

Electronic pneumonia decision support helps reduce mortality by 38% in community hospitals

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A real-time electronic decision support system helped clinicians at community hospitals provide best practice care for emergency

department patients with pneumonia, resulting in decreased intensive care unit admission, more appropriate antibiotic use, and 38% lower overall mortality according to a new study by researchers at Intermountain Healthcare in Salt Lake City.

Results of the study are published today in the *American Journal of Respiratory and Critical Care Medicine*.

"Treating pneumonia in emergency departments is challenging, especially in community hospitals that don't see severe pneumonia as often as urban academic medical centers," said Nathan Dean, MD, section chief of pulmonary and critical care medicine at Intermountain Medical Center and principal investigator of this study.

Pneumonia was the leading cause of death from [infectious diseases](#) in the United States, even before the COVID-19 pandemic, and continues to be a leading cause of death.

In the study, researchers at Intermountain Healthcare deployed the health system's electronic, open loop, clinical decision support (ePNa) system to 16 of its community hospitals between December 2017 to June 2019.

In that time, those hospitals had 6,848 pneumonia cases, and ePNa was used by a bedside clinician in 67% of eligible patients.

The Intermountain decision support tool gathers key patient indicators including age, fever, [oxygen saturation](#), laboratory and chest imaging results, and vital signs to make recommendations on care, including appropriate antibiotic therapy, microbiology studies, and care setting recommendations (i.e., whether a patient should be sent to the ICU, admitted to the [hospital](#), or is safe to go home).

Using the tool, Intermountain researchers found a range of positive

outcomes for patients, including:

- 38% relative reduction in mortality 30 days after being diagnosed with pneumonia, with the largest reduction in mortality in patients admitted directly from the emergency department to the ICU
- 17% increase in outpatient disposition
- decreased intensive care unit admission without safety concerns
- lowered mean time from emergency department admission to start of first antibiotic

Researchers say results of the study are consistent with a prior study deploying ePNa in Intermountain's larger hospitals.

"In giving clinicians a real-time assessment tool that pulls together over 50 factors that can determine how a patient will do with pneumonia, our study found that clinicians were able to make better treatment decisions with this resource," noted Dr. Dean. "Some of our [community hospitals](#) have as little as 20 beds. We wanted to validate the effectiveness of ePNa in very different healthcare settings."

During the time of this study, U.S. News and World Report also ranked Intermountain as high performing in pneumonia care with excellent outcomes.

Dr. Dean added that not only did ePNa make recommendations that helped clinicians, but it also enabled clinicians to be more structured and consistent in making decisions about patients with [pneumonia](#).

"Even if they don't follow the recommendation, decision-making is more consistent with best practices," he said.

For example, ePNa might recommend a patient be admitted to the

intensive care unit, but a [clinician](#) knows that it's not the right care setting for an elderly, stage IV cancer patient.

More information: Nathan C Dean et al, A Pragmatic Stepped-wedge, Cluster-controlled Trial of Real-time Pneumonia Clinical Decision Support, *American Journal of Respiratory and Critical Care Medicine* (2022). [DOI: 10.1164/rccm.202109-2092OC](https://doi.org/10.1164/rccm.202109-2092OC)

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