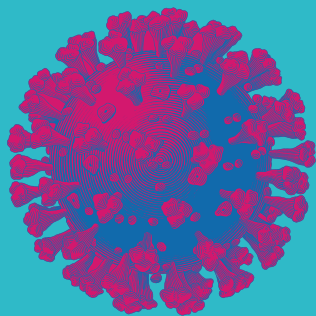
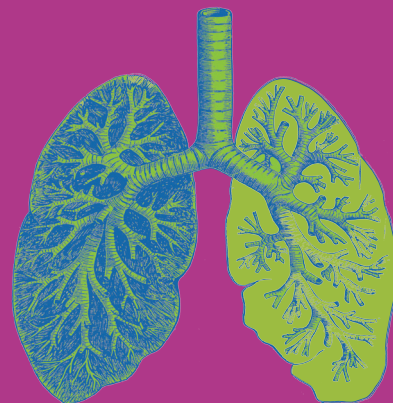


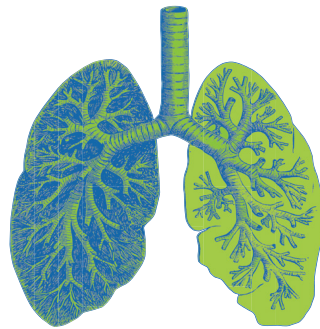
They're counting
on you.



Make sure you have
the biomarkers you need.

When They Have Trouble Breathing

Patients commonly present to the emergency department (ED) with breathing difficulties.² These signs and symptoms may reflect several respiratory and cardiac etiologies.^{3,4} Patients with COVID-19 infection have been shown to present with a greater than 20% incidence of dyspnea and a series of cardiovascular abnormalities.^{5,6}



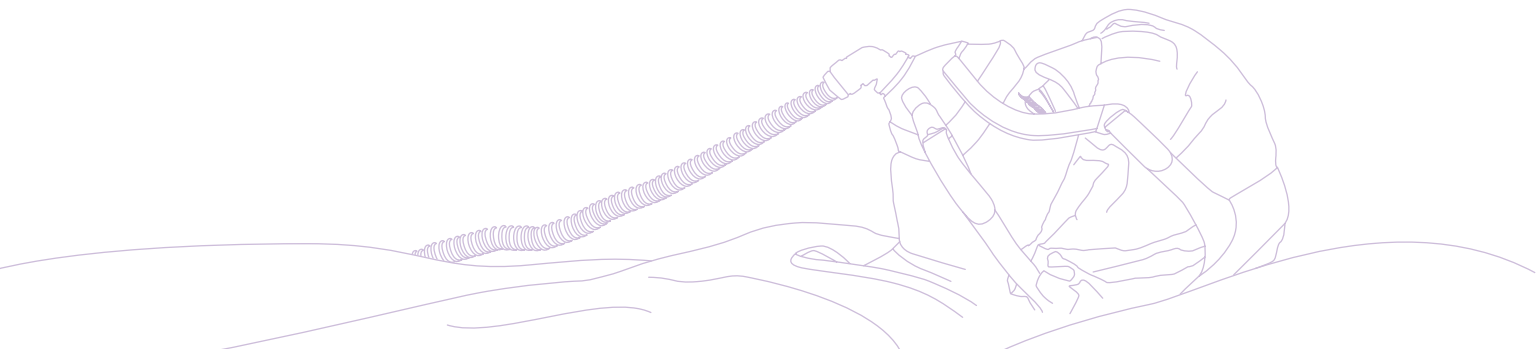
Influenza can also precipitate cardiac events. This is thought to be due to a range of factors including inflammatory release of cytokines, disruption of atherosclerotic plaques, and thrombogenesis.⁷

ED visits for influenza-like illness have been associated with and predictive of cardiovascular disease (CVD) mortality.¹

Older patients with influenza infection and those with prevalent CVD risk factors, have been shown to be especially prone to

myocardial infarction.^{8,9} Influenza infection has also been associated with increased in-hospital morbidity and mortality in patients with heart failure (HF).¹⁰

When they have trouble breathing, it is important to rapidly determine the cause and identify existing and potential sequelae whether cardiac or viral in origin.

