


Response to: Long-Term Mortality in Patients Transferred by Emergency Medical Services: Prospective Cohort Study

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Abbreviations:

EMS: Emergency Medical Services
POCT: point-of-care test

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To the Editor,

We are writing in response regarding the article “*Long-Term Mortality in Patients Transferred by Emergency Medical Services: Prospective Cohort Study*.”¹ We have read the study with interest and would like to offer the following commentary.

We would first like to address the primary outcome of this study, which was one-year all-cause mortality for patients transferred to hospital by Emergency Medical Services (EMS). We believe that the association being made between the mere presence of multiple different pathologies and a series of point-of-care tests (POCTs) is spurious. Data to support the prediction of short-term clinical outcomes using EMS data are weak.^{2–4} The prediction of long-term outcomes using those same data, which the authors attempt, is even more challenging. This is further compounded by confounders such as multiple hypothesis testing, non-modifiable risk factors, differential resource allocation based on response to initial therapy, and goals of care which may not be evident on initial presentation. We believe that the implication that one transport event’s prehospital parameters are associated with all-cause one-year mortality despite being marred with significant confounders is a dubious link to make.

The authors explain a data collection method where Advanced Life Support (ALS) teams comprised of nurses, emergency medical technicians, and a physician, whose specialty is not identified, selected patients for hospital transfer. How patients were assigned to hospital transfer remains unclear to us. This may have introduced a degree of selection bias. Additionally, the transport to a variety of facilities, four academic hospitals and one community, acts as a confounder given that these centers have different patient populations, resources, and access to specialists, likely affecting mortality outcomes.^{5–7}

There was no identification of specific pathologies making the assessment of one-year mortality based on different diseases difficult. Moreover, the decision to apply expansive, non-mutually exclusive disease categories such as “infection,” “neurological,” and “circulatory” makes detailed exploration of these parameters impossible. Were these categories determined upon presentation, or at discharge? Who was responsible for the determination? How were ambiguous cases adjudicated? Furthermore, POCT markers were collected, and despite being statistically significant between survival and death groups, no clinical significance can be observed between most markers as they were within physiological normal standards. The authors not only fail to address this, but go so far as to conclude that statistical significance equates clinical significance. We appreciate that the authors attempted to use the Charles Comorbidity Index to account for different baseline comorbidities but wonder about the amount of missing data after initial EMS assessment (eg, presence of diabetes, chronic obstructive pulmonary disease, or congestive heart failure) and how they accounted for this in their analysis.

While we agree with the intuitive conclusion that patients residing in nursing homes are more likely to succumb to death following a critical illness, we question how the data the authors present led them to such conclusions. No evidence was provided regarding if patients were living in a nursing home prior to transfer, if nursing homes were independent living facilities or care homes for fully dependent individuals, the age of the residents, nor



their co-morbid conditions. This dearth of information acts as a confounder, making the data-driven association between mortality and nursing homes unreliable.

Overall, we question the validity of the primary outcome. The conclusions stemming from this research are heuristically achievable (ie, individuals who are sicker at a certain point in time are more likely to die sooner). It is unclear to us how these

conclusions would ultimately affect in-hospital patient care for a particular transport event given the myriad of non-modifiable risk factors. Although the authors' ultimate and admirable goal was to have these data potentially influence policy for long-term health care resource allocation to patients, unreliable associations based on overly-ambitious end goals make this improbable.

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