Early Diagnosis and Treatment Optimization in Heart Failure Through NT-proBNP Testing in Primary and Specialist Care

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BACKGROUND E OBJECTIVES

Heart failure (HF) is a chronic, progressive condition with a high clinical and economic burden. Early diagnosis and timely treatment are critical to improving patient outcomes and reducing healthcare costs. This analysis evaluated two complementary diagnostic and treatment optimization pathways integrating N-terminal pro B-type natriuretic peptide (NT-proBNP) testing via Point-of-Care (PoC) devices: a primary care-based general practitioner (GP) pathway and a specialist pathway. The aim of the project is to assess the clinical and economic impact of implementing NT-proBNP-based early diagnosis and treatment optimization pathways for heart failure in real-world settings.

MATERIALS/METHODS

The project entailed the implementation of two integrated care pathways within general and specialist medicine
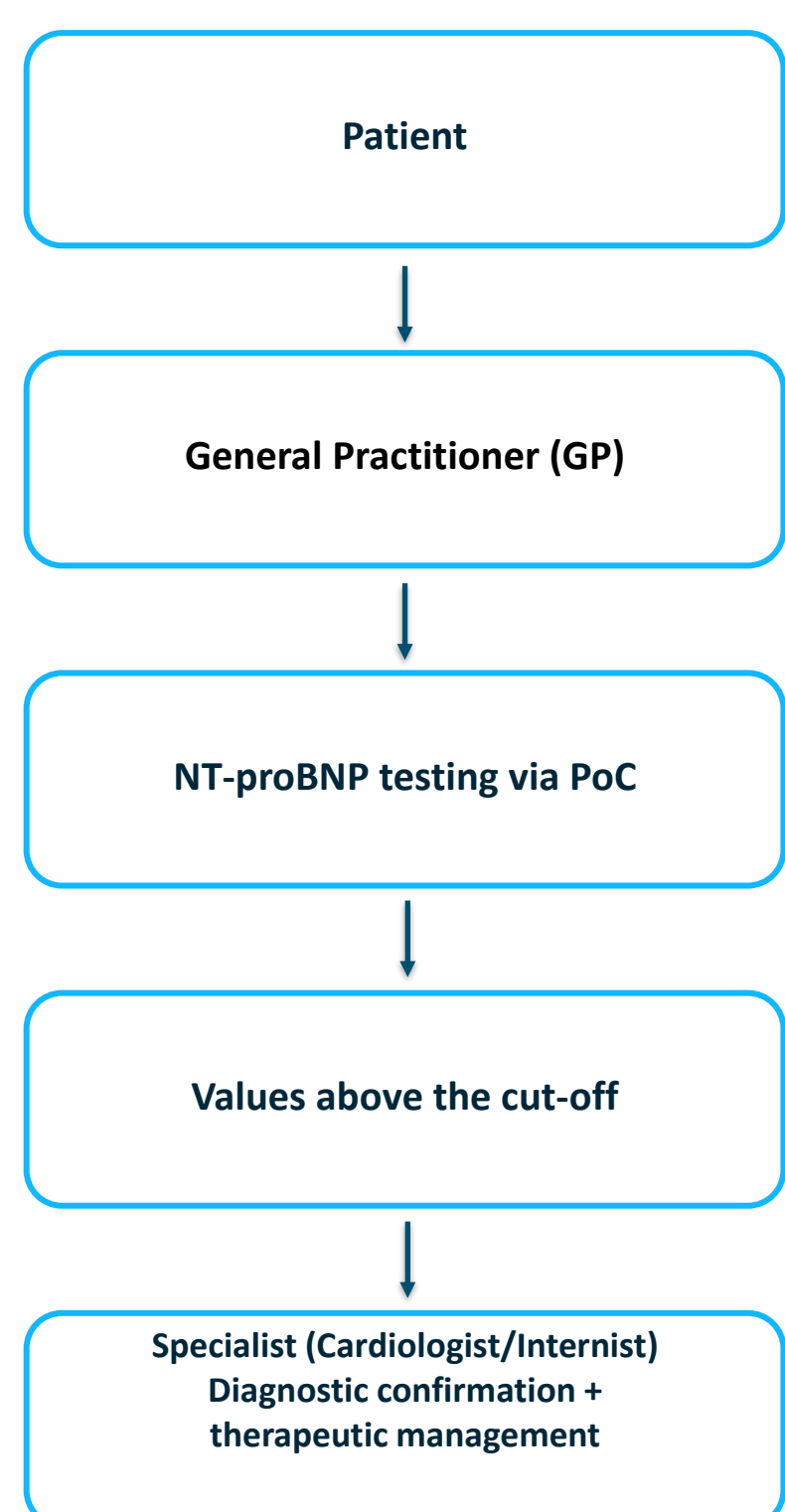
The **general practitioner (GP)** pathway was designed to promote the early detection of heart failure (HF) through NT-proBNP testing using Point-of-Care (PoC) devices. This approach aimed to support GPs in the timely identification of at-risk patients and facilitate their referral to cardiologists or internists for diagnostic confirmation via clinical evaluation and echocardiography.