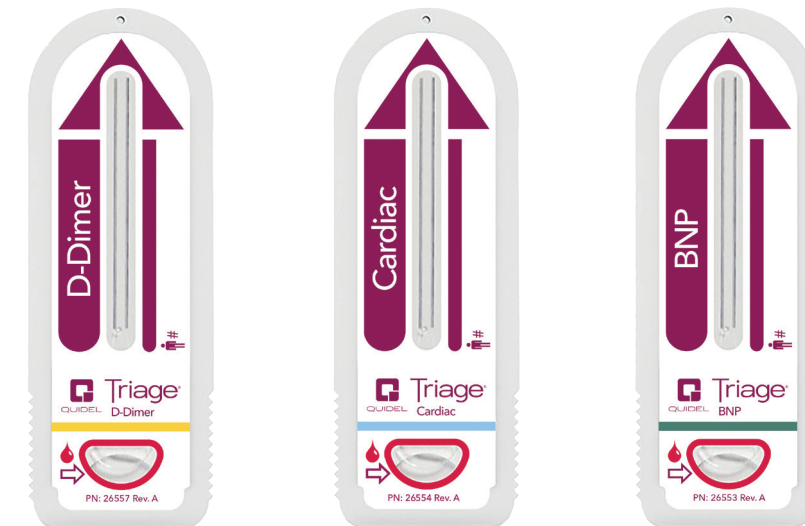


Three For the Crowd

In the U.S., the demand for ED services has increased rapidly.¹² Past influenza outbreaks and the ongoing pandemic have created great challenges for emergency departments. ED crowding has been shown to negatively impact patient outcomes, patient satisfaction, and patient safety.¹³⁻¹⁵ Increased ED occupancy has been found to be associated with more patients classified as higher acuity and result in higher hospital admission rates.¹¹

With all this added pressure on the ED, it is now more important than ever to adopt efficiencies which allow for a more rapid diagnosis.

Quidel's Triage[®] array of tests provide important data to assist with an expedient diagnosis and proper course of treatment.



Quidel Triage products are not indicated for use in testing for SARS-CoV-2 or influenza.

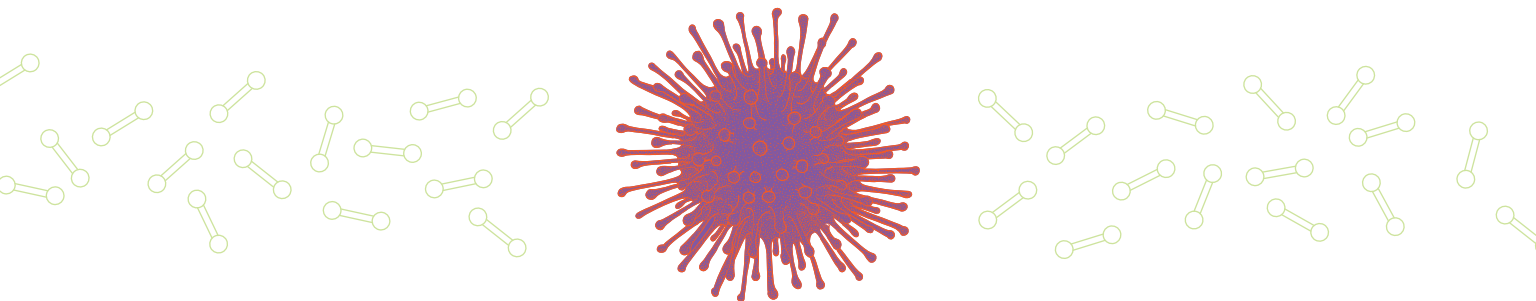
D-dimer Levels in COVID-19 and Influenza Patients Are Prognostic^{16,17}

The Quidel Triage D-Dimer Test is a rapid, quantitative, immunoassay to aid in assessing and evaluating patients with suspected disseminated intravascular coagulation and thromboembolic events including pulmonary embolism (PE) and deep venous thrombosis (DVT).¹⁸

