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| Table J-44. Surgical studies evaluating independent predictive value of NT-proBNP for the outcome of mortality | | | | | | | | |
| **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,)** |
| Assmus,190  2007  Multi-subs: TOPCARE-CHD, crossover trials and ongoing registry | Cohort  Patients with chronic ischemic heart disease, MI≥3 months | n=121  mean age: 62(10)y  87% male | ADM mean: 42-55,456\*\*\*  D/C mean: NR  Cutpoint: NR | NT-proBNP baseline (log), age\*, systolic BP\*, diabetes\*, creatinine, NYHA\*, MR\*, LVEF\*, baseline NT-proANP\* | 577(422) days  Mortality (14,121) | multivariate cox regression, stepwise linear regression with a forward entry-stepping algorithm | age, systolic BP, diabetes, creatinine, NYHA, MR, LVEF, baseline NT-proANP | HR=7.2 (2.4-22.2) |
| Berger,191  2009  CARE-HF | RCT  Patients with LVEF 35%, a QRS duration 150 ms or QRS ranging from 120 to 149 ms in addition to echocardiographic criteria for dyssynchrony, and NYHA III or IV despite optimized medical therapy. | n=813 (CRT=409,404 Medical therapy)  mean age:NR  % male: NR | ADM mean: 1,814\*\*(IQR 152-180)  D/C mean: Taken at 3 months but levels not reported  Cutpoint: 1,814\*\*(IQR 152-180) | log NT-pro-BNP, updated from baseline to 3 months values, CRT, age, sex, baseline clinical (etiology, NYHA functional class, heart rate, supine systolic BP, glomerular filtration rate), ECG (QRS duration), and echocardiographic characteristics (EF, MR area, end-systolic volume index, inter-ventricular mechanical delay), baseline medical therapy (use of an angiotensin converting enzyme-inhibitor or an angiotensin receptor blocker, use of a BB) | 37.6\*\*months (IQR 31.5-42.5)  All-cause mortality (228,813) | Cox proportional hazards model | CRT, age, sex, baseline clinical (etiology, NYHA functional class, heart rate, supine systolic BP, glomerular filtration rate), ECG (QRS duration), and echocardiographic characteristics (EF, MR area, end-systolic volume index, inter-ventricular mechanical delay), baseline medical therapy (use of an angiotensin converting enzyme-inhibitor or an angiotensin receptor blocker, use of a BB) | HR=1.56 (1.34-1.82) P<0.001 |

| Table J-44. Surgical studies evaluating independent predictive value of NT-proBNP for the outcome of mortality (continued) | | | | | | | | |
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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,)** |
| Berger,191  2009  CARE-HF  (cont’d) | RCT  Patients with LVEF 35%, a QRS duration 150 ms or QRS ranging  from 120 to 149 ms in addition to echocardiographic criteria for dyssynchrony, and NYHA III or IV despite optimized  medical therapy. | n=813 (CRT=409,404 Medical therapy)  mean age: NR  % male: NR | ADM mean: 1814\*\*(IQR 152-180)  D/C mean: Taken at 3 months but levels not reported  Cutpoint: 1,814\*\*(IQR 152-180) | log NT-pro-BNP, updated from baseline to 3 months values, CRT, age, sex, baseline clinical (etiology, NYHA functional class, heart rate, supine systolic BP, glomerular filtration rate), ECG (QRS duration), and echocardiographic characteristics (EF, MR area, end-systolic volume index, inter-ventricular mechanical delay), baseline medical therapy (use of an angiotensin converting enzyme-inhibitor or an angiotensin receptor blocker, use of a BB) | 37.6\*\*months (IQR31.5-42.5)  Pump failure death (91,813) | Cox proportional hazards model | CRT, age, sex, baseline clinical (etiology, NYHA functional class, heart rate, supine systolic BP, glomerular filtration rate), ECG (QRS duration), and echocardiographic characteristics (EF, MR area, end-systolic volume index, inter-ventricular mechanical delay), baseline medical therapy (use of an angiotensin converting enzyme-inhibitor or an angiotensin receptor blocker, use of a BB) | HR=1.92 (1.58-2.34) P<0.001 |
| 37.6\*\*months (IQR31.5-42.5)  Sudden death (79,813) | Cox proportional hazards model | CRT, age, sex, baseline clinical (etiology, NYHA functional class, heart rate, supine systolic BP, glomerular filtration rate), ECG (QRS duration), and echocardiographic characteristics (EF, MR area, end-systolic volume index, inter-ventricular mechanical delay), baseline medical therapy (use of an angiotensin converting enzyme-inhibitor or an angiotensin receptor blocker, use of a BB) | HR=1.33 (1.11-1.60) P=0.0025 |
| Cleland,192  2008  CARE-HF | Case-series  Patients with moderate or severe symptoms of HF (LVEF <35%) | n=813  “CRT grp” n=409  mean age: 66.5 (59.5–72.5)y\*\*  74.3% male  “Control grp” n=404,  mean age: 66.2 (59.0–71.7)y\*\*  72.5% male | ADM mean: “CRT grp” 1,920 (744–4,288)\*\*, “Control grp” 1,806 (719–3,949)\*\*  D/C mean: NR  Cutpoint: NR | NT-proBNP at 3 months, age\*, LVEF\*, NYHA, ischemic etiology, beta-blockers\*, GFR\*, IVMD, SBP\*, ESVI\*, CRT | 37.6 months\*\*  All-cause mortality (255, 813) | multivariable cox proportional hazard regression | age, LVEF, NYHA, ischemic etiology, beta-blockers, GFR, IVMD, SBP, ESVI | HR = 1.615 (1.411–1.848) |

\*median

**Abbreviations:** ADM = admission; D/C = discharge; BB = betablocker; EF = ejection fraction; GFR = glomerular filtration rate; grp = group; IQR = Interquartile range; LV = left ventricular; MR = mitral regurgitation; NYHA = New York Heart Association; QRS = quick release system; SBP = systolic blood pressure; CRT = cardiac resynchronization therapy;