
Date: March 11, 2019
To: Calgary Zone ED, Internal Medicine, Cardiology and Family Physicians, Nurse Educators, Nurse Managers, ED Unit Clerks, APL Chemistry Managers and Supervisors, MLTII/III, LIC, Accessioning, Clinical Biochemists
From: The Calgary Zone Joint ED, Cardiology and Laboratory Services Troponin Working Group*
Re: **Revised Reporting Comments and Critical Values for Troponin T, High Sensitivity**

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Key Message:

- Effective **March 6, 2019**, comments for all high sensitivity troponin (hs-Tn) T results will be revised to align with the Calgary Zone Acute Care Pathway for Suspected Acute Coronary Syndrome (ACS) in acute care centres in the Calgary Zone (Table 1 and Figure 1).
- This reporting is consistent with the European Society of Cardiology (ESC) 2015 ACS guidelines and is supported by an Alberta Health Services (AHS) working group with representation from the Departments of Cardiac Sciences and Emergency Medicine, and Alberta Public Laboratories (APL), South Sector.

Why this is important:

- The revised comment will assist clinicians in the evidence-based interpretation of these results and guide optimal patient management in conjunction with a multidisciplinary chest pain pathway.
- The new critical value for hs-TnT will be ≥ 53 ng/L.

Background:

- Evidence supporting rapid diagnostic algorithms for patients with suspected ACS using hs-TnT has demonstrated high sensitivity of low levels on presentation to rule out ACS, as well as the powerful ability of serial measurements in concentrations over fixed time intervals to rule in or exclude acute myocardial infarction.
- While hs-TnT offers improved diagnostic performance relative to conventional troponin assays, it is important to note that hs-TnT results alone cannot exclude all ACS presentations and high-risk clinical presentations remain high-risk, even if hs-TnT concentrations are normal.
- Furthermore, abnormal elevations in hs-TnT do not necessarily represent acute myocardial injury or coronary ischemia. Thus, clinical judgment remains essential to ensure safe patient management.

Action Required:

- All users of hs-TnT in the Calgary Zone should familiarize themselves with the revised Calgary Zone Acute Care Pathway for Suspected Acute Coronary Syndrome and accompanying comments.

Inquiries and feedback may be directed to:

*Dr. James Andruchow, ED Physician, AHS, 587-215-7320, James.Andruchow@ahs.ca

*Dr. Andrew McRae, ED Physician, AHS, 403-471-9692, amcrae@ucalgary.ca

*Dr. Ahmed Abdi Ali, Cardiologist, AHS, 403- 571-8616, Ahmed.AbdiAli@ahs.ca

*Dr. Andreas Westib, Cardiologist, AHS, 403 -571-8627, Andreas.Westib@ahs.ca

*Dr. Isolde Seiden Long, Clinical Biochemist, APL, 403-944-3993, Isolde.SeidenLong@albertapubliclabs.ca

Dr. Hossein Sadrzadeh, Section Chief Chemistry, APL, 403-770-3759, Hossein.Sadrzadeh@albertapubliclabs.ca

This memorandum has been reviewed and approved by:

Dr. Todd Anderson, Zone Clinical Department Head, AHS Calgary Zone Department of Cardiac Sciences

Dr. Eddy Lang, Zone Clinical Department Head, AHS Calgary Zone Clinical Department of Emergency Medicine

Dr. Leland Baskin, Associate Medical Director, South Sector, Alberta Public Laboratories

*Other working group members: Dr. Katherine Bateman, Dr. Andrew Fagan

Table 1:
The following tables outline the proposed text changes for in-hospital and community based hs-TnT reporting.

