



## The role of Troponin in the diagnosis of Acute Myocardial Injury

Troponin belongs to a class of compounds referred to by laboratorians as cardiac markers. These substances are located in the myocardium (heart muscle) where they have physiological function. However, when cardiac injury, such as myocardial infarction (heart attack), unstable angina pectoris, trauma, surgery, myocarditis, etc, occurs, these substances are released into the circulating plasma and can be measured. Of these, troponin, has most recently been at the forefront in the diagnosis of cardiovascular injury such as acute myocardial infarction (AMI).

Striated and cardiac muscle filaments are made up of three components, actin, myosin and a troponin complex. The troponin complex consists of three specific protein sub-units designated as C, T and I. The latter two, troponin T and I, can be measured relatively easily in blood following cardiac injury and are sensitive to even minor myocardial damage. In the absence of other clinical evidence, such as positive EKG, the presence of elevated troponins in a patient with chest pain is useful in identifying patients with high risk of adverse cardiac events, such as AMI. When cardiac injury occurs, troponins appear 4-8 hours after symptom onset, remain elevated up to 14 days post myocardial injury, and are useful in the risk stratification of patients with acute coronary syndrome (ACS). Typically, blood samples are obtained from a patient presenting with chest pain at admission and then 6-9 hours later. Cardiac troponin concentrations begin to rise 4-6 hours after onset of symptoms and peak values occur 18-24 hours later. If the first troponin level is significantly increased from normal levels, or the second sample obtained 6-8 hours later shows a marked increase, such as a 30% increase over the first sample, the physician will usually interpret this as signaling an adverse cardiac event, such as MI, noting that the troponin result must be correlated with serial results, other cardiac markers, if available, and the clinical history/findings of the patient in order to determine the clinical significance of the result.

When troponin results are reported by IRL, the following risk stratification profile is also reported as an aid in helping the physician interpret the results:

Reference Range: (units in ng/mL)

< 0.07	Little or no risk for ACS (acute coronary syndrome)
0.07-0.09:	Low risk for ACS
0.1-0.59:	Increasing risk for ACS
0.6-1.5:	Consistent with WHO (World Health Organization) criteria for AMI
>1.5:	Lab Evidence of acute myocardial injury (infarct, myocarditis, trauma, etc.

### *Drawing and Spinning Gold Top Tubes:*

When you draw a gold or red top tube, let the tube clot for 30 minutes then spin for 10 minutes. This allows time for a good clot formation and no fibrin in the serum specimen.

When you draw a lavender top tube, invert tube gently 10 times to ensure that mixing occurs and is adequate to prevent clot formation.

### JUNE IS NATIONAL SAFETY MONTH

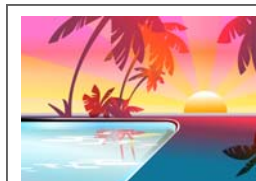
Let's be Safe! Most employee injuries can be prevented. It is important to be aware of your surroundings, pay close attention to what you are doing and to use the correct PPE.

Needle sticks are the most frequently occurring work related injury at IRL. When drawing patients it is good to remember to:

- Ask for assistance when drawing a combative patient.
- Anticipate patient responses and moves
- Know the correct way to use your phlebotomy supplies – and don't miss use them.
- Don't use over filled sharps containers.
- Don't re-cap needles. Use the safety shield attached to the needle.

If we all work together to increase our awareness our numbers of employee injuries should decrease. Remember – the injury that you prevent could be your own.

*It's about time.*



## 2009 National Health Observances

May— Allergy/Asthma Awareness Month

June— National Safety Month

July— UV Safety Month

### ARE YOU READY? Hurricane Preparedness & Important Contact Numbers

Hurricane Season is here—June 1 to November 30! Each year, we need to be ready for the effects of a hurricane or other severe weather. We cannot stress enough the importance of being prepared and developing a plan of action before the need for one arises. As a healthcare provider, being prepared for emergencies, such as a hurricane can reduce the anxiety, fear and major inconvenience brought on by such a situation. Listed below are important contact numbers that will be helpful to you and your staff during an emergency:

**IRL Client Hotline numbers (activated ONLY during an emergency):**

**Physician/Client - Status Reports Only 954-486-6713**

**Client Services Lines - Inquiries Only 954-485-0312 / 1-866-485-0312 / 954-485-3462 or 1-866-485-3462**

#### Other important community contacts:

Broward County Hurricane Hotline: 954-831-4000

Dade County Hurricane Hotline: 305-468-5900

Palm Beach County Hurricane Hotline: 561-712-6400

St. Lucie County Hurricane Hotline (EOC): 772-461-5201

TTY: 954-831-3940

American Red Cross (Broward Chapter): 954-763-9900

National Weather Service: [www.nws.noaa.gov](http://www.nws.noaa.gov)

