# Kinetics of Measures Guiding Decongestive Therapy in AHF: Comparison of Lung Ultrasound to Conventional Markers

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**Introduction:**
Lung ultrasound (LUS) scoring of pulmonary edema severity has been proposed as a marker to track treatment response in acute heart failure (AHF), with a hypothetical advantage of detecting changes in congestion more quickly than traditional markers of treatment response. We compared change in LUS congestion score to contemporaneous changes in daily weight, natriuretic peptides, subjective score of worst AHF symptom (WSS), and clinical/exam findings in hospitalized heart failure patients from ED arrival to discharge, to determine which measure showed the most dynamic reduction during decongestive therapy.

**Methods:**
This is a preliminary analysis of an ongoing prospective observational cohort study. ED patients were enrolled if they were being treated for presumed AHF diagnosis and if a LUS met diagnostic criteria for pulmonary edema. LUS, BNP, body weight, WSS, and clinical congestion score (CCS) (calculated based on orthopnea, JVD, hepatomegaly, and peripheral edema) were assessed at ED arrival and daily through discharge. Random effects models of percent change were fit for each measure, adjusted for initial value, to estimate magnitude and speed of change during ED and in-hospital decongestion.

**Results:**
78 observations of 21 patients were analyzed. Median age and NYHA score were 66 y/o and 4, respectively. LUS score dropped the most quickly, showed greatest mean change from ED to discharge, and showed the greatest change prior to transition to PO diuretics (initial 24-60 hours). BNP did not fall below ED values until day 3, and did not reach its nadir until day 6. The CCS correlated well with LUS, but showed a smaller magnitude of change from ED to discharge. Weight and WSS showed no significant change.

**Conclusions:**
LUS score showed a more rapid and larger change in response to diuretic therapy, suggesting it may be a more dynamic measure of decongestion than conventional measures of treatment efficacy.