

# New High Sensitivity (hs) Troponin T Assay

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## Summary

- The new hs Troponin T assay can now reliably measure very small elevations which are undetectable using other troponin assays.
- Sensitivity for detecting Acute Coronary Syndromes (ACS) including myocardial infarct has thus been improved, but some (non-ACS) chronic conditions may now also cause an abnormal result.
- Follow-up testing should thus be performed 3-6 hours after the initial test; a changing Troponin indicates an acute event associated with immediate ACS risk
- An unchanging elevation of troponin indicates chronic disease associated with a medium term cardiac risk
- Units have been changed so that results are now reported as whole numbers. (old units x 1000)

Clinipath Pathology and Bunbury Pathology use a highly sensitive Troponin T (Roche) assay. We are the first laboratories to introduce this assay in West Australia.

The introduction of this fifth generation Troponin assay coincides with new international guidelines that stipulate that Troponin results should be reported as whole numbers to minimise confusion; the new units are the old units multiplied by 1000.

The new troponin assay has several potential uses which relate to its ability to assess both short and medium term cardiac risk. It can detect the very low levels of troponin present in the serum of healthy patients. Until now, a detectable troponin has been indicative of cardiac disease. The new assay has a reference interval (<15 ng/L) and results below these are 'normal' while results above this level indicate cardiac damage.

**It is only when hs Troponin T levels exceed 50 ng/L that they become positive by the less sensitive fourth generation Troponin assays.**

While previous generations of the troponin assays could detect the relatively large amounts of

troponin released during ischaemia (acute coronary syndromes), this assay will detect virtually all the milder forms of cardiac damage that occur in non-acute conditions including congestive

cardiac failure, cardiac arrhythmias and pulmonary embolus. Levels are also elevated in chronic renal failure and acute-on-chronic respiratory illness which have a known association with cardiac risk.

The increased sensitivity will also allow earlier and clearer identification of patients experiencing an acute coronary event. The universal definition of myocardial infarction requires a setting of ischaemia (symptoms / ECG changes) plus a rising or falling troponin *with at least one value above the reference limit ( $\geq 15$  ng/L).*

## Troponin in General Practice

Troponin should only be requested in the primary care setting if symptoms or ECG evidence suggest that there is a possible, but low probability risk of ACS or MI. Patients with typical, high probability presentations should be urgently referred to hospital without delay.



The diagnosis of an acute coronary syndrome involves the demonstration of a rising troponin level, and patients with suspected myocardial ischaemia should be monitored while these tests are pending. Therefore, general practitioners should only request urgent troponin levels if they are able to monitor these patients until all results are obtained and should also provide their mobile number on the request form so that results can be communicated immediately they become available.

### Troponin in the Emergency Department

Troponin should be measured on admission. Although troponin typically takes a minimum of three hours to rise following acute chest pain, many of these patients will have early evidence of cardiac damage from pre-existing, subclinical ischaemia.

### Diagnostic approach

If the troponin level is normal (<15 ng/L), it should be retested three hours later. If it is still normal, it is very unlikely myocardial infarction has occurred.

If the initial troponin level is mildly elevated (15 - 50 ng/L), a second sample should be collected after three hours to see if a rise has occurred.

If the initial troponin result is over 50 ng/L, it is very likely that there is significant myocardial damage. A second reading will usually show a rise that confirms that an acute event has occurred.