DVT and PE are associated with significant morbidity and mortality.^{19,20} The clinical diagnosis can be difficult as signs and symptoms overlap with many other conditions including shortness of breath.²¹

The fibrinolytic degradation products of cross-linked fibrin are D-dimers.²² A negative D-dimer assay can be effectively used to exclude PE.²³

Early predictors of clinical outcome in COVID-19 patients are needed and D-dimer has been shown to effectively predict in-hospital mortality rates.¹⁶ Increased D-dimer levels are common in influenza cases and have been associated with disease progression and prognostication.¹⁷

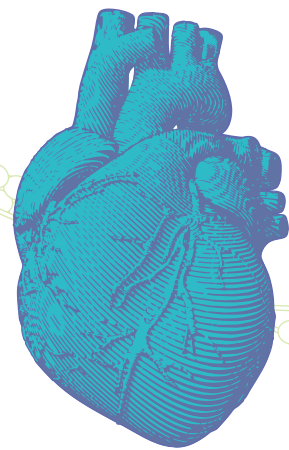


Knowing Troponin Levels Earlier Can Prevent Cardiac Damage.^{24,25}

Troponin is the preferred biomarker for aiding in the diagnosis of acute myocardial infarction by providing early detection to prevent myocardial injury and further cardiovascular damage.^{24,25} For patients with underlying CVD, viral illness can further damage myocardial cells through several mechanisms including direct damage by the virus, systemic inflammatory responses, destabilized coronary plaque, and aggravated hypoxia.²⁶⁻²⁸

The Quidel Triage Cardiac Panel is a fluorescence immunoassay to be used with the Quidel Triage Meter for the quantitative determination of creatine kinase MB (CK-MB), myoglobin, and troponin I in EDTA anticoagulated whole blood or plasma specimens.²⁹

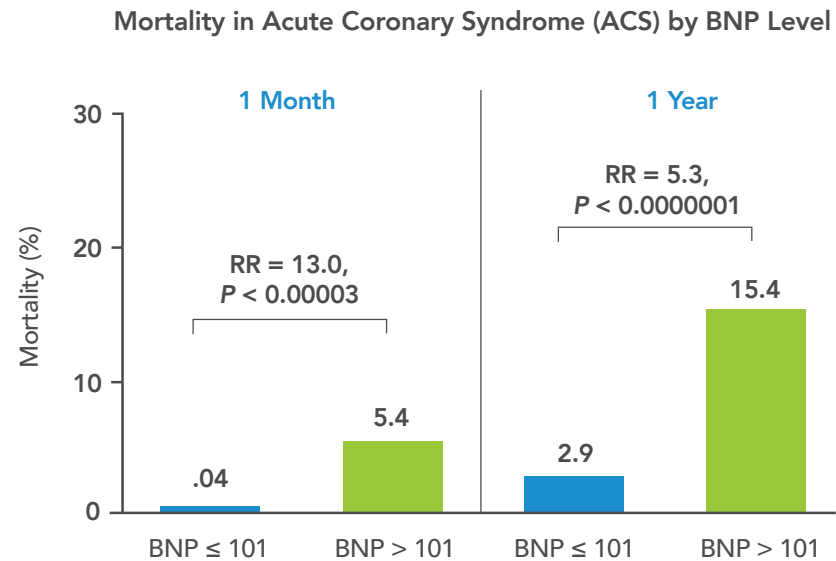
Point-of-care (POC) troponin testing has been shown to decrease patient length of stay, turn around time, and potentially decrease overall costs.³⁰



The Triage BNP Test Is Powerful³¹

BNP From the Beginning

A B-type natriuretic peptide (BNP) level on admission has been found to be an independent and powerful marker of early and late cardiac mortality in patients with acute chest pain without ST-segment elevation. It is suggested that BNP be measured upon arrival at the ED.³¹



Cardiac mortality in patients with acute chest pain without ST-segment elevation according to the receiver-operating characteristic curve-generated best prognostic BNP cut-off level (in pg/mL).

