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# . BEYOND TROPONIN: RETHINKING ACUTE MYOCARDIAL INFARCTION IN THE EMERGENCY DEPARTMENT

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**Background:** High-sensitivity cardiac troponin (hs-cTn) has transformed the evaluation of patients with suspected acute myocardial infarction (MI) in the emergency department (ED). However, increased sensitivity has also increased recognition of myocardial injury unrelated to acute myocardial ischemia. The 2026 Fifth Universal Definition of Myocardial Infarction (UDMI) addresses this diagnostic challenge by emphasizing integration of biomarkers with clinical presentation, electrocardiography (ECG), and cardiovascular imaging, rather than interpretation of troponin elevation in isolation.

**Objective:** To review the major changes introduced by the Fifth UDMI and translate them into a clinically applicable framework for the assessment of suspected acute MI in the ED.

**Discussion:** The Fifth UDMI defines acute myocardial injury as a rise and/or fall in cardiac troponin I or T with at least one value exceeding the sex-specific 99th percentile upper reference limit. Importantly, myocardial injury alone does not establish MI. A clinical diagnosis of MI requires acute myocardial injury together with evidence of acute myocardial ischemia derived from symptoms, ECG abnormalities, coronary pathology, or imaging evidence of new loss of viable myocardium or regional wall-motion abnormality. The previous numerical MI classification has been replaced by three clinically oriented categories: **primary MI**, caused by an acute coronary pathology; **secondary MI**, resulting from oxygen supply-demand imbalance due to another acute condition; and **procedure-related MI** following a cardiac intervention. This approach is particularly relevant in emergency care, where elevated troponin may accompany sepsis, arrhythmias, acute heart failure, pulmonary embolism, hypertensive emergencies, and other non-coronary conditions. The Fifth UDMI also reinforces serial hs-cTn testing, sex-specific thresholds, and greater use of coronary and cardiac imaging when the mechanism of myocardial injury remains uncertain.

**Conclusion:** The 2026 Fifth UDMI shifts the diagnostic focus from **"Is troponin elevated?"** to **"Why is troponin elevated, and is the myocardial injury ischemic?"** For emergency physicians, this represents a clinically meaningful transition from biomarker-centered diagnosis toward integrated, pathophysiology-based assessment, potentially improving differentiation of acute MI from other causes of myocardial injury and supporting more appropriate downstream investigation and treatment.

**Keywords:** Myocardial infarction; Cardiac troponin; Myocardial injury; Emergency medicine; Fifth Universal Definition.