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CVD. Psychosocial and biophysical outcomes from telehealth engagements are areas for further investigation.

Research

P013. BNP as a Predictor of Diuretic Nonadherence in 30-Day Heart Failure Readmissions

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Background: Diuretic treatment effectively treats heart failure (HF), lowers brain natriuretic peptide (BNP), and can reduce hospital readmissions, yet approximately 50% of HF patients do not take medications as prescribed. Additionally, 25% of HF hospital readmissions are thought to be preventable and associated with imperfect adherence to prescribed medications. One barrier to solving this problem is the lack of an objective marker for identifying or gauging diuretic-taking habits in the HF patient. Better understanding of the impact of imperfect diuretic adherence on BNP provides insight into the significance of taking diuretics as prescribed to 30-day HF readmissions and the usefulness of BNP in identifying patients at-risk for diuretic nonadherence.

Objective: The purpose of this retrospective, exploratory investigation was to examine the association between diuretic nonadherence and BNP in those with a 30-day HF readmission and further explore the usefulness of BNP as an objective marker for diuretic adherence.

Methods: A retrospective review of electronic health records from 10 Texas hospitals between the years of 2014 and 2018 was conducted. We examined the association of nonadherence to BNP with three BNP-related variables: change in BNP from index hospitalization to final readmission, percent change over time, and readmission BNP. We investigated the relationship of each with nonadherence and patient characteristics by performing backwards stepwise logistic regression using Bayesian information criterion (BIC) for model selection. The discrimination ability of these models was evaluated by calculating area under the curves (AUCs) and testing for differences among them with the DeLong method.

Results: Of the study sample (N=405), the medical records of 124 (31%) patients explicitly documented diuretic nonadherence at readmission. In final BIC-selected logistic regression models for predicting nonadherence in patients with a 30-day HF readmission, BNP-related variables were the only remaining predictors and were significantly associated with nonadherence; other variables concerning patient characteristics were excluded. The discrimination ability of these models was fairly high (between 0.64 and 0.67), and none had a significantly superior AUC than the others.

Conclusions: Results suggest that variables relating to patient characteristics are not as important as those relating to BNP for predicting diuretic nonadherence. Additionally, more investigation is warranted to determine if one of the three BNP-related variables we considered is a superior objective marker of diuretic nonadherence. BNP could be useful in identifying patients at risk for diuretic nonadherence and a hospital readmission. Since medication-taking habits are modifiable, finding new ways to gauge diuretic adherence could reduce hospital readmissions and improve HF outcomes.
Of the 126 COVID-19 inpatients who had a CE, 14.3% had cardiac arrhythmias and 8.7% had new onset of HF diagnoses, and 4.8% had acute myocardial infarctions.

**Conclusion:** Multiple risk factors for CEs and death were identified in this sample of hospitalized patients with COVID-19, and mortality was increased significantly in those inpatients who had CEs. HF, cardiac arrhythmia, and acute myocardial infarction were the most frequently cited CEs implicating the need for long-term follow-up.

### Table 1

**Demographics, comorbidities, and laboratory biomarkers of COVID-19 patients with and without cardiovascular events for the entire study cohort.** P-values for continuous variables were obtained using Mann-Whitney U test, and P-values for categorical variables were obtained using Chi-square test or Fisher’s exact test indicated by *.

| Variables                      | Cases without CV (N=574) | Cases with CV (N=126) | P-values |
|-------------------------------|--------------------------|-----------------------|----------|
| **Death**                     | 50 (8.7%)                | 57 (45.2%)            | <0.001   |
| **LOS for survivors** (Days)  | 5 (3,11)                 | 9 (6,18)              | <0.001   |
| **Days to mortality for non-survivors** (Days) (IQR)* | 8(5,11) | 106(15) | 0.088 |

#### Demographics

**Morphometrics**

| Age (years) | 57.8±19.37 | 66.8±15.2 | <0.001 |
| Female      | 310 (57.5%) | 54 (42.9%) | 0.004  |
| Male        | 244 (42.5%) | 30 (23.8%) | <0.001 |
| Hispanic    | 279 (14.8%) | 43 (3.2%) | <0.001 |
| Non-Hispanic black | 179 (31.2%) | 41 (32.5%) | 0.001  |
| Non-Hispanic white | 267 (46.5%) | 76 (60.3%) | <0.001 |
| Non-Hispanic other | 51 (9.9%) | 5 (4.0%) | 0.001  |

#### Comorbidities

| Pulmonary comorbidity count | 256 (44.6%) | 80 (63.5%) | <0.001 |
| Cardiovascular comorbidity count | 0 | 236 (41.1%) | 22 (17.5%) | <0.001 |
| Cardiovascular comorbidity count | 1 | 125 (21.8%) | 21 (16.7%) | 0.001  |
| Cardiovascular comorbidity count | 2-4 | 178 (31.0%) | 63 (50.0%) | <0.001 |
| Renal disease count | 35 (6.1%) | 20 (15.9%) | <0.001 |
| Renal disease count | 86 (15.0%) | 39 (31.0%) | <0.001 |
| Renal disease count | 48 (8.4%) | 25 (19.8%) | <0.001 |
| Renal disease count | 38 (6.6%) | 14 (11.1%) | 0.001  |
| Renal disease count | 164 (28.6%) | 60 (47.6%) | <0.001 |
| Renal disease count | 47 (8.2%) | 20 (15.9%) | 0.013  |
| Renal disease count | 0 | 527 (91.8%) | 106 (84.1%) | 0.026  |
| Renal disease count | 1 | 39 (6.8%) | 17 (13.3%) | <0.001 |
| Renal disease count | 2 | 8 (1.4%) | 3 (2.4%) | <0.001 |

#### Laboratory Tests

| AST/ALT Ratio | 1.5±0.77 | 1.7±0.83 | 0.003  |
| Neutrophil/lymphocyte Ratio | 6.4±7.69 | 9±10.74 | <0.001 |
| SaO2/FiO2 ratio | 382.1±105.22 | 282.4±136.89 | <0.001 |
| WBC (10^3/mm^3) | 7.4±4.43 | 8.6±5.72 | 0.026  |
| Neutrophil percentage | 71.5±13.33 | 75.4±14.24 | 0.002  |
| Lymphocyte percentage | 18.5±10.75 | 15.2±10.3 | 0.001  |
| Neutrophil (10^3/mm^3) | 7.8±13.03 | 8±9.63 | 0.013  |
| Lymphocyte (10^3/mm^3) | 1.7±3.3 | 1.5±2.92 | 0.001  |
| Serum potassium (mmol/liter) | 3.8±0.62 | 4.1±0.73 | <0.001 |

#indicates that median and interquartile range were reported.

**Figure 1.** Kaplan–Meier survival probability estimates for hospitalized COVID-19 patients stratified with or without cardiovascular events for entire cohort (Panel A), African Americans patients (Panel B) and White patients (Panel C), respectively.

### Practice Improvement

**OR4. Emphasis on Post-Acute Care Shows Improved Guideline Adherence in Three Metro Markets**

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**Background:** Nearly 6.5 million Americans are living with heart failure. Heart failure remains a leading cause of hospital admission and contribution to healthcare expenditure. It is projected that by the year 2030, the total cost of heart failure will increase by 127%. Participation in a quality improvement initiative aimed at improving adherence to evidenced based guidelines can assist in reducing cost and improving patient outcomes. While hospital participation in an in-