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**THE PRESENT AND FUTURE**

**STATE-OF-THE-ART REVIEW**

# Clinical Use of High-Sensitivity Cardiac Troponin in Patients With Suspected Myocardial Infarction



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**ABSTRACT**

High-sensitivity cardiac troponin (hs-cTn) assays have been used clinically by thousands of physicians in many countries throughout the world since their clinical introduction 7 years ago. In the early diagnosis of myocardial infarction (MI), beyond doubt, the most important indication of hs-cTn assays, these simple, inexpensive, and highly reproducible tools complement detailed clinical assessment including chest pain characteristics and the electrocardiogram. Hs-cTn assays for the first time allowed the precise quantification of cardiomyocyte injury around the 99th percentile and thereby substantially increased the accuracy of MI detection from blood obtained at presentation to the emergency department (ED). Higher accuracy at ED presentation enabled the development and extensive validation of early hs-cTn-based diagnostic algorithms, which substantially reduced the time required for the safe rule-out or rule-in of MI. This review summarizes key principles underlying the safe and effective use of hs-cTn in the ED in patients with suspected MI. (J Am Coll Cardiol 2017;70:996-1012) © 2017 by the American College of Cardiology Foundation.

About 20 million patients present with symptoms suggestive of myocardial infarction (MI) to emergency departments (EDs) in North America and Europe each year (1). Patients with MI may present with a wide variety of symptoms, such as chest pain, shortness of breath, weakness, nausea, and vomiting and even fatigue, making the diagnosis difficult (2,3). Demographics, traditional cardiac risk factors, chest pain characteristics, and physical examination can assist disposition decisions, but are insufficient by themselves to

Some patients may have objective evidence of a clear-cut diagnosis; however, the majority do not (8). Only a minority will be found to have MI and will instead have symptoms caused by noncardiac and often benign disorders such as musculoskeletal pain, pleuritis, or gastroesophageal reflux, highlighting the medical and economic need of rapid rule-out (9,10). Additionally, the early diagnosis of MI is crucial for the early initiation of evidence-based treatment. Missed MI has important medicolegal implications, being the highest single diagnosis