Publication Summary

Analytical Validation of a Novel Automated Amino-Terminal proB-Type Natriuretic Peptide Assay[1]

Key Facts

- This analytical validation study evaluated the automated Access NT-proBNP assay, which uses a novel antibody pair that targets epitope regions similar to those of established NT-proBNP assays
  - The Access NT-proBNP assay is a two-site immunoenzymatic sandwich assay performed on the DxI 9000 Access Immunoassay Analyzer
  - The evaluation followed Clinical and Laboratory Standards Institute (CLSI) guidelines
- The patient population included 675 adults (55% female; 79% white; 15% Black; 8% Latinx with a median age of 57 years

Strong Analytical Performance

- The assay demonstrated robust analytical performance:
  - Limit of blank, 1.1 ng/L; limit of detection, 4.8 ng/L; limit of quantitation, 4.8 ng/L
  - Linearity across the analytical measurement range
  - No significant interference or cross-reactivity with tested substances
  - Imprecision (total reproducibility CVs) ranged from 2.7%, at an NT-proBNP concentration of 38 ng/L, to 7.9%, at an NT-proBNP concentration of 23,848 ng/L
- Comparison with an established reference immunoassay method showed good harmony, with a Passing-Bablok regression equation of 0.92 *x - 1.2 ng/L (r=0.99)

Analytical Agreement With Reference Method

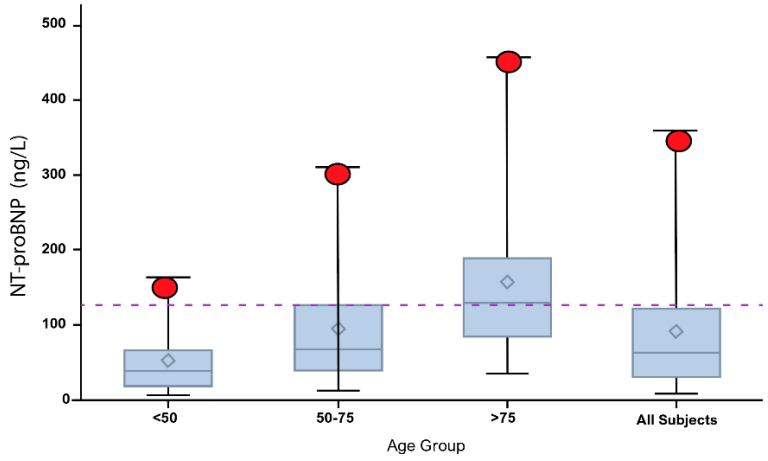
- The Access NT-proBNP assay showed strong analytical agreement with the reference NT-proBNP method at key clinical cutoff values

Cutoff	PPA, % (95% CI)	NPA, % (95% CI)	OPA, % (95% CI)
125 ng/L	97.9 (94.8–99.2)	100 (82.4–100)	98.1 (95.2–99.3)
300 ng/L	97.7 (94.3–99.1)	100 (89.6–100)	98.1 (95.2–99.3)
450 ng/L	96.6 (92.4–98.6)	100 (94.1–100.0)	97.6 (94.5–99.0)
900 ng/L	91.4 (84.9–95.3)	96.8 (91.0–98.9)	93.6 (89.7–96.3)
1800 ng/L	94.9 (87.7–98.0)	100 (97.2–100)	98.1 (95.2–99.3)

PPA, positive percent agreement; NPA, negative percent agreement; OPA, overall percent agreement

Age and Sex-specific Upper Reference Limits

The age-specific upper reference limits (97.5th percentile) for the Access NT-proBNP assay increased substantially with age.



	Age-specific upper limits of normal (97.5th percentile)		
	<50 y	50-75 y	>75 y
Both sexes	162 ng/L	311 ng/L	457 ng/L
Females	178 ng/L	317 ng/L	457 ng/L
Males	103 ng/L	284 ng/L	434 ng/L

Left: Box and whiskers plot for distribution of age-specific (both sexes) NT-proBNP values. Red dots indicate 97.5% upper reference limits. Dotted line indicates an NT-proBNP concentration of 125 ng/L.

Right: Numerical 97.5th percentile upper reference limits for the Access NT-proBNP assay by age group and sex. *Modified from reference 1; https://creativecommons.org/licenses/by/4.0/#ref-appropriate-credit*

Conclusions

- The novel Access NT-proBNP assay demonstrates robust analytical performance, achieving satisfactory precision, detection capability, and linearity across its measurement range
- The method concordance study revealed good harmony with the reference assay at clinically relevant cut points
- The age- and sex-specific upper reference limits established for those ≥21 years old in this study are consistent with existing data[2]
- These analytical findings indicate that the Access NT-proBNP assay is well-suited to support trials for establishing the performance of this assay as an aid for supporting heart failure diagnosis and prognosis

References

1. Christenson RH, Alahapperuma D, Allen BR, et al. Analytical characterization and validation of a novel automated amino-terminal proB-type natriuretic peptide assay. *J Appl Lab Med*. 2025;10(3):659-670. doi:10.1093/jalm/jfaf012.
2. Mu S, Echouffo-Tcheugui JB, Ndumele CE, et al. NT-proBNP reference intervals in healthy U.S. children, adolescents, and adults. *J Appl Lab Med*. 2023 Jul 5;8(4):700-712. doi: 10.1093/jalm/jfad024.

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