

Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

# Epidemiology, Patterns of Care, and Mortality for Patients With Acute Respiratory Distress Syndrome in Intensive Care Units in 50 Countries

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**IMPORTANCE** Limited information exists about the epidemiology, recognition, management, and outcomes of patients with the acute respiratory distress syndrome (ARDS).

**OBJECTIVES** To evaluate intensive care unit (ICU) incidence and outcome of ARDS and to assess clinician recognition, ventilation management, and use of adjuncts—for example prone positioning—in routine clinical practice for patients fulfilling the ARDS Berlin Definition.

**DESIGN, SETTING, AND PARTICIPANTS** The Large Observational Study to Understand the Global Impact of Severe Acute Respiratory Failure (LUNG SAFE) was an international, multicenter, prospective cohort study of patients undergoing invasive or noninvasive ventilation, conducted during 4 consecutive weeks in the winter of 2014 in a convenience sample of 459 ICUs from 50 countries across 5 continents.

**EXPOSURES** Acute respiratory distress syndrome.

**MAIN OUTCOMES AND MEASURES** The primary outcome was ICU incidence of ARDS. Secondary outcomes included assessment of clinician recognition of ARDS, the application of ventilatory management, the use of adjunctive interventions in routine clinical practice, and clinical outcomes from ARDS.

**RESULTS** Of 29 144 patients admitted to participating ICUs, 3022 (10.4%) fulfilled ARDS criteria. Of these, 2377 patients developed ARDS in the first 48 hours and whose respiratory failure was managed with invasive mechanical ventilation. The period prevalence of mild ARDS was 30.0% (95% CI, 28.2%-31.9%); of moderate ARDS, 46.6% (95% CI, 44.5%-48.6%); and of severe ARDS, 23.4% (95% CI, 21.7%-25.2%). ARDS represented 0.42 cases per ICU bed over 4 weeks and represented 10.4% (95% CI, 10.0%-10.7%) of ICU admissions and 23.4% of patients requiring mechanical ventilation. Clinical recognition of ARDS ranged from 51.3% (95% CI, 47.5%-55.0%) in mild to 78.5% (95% CI, 74.8%-81.8%) in severe ARDS. Less than two-thirds of patients with ARDS received a tidal volume 8 of mL/kg or less of predicted body weight. Plateau pressure was measured in 40.1% (95% CI, 38.2-42.1), whereas 82.6% (95% CI, 81.0%-84.1%) received a positive end-expiratory pressure (PEEP) of less than 12 cm H<sub>2</sub>O. Prone positioning was used in 16.3% (95% CI, 13.7%-19.2%) of patients with severe ARDS. Clinician recognition of ARDS was associated with higher PEEP, greater use of neuromuscular blockade, and prone positioning. Hospital mortality was 34.9% (95% CI, 31.4%-38.5%) for those with mild, 40.3% (95% CI, 37.4%-43.3%) for those with moderate, and 46.1% (95% CI, 41.9%-50.4%) for those with severe ARDS.

**CONCLUSIONS AND RELEVANCE** Among ICUs in 50 countries, the period prevalence of ARDS was 10.4% of ICU admissions. This syndrome appeared to be underrecognized and undertreated and associated with a high mortality rate. These findings indicate the potential for improvement in the management of patients with ARDS.

**TRIAL REGISTRATION** clinicaltrials.gov Identifier: NCT02010073

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