

A New Global Definition of ARDS

MAIN NEW RECOMMENDATIONS:

- Inclusion of HFNC with a minimum flow rate of >30 L/min.
- Inclusion of oxygen saturation as measured by pulse oximetry if oxygen saturation <97% to identify hypoxemia.
- Inclusion of ultrasound as an imaging modality.

DEFINITION OF ARDS

Acute, diffuse, inflammatory lung injury associated with increased shunting, increased alveolar dead space, and decreased lung compliance precipitated by a predisposing risk factor.

DIAGNOSIS OF ARDS

Recognition of a predisposing factor

- Pneumonia
- Sepsis
- Aspiration
- Shock
- Trauma
- Burn

Timing

Acute onset or worsening of hypoxemic respiratory failure *within 1 week* of the estimated onset of the predisposing risk factor or new or worsening respiratory symptoms.

Clinical hallmarks

- **Arterial hypoxemia**
 - Intubated patients
 - $\text{PaO}_2/\text{FIO}_2 \leq 300$, or
 - $\text{SpO}_2/\text{FIO}_2 \leq 315$ (if $\text{SpO}_2 < 97\%$)
 - Non intubated patients
 - $\text{PaO}_2/\text{FIO}_2 \leq 300$ or $\text{SpO}_2/\text{FIO}_2 \leq 315$ (if $\text{SpO}_2 < 97\%$)
 - On HFNO with flow of >30 L/min, or
 - On NIV with at least PEEP of 5
- **Diffuse lung opacities on chest imaging**
 - Bilateral opacities on CXR and CT or bilateral B lines and/or consolidations on ultrasound not fully explained by effusions, atelectasis, or nodules/masses.
- **ARDS can be diagnosed in the presence of other conditions such as cardiogenic pulmonary edema or atelectasis.**
 - If gas exchange and imaging abnormalities are not exclusively or primarily attributable to these conditions, and
 - A predisposing risk factor is also present.

Severity

Determined by the level of hypoxemia

- Non intubated patients
 - $\text{PaO}_2/\text{FIO}_2 \leq 300$ or $\text{SpO}_2/\text{FIO}_2 \leq 315$ (if $\text{SpO}_2 < 97\%$)

- Intubated patients
 - Mild
 - PaO₂/FIO₂ 200 - ≤300, or
 - SpO₂/FIO₂ 235 - ≤315 (if SpO₂ <97%)
 - Moderate
 - PaO₂/FIO₂ 100 - ≤200, or
 - SpO₂/FIO₂ 148 - ≤235 (if SpO₂ <97%)
 - Severe
 - PaO₂/FIO₂ <100
 - SpO₂/FIO₂ <148 (if SpO₂ <97%)

ATS 2023 Clinical Practice Guideline: An Update on Management of Patients with ARDS

Recommendations

- Use of corticosteroids
- Use of VV-ECMO in selected patients who meets criteria for refractory respiratory failure
- Use of neuromuscular blockers in patients with early severe ARDS
- Use of higher PEEP as opposed to lower PEEP
- Against use of prolonged lung recruitment maneuvers
- Recommendations from the 2017 guideline that remain in place include:
 - Limit tidal volume (4–8 mL/kg PBW and plateau pressure <30 cm
 - Prone positioning for >12 hours per day in patients with severe ARDS

Corticosteroids

No specific recommendations for duration of therapy or a specific agent

Summary of regimens used in clinical trials:

- Duration: 7 to 14 days
- Agents
 - Methylprednisolone 1 mg/Kg
 - Dexamethasone
 - 6 mg/d or 12 mg/d x10 days
 - 20 mg/day x 5 days, then 10 mg/day x 5 days
 - Hydrocortisone 200 mg/day

Neuromuscular blockers

Reserved for patients with:

- Early and severe ARDS (<48h with PaO₂/FiO₂ ratio <100.
- Receiving deep sedation or who, while under light sedation, have evidence of significant ventilator dyssynchrony with associated clinical deterioration that is not mitigated by adjustments to ventilator settings or sedation.
- Duration should be limited to a maximum of 48 hours whenever possible.

Higher PEEP as opposed to lower PEEP

Strategy in which PEEP is raised in response to hypoxemia guided by FiO₂-PEEP table up to a maximal safe plateau pressure.

FiO ₂	0.21	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.8	0.8	0.9	0.9	1.0
PEEP	5–12	14	14	16	16	18	20	20	20	20	22	22	22	> 22

However, if increase in PEEP results in:

- Decrease in VT and or the increase in Pplat is greater than the increase in PEEP (the increase in Pplat should be the same as or less than the increase in PEEP) it is consistent with overdistention.
- In this case, the PEEP should be adjusted to lower levels

Prolonged lung recruitment maneuvers (LRMs)

- Recommendation is against use of LRMs defined as incremental increases in PEEP to achieve airway pressures >35 cmH₂O for >60 second.
- There was a lack of consensus on brief LRMs.

ADDENDUM:

iNO

It should be largely reserved for patients with refractory hypoxemia, severe pulmonary hypertension, and right ventricular failure.

VV-ECMO

Indicated in patients with an acute, reversible, and early condition who fails conventional therapy with lung protective strategy to maintain acceptable gas exchange function and respiratory mechanics and without contraindications.

Definition of refractory respiratory failure:

- PaO₂/FiO₂ ratio <80 sustained for 6 hours with PEEP at least 10 and FiO₂ >60, or
- PaCO₂ ≥60 with pH <7.25 sustained for 6 hours.

Contraindications

Conditions associated with increased risk for futility of treatment

- Irreversible etiology of respiratory failure
- Mechanical ventilation > 7 days
- Immunosuppression
- Multi-organ failure
- Older age
- Systemic bleeding or other contraindication to anticoagulation
- Chronic medical condition and life expectancy <1yr
- CNS hemorrhage or irreversible and incapacitating CNS pathology