

**Salem Hospital will soon be in some very good company. Several of the top cardiology centers in the nation, as ranked by *US News & World Report* are Troponin T users, including the Cleveland Clinic, Duke University Medical Center, the Mayo Clinic and Mass General.**

#### **Enhanced Clinical Utility**

These prestigious institutions were aware that Troponin T has well-validated clinical utilities beyond mere AMI diagnosis. Large outcomes-based trials have shown it to be a useful tool for risk-stratification of patients with acute coronary syndromes, for guidance of therapy selection and for risk stratification of coronary morbidity in patients with chronic kidney disease.

### **What to expect**

#### **Confidence in your results**

So what does it mean for you to be using the state-of-the-art Troponin T assay? It means you won't have to question your results. You can have confidence that when you see a nonzero Troponin value that myocardial cell death has occurred. It is not likely to be false positive or analytical outlier.

#### **Freedom from analytical problems and standardization**

The Troponin T assay was designed to be an assay you can trust. It is not affected by many of the analytical problems which plague other Troponin assays, such as the currently used Troponin I assay. There have been no reports of interferences from fibrin clots, rheumatoid factor, heterophilic antibodies, or unstable calibrators. Since our antibodies are directed toward the stable central position of the Troponin T protein, measurements are unaffected by time-dependent sample instability caused by protein oxidation, phosphorylation, degradation, or complex formation. In addition, sample type can include heparin plasma, with no interference from heparin.

Troponin T values can be compared from one institution to another. Because all Troponin T assays use the same antibody pairs, you can be assured that your Troponin T results will be very similar to those run on another instrument.

#### **Greater Sensitivity**

This stability, along with the electrochemiluminescent detection technology employed in the Elecsys 2010 system and the MODULAR ANALYTICS 170 module, lets you achieve one of the lowest functional sensitivities in the cardiac marker business, with a CV of 20% of 0.01 ng/mL and CV 10% of 0.03 ng/mL. This ability to accurately measure small concentration of troponin is especially important in light of the current recommendations by the ACC, AHA, ESC, and IFCC to lower Troponin cutoff levels.

#### **Reliably identify more AMI patients**

When using Troponin T, you will likely see positive results more often than you did with previous markers. The GUSTO-IIa and PRISM trials showed that Troponin T is capable of picking up clinically significant minor myocardial damage that other assays miss. According to the new ESC (European Society of Cardiology) definition of MI, any patient with ischemic symptoms and even minor Troponin elevation is now classified as having MI. By using the sensitive Troponin T assay, you can reliably identify the 25%-33% of MI patients that CK-MB and TnI assays with higher cutoffs can miss.

#### **Consider all causes of cardiac injury**

Troponin T is not just a marker of AMI – it is a marker of cardiac damage. And, as Dr. Allan Jaffe of Mayo Clinic reminds us in his recent editorial in *Circulation*, it is very important to consider all causes of cardiac injury. Literature suggests you may see sustained Troponin T elevations in patients with:

- Congestive heart failure
- Renal failure
- Myocarditis
- Intracranial hemorrhage
- Pulmonary embolism
- Sepsis
- Hypotension or hypovolemia
- Hypothyroidism
- Cardiotoxic therapeutic regimens
- Acute Pericarditis
- Cardiac contusion
- Pulmonary hypertension
- Amyloidosis
- Cardiac surgery
- Direct current cardioversion
- Atrial fibrillation/supraventricular tachycardia

Serial testing can help you discriminate between ischemic and nonischemic causes of Troponin elevations. If you measure Troponin T at the time of presentation, and measure again two to four hours later, you will see an increased value in a patient whose elevation is due to a recent ischemic event. If the value stays constant, look more closely for other causes such as those listed above. You may wish to post this list in your laboratory or circulate it to your cardiologists. In any case, Troponin T findings should always be assessed in conjunction with the patient's medical history, clinical examination and other findings.

## Troponin T in Renal Patients

### Not false positives!

Hospitals with renal dialysis patients are especially concerned about Troponin T elevations in patients with end-stage renal disease. According to a recent survey of the literature, as many as 40% of dialysis patients may have chronic elevations in Troponin T. Detailed biochemical studies by Dr. Fred Apple and others have documented that these elevations originate from the heart and are not false positives. Increases in Troponin T are in fact real and indicate underlying cardiac pathology, even in patients autopsy. Troponin elevations give vital information about a renal patient's risk of cardiovascular morbidity and mortality. In fact, Troponin T is the only assay FDA cleared to be used in risk-stratification of patients with chronic kidney disease.

### Experts recommend: get a baseline

Because of established data like this, experts are no longer confused about the significance of Troponin T elevations. In fact, Dr. Allan Jaffe at the Mayo Clinic is actually recommending that Troponin T baselines be obtained on all renal dialysis patients. One study shows that dialysis patients whose Troponin T values increase by 30% over a year's time are twice at the risk of death as those whose Troponin T levels remain constant. Knowledge of a renal patient's Troponin T baseline could aid in the evaluation of subsequent Troponin T evaluations, making it easier to differentiate an acute ischemic event from chronic cardiac damage.

## Sampling Strategy

### The Guidelines

The ACC/AHA Practice Guidelines emphasize that serial Troponins should be used in conjunction with clinical parameters such as history, physical exam, and 12-lead ECG. Their algorithm for the evaluation and management of patients with suspected ACS is attached.

**Sample timing**

According to the Guidelines, blood should be obtained for testing on hospital admission at six to nine hours and again 12 to 24 hours if the earlier samples are negative and the clinical index of suspicion is high.

**In the ED: rule in/rule out**

Many of the ED customers have found that an additional sample collected two to four hours after presentation can facilitate an earlier triage decision. Again, the experts remind us that Troponin should be measured on serial blood samples collected at least six to nine hours after onset of symptoms, before a patient is ruled in or ruled out for MI.

**Using Troponin T to guide therapy selection**

Troponin T is elevated in nearly 100% of patients with an AMI. Positive Troponin T values can help physicians identify the patient that will respond best to therapy with platelet glycoprotein IIb/IIIa therapies. One large study showed a 64% risk reduction during angioplasty in elevated Troponin T patients who were pretreated with Abciximab.