Figure 1 Flowchart of (GP)
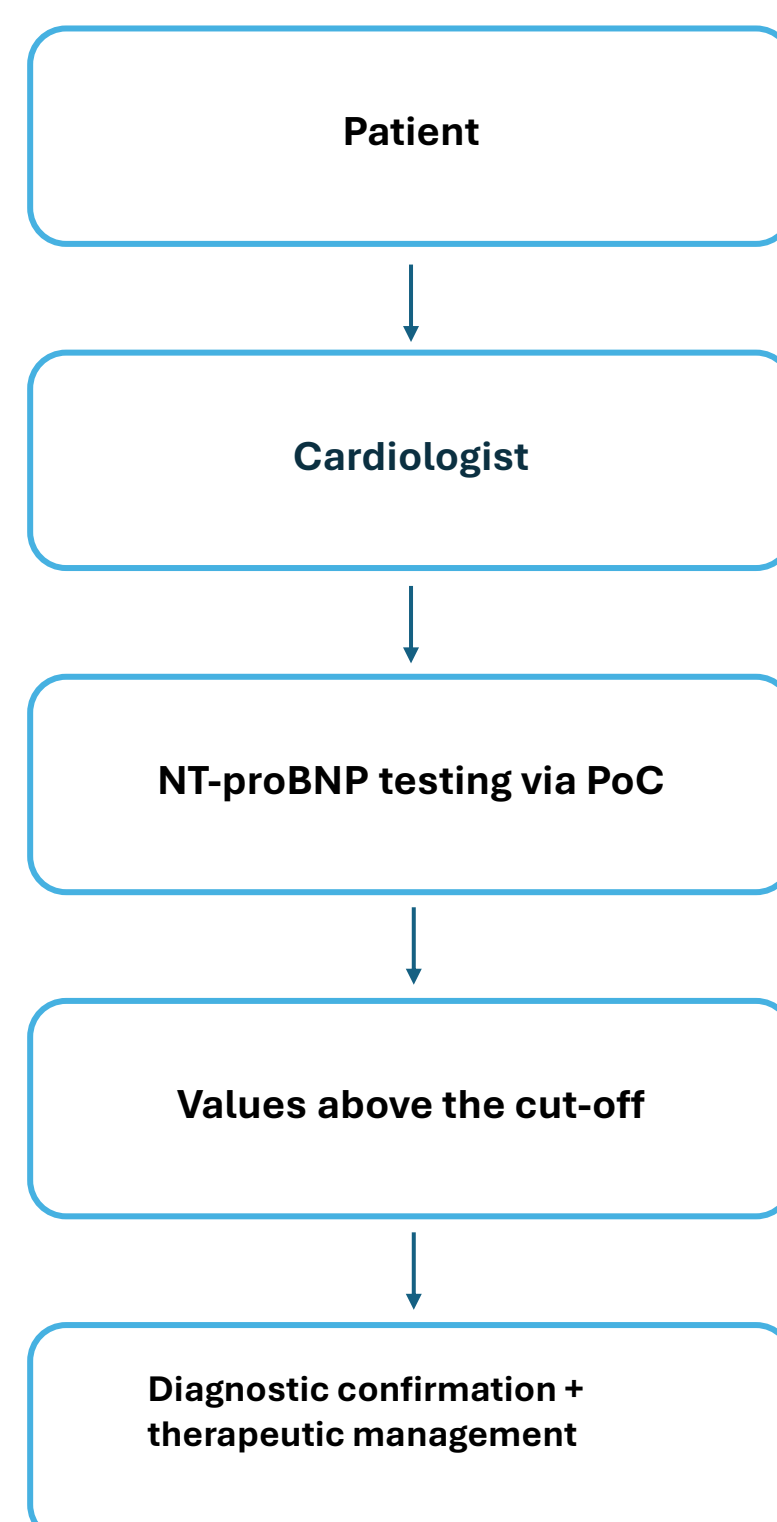
The **specialist** pathway pursued the same diagnostic objective, with patient identification and confirmation managed directly by cardiologists. Pre- and post-intervention questionnaires administered to participating physicians enabled the collection of data on diagnostic timelines, prescribed therapies, and overall disease management. These data were subsequently analyzed to assess the impact of the implemented strategies on reducing diagnostic delays, improving treatment quality, and minimizing avoidable hospitalizations and healthcare expenditures.

