Laboratories convert to new assay for NT-proBNP

In December 2006, Fairview Laboratories converted from a manual brain natriuretic peptide (BNP) method to an automated, more precise amino-terminal probrain natriuretic peptide (NT-proBNP) assay to aid in the diagnosis of congestive heart failure (CHF).

During the past five months, University of Minnesota Medical Center, Fairview, has performed approximately 1,900 patient correlations of Biosite BNP results and Ortho Clinical Diagnostic's Eci NT pro- BNP results. Results suggest that NT-proBNP and BNP give very similar clinical information based on cut-points determined by the International Collaborative of NT-proBNP (ICON) study (Januzzi JL et al. Eur Heart J 2006; 27:330-7). Graphs and brief clinical histories of several patients at University of Minnesota Medical Center, Fairview for whom multiple BNP or NT-proBNP tests were ordered are presented below.

The ICON study suggests the following NT-proBNP cut-points for the diagnosis of acute CHF. We are showing these cut-points in the computer-reported reference ranges for patients in our inpatient and emergency department settings.

Rule in CHF

| Age	Optimal Cut-point	PPV	NPV
<50 years	450 pg/mL	76%	99%
50-75 years	900 pg/mL	83%	88%
>75 years	1800 pg/mL	92%	55%

Rule out CHF

	Optimal Cut-point	PPV	NPV
All patients	300 pg/mL	77%	98%

For patients in the non-acute setting, we are reporting the FDA-approved cut-points for ruling out CHF. We are reflecting these cut-points in the computer-reported reference ranges for all patients in outpatient clinic settings. For more information about the conversion to NT-proBNP, see *Lab Focus*, December 2006, on *intranet.fairview.org*. Click on Laboratory Services, then Newsletters.

Outpatient (non-acute)	pg/mL
0-74 years	0-125
75 years and older	0-450
Establishing a baseline value for each individual patient is useful for future follow-up.	

Examples Comparing BNP to NT Pro-BNP

3-month-old male
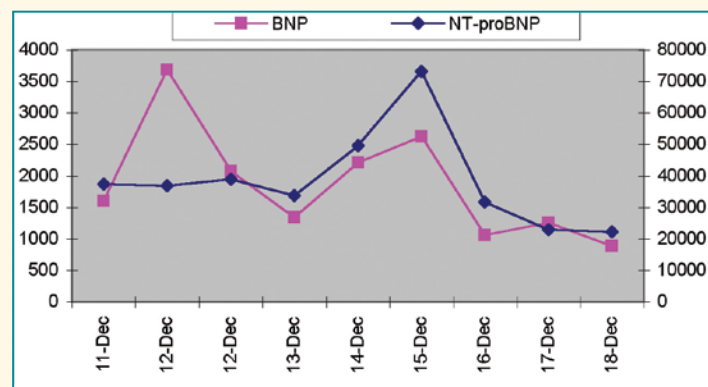
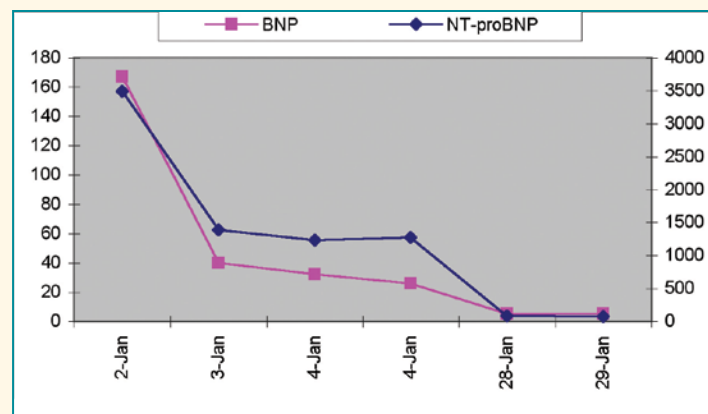**Reference Range:** **BNP:** 0-100 pg/mL
NT-proBNP: 0-450 pg/mL

Admit diagnosis: Aortic valve stenosis and severe left ventricle dysfunction

Surgery 12/12: Aortic valvotomy and ligation of ductus

Discharged 2/19

1-month-old female

Reference Range: **BNP:** 0-100 pg/mL
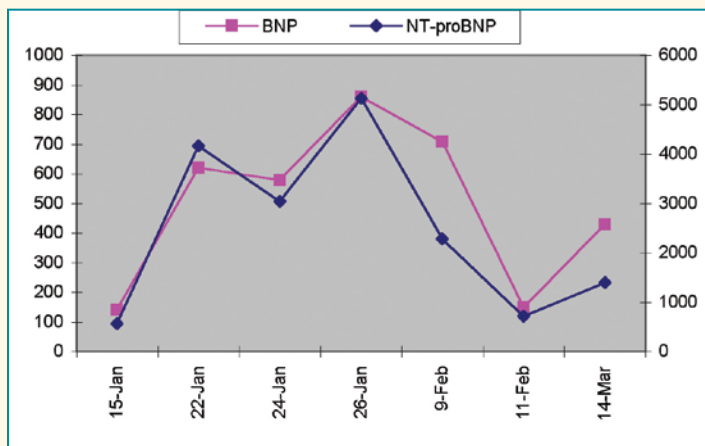**NT-proBNP:** 0-450 pg/mL

