

## Which deteriorating ward patients benefit most from ICU transfer?



A cohort study of deteriorating ward patients who were transferred to intensive care unit found that the benefits of ICU care may increase among patients at high levels of baseline physiological severity across different age groups, especially among elderly patients.

The study used a person-centred instrumental variable (IV) approach to evaluate estimates of treatment effect of ICU transfer and mortality according to age and physiological severity alone and in combination. Results showed an increased risk reduction in 28-day mortality in patients transferred to ICU who were older than 75 years and had greater illness severity (National Early Warning Scores >6).

A major challenge in generating evidence to support clinical decision-making is that the gains from ICU care may differ according to unmeasured characteristics, such as frailty, which may also determine whether or not the patient is transferred to the ICU. Previous studies have not recognised that the effectiveness of ICU care may differ according to unmeasured patient-level factors.

A new method for fully examining heterogeneity that addresses confounding by indication reports person-centred treatment (PeT) effects. This method uses insights about how clinicians select interventions according to the anticipated health gain for each patient to provide individual level estimates of treatment effectiveness.

The present study was conducted at 49 UK National Health Service hospitals. Participants were 9,192 deteriorating ward patients assessed for ICU transfer (4,596 matched pairs). The primary outcome was mortality up to 28 days after ICU assessment. To address unobserved confounding, ICU bed availability was the IV for whether or not a patient was transferred.

Both comparison groups included 4,596 patients. In the group assessed with “many” ICU beds available (median, 7), 52.8% were male, and the mean (SD) age was 65.2 (17.7) years; in the group assessed with “few” ICU beds available (median, 2), 53.3% were male, and the mean (SD) age was 65.0 (17.3) years. The overall 28-day mortality estimates were 23.2% (2,090 predicted deaths) if all of the matched patients were transferred vs. 28.1% (2,534 predicted deaths) if none of the matched patients were transferred, an estimated risk difference of -4.9% (95% CI, -26.4% to 16.6%).

Meanwhile, the estimated effects of ICU transfer differed by age and by physiological severity according to the National Early Warning Score (NEWS): the absolute risk differences in 28-day mortality after ICU transfer ranged from 7.7% (95% CI, -5.5% to 21.0%) for ages 18 to 23 years to -5.0% (95% CI -26.5% to 16.6%) for age 78 to 83 years and ranged from 3.7% (95% CI, -12.1% to 19.5%) for NEWS of 0 to -25.4% (95% CI, -50.6% to -0.2%) for NEWS of 19.

This is the first study to evaluate ICU transfer with an IV method that simultaneously recognises patient heterogeneity and addresses confounding by indication. This patient-centred approach suggests that age and physiological severity act in synergy to predict the likely benefits and harms from ICU care for individual patients. This approach can help improve clinical outcomes from limited ICU capacity by informing decisions about triage for ICU care and can inform moves to personalise clinical decision-making more widely.

Source: [JAMA Network Open](#)

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Published on : Wed, 20 Feb 2019