

NT Pro-BNP requesting in primary and secondary care settings, with insight on minimum retesting interval interventions

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1. Introduction

N-Terminal pro-B-type Natriuretic Peptide (NT Pro-BNP) is released into the circulation when the cardiac muscles are stretched. Its concentrations are elevated in several conditions, including heart failure, therefore its diagnostic utility is highest in cases of suspected heart failure.

Signs and symptoms of heart failure are non-specific and include shortness of breath, peripheral oedema, fatigue. Those with suspected heart failure are recommended to undergo NT Pro-BNP measurement.

Performing an echocardiograph is expensive, requiring a secondary care referral and trained cardiac physiologists, so measurement of NT Pro-BNP can support triaging of patients to prevent unnecessary resource waste. NICE guidance recommends further investigations based on NT Pro-BNP results, using the clinical decision limits in Table 1.

NT Pro-BNP (ng/L)	Clinical scenario	Recommendation
>2000	Suspected chronic HF	Suggest referral for specialist assessment and transthoracic echocardiography within 2 weeks, due to very high levels of NT Pro-BNP carrying a poor prognosis.
400 – 2000		Suggest referral within 6 weeks.
<400		In an untreated person, heart failure diagnosis is less likely
<300	Suspected acute HF	Used to rule out acute heart failure

Table 1. NT Pro-BNP result thresholds and the clinical interpretation.

2. Aims and audit standards

This audit aimed to assess the NT Pro-BNP service provided by the Clinical Biochemistry laboratories at North Midlands and Cheshire Pathology Service (NMCPS), which serves Macclesfield District General Hospital, Leighton Hospital, Royal Stoke University Hospital and County Hospital.

The following guidelines were considered to create standards:

- NICE NG106: Chronic Heart Failure in adults: diagnosis and management
- NICE CG187: Acute Heart Failure, diagnosis and management
- Getting it Right First Time (GIRFT) – NT Pro-BNP April 2025.

Both the technical service provided by the laboratory and the accompanying clinical interpretation on reports were evaluated.

3. Methods

A retrospective audit of NT Pro-BNP requests received at NMCPS was carried out. Data for all NT Pro-BNP requests made during a 4-month period (01/01/25 - 31/04/25) were extracted from the laboratory information management system (LIMS), WinPath Enterprise, and were assessed against standards derived from the above sources.

4. NT Pro-BNP service provision

The audit demonstrated that the NT Pro-BNP service provision meets national guidance recommendations, shown below in Table 2.

Audit standard	Achieved
NT Pro-BNP available to all primary and secondary care service users	Yes – available to all service users at all sites
NT Pro-BNP is reported in ng/L	Yes – ng/L
NT Pro-BNP results available within 48h	Yes - 98.7% reported with 2 days of request
Minimum Retest Interval (MRI) in-line with FRCPATH guidance	Yes – 6-month interval in place with opportunity for clinically led reinstatement
Harmonised advice and interpretation based on NG106 (chronic) and CG187 (acute) guidance provided	Chronic HF – Yes Acute HF – Only for primary care. <i>See audit recommendations for response.</i>

Table 2. Audit standards used to assess the NT Pro-BNP service, and whether they were achieved.

Clinical Reporting Comments

It was identified during the audit, that the acute heart failure NT Pro-BNP threshold was acknowledged in the clinical interpretation applied to primary care locations, but not to secondary care locations.

5. NT Pro-BNP requesting and results

The total number of requests received and the number of requests per patient sex and age is shown in Table 3. A breakdown of all results reported according to the clinical interpretation provided is demonstrated in Figure 1. 76% of results 0 – 399 ng/L were from primary care locations, whereas 74% of results >2000 ng/L were from secondary care locations.

	Number	Percentage
Total Number of Requests	14,584	
Male	6,993	48.0%
Female	7,591	52.0%
<60 years old	2,483	17.0%
60 – 70 years old	2,810	19.3%
70 – 80 years old	4,835	29.7%
>80 years old	4,456	34.0%

Table 3. The total number of requests received, with a breakdown of requests according to sex and age group.