In-Hospital Reporting	
Current:	Revised:
<p>Troponin T Hs 1-14 ng/L Troponin T Hs is within the reference range: 0-14 ng/L and results not consistent with myocardial infarction or damage, providing the specimen was collected >6 hrs from the onset of symptoms.</p>	<p>Troponin T, High Sensitivity <5 ng/L For patients with a non-ischemic ECG, a Troponin T, High Sensitivity of 4ng/L or less on presentation is highly sensitive for excluding acute myocardial infarction, provided the specimen was collected more than 3-hours from symptom onset. However, for patients with symptoms less than 3-hours duration or concerning clinical presentations, repeat troponin testing at 2-hours after the initial sample is recommended. Please note that patients with ischemic ECG changes and/or high-risk clinical presentations should be considered for further evaluation irrespective of troponin results.</p> <p>Troponin T, High Sensitivity 5-13 ng/L Troponin T, High Sensitivity is below the upper reference limit (14 ng/L) and results are not consistent with myocardial infarction or injury. However, patients with acute symptoms (less than 6-hours) or concerning clinical presentations should undergo repeat troponin testing at 2-hours after the initial sample.</p> <ul style="list-style-type: none"> • A 2-hour change of 3 ng/L or less is highly sensitive for excluding acute myocardial infarction. • A 2-hour change of 4-9 ng/L may indicate acute myocardial injury. Repeat clinical evaluation, ECG and troponin at 4-hours after the initial sample is recommended. • A 2-hour change of 10 ng/L suggests an acute myocardial injury and may represent acute myocardial infarction in the appropriate clinical scenario. <p>Please note that patients with ischemic ECG changes and/or high-risk clinical presentations should be considered for further evaluation irrespective of troponin results.</p>
<p>Troponin T Hs 15-49 ng/L Troponin T-HS has non-specific/non-diagnostic elevation and is inconclusive for myocardial infarction provided the specimen was collected >6 hrs from the onset of symptoms. Repeat testing in 2-4 hours may be useful depending on the clinical situation.</p>	<p>Troponin T, High Sensitivity 14-52 ng/L Troponin T, High Sensitivity has a non-specific/non-diagnostic elevation. Interpretation is highly dependent on clinical presentation and patient history. New elevations are concerning; however, many patients have chronic elevations in troponin and measured concentrations near the patient's baseline are reassuring. Patients with acute symptoms (less than 6 hours) or concerning clinical presentations should undergo repeat troponin testing at 2-hours after the initial sample.</p> <ul style="list-style-type: none"> • A 2-hour change of 3 ng/L or less suggests acute myocardial infarction is unlikely. • A 2-hour change of 4-9 ng/L may indicate acute myocardial injury. Repeat clinical evaluation, ECG and troponin at 4-hours after the initial sample is recommended. • A 2-hour change of 10 ng/L suggests an acute myocardial injury and may represent acute myocardial infarction in the appropriate clinical scenario. <p>Please note that patients with ischemic ECG changes and/or high-risk clinical presentations should be considered for further evaluation irrespective of troponin results.</p>
<p>Troponin T Hs 50-109 ng/L Borderline elevation of Troponin T Hs. Troponin is elevated but the level of Troponin is inconclusive for myocardial infarction, providing the specimen</p>	<p>Troponin T, High Sensitivity >=53 ng/L Clear elevation of Troponin T, High Sensitivity consistent with acute myocardial injury or infarction in the appropriate clinical context. Repeat troponin testing at 2-hours after the initial sample may be helpful to assess for ongoing myocardial injury.</p>

was collected >6 hrs from the onset of symptoms. Repeat testing in 2-4 hours may be useful depending on the clinical situation.	
Troponin T Hs >= 110 ng/L Clear elevation of Troponin T Hs and the value is consistent with myocardial infarction or damage	*Remove

***Note: New Critical value for Troponin T, High Sensitivity will be >= 53 ng/L**

Community Reporting	
Current:	Revised:
Troponin Hs 1-14 ng/L Troponin T Hs is within the reference range: 1-14 ng/L and results are not consistent with myocardial infarction or damage, providing the specimen was collected > 6 hr from the onset of symptoms.	Troponin T, High Sensitivity 1-13 ng/L Troponin T, High Sensitivity is below the upper reference limit (14 ng/L) and results are not consistent with myocardial infarction or injury, provided the specimen was collected more than 6-hours from the onset of symptoms. Patients with active symptoms, ischemic ECG changes and/or concerning clinical presentations should be considered for urgent evaluation irrespective of troponin results.
Troponin T Hs 15-49 ng/L Troponin T Hs has a non-specific, non-diagnostic elevation. Interpretation of results from ambulatory out-patients is highly dependent on clinical presentation. Cardiac risk assessment by the ordering physician or urgent-access cardiology clinic (or emergency department) may be indicated.	Troponin T, High Sensitivity 14-52 ng/L Troponin T, High Sensitivity has a non-specific/non-diagnostic elevation. Interpretation is highly dependent on clinical presentation and patient history. New elevations are concerning; however, many patients have chronic elevations in troponin and measured concentrations near the patient's baseline are reassuring. Patients with active symptoms, ischemic ECG changes and/or concerning clinical presentations should be considered for urgent evaluation irrespective of troponin results.
Troponin T Hs 50-109 ng/L Borderline elevation of Troponin T Hs. Troponin is elevated but the level of Troponin is inconclusive for myocardial infarction, providing the specimen was collected >6 hr from the onset of symptoms. Interpretation of results from ambulatory out-patients is highly dependent on clinical presentation. Cardiac risk assessment by the ordering physician, urgent-access cardiology clinics (or emergency department) may be indicated.	Troponin T, High Sensitivity >=53 ng/L Clear elevation of Troponin T, High Sensitivity consistent with myocardial injury or infarction. Interpretation is highly dependent on clinical presentation and patient history. Many patients have chronic elevations in troponin and measured concentrations near the patient's baseline are reassuring. New troponin elevations are concerning and urgent assessment in an emergency department may be indicated in the appropriate clinical context.
Troponin T Hs >= 110 ng/L Clear elevation of Troponin T-HS and the value is consistent with myocardial infarction or damage.	*Remove

***Note: New Critical value for Troponin T, High Sensitivity will be >= 53 ng/L.**

Figure 1: This revised reporting supports the following proposed multidisciplinary pathway which outlines the management of patients presenting with suspected ACS to acute care settings.

