| Table J-22. Studies evaluating independent predictive value of NT-proBNP for the composite outcome of all-cause mortality and cardiovascular morbidity—admission and discharge (all time periods) in patients with decompensated heart failure | | | | | | | | |
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| **Author**  **Year** | **Study Design**  **Population** | **n**  **Mean Age (SD)**  **% male** | **BNP Levels (pg/ml)** | **Prognostic Markers** | **Followup**  **Outcomes**  **(#events, #risk)** | **Model** | **Adjusted/Non-adjusted Covariates** | **Measure(s) of Risk**  **(95% CI,)** |
| van Kimmenade50  2006  PRIDE | Cohort  patients admitted with AHF | n=209  mean age:  72.8y (13.6)  51% male | ADM mean:  dead= 9,332 (3,864–15,717)\*\*  alive= 3,511 (1,610–9,541)\*\*  D/C mean: NR  Cutpoint: NR | Log NT-proBNP\*, Log galectin-3, Glomerular filtration rate\*, NYHA functional classification\*, age | 2 months  composite (all-cause mortality / recurrent HF)  (77, 209) | multivariable logistic regression | Log galectin-3, Glomerular filtration rate, NYHA functional classification, age | ADM: OR = 2.92 (0.53–9.11), p=0.42 |
| Metra70  2007 | Cohort  patients with AHF admitted to hospital | n=107  mean age:  survivors= 66y (13)  dead= 68y (10)  92% male | ADM mean: 4,421 (1,621 – 8,536)\*\*  D/C mean: 2,779 (967 – 6,392)\*\*  Cutpoint: ≥3,000 | NT-proBNP at D/C, cTnT, NYHA class | 184 days\*\*  composite (all-cause mortality or CV hospitalization)  (52, 107) | multivariable Cox regression | Age, gender, BMI, SBP, HR, LVEF, sodium, cTnT, NYHA class | D/C: HR = 3.88 (3.25 - 4.52) |
| Perna48  2006 | Cohort  decompensated HF patients | n=76  mean age:  62.3y (15)  71% male | ADM mean: 6,234 (7,420)  D/C mean: 5,146 (7,069)  Cutpoint: >3,700 | NT-proBNP at ADM, cTnT, SBP, HR, blood urea, previous hospitalization, LVEF | 252 days  composite (all-cause mortality or HF re-hospitalizations  (30, 76) | multi-variable cox regression | cTnT, SBP, HR, blood urea, previous hospitalization, LVEF | ADM: HR= 5.1 (2.3, 12.2), p<0.0001 |
| ADM mean: 6,234 (7,420)  D/C mean:  5,146 (7,069)  Cutpoint: >3,700 | NT-proBNP at ADM, NT-proBNP D/C, cTnT, SBP, HR, blood urea, previous hospitalization, LVEF | 252 days  composite (all-cause mortality or HF re-hospitalizations  (30, 76) | multi-variable cox regression | NT-proBNP D/C, cTnT, SBP, HR, blood urea, previous hospitalization, LVEF | ADM: HR= 5.0 (2.3, 11.2), p<0.0001 |
| Fernández64  2009 | Cohort  patients hospitalized for acute HF | n=138  mean age:  74y (67 - 80)\*\*  54% male | ADM mean:  Tertile 1= 2,358 (1,359–3,853)\*\*  Tertile 2= 3,571 (1,680–7,597)\*\*  Tertile 3= 5,255 (2,968–14,543)\*\*  D/C mean: NR  Cutpoint: per 100 pg/dl | NT-proBNP, age, hyperlipidemia, NYHA class, DM, previous MI, anemia, cTnT, cystatin C, creatinine, MDRD | 261 days\*\*  composite (all-cause mortality or HF re-ADM  (60, 138) | multi-variable cox regression | age, hyperlipidemia, NYHA class, DM, previous MI, anemia, cTnT, cystatin C, creatinine, MDRD | ADM: HR=1.004 (1.001, 1.007) per 100 pg/dl |

| Table J-22. Studies evaluating independent predictive value of NT-proBNP for the composite outcome of all-cause mortality and cardiovascular morbidity—admission and discharge (all time periods) in patients with decompensated heart failure (continued) | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author**  **Year** | **Study Design**  **Population** | **n**  **Mean Age (SD)**  **% male** | **BNP Levels (pg/ml)** | **Prognostic Markers** | **Followup**  **Outcomes**  **(#events, #risk)** | **Model** | **Adjusted/Non-adjusted Covariates** | **Measure(s) of Risk**  **(95% CI,)** |
| Korewicki77  2011 | Cohort  Severe chronic HF in patients considered for heart transplantation | n=983  mean age:  49.38y (11.2)  87.8% male | ADM mean: 2,294.5  (28.0-46,128)  D/C mean: NR  Cutpoint: ≥ 4,302 pg/mL | NT-proBNP, NYHA class, HFSS, BMI, hs-CRP, PCWP, PASP, SBP | 601 days\*\*  composite (all-cause mortality or Heart transplantation  (164, 983) | multi-variable cox regression | Left atrial volume index, Pulmonary artery systolic pressure, E/E ratio | ADM: HR= 1.600 (1.074, 2.385), p<0.0001 |

\*\*median

**Abbreviations:** ADM = admission; AF = atrial fibrillation; BMI = body mass index; CRP = C-reactive protein; cTnT = cardiac troponin T; D/C = discharge; DM = diabetes mellitus; EF = ejection fraction; HF = heart failure; HFSS = Heart Failure Survival Score; HR = heart rate; hsCRP = high-sensitivity c-reactive protein; LV = left ventricular; MDRD = Modification of Diet in Renal Disease formula; MI = myocardial infarction; NR=not reported; NT-proBNP = N-terminal pro-B-type natriuretic peptide; NYHA = New York Heart Association; PASP = pulmonary artery systolic pressure; PCWP = pulmocapillary wedge pressure; SBP = systolic blood pressure; yrs=years