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### Hospitalization Rates Before and After Palliative Care Utilization for Heart Failure Patients (from a Nationwide Sample)



Despite the advancement in heart failure (HF) management, HF remains a progressive disease with substantial morbidity, mortality and considerable burden on the health care system.<sup>1</sup> Palliative care (PC) is an under-utilized, nonpharmacological modality that improves quality of life for HF patients and their families.<sup>2</sup> Previous studies

showed a potential reduction in the hospitalization rates with integration of PC; however, the rates remain relatively high (~30%) over 6 months.<sup>2</sup> To better understand the effect of PC on hospitalizations and to put these readmissions into context, we queried the Nationwide Readmission Database (NRD) to explore the change in hospitalizations before and after PC, instead of only focusing on the post discharge readmissions only.

NRD is a publicly available, de-identified, discharge level data from 28 States, and accounts for 58.7% of United States hospitalizations.<sup>3</sup> We analyzed hospitalizations from 2010-2018 using ICD-9/10-codes to identify patients who had PC encounters (V66.7 / Z51.5) during hospitalizations with a primary diagnosis of acute on chronic HF (428.23, 428.33, 428.43 / I50.23, I50.33, I50.43, and I50.813).<sup>4</sup> We excluded patients who died during index admission, or admissions during January-March or October-December to ensure 90-day follow up since the NRD data do not cross the calendar year.<sup>5</sup> The primary outcome was the change in 90-day all-cause hospitalization rate before and after PC. The secondary outcomes were: (1) change in 90-day HF and non-HF hospitalization rates; (2) monthly hospitalization rates before and after PC; and (3) the annual trends of 90-day hospitalization rates before and after PC over the study period. McNemar's test was used to explore the hospitalization rates before and after index admission and a linear-by-linear test was used for the trend analysis over the study period. A p-value of <0.05 was considered statistically significant. This analysis was exempted by the Institutional Review Board as the NRD data are de-identified.

A final analytic cohort of 25,127 admissions were included with a median age of 83 (IQR 67 to 99) years, 51.9% women, and a median length of stay 6 (IQR 1-12) days. Over the 90-day period before and after index admission with a PC encounter, the hospitalization rate for all-cause hospitalization decreased from 56.3% to 22.2% (relative reduction 60.5%, p <0.001), HF-related hospitalization rate decreased from 25.0% to 9.3% (relative reduction 62.8%, p <0.001), and non-HF hospitalization rate changed from 41.3% to 16.0% (relative reduction 61.2%, p <0.001). The 30-day

time frame analysis showed a significant drop in hospitalization rates just after PC encounters, and continued to decrease over time (*Panel A*). The annual trends for 90-day all-cause hospitalization rates before PC encounters showed a significant reduction over time (59.7% in 2010 to 53.3% in 2018,  $p < 0.001$ ), but hospitalization rates after PC remained stable over the study period (*Panel B*).

In this observational nationwide analysis of over 25,000 acute on chronic HF admissions, PC encounters were associated with a significant reduction in all-cause, HF-specific, and non-HF 90-day hospitalization rates. This reduction was noted immediately after discharge from the index admission with a PC encounter. Hospitalization rates before PC utilization decreased over the study period perhaps due to the early recognition of value of PC among these sick patients.

This study is limited by the nature of this administrative database which carries a risk of mis- or under-coding. Additionally, we could not identify patients who died after hospital discharge. Some of the reduction in readmission may be due to this factor. However, it is unlikely that death would

account for the entire decrease in admission rates after a hospital PC consultation, since not all patients seen by PC physicians are appropriate for hospice or accept a palliative approach to care, and the previously reported post-HF discharge 30-day mortality rate  $\sim 7\%$  (1). Moreover, the philosophical change of care to a palliative approach encourages a decrease in low-value health care utilization such as repeat hospital admissions at the end of life. In summary, we found that patients who received a PC encounter during a hospitalization had a reduction in subsequent readmission rates. Further studies should assess the competing risk of death in this population.

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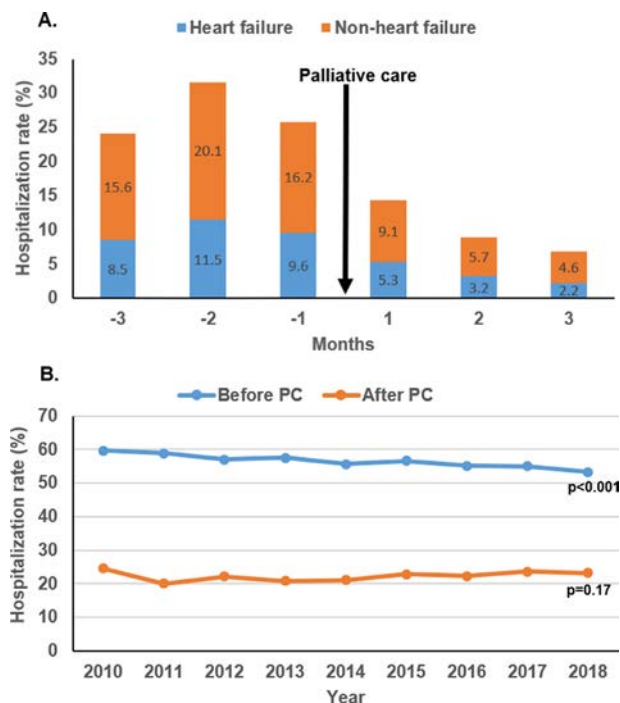


Figure. *Panel A*, Monthly heart failure and non-heart failure hospitalization rates before and after palliative care encounters. *Panel B*, Annual trends of all-cause 90-day hospitalization rates before and after palliative care encounters. PC=palliative care.

## Meta-analysis of the Effect of Colchicine on Mortality and Mechanical Ventilation in COVID-19



Due to the significant healthcare and economic burdens of the coronavirus disease 2019 (COVID-19) and the lack of effective treatment, repurposing of existing medications based on plausible mechanism of action have been used. Colchicine, an anti-inflammatory medication, has been proposed as a possible treatment option for COVID-19.