RR = relative risk

The Triage BNP Test Can Assist With a Rapid Rule Out³²

Natriuretic peptide testing is now recommended for the prevention, diagnosis, and prognosis of HF.³³

The newest guideline recommends that the measurement of baseline levels of natriuretic peptide biomarkers and/or cardiac troponin on admission are useful in establishing a prognosis in acute decompensated heart failure.³³

The evidence is strong. When you need to know, you need a BNP.

Indication	Class	Level of Evidence
Diagnosis	I	A
Prognosis	I	A
Pre-discharge Risk Assessment	IIa	B-NR
Prevent Onset of Heart Failure	IIa	B-R

NR = non randomized R = randomized

A single measurement of BNP in the ED is associated with greater diagnostic accuracy and its use decreases time to discharge and cost of stay.³⁴

The Quidel Triage BNP Test is a rapid, POC fluorescence immunoassay used with the Quidel Triage MeterPro. The test is used to measure BNP in EDTA anticoagulated whole blood or plasma specimens. The Triage BNP Test is the first rapid BNP immunoassay indicated for risk stratification for both ACS and HF.³⁵

References

1. Nguyen JL, Yang W, Ito K, et al. Seasonal influenza infections and cardiovascular disease mortality. *JAMA Cardiol.* 2016;1(3):274-281.
2. Centers for Disease Control and Prevention. National Hospital Ambulatory Medical Care Survey: 2017 Emergency Department Summary Tables. 2020. https://www.cdc.gov/nchs/data/nhamcs/web_tables/2017_ed_web_tables-508.pdf. Accessed 29 July 2020.
3. Collins S, Storrow AB, Kirk JD, et al. Beyond pulmonary edema: diagnostic, risk stratification, and treatment challenges of acute heart failure management in the emergency department. *Ann Emerg Med.* 2008;51:45-57.
4. Liteplo AS, Marill KA, Villen T, et al. Emergency thoracic ultrasound in the differentiation of the etiology of shortness of breath (ETUDES): sonographic B-lines and N-terminal pro-brain-type natriuretic peptide in diagnosing congestive heart failure. *Acad Emerg Med.* 2009;16:201-210.
5. Li LQ, Huang T, Wang YQ, et al. COVID-19 patients' clinical characteristics, discharge rate, and fatality rate of meta-analysis. *J Med Virol.* 2020;92(6):577-583.
6. Wu L, O'Kane A, Peng H, et al. SARS-CoV-2 and cardiovascular complications: from molecular mechanisms to pharmaceutical management. *Biochem Pharmacol.* 2020;178:1141-1144. <https://www.sciencedirect.com/science/article/pii/S0006295220303506?via%3Dihub>. Accessed 18 August 2020.
7. MacIntyre CR, Mahimbo A, Moa Am, et al. Influenza vaccine as a coronary intervention for prevention of myocardial infarction. *Heart.* 2016;102(24):1953-1956.
8. Ludwig A, Lucero-Obusan C, Schirmer P, et al. Acute cardiac injury events ≤ 30 days after laboratory-confirmed influenza virus infection among U.S. veterans, 2010-2012. *BMC Cardiovasc Disord.* 2015;15:109.
9. Barnes M, Heywood AE, Mahimbo A, et al. Acute myocardial infarction and influenza: a meta-analysis of case-control studies. *Heart.* 2015;101(21):1738-1747.
10. Panhwar MS, Kalra A, Gupta T, et al. Effect of influenza on outcomes in patients with heart failure. *JACC Heart Fail.* 2019;7(2):112-117.
11. Chen W, Linthicum B, Argon NT, et al. The effects of emergency department crowding on triage and hospital admission decisions. *Am J Emerg Med.* 2020;38(4):774-779.
12. Bellow AA, Gillepsie GL. The evolution of ED crowding. *J Emerg Nurs.* 2014;40(2):153-160.
13. Pines JM, Hollander JE. Emergency department crowding is associated with poor care for patients with severe pain. *Ann Emerg Med.* 2008;51(1):1-5.
14. Bursch B, Beezy J, Shaw R. Emergency department satisfaction: what matters most? *Ann Emerg Med.* 1993;22(3):586-591.
