

## Lung Protective Ventilation Strategy for Acute Respiratory Distress Syndrome (ARDS) Worksheet

1. **Measure and document** patient's height on table. It is recommended that height is measured by 2 people separately to ensure accuracy.
2. **Circle the 3 tidal volumes in cells for 8, 6, 4 mL/kg** predicted ideal body weight (IBW) that corresponds to the height and appropriate sex. If exact height is not available, round up to the next higher number.

Patient Height: \_\_\_\_\_  Male  Female

Determine Predicted Ideal Body Weight (IBW):								
Height			Male			Female		
cm	inches	feet	8 mL/kg IBW	6 mL/kg IBW	4 mL/kg IBW	8 mL/kg IBW	6 mL/kg IBW	4 mL/kg IBW
157.5	62	5'2"	440	330	220	400	300	200
162.5	64	5'4"	480	360	240	440	330	220
167.6	66	5'6"	510	390	260	480	360	240
172.7	68	5'8"	550	410	280	510	390	260
177.8	70	5'10"	620	440	290	550	410	280
182.9	72	6'0"	640	470	310	590	440	290
188	74	6'2"	660	500	330	620	470	310

### 3. Initial Ventilator Settings:

**Mode:** Volume Assist Control Mode (AC)

**Initial Tidal Volume:** \_\_\_\_\_ (Target: 6 mL/kg IBW)

**Respiratory Rate (RR):** Increase breaths per minute (up to 35) based on tidal volume to maintain current ventilation.

Decrease tidal volumes in 25-50 mL increments to achieve targeted tidal volume over up to 2 hours.

**FiO2 and PEEP:** Goals of PaO<sub>2</sub> 55 – 80 or SaO<sub>2</sub> greater than 88% using one of the three below methods as ordered:

Use the PEEP/FiO<sub>2</sub> ladder protocol as noted below.

FiO <sub>2</sub>	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.0
PEEP	5	5	8	8	10	10	10	12	14	14	14	16	18	18	20-24

For PaO<sub>2</sub> less than 55 or sustained SaO<sub>2</sub> less than 88%, move one column to the right.

For PaO<sub>2</sub> greater than 80 or sustained SaO<sub>2</sub> greater than 96%, move one column to the left.

Notify the physician prior to increasing PEEP if PEEP will be above 12 or the systolic blood pressure is less than 90.

Physician directed PEEP titration if PEEP is over 12

PEEP to be determined by performing a "Best PEEP study" according to an acceptable method after discussion with the attending physician

### 4. Monitoring, Ventilator Settings, and Goals:

Check arterial blood gas within 2 hours of initiation of lung protective ventilation.

Ventilation Goals based on pH: Lung protective ventilation aims for patients to have arterial pH 7.30-7.45

- If pH 7.15-7.29: Increase RR to maximum of 35 breaths per minute.
- If pH less than 7.15 does not respond to RR of 35: Notify the attending physician. Consider intravenous bicarbonate or increase the tidal volume by 50 mL every 30 minutes until pH is greater than 7.15.
- If pH greater than 7.45 and patient is NOT breathing over set RR, decrease the RR to maintain pH 7.35 – 7.40.

Volume and Pressure Goals: Tidal volume of 6 mL/kg IBW and plateau pressure of less than or equal to 30 cm H<sub>2</sub>O

