WHAT ARE THE CORRECT NT-PROBNP CUT-POINTS IN PATIENTS WITH CHRONIC KIDNEY DISEASE?

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BACKGROUND

- Diagnosing acute heart failure (HF) in patients with chronic kidney disease (CKD) is challenging due to the impact of CKD on NT-proBNP levels.

- This study evaluates the impact of CKD on NT-proBNP-based HF diagnosis using novel age-stratified cut points and assesses diagnostic performance.

METHODS

PRECISE-HF: Prospectively enrolled emergency department (ED) patients across 17 U.S. sites.

Inclusion
- Adult patients (over the age of 21 years)
- Presented with a clinical suspicion of acute HF

Exclusion
- Stage 4 or 5 CKD
- Chronic dialysis
- Subjects with dyspnea not secondary to HF

NT-proBNP Testing: Access NT-proBNP (Beckman Coulter, Inc., Chaska, U.S.A.).

CKD Focus: Diagnostic performance assessed in patients with eGFR <60 mL/min/1.73m².

Revised Age-stratified Cut Points:

- ≥750 ng/L for <50 years

- ≥1550 ng/L for 50–75 years

- ≥1700 ng/L for >75 years

Analysis Metrics: sensitivity, specificity, AUC, and Cox proportional hazard ratios.

Outcome Assessment: 90-day MACE (major adverse events); defined as death, myocardial infarction, or stroke.

Table 1 Rule-in performance for subjects with CKD applied in age-group cutoffs (eGFR < 60)

Age (yrs)	Cutoff (ng/L)	Sensitivity% (n/N)	95% CI	Specificity% (n/N)	95% CI	NPV% (n/N)	95% CI	PPV % (n/N)	95% CI	AUC (95% CI)
< 50	750	86.0% (86/100)	77.9-91.5%	77.5% (124/160)	70.4-83.3%	89.9% (124/138)	83.7-93.9%	70.5% (86/122)	61.9-77.9%	0.88 (0.84-0.93)
50-75	1550	80.4% (197/245)	75.0-84.9%	77.3% (136/176)	70.5-82.8%	73.9% (136/184)	67.1-79.7%	83.1% (197/237)	77.8-87.4%	0.87 (0.84-0.91)
>75	1700	82.3% (163/198)	76.4-87.0%	66.9% (99/148)	59.0-74.0%	73.9% (99/134)	65.9-80.6%	76.9% (163/212)	70.8-82.1%	0.83 (0.79-0.87)
All	-	82.1% (446/543)	78.7-85.1%	74.2% (359/484)	70.1-77.9%	78.7% (359/456)	74.7-82.2%	78.1% (446/571)	74.5-81.3%	0.87 (0.84-0.89)

RESULTS

Study Enrollment: 2,384 patients enrolled with 14.2% CKD.

Using Revised Cut Points:

- **Diagnostic specificity** maintained at 74% vs 72% using traditional cut points; **PPV** maintained at 78% vs 68.8% using traditional cut points.

- **Overlapping confidence intervals** for diagnostic sensitivity (78.7–85.1%) versus using traditional cut points (sensitivity 81.8–91.1%).

- **AUC for HF diagnosis**: 0.88 <50 years, 0.87 for 50–75 years, and 0.83 for >75 years, overall AUC at 0.8767 using traditional cut points.

- **Higher MACE mortality** in HF patients with CKD when NTproBNP ≥ respective age stratified cut points (750, 1550, and 1700 ng/L), log rank P value < 0.01.

- **Cox proportional hazards model**: CKD patients had 1.539 increased risk of adverse events, P < 0.001.

CONCLUSION

Adjusting NT-proBNP rule-in thresholds for CKD patients preserves diagnostic accuracy and prognostic association. The novel cut points enhance HF diagnosis in renal impairment, supporting more precise clinical decision-making in this high-risk population.