15. Trzeciak S, Rivers EP. Emergency department overcrowding in the United States: an emerging threat to patient safety and public health. *Emerg Med J.* 2003;20(5):402-405.
16. Wang ZF, Su F, Lin XJ, et al. Serum D-dimer changes and prognostic implication in 2009 novel influenza A(H1N1). *Thromb Res.* 2011;127(3):198-201.
17. Zhang L, Yan X, Fan Q, et al. D-dimer levels on admission to predict in-hospital mortality in patients with Covid-19. *Thromb Haemost.* 2020;18(6):1324-1329.
18. Triage D-Dimer Test [package insert]. San Diego, CA: Quidel Cardiovascular Inc., 2018.
19. Anderson FA Jr, Wheeler HB, Goldberg RJ, et al. A population-based perspective of the hospital incidence and case-fatality rates of deep vein thrombosis and pulmonary embolism. The Worcester DVT Study. *Arch Intern Med.* 1991;151(5):933-938.
20. Ozaki A, Bartholomew JR. Venous thromboembolism (deep venous thrombosis & pulmonary embolism). December 2012. <http://www.clevelandclinicmeded.com/medicalpubs/diseasemanagement/cardiology/venous-thromboembolism/>. Accessed 29 July 2020.
21. Le Gal G, Righini M. Controversies in the diagnosis of venous thromboembolism. *J Thromb Haemost.* 2015;13 (Suppl 1):S259-S265.
22. Kesieme E, Kesieme C, Jebbin N, et al. Deep vein thrombosis: a clinical review. *J Blood Med.* 2011;2:59-69.
23. Fesmire FM, Brown MD, Espinosa JA, et al. Critical issues in the evaluation and management of adult patients presenting to the emergency department with suspected pulmonary embolism. *Ann Emerg Med.* 2011;57(6):628-652.
24. Thygesen K, Alpert JS, Jaffe AS, et al. Third universal definition of myocardial infarction. *Eur Heart J.* 2012;33:2551-2567.
25. Amsterdam EA, Wenger NK, Brindis RG, et al. 2014 AHA/ACC Guideline for the Management of Patients with Non-ST-Elevation Acute Coronary Syndromes: a Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* 2014;64:e139-e228.
26. Guo T, Fan Y, Chen M, et al. Cardiovascular implications of fatal outcomes of patients with coronavirus disease 2019 (COVID-19). *JAMA Cardiol.* 2020;5(7):1-8.
27. Zheng YY, Ma YT, Zhang JY, et al. COVID-19 and the cardiovascular system. *Nature Reviews Cardiology.* 2020;5:1-2.
28. American College of Cardiology. Troponin and BNP use in COVID-19. <https://www.acc.org/latest-in-cardiology/articles/2020/03/18/15/25/troponin-and-bnp-use-in-covid19>. Accessed 17 August 2020.
29. Triage Cardiac Panel [package insert]. San Diego, CA: Quidel Cardiovascular Inc., 2018.
30. Koehler J, Flarity K, Hertner G, et al. Effect of troponin I point-of-care testing on emergency department throughput measures and staff satisfaction. *Adv Emerg Nurs J.* 2013;35(3):270-277.
31. Bassan R, Tura BR, Maisel AS. B-type natriuretic peptide: a strong predictor of early and late mortality in patients with acute chest pain without ST-segment elevation in the emergency department. *Coron Artery Dis.* 2009;20(2):143-149.
32. Harrison A, Amundson S. Evaluation and management of the acutely dyspneic patient: the role of biomarkers. *Am J Emerg Med.* 2005;23(3):371-378.
33. Yancy CW, Jessup M, Bozkurt B, et al. 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure: Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Failure Society of America. *Circulation.* 2017;136(6):e137-e161.
34. Mueller C, Scholler A, Laule-Kilian K. Use of B-type natriuretic peptide in the evaluation and management of acute dyspnea. *N Engl J Med.* 2004;350(7):647-654.
35. Triage BNP Test [package insert]. San Diego, CA: Quidel Cardiovascular Inc., 2018.

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