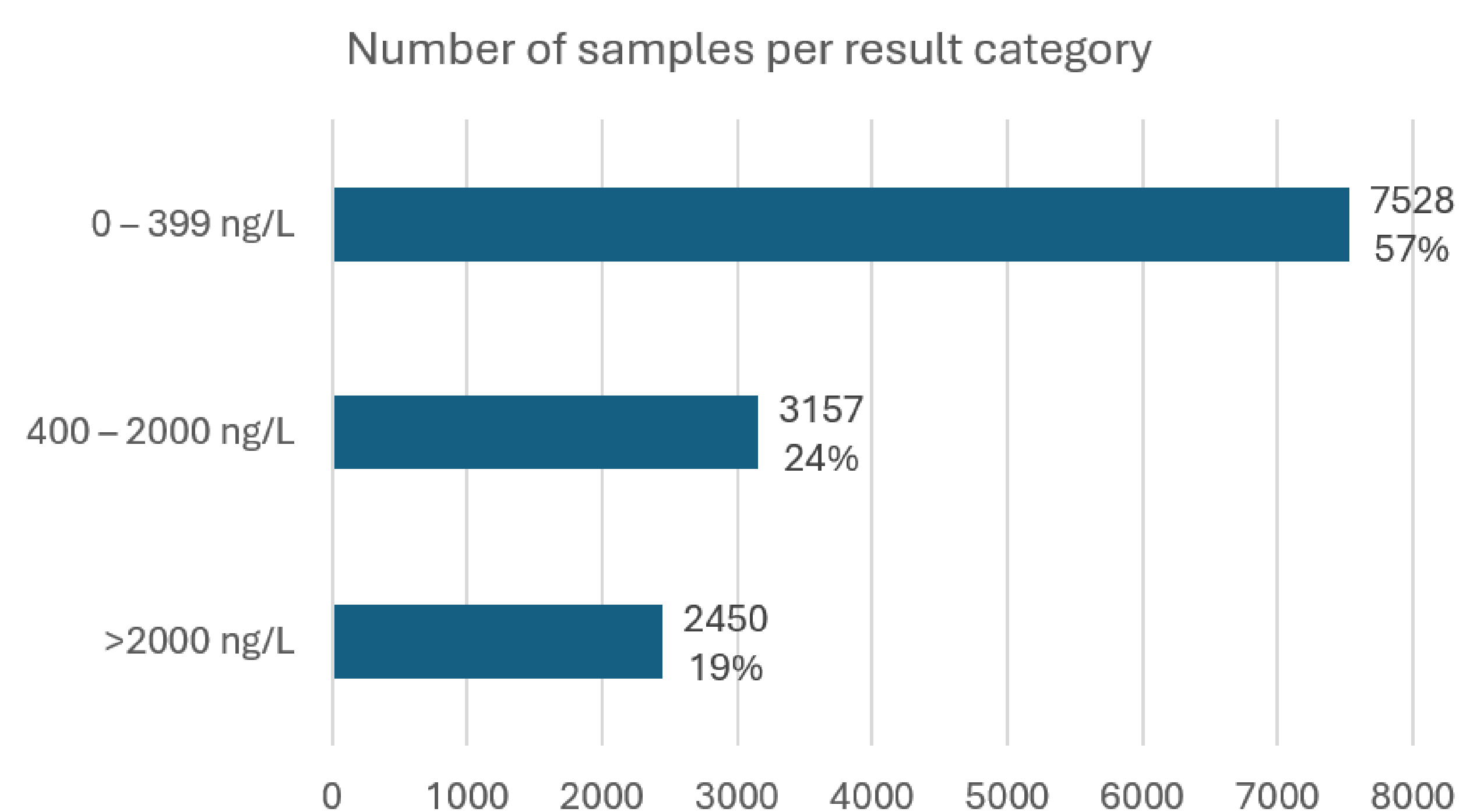


Figure 1. The breakdown of results reported according to the clinical interpretation.

6. Minimum Retesting Intervals

The MRI at NMCPS is 182 days (6 months). Any requests within this timeframe from the previous result are rejected.

FRCPATH National Minimum Retesting Intervals recommend single measurement unless there has been a change in clinical presentation, suspected new acute heart failure, or as part of a treatment optimisation protocol. LIMS rules brings these rejected tests into a review queue managed by Clinical Scientists – if clinically appropriate these are reinstated.

1,314 requests (9% of total requests) were made within the 6-month MRI. 535 of these requests were reinstated, therefore demonstrating that **40.7% of the ‘duplicate’ requests were reinstated** following a clinical review. The reasons for these reinstatements largely reflected the FRCPATH National MRI recommendations for repeated measurement.

There were no particular trends identified when the locations of duplicate requests were considered.

- 7% of GP requests were repeats within 6 months, and a third of these duplicates were reinstated.
- 25% of A&E requests were repeats within 6 months, just under a third of these duplicates were reinstated.

7. Conclusions

Overall, the service provided meets the audit standards adapted from NICE guidance and GIRFT publications, except for acute heart failure clinical interpretation for secondary care requests, arguably the more clinically relevant patient cohort to consider acute presentations in.

The MRI / duplicate process was deemed appropriate. The reinstatement rate was higher than anticipated, but not enough to warrant a change of practice without incurring additional costs that outweighed the benefit of removal of this MRI limit.

Audit recommendations:

To introduce the acute heart failure rule out threshold of <300 ng/L to the comment automatically applied to secondary care requests.