State of Florida Emergency Management: [www.floridadisaster.org](http://www.floridadisaster.org)

Federal Emergency Management Agency: [www.fema.gov](http://www.fema.gov)

### H1N1 UPDATE

H1N1 is a novel Influenza A virus that causes a wide range of flu-like symptoms, including fever, cough, sore throat, body aches, headache, chills and fatigue. Many people also have reported nausea, vomiting and diarrhea. The virus first caused illness in Mexico and the US in March and April of this year and by June 3, 2009; all 50 states in the US and the District of Columbia and Puerto Rico were reporting cases of H1N1 infection. H1N1 outbreaks are ongoing in parts of the U.S., in some cases with intense activity. As of July 24, 2009, a total of **43,771** confirmed and probable H1N1 infections and **302** US deaths have been reported by the CDC. Over 99% of all subtyped influenza A viruses reported to CDC were pandemic influenza A (H1N1) viruses. The state of Florida had a total of **2,915** cases lab-confirmed H1N1 infections and **23** deaths. Ninety percent of positive influenza tests performed in recent weeks by the FlaDOH laboratory subtyped as H1N1, rather than the seasonal influenza viruses that were circulating last winter and spring.

**Laboratory Diagnosis:** Priority for laboratory testing includes **persons who require hospitalization** or are at high-risk for severe disease. Not all people with suspected novel influenza (H1N1) infection need to have the diagnosis confirmed, especially if the person resides in an affected area or if the illness is mild. Almost all people with influenza are infected with the new virus, which is susceptible to both oseltamivir and zanamivir (Tamiflu and Relenza).

**Specimen:** To test for novel H1N1 influenza virus, upper respiratory specimens, such as a nasopharyngeal swab or aspirate, nasal swab plus a throat swab or nasal wash, or tracheal aspirate should be collected. Ideally, swab specimens should be collected using swabs with a synthetic tip (e.g. polyester or Dacron) and plastic shaft. The swab specimen collection vials should contain 1-3ml of viral transport medium.

**Rapid influenza:** Rapid diagnostic tests detect seasonal influenza A and B viral nucleoprotein antigens in respiratory specimens. Data are not yet available to inform recommendations on the use of rapid influenza diagnostic tests in patients with novel H1N1 virus infection. The sensitivity and specificity of the different rapid tests is not yet known for this novel virus and have suboptimal sensitivity to detect seasonal influenza viruses. Clinicians may consider using rapid diagnostic tests as part of their evaluation of patients with signs and symptoms compatible with influenza, but results should be interpreted with caution. H1N1 flu virus infection cannot be excluded when a patient tests negative for influenza A by rapid antigen test. Confirmation of novel H1N1 flu infection can only be made by reverse-transcription polymerase chain reaction (RT-PCR) or viral culture.

**Performance of the rapid Influenza A&B test for detecting H1N1 Influenza A:** At IRL we have submitted over 140 samples for H1N1 by RT-PCR at the FlaDOH Lab since April 2009. Of those, 27 samples were positive for H1N1, 21 were positive for seasonal Influenza (not H1N1) and 95 were negative (19% H1N1 positivity rate). Of the 27 samples that were positive for H1N1, 6 had a rapid Influenza test performed and of those only 2 were positive by the rapid test.

**RT-PCR:** Real-time RT-PCR is the recommended test for confirmation of novel influenza A H1N1 cases. Effective July 13, 2009 the FlaDOH laboratory will phase out the use of H1N1 RT-PCR for purposes other than for:

Patients admitted to the hospital with life-threatening illness suggesting influenza.

Patients from county health departments investigating suspected influenza outbreaks, and

Patients from the Florida network of sentinel surveillance practices.

Specimens from outpatients will not be tested at the Florida Bureau of Laboratories. If specific H1N1 testing is required, IRL will send the specimen to a reference laboratory for specific H1N1 testing by RT-PCR at a cost of XXXXXXXX.

**Call your county health department** Clinicians should contact their state public health department if they test a person for novel influenza A (H1N1) infection to report people hospitalized with strongly suspected or confirmed life-threatening H1N1 infection, to report possible influenza outbreaks, and to get advice on testing and management of cases and contacts. The CHD will advise on whether or not specific tests are needed on patients who appear to be part of an outbreak.

**Infection Control** Decisions regarding infection control and personal protective equipment for patients with illness suggesting influenza do not require and should not wait for specific novel H1N1 laboratory diagnosis. To prevent the transmission of all respiratory infections in healthcare settings, including novel H1N1, respiratory hygiene/cough etiquette infection control measures should be implemented at the first point of contact with a potentially infected person.

*It's about time.*