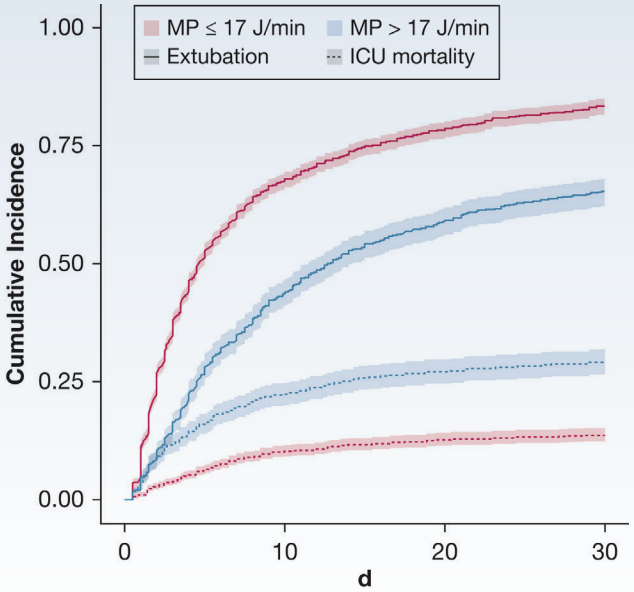
Mortality in Relation to Mechanical Power in the First 24 Hours of Mechanical Ventilation in Patients With Hypoxemic Respiratory Failure

STUDY DESIGN

- Multicenter registry cohort study of 9,031 patients with hypoxemic respiratory failure requiring invasive mechanical ventilation within 24 hours
- Inclusion if positive end-expiratory pressure (PEEP) ≥ 5 cm H_2O and Pao_2:FIo_2 ≤ 300 or Spo_2:FIo_2 ≤ 315
- Mechanical power (MP) calculated as RR (respiratory rate) x V_T (tidal volume) x (P_{peak} - [ΔP_{dyn}]/2) x 0.098 where ΔP_{dyn} = (P_{peak}) - PEEP

RESULTS



MP of > 7.21 J/min (95% CI, 6.20-29.35 J/min) was associated with a change in the association with ICU mortality.

- Severity of lung injury did not modify the association between high MP and ICU mortality.
- High MP, calculated using driving pressure, was associated with a significantly increased ICU mortality (OR, 1.31; 95% CI, 1.12-1.50).

This study suggests that mechanical power can be used as a clinically relevant variable that is associated with ICU mortality in the course of mechanical ventilation for patients with hypoxemic respiratory failure.

von Düring S, et al. *CHEST* October 2025 | @journal_CHEST | https://doi.org/10.1016/j.chest.2025.03.012