

Use of B-Type Natriuretic Peptide (BNP) and N-Terminal proBNP (NT-proBNP) as Diagnostic Tests in Adults With Suspected Heart Failure: Recommendation

Final Recommendation

- Ontario Health, based on guidance from the Ontario Health Technology Advisory Committee, recommends publicly funding natriuretic peptide (BNP or NT-proBNP) testing for the diagnosis of people with suspected heart failure in the community and emergency department settings

Rationale for the Recommendation

The Ontario Health Technology Advisory Committee has reviewed the findings of the health technology assessment¹ and determined that both B-type and N-terminal pro-B-type natriuretic peptide tests have high diagnostic accuracy to rule out heart failure. Committee members noted that using natriuretic peptide testing (either B-type or NT pro-B-type) when there is uncertainty about the cause of a person's symptoms, such as dyspnea (shortness of breath), may affect important clinical outcomes. The economic evidence supports the cost-effectiveness of both tests when a diagnosis is still uncertain after standard clinical investigations. The Ontario Health Technology Advisory Committee also considered the lived experience of people with heart failure and their caregivers, who expressed a preference for being diagnosed quickly.

Committee members noted that education support should be provided for health care providers to ensure testing is used when appropriate.

Decision Determinants for the Use of B-Type Natriuretic Peptide (BNP) and N-Terminal proBNP (NT-proBNP) as Diagnostic Tests in Adults With Suspected Heart Failure

Decision Criteria	Subcriteria	Decision Determinants Considerations
Overall clinical benefit How likely is the health technology/intervention to result in high, moderate, or low overall benefit?	Effectiveness How effective is the health technology/intervention likely to be (taking into account any variability)?	<p>Overall, BNP and NT-proBNP testing has been found useful in ruling out heart failure in both the community and ED settings; BNP and NT-proBNP have high sensitivity (80%–94% and 86%–96%, respectively) and low negative likelihood ratios (0.08–0.30 and 0.09–0.23, respectively).</p> <p>When used in an ED setting, BNP or NT-proBNP testing reduced the number of days in hospital by at least 1 day. We did not find any evidence on the impact of BNP testing on days spent in hospital after use in the community.</p>
	Safety How safe is the health technology/intervention likely to be?	<p>BNP and NT-proBNP levels are assessed with a blood test. While blood tests are an invasive procedure, there are no perceived harms associated with undertaking the test.</p>
	Burden of illness What is the likely size of the burden of illness pertaining to this health technology/intervention?	<p>The age-standardized incidence rates of heart failure in Ontario between 2012 and 2013 among men and women were 6.2 and 4.5 per 1,000, respectively. In Ontario during the 2010/11 fiscal year, 18,046 people were admitted to hospital for heart failure.</p>
	Need How large is the need for this health technology/intervention?	<p>Heart failure is widely known to affect Canada’s aging population, and early diagnosis is vital for effective treatment. Heart failure symptoms are nonspecific, and diagnosis currently relies on a combination of symptoms, a physical exam, and testing (e.g., x-ray); natriuretic peptide testing offers the opportunity to arrive more efficiently at a definite diagnosis for a person’s symptoms.</p>

Decision Criteria	Subcriteria	Decision Determinants Considerations
<p>Patient preferences and values</p> <p>How likely is adoption of the health technology/ intervention to be congruent with patient preferences and values and with ethical or legal standards?</p>	<p>Patient preferences and values</p> <p>Do patients have specific preferences, values, or needs related to the health condition, health technology/intervention, or life impact that are relevant to this assessment? (Note: The preferences and values of family members and informal caregivers are to be considered as appropriate.)</p> <p>Autonomy, privacy, confidentiality, and/or other relevant ethical principles as applicable</p> <p>Are there concerns regarding accepted ethical or legal standards related to patient autonomy, privacy, confidentiality, or other ethical principles that are relevant to this assessment? (Note: The preferences and values of the public are to be considered as appropriate.)</p>	<p>Patients reported a preference for receiving natriuretic peptide testing to help diagnose heart failure, believing it would make the process more efficient, timely, and simple, and would lower stress.</p> <p>Patients believed that providing the option for a more efficient diagnosis would lead to reduced misdiagnosis, as well as reduced time, money, and energy spent on trying to manage symptoms for the wrong condition or for an unknown condition. They also believed it would reduce stress, anxiety, and the progression of symptoms by allowing them timely access to treatment.</p>
<p>Equity and patient care</p> <p>How could the health technology/ intervention affect equity of access and coordination of patient care?</p>	<p>Equity of access or outcomes</p> <p>Are there disadvantaged populations or populations in need whose access to care or health outcomes might be improved or worsened that are relevant to this assessment?</p> <p>Patient care</p> <p>Are there challenges in the coordination of care for patients or other system-level aspects of patient care (e.g., timeliness of care, care setting) that might be improved or worsened that are relevant to this assessment?</p>	<p>Barriers to accessing natriuretic peptide testing may lead to inequities in care, because people with suspected heart failure and access to natriuretic peptide testing may have their diagnosis confirmed more quickly than people who don't have access to testing. Currently, there is variation in access to natriuretic peptide testing across the province, and testing in community laboratories is not publicly funded.</p> <p>Educational support for health care providers will be required to ensure natriuretic peptide testing is used when appropriate.</p>

Decision Criteria	Subcriteria	Decision Determinants Considerations
<p>Cost-effectiveness How efficient is the health technology/intervention likely to be?</p>	<p>Economic evaluation How efficient is the health technology/intervention likely to be?</p>	<p>Our economic literature review found a total of 12 studies evaluating the cost-effectiveness of BNP or NT-proBNP testing in people with suspected heart failure. The studies suggested that BNP or NT-proBNP testing, when used in addition to standard clinical investigations, was either dominant (i.e., less costly and more effective) or cost-effective across different countries (including Canada) and settings. We transferred the results from two NICE economic evaluations to Ontario and found that BNP or NT-proBNP testing was highly likely to be cost-effective in Ontario in the ED and community settings.</p>
<p>Feasibility of adoption into health system How feasible is it to adopt the health technology/intervention into the Ontario health care system?</p>	<p>Economic feasibility How economically feasible is the health technology/intervention?</p> <p>Organizational feasibility How organizationally feasible is it to implement the health technology/intervention?</p>	<p>Over the next 5 y, publicly funding BNP and NT-proBNP testing would result in an additional cost of about \$38 million in the ED (\$75 per test) and a saving of about \$20 million in community care (\$28 per test).</p> <p>BNP and NT-proBNP tests are currently available in both hospitals and community laboratories.</p>

Abbreviations: BNP, B-type natriuretic peptide; NT-proBNP, N-terminal-proBNP; ED, emergency department; NICE, National Institute for Health and Care Excellence.

Reference

- (1) Ontario Health. Use of B-type natriuretic peptide (BNP) and N-terminal proBNP (NT-proBNP) as diagnostic tests in adults with suspected heart failure: a health technology assessment. Ont Health Technol Assess Ser [Internet]. 2021 May;21(2):1–125. Available from: <https://www.hqontario.ca/evidence-to-improve-care/health-technology-assessment/reviews-and-recommendations/use-of-BNP-and-NT-proBNP-as-diagnostic-tests-in-adults-with-suspected-heart-failure>

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Ontario Health
130 Bloor Street West, 10th Floor
Toronto, Ontario
M5S 1N5
Tel: 416-323-6868
Toll Free: 1-866-623-6868
Fax: 416-323-9261
Email: oh-hqo_hqa@ontariohealth.ca

www.hqontario.ca

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