Supplementary material

Methodology

The first continuous 24 hours of mechanical ventilation were utilized for analysis for the following reasons:

1. Mechanical ventilator settings and pharmacological sedation were stable during this time.
2. After 24 hours, ventilator settings commonly were influences by weaning strategies, and new pharmacological interventions. Of note, daily rounds were made by a pulmonary and/or critical care specialist, during which patients were assessed for weaning potential. Formal institutional weaning protocols were followed.

Patients were identified as being treated with ventilator settings deviating from the ARDSnet protective ventilatory strategy if at any time during the first 24 hours of ICU mechanical ventilation they did not meet the ARDSnet ventilation criteria.

Definitions:

Idiopathic cause of acute respiratory failure:

-Computed tomography revealing new or worsening of pulmonary infiltrates

-Unexplained worsening of dyspnea requiring ICU admission

-No evidence for cardiac event or pulmonary thromboembolism to explained worsening

-No pneumothorax

-Lack of positive microbiological growth on blood culture or from lower respiratory tract

Cardiac cause of acute respiratory failure:

-Congestive heart failure: (1) clinical evidence of heart failure; (2) normal or mildly abnormal left ventricular systolic function; and (3) evidence of abnormal left ventricular relaxation, filling, diastolic distensibility, or diastolic stiffness[27] by echocardiography with bilateral pulmonary infiltrates on chest x-ray consistent with edema with clinical evidence of left atrial hypertension.

-Myocardial ischemia: cardiac symptom/sign, biomarker, and ECG findings.[28]

Infection, and sepsis as cause of acute respiratory failure were identified using standard definitions.[29]

Intraoperative definitions:

The respiratory-system compliance (ml/cm of H_2O): $\frac{Vt}{\text{Plateau pressure - PEEP}}$

The predicted body weight of male patients was calculated as equal to 50 +0.91 (centimeters of height – 152.4); and that of female patients as equal to 45.5 + 0.91 (centimeters of height – 152.4)

Data collection:

From the electronic medical records, we collected data including demographics, hospital and ICU date of admission, reason for ICU admission, last pulmonary function test and echocardiogram performed before ICU admission, arterial blood gas results during the

first 24 hours of admission, use of high-dose corticosteroid therapy during ICU stay (at least 1g of methylprednisolone IV daily for 3 days), date and cause of death. From the institutional databases we obtained the Acute Physiology and Chronic Health Evaluation (APACHE) III scores and predictions, and duration of mechanical ventilation. We reviewed the reports of the histological findings of lung tissues obtained surgically from the institutional pathological tissue registry. The date of surgical lung biopsy or diagnosis of ILD by clinical diagnostic criteria was recorded as the date of diagnosis. From the electronic ventilator database, the following continuous mechanical ventilation settings during the first 24 hours were obtained: tidal volume (Vt) (adjusted according to lung size based on the predicted body weight; the exhaled Vt was recorded for those on pressure-control ventilation), respiratory rate, minute ventilation, mean airway pressure, peak airway pressure, plateau pressure, dynamic respiratory system compliance, PEEP and FiO_2. To determine the response to PEEP, we compared average peak and plateau airway pressures, respiratory system compliance, expired tidal volume and oxygen saturation before and after the increase in PEEP to >10 cm H_2O.

Table 1. Causes of respiratory failure requiring ICU admission

	Medical ICU admissions	**Post-surgical ICU admission**
Idiopathic	34	38
Cardiac	9	1
Infection	7	1
Cerebrovascular accident	1	1
Nontraumatic pneumothorax	2	
Total	53	41

Table 2. Distribution of PEEP exposure by hospital mortality and risk of death at 12 months in medical patients

	Hospital Mortality	
PEEP first 24h, cm H_2O	**Yes**	**No**
<5	9	7
6-10	16	7
>10	13	1

		12 months Survival	
	Hazard ratio	**95% CI**	***P***
PEEP first 24h, cm H_2O			
0-5	0.58	0.24-1.30	0.194
6-10	1.71	0.76-4.08	0.193
>10	3.01	1.19-8.04	0.019

Table 3. Distribution of PEEP exposure by hospital mortality and risk of death at 12 months in post-surgical patients

	Hospital Mortality	
PEEP first 24h, cm H_2O	**Yes**	**No**
<5	3	18
6-10	4	10
>10	5	1

		12 months Survival	
	Hazard ratio	**95% CI**	***P***
PEEP first 24h, cm H_2O			
0-5	0.28	0.05-1.36	0.114
6-10	3.52	0.73-19.34	0.114
>10	6.15	1.55-30.02	0.009

Figure 1. One-year survival after ICU admission (all patients)

