

Females) in the oldest age groups. **Conclusion:** Use of age- and sex-specific partition values enhances the operating characteristics of BNP for detection of LVSD in the community.

	BNP@75%Spec	Sens/Spec	AUC
Males 45-54 yrs	17 pg/ml	75%/75%	0.88
Females 45-54 yrs	33 pg/ml	ND/75%	ND
Males 55-64 yrs	28 pg/ml	100%/75%	0.94
Females 55-64 yrs	54 pg/ml	100%/75%	0.97
Males 65-74 yrs	68 pg/ml	82%/75%	0.89
Females 65-74 yrs	63 pg/ml	100%/75%	0.90
Males => 75 yrs	174 pg/ml	78%/75%	0.89
Females =>75 yrs	168 pg/ml	75%/75%	0.85

11:15 a.m.

895-4 Utility of Natriuretic Peptides for Detecting Left Ventricular Hypertrophy and Dysfunction: The Framingham Study

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Background: Brain natriuretic peptide (BNP) and N-terminal atrial natriuretic peptide (NT-ANP) have been proposed as screening tests for left ventricular hypertrophy (LVH) and LV dysfunction. However, prior studies were limited by small samples and none compared the diagnostic performance of these peptides in men and women.

Methods: We evaluated 3441 Framingham Study subjects (1823 women; mean age 59 years) who attended a routine exam at which echocardiography was performed, and plasma BNP and NT-ANP estimated. We examined the contribution of peptide levels for detecting LVH, LV dysfunction (fractional shortening [FS]<0.30), and severe LV dysfunction (FS<0.22) by constructing sex-specific ROC curves for each outcome.

Results: The areas under the ROC curve (AUC) for BNP were consistently higher for men compared with women for LVH and LV dysfunction, but not for severe LV dysfunction (Table). Performance characteristics of BNP values that yielded 0.95 specificity are shown in the Table. Both BNP and NT-ANP peptides performed well for excluding severe LV dysfunction (data for NT-ANP not shown).

Conclusions: In our large community-based sample, performance of BNP and NT-ANP for detection of LV dysfunction and LVH differed between men and women. A high negative predictive value for severe LV dysfunction indicates their potential utility for excluding severe LV dysfunction. These results can be used to determine the utility of natriuretic screening for LVH and LV dysfunction in asymptomatic people.

Diagnostic Performance of BNP

	LVH		LV Dysfunction		Severe LV Dysfunction	
	Men	Women	Men	Women	Men	Women
AUC (95% CI)	0.70 (0.65-0.74)	0.57 (0.54-0.60)**	0.68 (0.64-0.72)	0.56 (0.50-0.62)**	0.84 (0.75-0.93)	0.82 (0.61-1.0)
Sensitivity*	0.30	0.12	0.25	0.14	0.35	0.43
PPV/NPV*	0.55/0.87	0.57/0.67	0.44/0.90	0.14/0.95	0.21/0.98	0.04/0.99

* for specificity =0.95. ** p<0.01 for men vs women. PPV and NPV: positive and negative predictive value

11:30 a.m.

895-5 A Rapid BNP Assay Accurately Diagnoses Left Ventricular Dysfunction and Heart Failure: A Multicenter Study

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Background: B-Type Natriuretic peptide (BNP), a protein released from the left ventricle in response to volume and pressure overload, has emerged as the first whole blood marker for the identification of patients with congestive heart failure (CHF). The increased awareness and clinical significance of BNP has warranted the development of the first point-of-care assay to rapidly identify and determine severity of CHF. **Objective:** To assess the performance of a point-of-care-assay to diagnose and evaluate the severity of CHF. **Methodology:** Through a prospective, multi-center trial (5 centers), whole blood was collected from 1053 patients during the years of 1999-2000. Participants were divided into subgroups: normal (n=473), hypertension but no CHF (n=168), and CHF (n=804), divided by New York Heart Association (NYHA). **Results:** The coefficient of variation (CV) for intra-assay precision of the test was 9.5% with an analytical sensitivity of 5.0 pg/ml. 100% of samples were stable up to 8 hours at 4 degrees. Minimum stability at room temperature was 4 hours. Patients with no CHF had BNP levels of 9.3 pg/ml and was not different from patients with hypertension and no CHF. The median BNP value was higher in normal females (12.8) than in males (5.4 pg/ml, P < 0.001) Median BNP levels increased with age for both genders. BNP levels increased with severity, but because of overlap, could not predict individual NYHA classes. Median BNP levels, for NYHA I-IV were 83 pg/ml, 235 pg/ml, 459 pg/ml, and 1119 pg/ml, respectively. The receiver operated characteristic curve for all CHF classes was 0.97 (P< 0.001). Using a decision

threshold of 100 pg/ml, the assay demonstrated 82% sensitivity and 99% specificity for distinguishing control and CHF subjects. **Conclusion:** BNP concentrations obtained from whole blood samples are useful in the diagnosis of CHF and staging the severity of disease.

11:45 a.m.

895-6 Primary Results of the BNP Multinational Study: B-Type Natriuretic Peptide in the Emergency Diagnosis of Heart Failure

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Background. B-type natriuretic peptide (BNP) is released from ventricular myocytes in response to wall tension and has been approved as an aid in the diagnosis of congestive heart failure (CHF). We sought to determine the diagnostic utility of BNP in the emergency department (ED) evaluation of dyspnea in a broad spectrum of patients.

Methods. The BNP Multinational Study was a seven-center, prospective cohort study of 1586 patients who presented to the ED with acute dyspnea and had BNP measured with a point-of-care device upon arrival. The gold-standard for CHF was adjudicated by two independent cardiologists, blinded to BNP results, who reviewed all clinical data and standardized CHF scores (NHANES and Framingham).

Results. Baseline characteristics: mean age 64.4 years, male 55.5%, female 44.5%, Caucasian 49.2%, African American 44.5%, and other race 6.3%. The final diagnosis was CHF in 804 (50.7%), a history of CHF but dyspnea due to noncardiac causes in 138 (8.7%), and not CHF in 644 (40.6%), with mean BNP levels displayed (see figure). The most common other diagnoses were asthma and emphysema. The area under the receiver operator characteristic curve for the determination of CHF was 0.90, 95% CI 0.89-0.92. The diagnostic accuracy for BNP was 82.7% for the correct diagnosis at at cutoff level of 125 pg/ml.

Conclusions. In patients with acute dyspnea, using a point-of-care device in the ED, measurement of BNP has a high degree of diagnostic accuracy in establishing the diagnosis of CHF.

