



# Research Week 2023

## Applying user-centered design in the development of an ICU triage intervention for patients presenting to the emergency department with acute respiratory failure

Allison Young, BA, Sara Golden, PhD, MPH, Scott Warner, MD, Anaïs Tuepker, PhD, MPH, Christopher Slatore, MD, MS, Kelly Vranas, MD, MCR, Oregon Health & Science University

### Keywords

User-centered design, acute respiratory failure, healthcare delivery intervention, ICU utilization, triage

### Abstract

#### Background

Substantial variability exists in the use of critical care for patients with acute respiratory failure (ARF), suggesting a knowledge gap about when and how to best use the ICU. User-centered design (UCD) methodology- a systematic approach that prioritizes the needs of service end-users and involves multidisciplinary teams to develop and rapidly iterate novel, feasible solutions- is a potential approach to develop innovative care delivery processes that improve the quality and efficiency of care for patients with ARF.

#### Methods

At a single VA medical center, investigators created a stakeholder taskforce including physicians, nurses, and respiratory therapists (RTs) serving in clinical and administrative roles across the emergency department (ED), ICU, and acute care wards. Through a series of four meetings, we applied UCD to create a process map depicting the current process of triage for ARF patients, identify barriers and facilitators to the delivery of safe and efficient care, and develop a system-level intervention to guide ICU utilization for ARF patients. Investigators used inductive thematic analyses for qualitative analyses between meetings.

#### Results

The taskforce included ten participants (four nurses, four physicians, and two RTs). We identified three domains of hospital-level factors that influence ICU admitting decisions for patients with ARF: (1) hospital structure and organization; (2) available resources; and

(3) staff interactions. These results informed the creation of a system-level intervention that includes: a) creating explicit ICU admission criteria and assigning levels of care to patients based on their clinical needs at the time of admission; b) geographically cohorting patients with shared needs; and c) re-engineering rapid response teams to proactively follow borderline patients outside the ICU.

## Conclusion

UCD is a promising methodology to develop innovative interventions designed to improve the quality and efficiency of the critical care delivery system for patients with ARF.