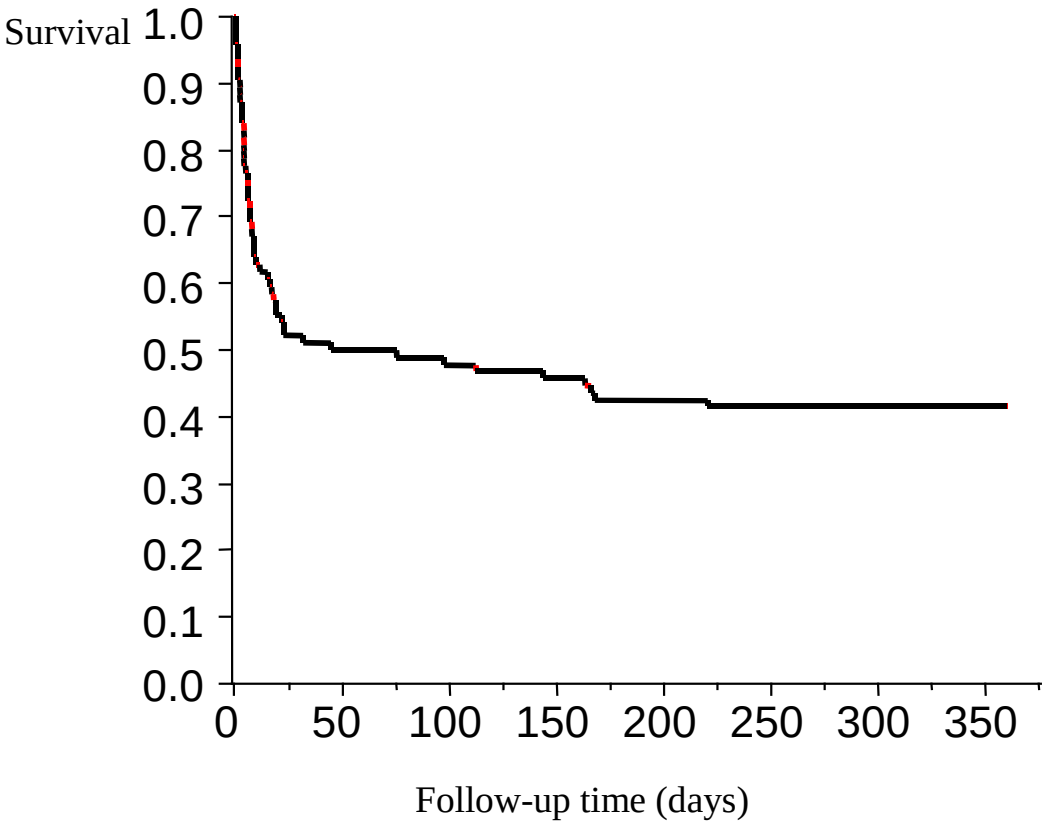
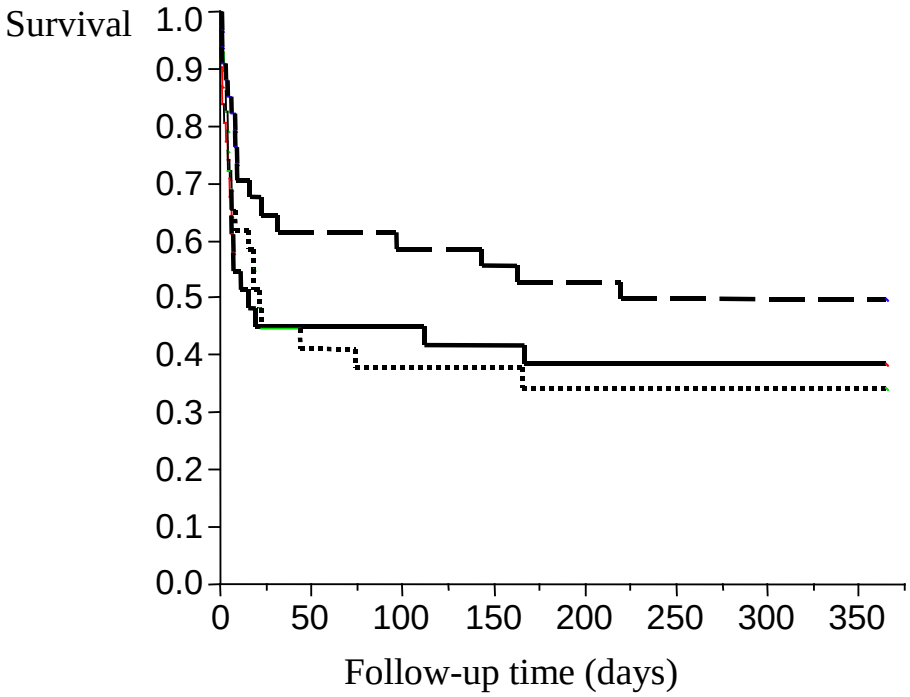


Figure 2. One-year survival by type of ILD after ICU admission



Dash line, other forms of chronic interstitial lung diseases; continuous line, Non-idiopathic pulmonary fibrosis idiopathic interstitial pneumonias, dotted line, idiopathic pulmonary fibrosis. Log-Rank, p=0.315.