Figure 1 Flowchart of (specialist)

An additional aspect investigated concerned the waiting time to obtain a definitive diagnosis. The aim was to assess whether NT-proBNP testing contributed to reducing diagnostic delays, potentially yielding clinical benefits for patients (Figure 9).

RESULTS

NT-proBNP testing reduced the average diagnostic timeline from approximately three months to just over one week. Both pathways led to faster initiation of evidence-based therapies and improved adherence to clinical guidelines. The economic analysis projected annual cost savings of approximately €10 million for the national healthcare system, including over €4.8 million for patients with preserved ejection fraction.

Comparison between boxplots highlights a significant reduction in diagnostic timelines. The average waiting time (excluding outliers) decreased from approximately three months to just over one week.

Figure 5: boxplot of Average Waiting Times (in Weeks) for Echocardiographic Examination under the National Health Service (SSN), Excluding Outliers – First Questionnaire (Specialist Pathway)
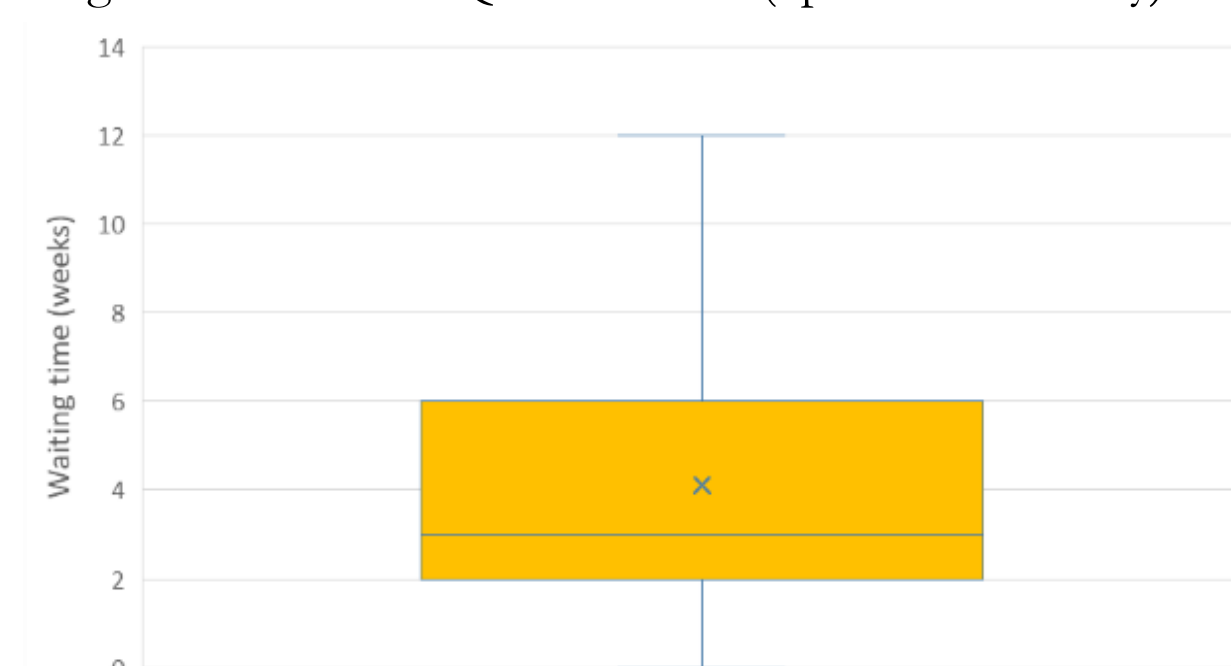
Figure 9. average Time Elapsed (in Weeks) Between NT-proBNP Testing and Echocardiographic Examination
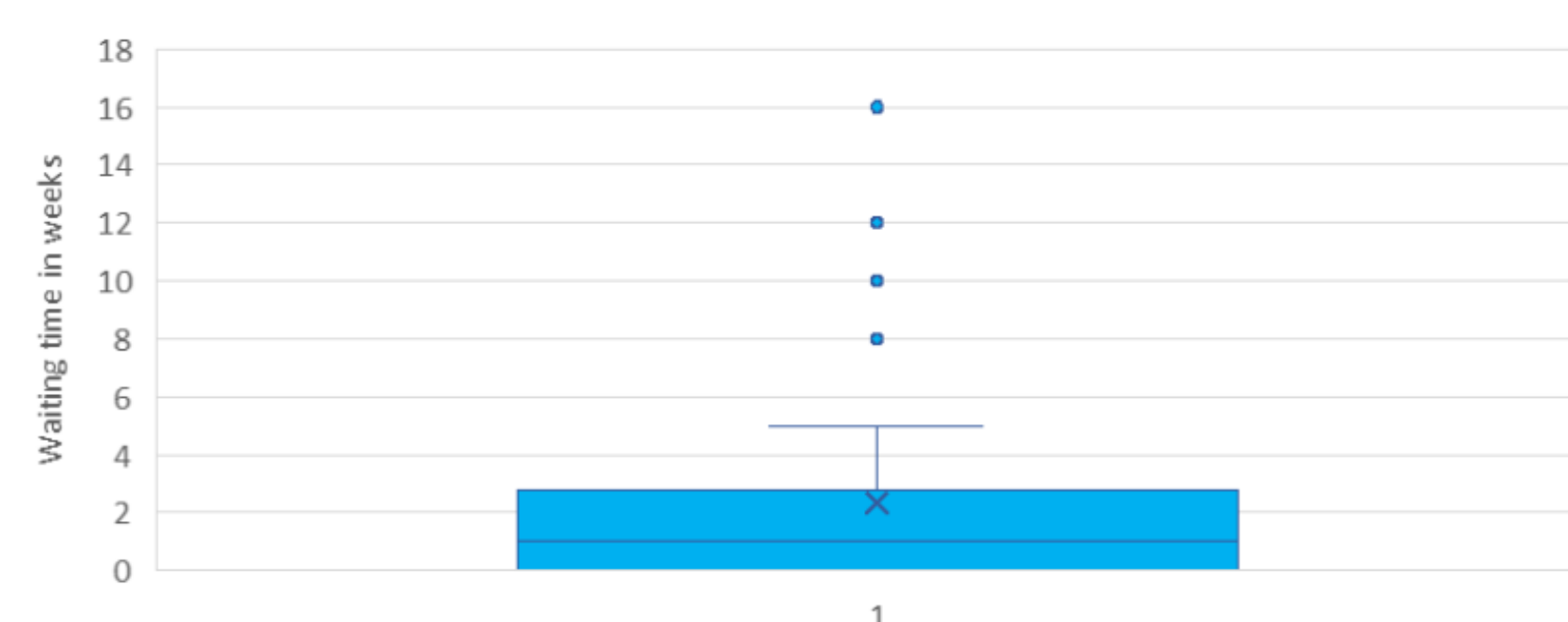
CONCLUSIONS

Incorporating NT-proBNP testing in primary and specialist care settings facilitates earlier diagnosis and improved therapeutic management of heart failure. These pathways enhance clinical outcomes and generate substantial healthcare savings. Broad implementation of this model may improve health system efficiency and patient prognosis across the HF population.

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