasound into Clinical Practice by Hospitalists in an Academic Medical Center

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## Background

Point of care lung ultrasound (LUS), ultrasound of the lung that is performed at the bedside by a clinician, is an imaging modality that is more accurate than physical exam maneuvers or chest radiography for multiple common causes of dyspnea including pneumonia, pulmonary edema, pleural effusion and pneumothorax<sup>1,2,3,4</sup>. LUS is now a recommended test by multiple professional societies including the American College of Physicians for its increased accuracy and multiple other benefits including avoidance of ionizing radiation. In spite of its many advantages, few hospitalists have fully integrated this patient-centric imaging modality into clinical practice. Although superior accuracy of LUS has been demonstrated under research conditions, little is known about LUS utility in real world clinical practice as many centers do not routinely archive or document their POCUS exam findings. The purpose of this study was to understand the impact LUS has in real world clinical environments as well as identify opportunities for process improvement in training and quality assessment processes.

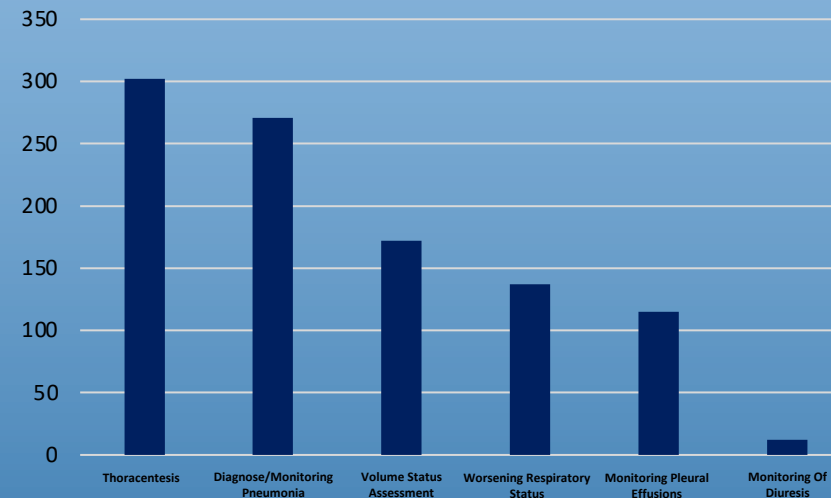
## Methods

A retrospective chart review was conducted of patients who received a LUS while hospitalized at a quaternary care academic medical center in Aurora, CO between July 2020 through June 2022. Data was extracted from the electronic health record (EHR) into a standardized REDcap form. Cases were defined as patients who had received LUS that 1) had images archived that were accessible to viewing through the electronic health record (EHR) and 2) had an imaging report documented in the EHR. LUSs were recorded as diagnostically useful if they were documented in the EHR as: 1) changing the pre-test probability of diagnosis 2) offering sufficient information for monitoring of a disease process 3) offering sufficient information to decide whether thoracentesis was indicated.

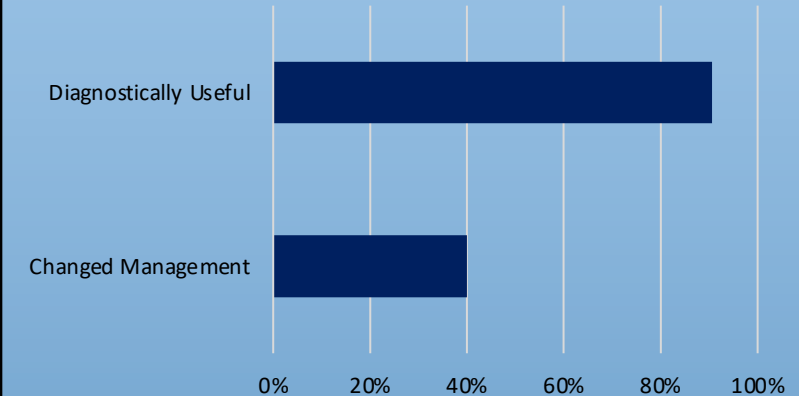
## Results

Of the 831 LUSs reviewed, 302 were performed to evaluate for appropriateness of thoracentesis, 271 for diagnosing or monitoring pneumonia, 172 for volume status assessment, 137 for worsening respiratory status, 115 for monitoring plural effusions, and 12 for monitoring of diuresis. 87.9% were considered to be diagnostically useful (ie LUS results changed pretest probability) and 39.2% changed management (ie thoracentesis was performed or diuretics were given based on LUS findings).

### Lung Ultrasound Indications



### Lung Ultrasound Utility



## Conclusion

Our current data suggests hospitalists are using LUS for a variety of indications. In this cohort, it was most often a diagnostically useful test and the results routinely changed management. Future work will focus on further enhancing implementation of evidenced-based indications for LUS such as assessment of volume status in patients with heart failure to guide diuresis. In addition, we will assess the clinical notes within the EHR for common cognitive errors seen with the use of LUS in order to inform improvements in hospitalist training.

## References

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