




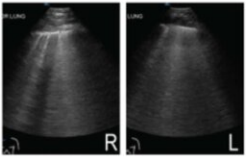


# Experts propose new global definition of acute respiratory distress syndrome

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Patient Description	Imaging	Oxygenation	ARDS Categories
 <p>68 M with abdominal sepsis, septic shock, and acute hypoxemic respiratory failure</p>		<p>Mechanically ventilated FiO<sub>2</sub> 0.5 PaO<sub>2</sub> 75 P/F = 150</p>	<p><b>Intubated ARDS</b> Severity: Moderate <i>Typical patient included in prior Berlin definition</i></p>
 <p>54 F with history of breast cancer, COVID-19 pneumonia, and worsening SOB for the past 6 days</p>		<p>High flow nasal oxygen HFNO 40L/min FiO<sub>2</sub> 0.80 SpO<sub>2</sub> 91% S/F = 114</p>	<p><b>Non-Intubated ARDS</b> <i>New category in Global definition</i></p>
 <p>39 F with abdominal sepsis and gram negative bacteremia in a small under-resourced hospital without blood gases, radiography or mechanical ventilation</p>		<p>Supplemental oxygen by face mask at 15L/min FiO<sub>2</sub> 0.6 SpO<sub>2</sub> 85% S/F = 142</p>	<p><b>ARDS in resource-variable settings</b> <i>New category in Global definition, consistent with Kigali modification</i></p>

Illustrative cases with patient descriptions, representative lung imaging and oxygenation data for the three categories of ARDS in the Global Definition: intubated ARDS (top panel), non-intubated ARDS (middle panel) and ARDS in a resource-variable setting (bottom panel). Note the patient in the resource-variable setting can be identified with either an ultrasound (bottom panel, demonstrating bilateral diffuse B-line in non-dependent areas of the lung) or chest radiograph. Also, only the patient with intubated ARDS (top panel) meets criteria for the Berlin definition of ARDS. Arrow: endotracheal tube. Credit: *American Journal of Respiratory and Critical Care Medicine* (2023). DOI: 10.1164/rccm.202303-0558WS

In a new report posted online in the *American Journal of Respiratory and Critical Care Medicine*, a global consensus conference of 32 critical care experts with broad international representation and from diverse backgrounds has proposed a new definition of acute respiratory distress syndrome (ARDS).

In addition to the experts, critical care societies from around the world provided input, once they received feedback from their members. The report, which builds on the 2012 Berlin Definition of ARDS, will be published Jan. 1, 2024 in the American Thoracic Society's *AJRCCM*.

ARDS is a life-threatening illness in which the lungs are severely inflamed. It has a number of possible causes, including sepsis and severe pneumonia.

Leaders in the field saw the need for an expanded definition due to new research and developments in the diagnosis and treatment of ARDS such as:

- Expanded use of [pulse oximetry](#) in place of measurement of arterial blood gases (oxygen and carbon dioxide, which are measured through a blood draw). Recent clinical trials in ARDS have used  $\text{SpO}_2/\text{FIO}_2$  (as measured by pulse oximetry) for patient selection and ARDS patients diagnosed using pulse oximetry measurement have similar outcomes to those diagnosed using arterial gas measurement.
- The use of high flow nasal oxygen (HFNO; use of nasal cannula to deliver a large amount of heated and humidified gas). The use of HFNO to manage severe hypoxemic respiratory failure, which occurs when there is not enough oxygen in the blood, has increased dramatically following publication of [FLORALI trial results](#) in 2015. In addition, HFNO was widely used at the height

of the COVID-19 pandemic, providing further evidence of its usefulness.

- There has also been increased recognition that chest ultrasound, performed by trained personnel, can substitute for or serve as an adjunct to chest X-rays in settings that have [limited resources](#) and do not have access to X-ray equipment.

"One of the major limitations of the Berlin Definition is that its requirement for invasive or non-invasive ventilation cannot be met in settings where [mechanical ventilation](#) is not available," said corresponding author Michael A. Matthay, MD, professor, medicine and anesthesia; associate director, [critical care medicine](#); and senior associate, Cardiovascular Research Institute, University of California, San Francisco.

"By expanding the definition of ARDS and the use of pulse oximetry and ultrasound to help diagnose and stage ARDS, and HFNO to treat it, we will be able to help many more patients who are in resource-limited settings. This expanded definition also opens up new avenues of research and will encourage clinical trials to test new treatments that can include more ARDS patients who were not previously included because they were not mechanically ventilated."

As described in the article, the committee made minor modifications to the Berlin Definition's conceptual model of ARDS and proposed four main recommendations:

- Include HFNO with a minimum flow rate <sup>3</sup> 30 liters a minute. HFNO has already demonstrated its value in critically ill patients and may have value in resource-limited settings throughout the world where mechanical ventilation is not available.
- As an alternative to arterial blood gas measurements, use arterial

oxygen tension ( $\text{SpO}_2/\text{FIO}_2$ ), as measured with [pulse oximetry](#), for ARDS diagnosis and assessment of severity if  $\text{SpO}_2$  is less than or equal to 97 percent. This measurement will help identify hypoxemia earlier, making trials and early interventions with non-intubated patients more feasible.

- Retain bilateral lung opacities (areas of the lung that appear more opaque) for imaging criteria, but add ultrasound as an imaging modality, especially in resource-limited areas.
- In resource-limited settings, do not require positive end-expiratory pressure (PEEP; the positive pressure that remains in airways at the end of exhalation), oxygen flow rate, or specific respiratory support devices.

"The new definition will likely enhance recognition of ARDS in many patients at an earlier stage of their respiratory failure, when interventions are more likely to succeed," said Dr. Matthay.

**More information:** Michael A. Matthay et al, A New Global Definition of Acute Respiratory Distress Syndrome, *American Journal of Respiratory and Critical Care Medicine* (2023). [DOI: 10.1164/rccm.202303-0558WS](#)

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