



# Troponin T, High Sensitivity (hs-TnT)

CPT Code **84484\***

Order Code **38685**

Specimen Type **Plasma**

Tube Type **Lithium Heparin (Green-Top)**

## hs-TnT levels are associated with:

- Coronary heart disease (CHD)
- Cardiovascular mortality
- Heart failure (HF)

## hs-TnT levels may be measured in:

- Present/suspected coronary artery disease (CAD)
- Angina

## Description

The troponin protein complex plays a key role in the regulation of cardiac muscle contractions.<sup>1</sup> Prolonged ischemia of the myocardium can lead to death of cardiomyocytes and release of intracellular proteins, such as troponins, into circulation.<sup>1</sup> For this reason, Troponin T levels exceeding the 99<sup>th</sup> percentile of a normal reference population are designated as the decision level for the diagnosis of an MI in conjunction with that patient's clinical presentation.<sup>2,3</sup> The development of high-sensitivity assays allows for lower levels of cardiac troponins to be assessed for other etiologies.<sup>3</sup> Literature shows that even minimal increases of troponin levels are associated with unfavorable cardiovascular and all-cause mortality outcomes.<sup>4</sup> This association is also independent of conventional risk factors.<sup>4</sup>

## Clinical Use

Troponin T, High Sensitivity (hs-TnT) is an independent prognostic marker that aids in the diagnosis of myocardial infarction (MI) in an acute setting (>22 ng/L for males and >14 ng/L for females), and there is literature supporting its use to assess relative risk for cardiovascular disease (CVD) and adverse cardiovascular events (≥6 ng/L for males and females).

## Clinical Significance

- In a review of more than 154,000 patients in the general population, detectable troponin concentrations below the diagnostic threshold for myocardial infarction (MI) were associated with increased relative risk of CVD, as well as death secondary to CHD and stroke.<sup>5</sup>
- Several trials, comprised of generally healthy individuals (ARIC, CHS, DHS, and MESA), demonstrate that any detectable level ≥6 ng/L confers increased relative risk for CVD.<sup>6-9</sup>
- hs-TnT levels can help identify and stratify disease severity in patients, without history of diagnosed CAD, presenting to the outpatient department with angina.<sup>10,11</sup>
  - hs-TnT is demonstrated to independently predict the presence of CAD, and there is a dose-dependent relationship between hs-TnT levels and CAD severity.<sup>10</sup> Additionally, hs-TnT levels correlate with CT plaque burden.<sup>10</sup>
  - hs-TnT levels (>6 ng/L) correlate with increased relative cardiac risk and relative risk of cardiovascular events, independently of Framingham Risk Score (FRS), coronary artery calcium (CAC) score, or coronary CT-angiography, and improve relative risk classification when combined with these evaluation methods.<sup>11</sup>
- In a meta-analysis of general population studies, elevated hs-TnT was strongly associated with an increased relative risk of cardiovascular and all-cause mortality.<sup>4</sup>
- Increased hs-TnT within a 6-year follow-up was independently associated with incident CHD, death, and HF, while decreases were associated with reduced risk of the same outcomes.<sup>12</sup>
- In patients with chronic heart failure, hs-TnT is a strong and independent predictor of all-cause and cardiovascular mortality, and of hospitalization for cardiovascular causes.<sup>13</sup>

## Testing Frequency

hs-TnT testing is determined by an individual's medical history, but it may be performed semi-annually or annually as necessary. If the initial test result is abnormal, then follow-up testing may be performed within 3-6 months following treatment.

## Commercial Insurance or Medicare Coverage

Coverage guidelines, also known as NCD (National Coverage Determination) or LCD (Local Coverage Determination), have not been established or posted by CMS (Centers for Medicare & Medicaid Services). A review of larger carriers—including Aetna®, UnitedHealthcare®, Cigna®, and the Blue Cross®/Blue Shield® organizations—revealed information is limited or has not been posted.

## Specimen Type

The hs-TnT test should be performed on a plasma lithium heparin specimen. Fasting is not required for this test.

### RELATIVE RISK

hs-TnT (ng/L)

	Low	Moderate	High
Males	<6	6-22	>22
Females	<6	6-14	>14

## Treatment Considerations†

*These treatment considerations are for educational purposes only. Specific treatment plans should be provided and reviewed by the treating practitioner.*

### Assess level of exercise.

hs-TnT levels may be elevated in marathon runners and other athletes following strenuous exercise.<sup>14,15</sup>

### Assess smoking habits.<sup>16</sup>

Smoking cessation is essential, as individuals who smoke are at increased risk of heart disease and blood clots.

### Assess LDL-C levels.

If not at an optimal level, consider lipid-lowering therapies<sup>17</sup> described in the National Cholesterol Education Program/Adult Treatment Panel III (NCEP ATP III) Guidelines.<sup>18</sup>

### Assess insulin sensitivity.<sup>19</sup>

If not at an optimal level, consider insulin-sensitizing therapies described in the ADA guidelines for the management of pre-diabetes/diabetes.<sup>20</sup>

### Assess blood pressure.

If not at an optimal level,<sup>21</sup> consider initiating, or titrating, antihypertensive therapy.

### Assess the presence of coronary artery disease (CAD) with imaging techniques such as carotid intima media thickness testing (CIMT) or coronary artery calcium (CAC) scoring.<sup>10</sup>

### Assess presence of chronic obstructive pulmonary disease (COPD).<sup>7,9,22,23</sup>

COPD may lead to hypoxia and tachycardia, resulting in subclinical myocardial damage and hs-TnT elevations.<sup>6</sup>

### Assess for heart failure.

If heart failure is present or suspected,<sup>9,12,13</sup> reference the American College of Cardiology/American Heart Association/Heart Failure Society of America (ACC/AHA/HFSA) guidelines for management of heart failure.<sup>24</sup>

\* The CPT codes provided are based on AMA guidelines and are for informational purposes only. CPT coding is the sole responsibility of the billing party. Please direct any questions regarding coding to the payer being billed.

† The treatment considerations are provided for informational purposes only and are not intended as medical advice. A physician's test selection and interpretation, diagnosis, and patient management decisions should be based on his/her education, clinical expertise, and assessment of the patient.

## References

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