Figure 1 Patient enrollment was conducted across 17 US sites..
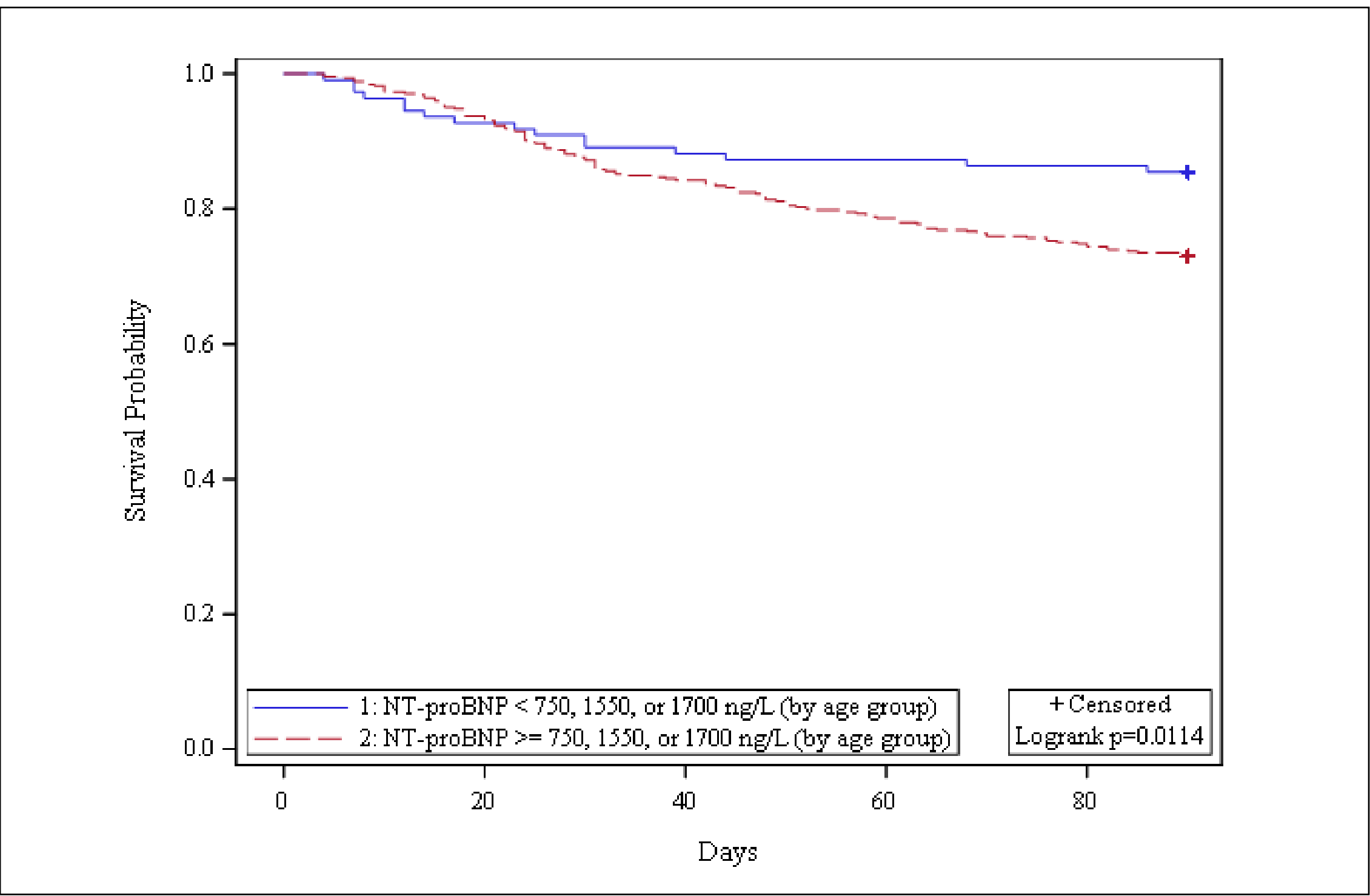

Figure 2 Survival curves of CKD patients over 90 days with the Access NT-proBNP levels below versus above age-stratified cut points.