Admit diagnosis: Preterm (27+ weeks), respiratory distress syndrome

Discharge diagnosis: Respiratory distress syndrome

Examples Comparing BNP to NT Pro-BNP continued

80-year-old female

Reference Range: **BNP: 0-100 pg/mL**
NT-proBNP: 0-1800 pg/mL

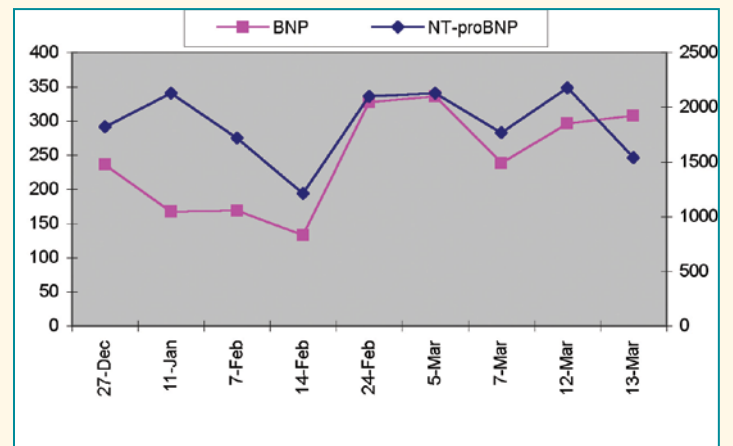**Admit diagnosis:** Respiratory distress, CHF exacerbation

Discharge diagnosis 1/19: CHF, atrial fibrillation, hypertension, hyponatremia

Discharge diagnosis 1/27: Same

ER visit 2/9: Falls, confusion, SOB related to CHF

Discharge diagnosis 2/13: CHF exacerbation

47-year-old female

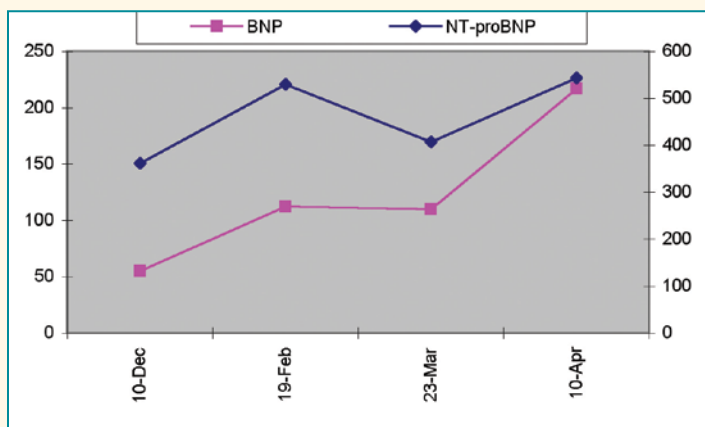**Reference Range:** **BNP: 0-100 pg/mL**
NT-proBNP: 0-450 pg/mL

Admit diagnosis: Pulmonary hypertension

Discharge diagnosis 1/11: Pulmonary arterial hypertension, right-sided heart failure

ED visit 2/24: Primary pulmonary hypertension with mild volume overload

70-year-old male

Reference Range: **BNP: < 100 pg/mL**
NT-proBNP: < 900 pg/mL
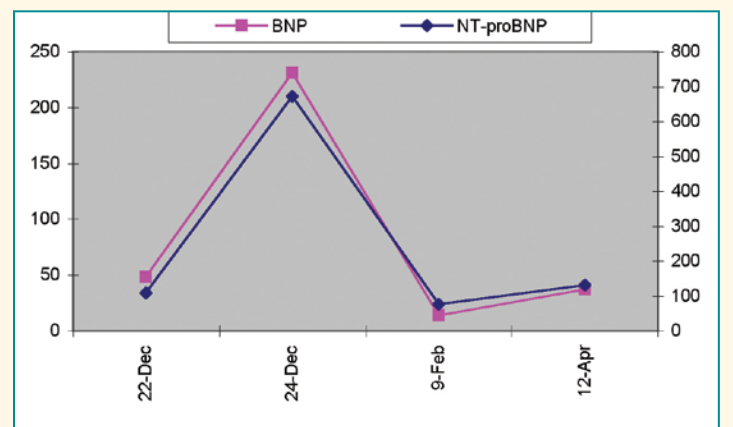
ED visit 12/10: Possible flu

ED visit 12/19: Light headed, nausea, weakness

ED visit 3/23: Light headed

Admit diagnosis 4/10: Chest pain, history of coronary disease

Discharge diagnosis: Ruled out MI with serial troponins, known to have normal left ventricular function, some inferior posterior hypokinesis

42-year-old male

Reference Range: **BNP: 0-100 pg/mL**
NT-proBNP: 0-450 pg/mL

Admit diagnosis 12/22: Chest pain, acute intoxication, aspiration pneumonia, GI bleeding

Ed visit12/25: Returned with increasing dyspnea, admitted for pneumonia, abdominal swelling, pulmonary edema, hypertension

Discharge diagnosis 12/26: Pneumonia, hypertensive urgency, alcohol abuse, GI bleeding

Discharge diagnosis 2/16: Atypical chest pain, hypertension, prerenal azotemia evolving into mild ischemic tubular damage