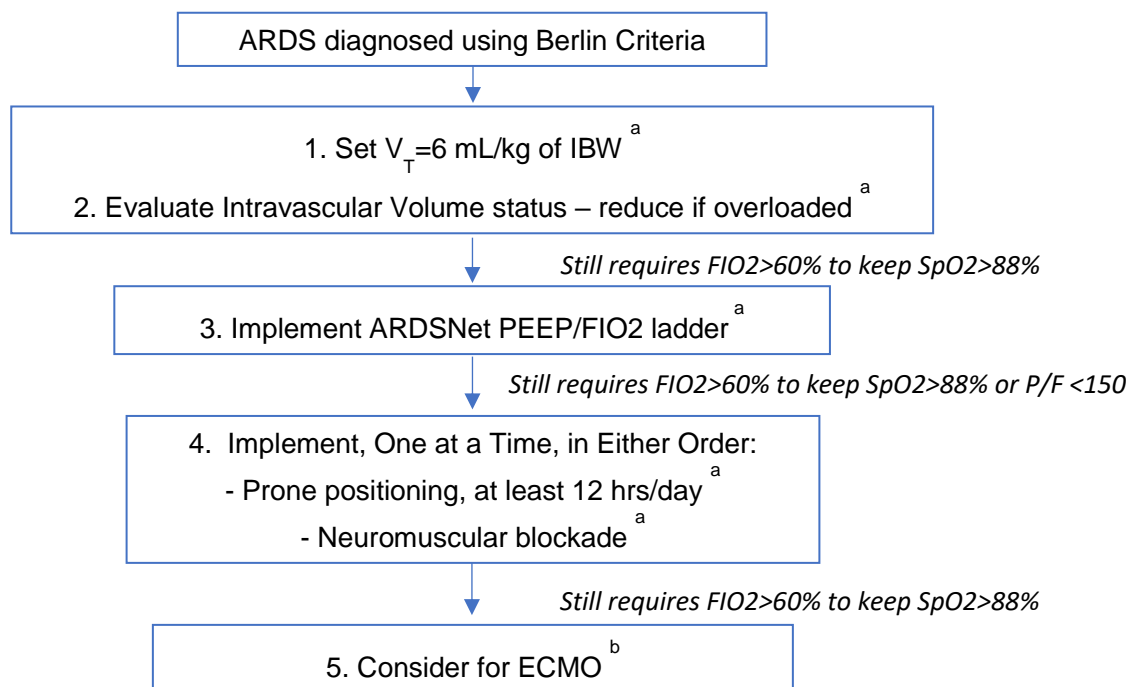
- Measure and document plateau pressure on the ventilator flow sheet daily and after every tidal volume or PEEP change.
- If plateau pressure is greater than 30 cm H<sub>2</sub>O for two consecutive ventilator checks, decrease the tidal volume by 50 mL every 60 minutes until plateau pressure is less than or equal to 30 cm H<sub>2</sub>O, but do not decrease less than 4 mL/kg IBW. Notify attending physician prior to reducing the tidal volume if pH less than 7.25 or PaO<sub>2</sub> less than or equal to 70 mmHg on current ventilator settings. Change in pH or oxygen saturation goals should be written in physician orders.
- If tidal volume is less than 6 mL/kg and plateau pressure is less than 25 cmH<sub>2</sub>O for two consecutive ventilator checks, then increase the tidal volume by 50 mL every 60 minutes until tidal volume is 6 mL/kg IBW, provided the plateau pressure remains less than or equal to 30 cm H<sub>2</sub>O.

## Acute Respiratory Distress Syndrome (ARDS) Diagnosis

Timing	Acute - Within 1 week of known clinical insult of new/worsening respiratory symptoms		
Chest Imaging	Bilateral opacities		
Origin of Edema	Respiratory failure not fully explained by cardiac failure or fluid overload		
Oxygenation	Mild $200 < \text{PaO}_2/\text{FiO}_2 \leq 300$	Moderate $100 < \text{PaO}_2/\text{FiO}_2 \leq 200$	Severe $\text{PaO}_2/\text{FiO}_2 \leq 100$

*Berlin Consensus Diagnostic Definition*

## ARDS Management Algorithm



### NOTES:

- Re-evaluate each step daily
- <sup>a</sup> Good evidence for improvement in at least one clinically relevant endpoint
- <sup>b</sup> Only weak evidence for improvement in any clinically relevant outcomes
- No current evidence for efficacy of: inhaled nitric oxide, high-frequency ventilation