

Post-Discharge Health Resource Use in Pediatric Survivors of Prolonged Mechanical Ventilation for Acute Respiratory Disease

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Background

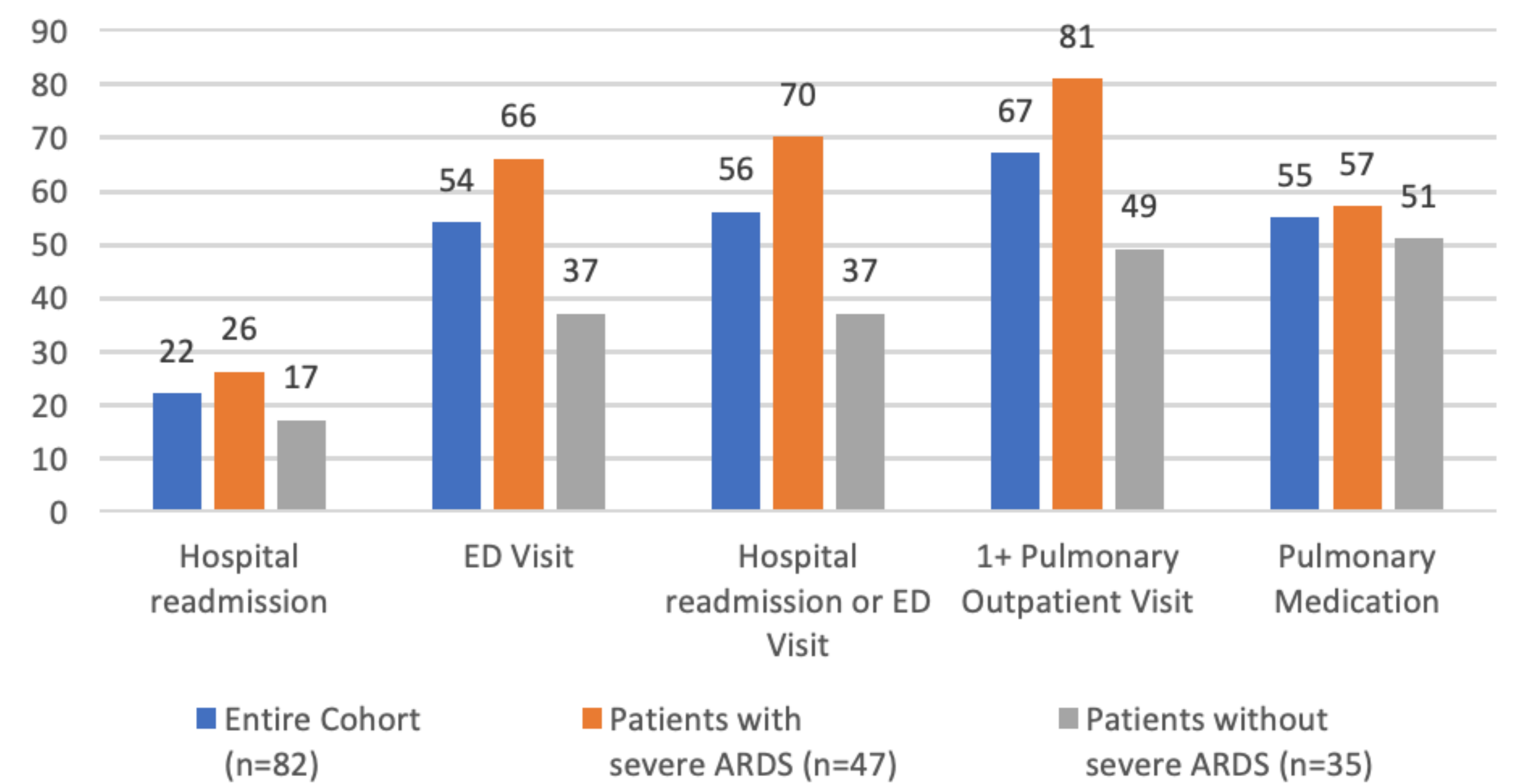
- Respiratory failure remains one of the most common reasons for children to be admitted into the pediatric intensive care unit (PICU).
- Intubation and prolonged mechanical ventilation expose children to risks related to ventilator associated lung injury, sedation, and immobility.
- It is poorly understood what long-term effects children face following survival of acute respiratory disease.
- The objective of this study was to characterize hospitalization and emergency department [ED] visits during the post-discharge year and identify risk factors associated with these health care visits.

Methods

- **Study design:** Retrospective cohort study
- **Patients:** Critically ill children admitted to the Children’s Hospital of Colorado (CHOC) PICU on or after January 1, 2013 and discharged before January 1, 2017
- **Inclusion Criteria:** Required mechanical ventilation ≥ 3 days, did not have tracheostomy prior to admission, survived to discharge, and had post-discharge insurance eligibility in the Colorado All Payer Claims Database (APCD).
- **Database:** Data collected from our hospital’s Virtual Pediatric Systems (VPS) database
- **Analysis:** Multivariable logistic regression
- **Primary outcomes**
 - Hospital admission and ED visit within one year of discharge
- **Secondary outcomes**
 - Pulmonary outpatient visits
 - Medication prescription use

Results

Percent of cohort and sub-cohorts who experienced a hospital readmission, ED visit, outpatient pulmonary visit, or had a pulmonary medication filled during post-discharge year



- * ED visit: $p = 0.02$
- * Hospital admission or ED visit: $p < 0.01$
- * Pulmonary outpatient visit: $p < 0.01$

Multi-variable model to identify risk factors for hospital readmission or ED visit during post-discharge year

Predictor of Health Care Visit	Odds Ratio (95% CI)
Duration of mechanical ventilation (per day)	0.99 (0.87, 1.11)
Age (per month)	1.06 (0.98, 1.41)
Duration of ARDS (per day)	0.95 (0.76, 1.18)
Severe ARDS (reference: patients without severe ARDS)	5.53 (1.79, 19.09)

Discussion

- Children who survive prolonged mechanical ventilation for respiratory disease experience high rates of post-discharge health resource use, particularly those surviving severe ARDS.
- During the post-discharge year, one in four patients experienced a hospital readmission, more than half of the patients had an ED visit, and more than half of the patients filled a prescription for a pulmonary medication.
- Severe ARDS was independently associated with a 5.53-fold increased risk of readmission or ED visit compared with patients without severe ARDS.
- Study strength includes use of insurance data to reduce systemic bias associated with loss to follow-up.
- Limitations include small sample size and use of Berlin ARDS definition rather than the more contemporary Pediatric Acute Lung Injury Consensus Conference definition.

Implications

- Pediatric patients, particularly those surviving severe ARDS, are at high risk for persistent pulmonary impairments and unplanned post-discharge healthcare needs.
- Consistent follow-up for these patients is vital to mitigating long-term consequences of severe respiratory disease.

Disclosures

- None