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The Dimension Vista LOCI Cardiac Troponin I Assay User Guide

Achieve Accurate Diagnosis of AMI

siemens.com/troponin

3-hour algorithm

Using the Dimension Vista LOCI Troponin I Assay for Accurate Early Diagnosis of AMI

On the basis of sensitivity and myocardial specificity, cardiac troponin (cTn) is the preferred biomarker for diagnosis of acute myocardial infarction (AMI).[1] Conventional cardiac troponin assays require 4–8 hours (h) for levels to become abnormal, peaking at 12–16 h and declining over the subsequent 5–9 days.[2,3] Newer, more sensitive cardiac troponin assays allow earlier detection, supporting more rapid triage of chest-pain patients. Use of a sensitive cardiac troponin I assay facilitates expeditious detection and assessment of a change—important in the differentiation of an AMI related to myocardial ischemia from other causes of myocardial necrosis.[4-6]

Diagnosis of Acute Myocardial Infarction[7-12]

Acute myocardial infarction (AMI) is diagnosed when there is evidence of myocardial necrosis in a clinical setting consistent with acute myocardial ischemia. Necrosis has been defined by a significant rise or fall (serial change) of cardiac troponin, with at least one value above the 99th percentile upper limit of normal (ULN). Diagnosis also requires at least one other well-defined hallmark of AMI (evidence of ischemia, ECG and/or imaging abnormalities).

Cardiac troponin assays should strive for total imprecision of ≤10% coefficient of variation (CV) at the 99th percentile ULN of the reference population.

On the basis of imprecision and other performance characteristics, the Dimension® Vista™ LOCI® assay is a contemporary-sensitive assay[13] which is guideline acceptable.[14-16]

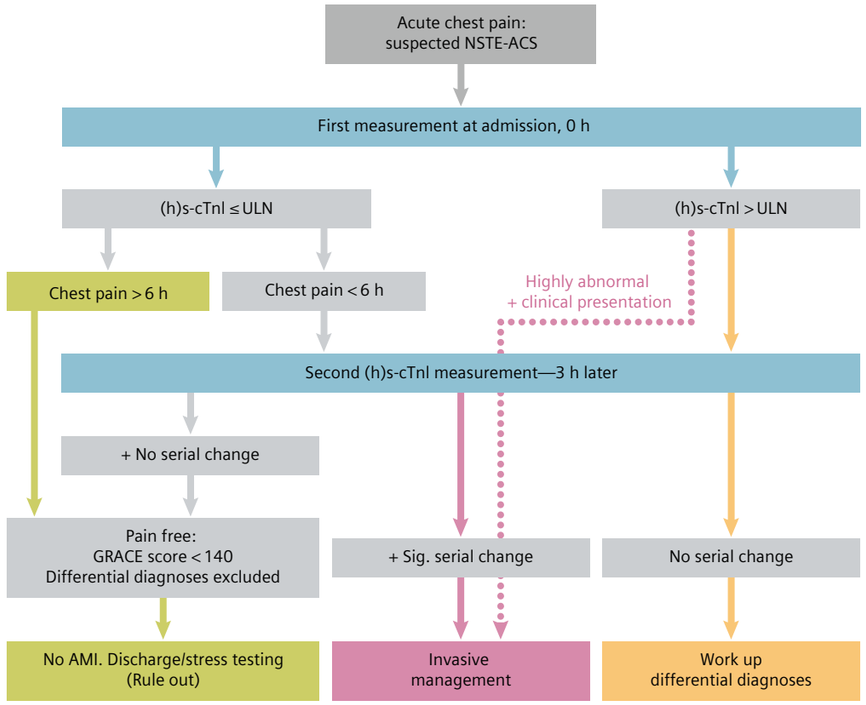
Clinical introduction of the sensitive cardiac troponin assays significantly increases the number of chest pain patients presenting with values exceeding the 99th percentile ULN as a result of causes other than AMI (see table).[6,17-19]

In the appropriate clinical setting, serial testing can differentiate between increased troponin levels due to AMI and increased levels due to non-ischemic causes. Rising or falling patterns indicate AMI (NSTEMI);[7,9-12,20] whereas, unchanged levels are found in chronic diseases.

However, changes in cardiac troponin concentrations are also observed in patients with atrial fibrillation non-coronary artery disease; and, for other acute cardiac situations such as tachyarrythmias, myocarditis, hypertensive crisis, and Takotsubo cardiomyopathy.[21-24]

It is important to remember that interpretation of cardiac troponin values must always accompany clinical assessment, including evidence of ischemia by clinical symptoms, ECG, and imaging.

Example algorithm for the diagnosis of AMI and risk stratification of patients with suspected NSTE-ACS using sensitive (s) and high-sensitivity (hs) assays.[9,10,17]



Dimension Vista LOCI TnI-Ultra Assay Decision Cutoffs:

ULN = upper limit of normal
= 99th percentile of a healthy population
= 45 ng/L (45 pg/mL, 0.045 µg/L)[14]

Example significant serial change 3 h = >21 ng/L (21 pg/mL, 0.021 µg/L)[25]

The significant serial change must be determined for each assay, and may be determined independently by each institution.[11]

Elevations of Cardiac Troponin Values Due to Myocardial Injury[11,23]

Injury Related to Primary Myocardial Ischemia[11,23]

- Plaque rupture
- Intraluminal coronary artery thrombus formation

Injury Related to Supply/ Demand Imbalance of Myocardial Ischemia

- Tachy-/bradyarrhythmias
- Aortic dissection or severe aortic valve disease
- Hypertrophic cardiomyopathy
- Cardiogenic, hypovolemic, or septic shock
- Severe respiratory failure
- Severe anemia
- Hypertension, with or without LVH
- Coronary spasm
- Coronary embolism or vasculitis
- Coronary endothelial dysfunction without significant CAD
- Injury not related to myocardial ischemia
- Cardiac contusion, surgery, ablation, pacing, or defibrillator shocks
- Rhabdomyolysis with cardiac involvement
- Myocarditis
- Cardiotoxic agents

Multifactorial or Indeterminate Myocardial Injury

- Congestive heart failure: acute and chronic
- Stress cardiomyopathy
- Severe pulmonary embolism or pulmonary hypertension
- Sepsis and critical illness
- Renal failure
- Acute neurological disease, including stroke, or subarachnoid hemorrhage
- Infiltrative diseases (amyloidosis, hemochromatosis, sarcoidosis, and scleroderma)
- Strenuous exercise

Abbreviations	
LVH	Left ventricular hypertrophy
CAD	Coronary artery disease
GRACE Score	Global Registry of Acute Coronary Events Risk Score
NSTE-ACS	Non-ST-elevation acute coronary syndrome
NSTEMI	Non-ST-elevation myocardial infarction
ECG	Electrocardiograph