

## Audioelectric Parameters are Superior to BNP for Detecting Hemodynamic Evidence of Heart Failure

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**Background:** B-type natriuretic peptide (BNP) is frequently used to detect heart failure (HF). However, depending upon the threshold value chosen, using BNP can yield suboptimal sensitivity or specificity for diagnosing HF. We sought to compare the diagnostic performance of BNP at several different threshold values vs. electronically recorded heart sound data.

**Methods:** Within a 4-hour period, we performed cardiac catheterization, echocardiography, BNP measurement, and audioelectric cardiography (Audicor, Inovise Medical, Inc., Portland, OR) on 90 adults. Those with HF were diagnosed by having both LVEDP > 15 mmHg and LVEF < 50%. The Audicor device records and algorithmically interprets simultaneous ECG and heart sound data. The audioelectric parameters used were S3, S4 and the electromechanical activation time (EMAT; the interval from the onset of the Q wave of the ECG to the S1).

**Results:** Of the 90 patients, 68% were male, the mean age was 62±13 years, 29% were diabetic, 80% had hypertension, and 71% had CAD. LVEDP was elevated in 46%, LVEF reduced in 28%, BNP > 100 pg/mL in 58%, while 21% had both elevated LVEDP and reduced LVEF. The table shows the sensitivity, specificity, positive likelihood ratio (PosLR) and the negative likelihood ratio (NegLR) of BNP at 3 cut-points and of the audioelectric parameters for the diagnosing patients with elevated LVEDP and reduced LVEF.

### Diagnostic Test Parameters: Diagnosing Heart Failure Patients with Elevated LVEDP and Reduced LVEF

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Parameter	Sensitivity	Specificity	Positive LR	Negative LR
<b>S3</b>	61%	88%	5.1	0.44
<b>S4</b>	56%	75%	2.2	0.60
<b>EMAT</b>	44%	94%	7.4	0.59
<b>BNP &gt;100 pg/mL</b>	100%	55%	2.2	0
<b>BNP &gt;250 pg/mL</b>	94%	76%	3.9	0.08
<b>BNP &gt;500</b>	59%	91%	6.5	0.45

**Conclusions:** Audioelectric parameters (S3 and EMAT) have better overall performance for detecting decompensated HF than does BNP.

Michaels AD, Marcus GM, Jordan MV, Gerber IL, McKeown BH, Huddleston M, Foster E, Chatterjee K. Audioelectric parameters are superior to BNP for detecting hemodynamic evidence of heart failure. *JACC*. Feb. 2006;47(4)(suppl A):67A. Abstract 986-90.