The new Fourth Universal Definition of Myocardial Infarction (MI), published in August, introduced the term “myocardial injury,” defined as an elevated troponin value above the 99th percentile upper reference limit (URL). In chronic myocardial injury, troponin remains elevated at consistent levels. Myocardial injury is considered “acute” when an elevated level increases further or there is a decrease from the elevated level, indicating that the earlier level had been acutely elevated.

MI is defined as acute myocardial injury with clinical evidence of myocardial ischemia. The diagnosis of myocardial ischemia involves application of the physician’s clinical judgment to the patient’s clinical circumstances. The concept of “myocardial injury” replaces the term “necrosis,” allowing a clearer distinction between ischemic and nonischemic causes.

The recommended biomarkers for evaluation of myocardial injury and MI are troponins. Under the new universal definition, troponin is the only recommended diagnostic biomarker for MI. Creatine kinase-MB and myoglobin are no longer recommended. Creatine kinase-MB is not as accurate or reliable as troponin.

Troponin reference ranges depend on the methodology of the specific test used. It is important to know the 99th percentile reference range for your hospital’s lab. Troponin I is more accurate than troponin T, and high-sensitivity troponin (hs-cTn) has been newly endorsed to supplement troponin I or T.

Causes of myocardial injury may be ischemic (such as MI) or nonischemic. Ischemic causes include coronary artery disease (CAD), supply-demand mismatch, and postprocedural infarction. Nonischemic causes include heart failure, myocarditis, cardiomyopathy, catheter ablation, defibrillation, cardiac contusion, and systemic causes such as sepsis, cerebrovascular accident/hemorrhage, pulmonary embolism, hypertension, chemotherapy, and infiltrative diseases (e.g., amyloidosis, sarcoidosis).

When troponin levels are persistently elevated and do not fall, it indicates a chronic nonischemic myocardial condition causing myocardial injury. Troponin levels are commonly elevated without any myocardial injury in chronic kidney disease.

The types of MI according to the Fourth Universal Definition are shown in Table 1. The new definition includes some changes from those outlined in the November 2017 Coding Corner addressing the Third Universal Definition. The diagnostic criteria for myocardial ischemia have been enlarged and described more specifically for types 1 and 2, with nonischemic causes described in greater detail. Type 4c has been affirmed where it previously was not.

Type 1 MI includes ST-elevation MI (STEMI), Q-wave infarction, and non-ST-elevation MI (NSTEMI) with coronary thrombosis due to CAD. STEMI or Q-wave infarctions are usually self-evident with characteristic electrocardiogram (EKG) findings and typically require immediate reperfusion therapy or percutaneous coronary intervention (PCI). NSTEMI is identified by elevated troponin levels with only minor nonspecific ST/T-wave changes or even a normal EKG.

The diagnosis of type 1 and 2 MI requires at least one of the following: symptoms of acute myocardial ischemia, new ischemic