

ratio of those nurses in their finding, which we think provides some but limited evidence on effective staffing interventions. For instance, beyond being cared for by more high-betweenness nurses, a patient with low mortality risk can also be cared for by more low-betweenness nurses. Moving forward, we believe that a study focusing on the percentages (percent of core and high-betweenness nurses of all nurses caring for a patient), instead of the raw numbers, can supply more comprehensive suggestions to ICU staffing. ■

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## Reply to Chen et al.

From the Authors:

Thank you to Dr. Chen and colleagues for their thoughtful letter in response to our recent paper “The Structure of

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Critical Care Nursing Teams and Patient Outcomes: A Network Analysis” (1). We conducted an exploratory, hypothesis-generating study using network analysis methods to more deeply understand and examine ICU nurse staffing. We very much appreciate Dr. Chen and colleagues’ helpful comments to further advance the field of network science in health care.

We acknowledge the potential limitations of defining a connection between nurses if they provided direct care for the same patient during the patient’s ICU stay. Defining a connection among clinicians as to whether they shared the same patient is the most commonly used approach in healthcare network analyses (2–5). Nonetheless, we agree that defining connections this way may be problematic when patients have prolonged ICU stays (i.e., 30 d or more). However, in our sample, the mean length of stay was 4.7 days (SD, 6.8), indicating that the majority of our patient sample had ICU stays of 11 days or less, and that prolonged ICU stays are less of a concern in our sample. In other studies in which patients have prolonged ICU stays, considering alternative definitions of a connection between healthcare clinicians, such as whether a nurse handed off a patient to another nurse, might be a possible way to measure connections among clinicians. Additionally, in our study, an average patient was cared for by only seven different nurses, further ameliorating the concern that our measure may not be sufficiently discriminative. Our sociogram also demonstrates that there is enough variability in the coreness and betweenness measures to identify significant associations with outcomes of interest.

The authors rightfully point out the possibility of a selection bias from nonrandom assignment of nurses to patients in our work. This bias is a limitation in all cross-sectional analyses of healthcare variables and patient outcomes. However, among all the selection bias present in healthcare studies, nurse-to-patient assignment bias has been least likely to occur. Previous studies by our team and others show that nurse assignments are based on staffing availability, patient case-mix, and other unit-level factors (6, 7) and are near random at the patient level (8). In addition, in studies by our team, when nurse assignments were nonrandom, better-prepared, qualified nurses tended to be assigned to sicker patients (8)—a negative bias that works to weaken the results of our findings. However, we agree that unobserved selection could be confounding our findings, particularly considering the exploratory nature of our study; we acknowledged unobserved selection bias in our limitations section (1). In addition, we are unable to adjust or account for patient acuity measures, such as the Acute Physiology and Chronic Health Evaluation score (9), and therefore we are unfortunately unable to examine mortality risk and nurse network positions, as suggested by Chen and colleagues.

Lastly, we favored modeling the exposure variable as the number of core and high-betweenness nurses in a patient’s care team instead of a percentage as suggested by Chen and colleagues. We chose to measure the number of core and high-betweenness nurses because a percentage measure is calculated as a ratio of two variables (percentage core nurses = number of core nurses over the total number of nurses); both of these variables are stochastic (or random) and both are collinear with ICU length of stay. Including a stochastic variable nonlinearly (e.g., as a denominator of another stochastic variable) could bias the model.

We thank Dr. Chen and colleagues for their thoughtful comments, and we agree that future work should further examine and study the intricacies of ICU nurse staffing and its implications to patient care and outcomes. ■

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## Erratum: Telemedicine-enabled Accelerated Discharge of Patients Hospitalized with COVID-19 to Isolation in Repurposed Hotel Rooms



There is an error in the article by Bruni and colleagues, published in the August 15, 2020, issue of the *Journal*. On the bottom of the first page there is a missing sentence at the end of the third footnote paragraph. This sentence should read: “Telemetry software provided by Vree Health Italia, Rome, Italy.” ■

## Reference

- Bruni T, Lalvani A, Richeldi L. Telemedicine-enabled accelerated discharge of patients hospitalized with COVID-19 to isolation

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