Boston University Hospital

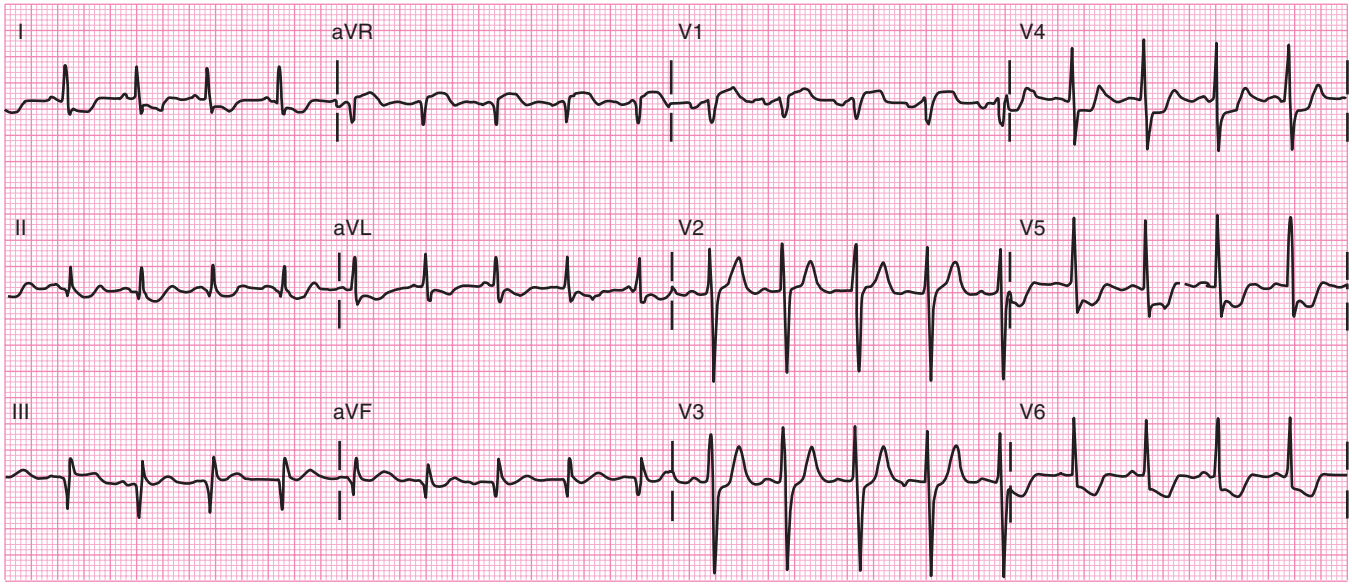

FIGURE 8-6 Marked ST-segment depression in a patient with prolonged chest pain resulting from an acute non–ST-segment elevation myocardial infarction. Between 1 and 3 mm of ST-segment depression is seen in leads I, aVL, and V_4 to V_6. The patient was known to have had a previous inferior myocardial infarction.

definitive evidence of MI, and they are particularly helpful to provide prognostic significance when symptoms are mild and ECG changes are minimal. Common biomarkers include creatine kinase (CK), troponin I, troponin T, lactate dehydrogenase (LDH), and aspartate aminotransferase (AST). Sequential measurement of biomarkers demonstrates their various time courses for abnormal elevation after an acute MI (Fig. 8-7). This information can be helpful in retrospectively timing the occurrence of an event. In contemporary practice, troponin has become the most frequently measured biomarker, although CK is still used. LDH and AST are no longer routinely measured for the diagnosis of MI.

Troponins I and T are the most sensitive and most specific markers of myocardial necrosis, and as a consequence, they have become the standard in the biochemical diagnosis of acute MI. The myocardial-specific isozyme CK-MB may be in the normal range while concomitant measurement of troponin I or T reveals the presence of myocardial necrosis. Troponins I and T begin to rise within 4 hours of myocardial necrosis and remain elevated for 7 to 10 days after the MI event. Confounding elevations of troponin T occur in patients with renal failure and congestive heart failure not related to ACS. Troponin release also occurs in the case of demand ischemia not related to coronary thrombosis. This requires careful attention to the entire clinical presentation in discerning the likelihood of underlying ACS due to coronary thrombosis.

In the absence of clear evidence of NSTEMI (i.e., normal examination, ECG findings, and biomarkers), patients who present with the diagnosis of unstable angina should undergo stress testing. A negative exercise stress test is very helpful for distinguishing those patients who require more aggressive diagnostic testing (e.g., catheterization) from those who can be monitored as outpatients. Some centers have embraced the use of CT coronary angiography in the assessment of low-risk patients. This technique has a high negative predictive value in establishing a diagnosis of CAD.

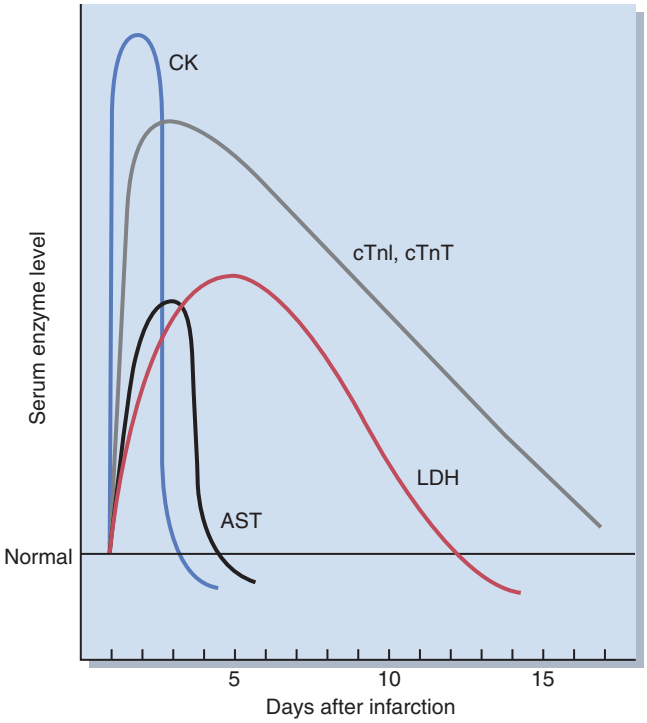

FIGURE 8-7 Typical time course for the detection of enzymes released after myocardial infarction. AST, Serum aspartate aminotransferase; CK, creatine kinase; cTnI, cardiac troponin I; cTnT, cardiac troponin T; LDH, lactate dehydrogenase.

Echocardiography can be helpful in patients with equivocal ECG findings for ischemia and normal biomarkers. The presence of regional wall motion abnormalities, particularly if they correlate with the distribution of ECG abnormalities, raises the risk