



Cardiac Marker Testing Practices for Clinicians

SYNOPSIS AND RELEVANCE

Guidelines have been published that recommend using cardiac troponin (cTn) as the preferred marker of acute myocardial injury (AMI). Adherence to these recommendations can:

1. Ensure that cTn is utilized properly and preferentially as a marker of AMI.
2. Reduce the utilization of other markers of AMI like the creatine kinase MB (CK-MB) fraction. While this module focuses on cTn and CK-MB testing, a similar strategy could be used to evaluate other cardiac markers.
3. Impact patient care by establishing and following an effective approach for detecting AMI.

INSIGHTS

1. cTn is the most widely available, sensitive and specific test used to detect AMI.
2. The CK-MB test provides little to no additional information to that provided by a cTn test when evaluating patients for AMI.

BACKGROUND

For several decades the creatine kinase MB fraction had been used as a marker of acute myocardial injury (AMI). CK-MB is released into the blood following heart or skeletal muscle injury. The CK-MB “relative index”, defined as the amount of CK-MB relative to total CK, is calculated to differentiate cardiac from skeletal muscle as the injury source. There is a delay in the appearance of measurable CK-MB following AMI due to the relatively large size of this molecule. The automated instruments in most laboratories are capable of running this test.

The development and widespread adoption of a more specific measure of myocardial injury, cardiac troponin (cTn), including troponin I (TnI) and troponin T (TnT), has called into question the need to routinely perform CK-MB testing. Following AMI, cTn is released before CK-MB and levels remain elevated longer than CK-MB due to myofibril degradation. Practice guidelines first published in 2007 state that the standard for diagnosing AMI is cTn because of its superior specificity and sensitivity. Opposition to removing CK-MB from test menus is usually based on concerns that reinfarction and injury post cardiac intervention may not be detected using only cTn due to its prolonged elevation following ischemia. In fact, it is now clear that reinfarction can be detected when there is re-elevation of cTn after it reaches a plateau stage or declines toward normal levels. cTn levels can also be used to estimate infarct size like CK-MB.

Optimizing the utilization of tests commonly used to detect AMI may increase the value of clinical cardiac services for providers and patients by:

- Improving the performance of the diagnostic strategy used at your institution to detect AMI.
- Streamlining the evaluation of patients with AMI for your health care professionals in a collaborative manner.
- Enhancing the training and education of providers who routinely order cardiac marker testing.
- Ensuring that your health information technology services support the decision making of health care providers who utilize cardiac marker testing by optimizing the electronic test ordering and laboratory test resulting systems.
- Impacting the testing costs for patients being evaluating for AMI.

REFERENCE

Apple FS, Jesse RL, Newby LK, et al. National Academy of Clinical Biochemistry and IFCC Committee for Standardization of Markers of Cardiac Damage Laboratory Medicine Practice Guidelines: Analytical issues for biochemical markers of acute coronary syndromes. *Clin Chem*. Apr 2007;53(4):547-551.
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