Early testing in unexplained shortness of breath

Early diagnosis is important to improve patient outcomes[1].

Value of BNP/NT-proBNP testing

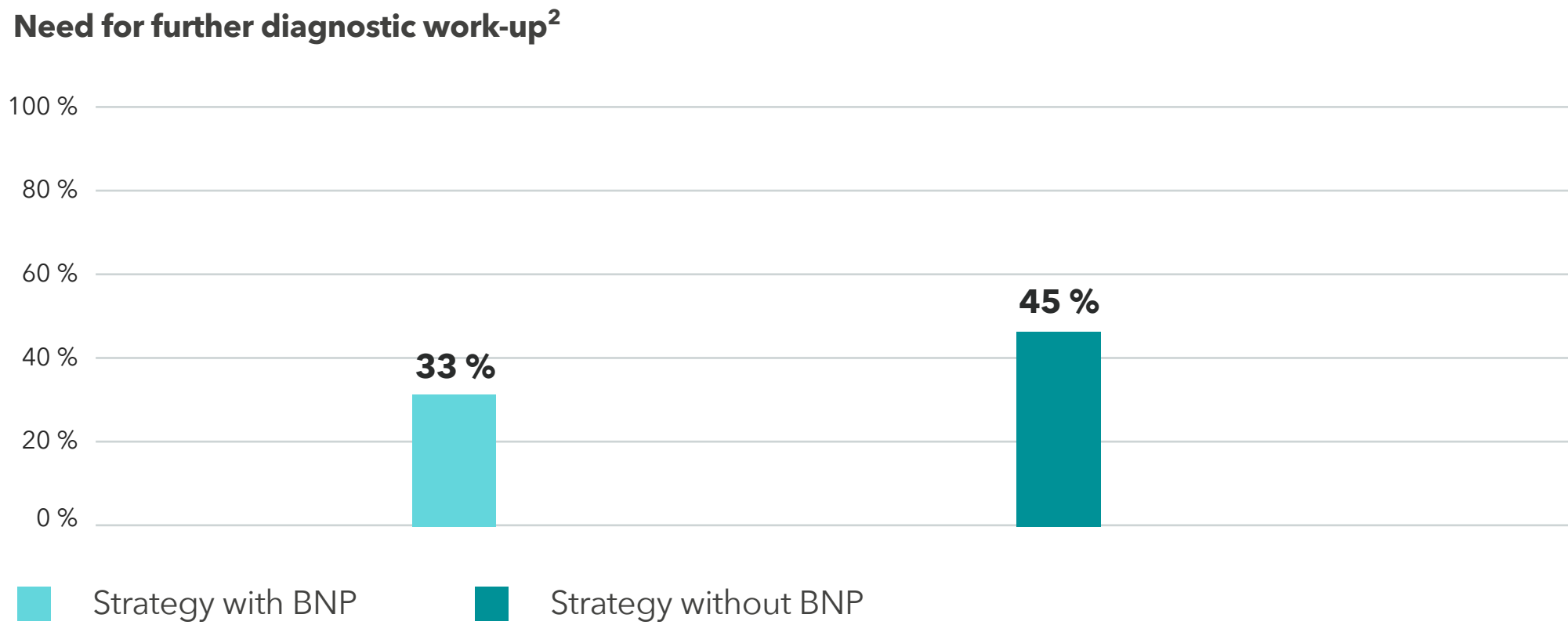Testing may improve diagnostic certainty and decrease time to referral

Use of BNP/NT-proBNP measurement[2]

- **Increased diagnostic certainty:** Less additional work-up needed to ensure correct diagnosis

In studies of chronic unexplained shortness of breath, the addition of BNP/NT-proBNP testing has improved diagnostic accuracy and time to diagnosis for cardiomyopathy-related disease[3].

BNP/NT-proBNP is useful as a rule-in test for heart disease, which enables appropriate selection of candidates for in-depth evaluation by cardiology[4].

BNP and NT-proBNP are key tools in the diagnosis of heart failure[5]

Need for further diagnostic work-up[2]

- ■ Strategy with BNP
- ■ Strategy without BNP

Use of NT-proBNP testing can increase diagnostic certainty

Benefits of NT-proBNP in primary care

Improvement of time-to-diagnosis and referral quality

EXCLUSION THRESHOLDS OF NATRIURETIC PEPTIDES FOR SUSPECTED HEART FAILURE [6]

	Sensitivity % (CI) n = 104	Specificity % (CI) n = 104
Clinical decision rules (CDR) + NT-proBNP (lower cut-offs)	90.4 (83.0–95.3)	45.5 (38.5–52.7)
NT-proBNP < 400 pg/ml	76.9 (67.6–84.6)	91.5 (86.7–95.0)
NT-proBNP < 125 pg/ml	94.2 (87.9–97.9)	49.0 (41.9–56.1)

Prospective, observational diagnostic validation study of patients > 55 years presenting with unexplained shortness of breath[6]

Thanks to the blood test, 104 (34.2%; 95% CI 28.9-39.8) confirmed diagnoses of heart failure (HF) from 304 patients[6]

At threshold of NT-proBNP < 125 pg/mL, the sensitivity of the test alone was better than a validated CDR+NT-proBNP approach for identifying patients who were subsequently diagnosed with HF[6]

Higher NT-proBNP threshold of 400 pg/mL may result in one in five patients with HF not being appropriately referred[6]

Although testing can help detect cardiac conditions, other causes of raised NT-proBNP levels should be considered[5,7].

Measuring NT-proBNP* levels can help differentiate cardiac causes from other causes of unexplained shortness of breath

- NT-proBNP is exclusively produced by the cardiac tissue and reflects wall stress[5]

- While a broad range of structural and functional cardiac abnormalities can lead to elevations of NT-proBNP, this biomarker is of substantial medical value in diagnosing suspected heart failure[5]

- In the primary care setting**, the upper limit of normal for NT-proBNP is 125 pg/mL and patients with normal NT-proBNP levels (< 125 pg/mL) are unlikely to have heart failure[8]

- NT-pro BNP can be measured in the primary care setting with either a point-of-care device or by a central laboratory[5]

*Alternatively, BNP levels can be measured; **A higher cut-off of 300 pg/mL for NT-proBNP is recommended in the acute setting.

Elevated NT-proBNP levels can also be associated with other conditions[9]

Cardiac conditions

- PH and PAH

- Heart muscle disease, including LVH

- Valvular heart disease

- Acute coronary syndromes

- Pericardial disease

- Atrial fibrillation

- Myocarditis

- Cardiac surgery

- Cardioversion

- Toxic-metabolic myocardial insults, including cancer chemotherapy

Non-cardiac conditions

Pulmonary
- Obstructive sleep apnoea

- Severe pneumonia

- Acute embolism

Others
- Advancing age

- Anaemia

- Renal failure

- Critical illness

- Bacterial sepsis

- Severe burns

NT-proBNP levels should always be interpreted in conjunction with all other clinical information[5]

References

BNP: B-type natriuretic peptide; NT-pro BNP: N-terminal pro-BNP, CDR: clinical decision rules; HF: heart failure; LVH: left ventricular hypertrophy; RAH: pulmonary arterial hypertension; PH: pulmonary hypertension.

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