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Elevating the Lab with High-Sensitivity Troponin T

Announcer:
Welcome to ReachMD. This medical industry feature, titled “Elevating the Lab with High-Sensitivity Troponin T” is sponsored by Roche Diagnostics.

Here’s your host Dr. Jennifer Caudle.

Dr. Caudle:
Given the growing focus on meeting emergency department quality measures, healthcare providers are challenged to reduce length of stay, and triage patients as accurately and quickly as possible. The laboratory is a critical component of meeting these measures, as they can influence turnaround times and provide clinical consultation on challenging cases. This is especially true when it comes to the adoption and integration of Gen-5 troponin T. So how are labs serving as a clinical partner in the utilization of highly sensitive troponin?

This is ReachMD, and I’m your host, Dr. Jennifer Caudle. In this second episode of this three-part series, we’ll be discussing this topic from a laboratory perspective. I’d like to welcome our esteemed guest, Dr. Ibrahim Hashim, Professor and Chief of Clinical Pathology at the University of Texas Southwestern Medical Center, Parkland Memorial Hospital in Dallas, Texas. Dr. Hashim, welcome to the program.

Dr. Hashim:
Thank you very much. Thank you for the invitation, and thank you for the opportunity, Dr. Caudle.

Dr. Caudle:
So, diving right in, Dr. Hashim, why did your organization decide to adopt high-sensitive troponin T? What was considered before making that decision?

Dr. Hashim:
Well, the assay has been used in Europe for quite some time and has been shown to help reduce ED dwell time because of its high sensitivity. It has also allowed the development of various accelerated diagnostic protocols over there. Here we have one of the largest emergency departments in the country, 140 beds, the third busiest, and frequently exceeding capacity with over 250,000 visits a year. Chest pain obviously is a frequent complaint. We were really thrilled when the assay was approved by the FDA and began discussions with our cardiology and ED colleagues on the need to adopt the assay and on how to examine its impact on our patients, particularly with the reduction in the ED dwell time.

Dr. Caudle:
Now let’s talk about your role in both the pre and post implementation process of troponin T. Focusing on the pre implementation first, what did your role look like?

Dr. Hashim:
So, there was enthusiasm for the new assay. I immediately knew that my role was going to be to provide the interface between the patient’s clinical care team, the assay end user and the clinical laboratory. I also knew that the implementation was going to be a challenge to all concerned for various reasons. So, for example, to the patient care clinicians and nurses, the new generation assay offers numerical results that is very different from the current one – from the old assay, where the new assay reports whole numbers, whereas the old assay reported two decimal points. The units were also very different; nanograms per mL in the old, nanograms per liter in the new. One might mistakenly think it’s a conversion factor, but it isn’t because the numbers do not really correlate at all. For the laboratory, we rarely encounter an assay update measuring the same analyte such as troponin, but offers completely different

reportable values, as I mentioned, and those values are not interchangeable at all. What should the limit of detection be? What should the analytical measurement range be? What is the clinical value? What other clinical decision points would be and precision of the assay? So, all of us within the laboratory had those questions that needed to be answered. The fact that the numbers are not interchangeable I knew that this required a different approach altogether. Clinical correlations and outcomes analysis were going to be immediate as part of the technical validation and implementation of the assay. So, playing at the clinical interface, if the assay was to be utilized, the sample collection, transportation, processing all has to be done within a reasonable amount of time to allow for decision-making. The quality of the sample is also important. As a PI on a CDC-sponsored project, we were able to reduce sample hemolysis in the ED and this is very important because it helps significantly with the implementation and has the ability to produce results in a timely fashion. We set up our clinical laboratory and a multispecialty team made up of clinical chemistry, cardiology, emergency medicine, hospitalists, nursing, nursing education, health informatics, and laboratory administration. Also in the project, the project management folks were there. We had to make decisions on a number of things. We set up a new code for the health information system. We agreed on measuring both the generation 4 and generation 5 troponin. They [clinical teams] moved on generation 4 in the usual way but [the implementation team] kept the data on the high sensitivity troponin for the analysis. We did about 1,000 patients, and we carried on for about three months. So, it was a very, very lengthy process, but it is very helpful in terms of our teammate approach.

Dr. Caudle:
Thanks for that insight, Dr. Hashim. If we look at the post-implementation process, what changed?

Dr. Hashim:
It was a lengthy process. Initially we set up our multispecialty team made up from clinical chemistry, cardiology, emergency medicine, hospitalist, nursing, nursing education, and various other people in administration and health informatics was very important. We had a serious number of decisions that needed to be made. They generate a new test code. How many patients do you need to collect? How are you going to do the validation? So, one of the things that was very important is we ran the old and the new assay consecutively together. So, for samples coming from the ED, there were about 1,000 patients over a few-months period, we ran both assays. We only reported the generation 4, the old assay, and we kept the data for the generation 5 behind the scene in order to do the analyses and be able to come up with training modules and interpretation. The assays were validated very well, and precision of the assays were assessed and adopted. We adopted clinical decision points. The two assays correlated very well, especially when we did a clinical assessment of the patients. We had three cardiologists reviewing the data and reviewing the chart notes. Once we had gone live, we had a clinical support team that was on call. I was one of the team members being on call and we helped answer any questions from nursing and from physician. There were really very few [calls], and often related to sample quality, missed serial timing, and a few on interpretation. The impact on the laboratory post implementation was actually, I would say, that the number of troponin requests increased. This was anticipated and was questioned. I'm a strong advocate for appropriate utilization of laboratory tests. Although some may consider over-analyzation is a significant problem, I believe that underutilization of laboratory results was actually more relevant and prevalent than overutilization. Troponin, I find, is an excellent example whether it's used randomly, most have a screen. It was now appropriately utilized with greater understanding of its utility, the impact on ED dwell time, the proportion of patients being ruled out, the cost avoidance to the other non-laboratory services, and had a more significant impact, in my mind, to the entire healthcare system for a relatively small cost of the troponin assay.

Dr. Caudle:
Now that the implementation process is complete, how has your role as a clinical partner changed?

Dr. Hashim: As you said earlier in the introduction, the clinical laboratory is critical to meeting quality measures. We provide a lot of data and most of the information needed to make healthcare decisions. In the ways of the profile of the institution, the project was presented at a national meeting, the ACC cardiology meetings, and we won the academic outstanding presentation award. The project was presented at hospital quality improvement meetings. It was a high-profile project. Senior executives were aware of both the progress and the outcomes. There is no assay that I can recall that the clinical lab has introduced that gained so much publicity and had such a high profile both within the institution and for those with interest in healthcare outcomes and safety. For me personally, and for those in the clinical chemistry profession, it really showed how our expertise worked in the technical and clinical arena. We're able to impact healthcare at the forefront. The assay is now available at this moment and this really generated a lot of interest among of our faculty. I receive requests for collaborative research from colleagues from different clinical departments who want to utilize the high sensitivity of the assay to study the impact on various pathophysiologies and the impact on the myocardium. As a matter of fact, we have three projects ongoing right now as we speak.

Dr. Caudle:
For those of you who are just joining us, this is ReachMD. I'm your host, Dr. Jennifer Caudle, and today I'm speaking with Dr. Ibrahim Hashim about high-sensitive troponin T. So, Dr. Hashim, now that we've covered how your individual role was impacted after Parkland

Memorial Hospital's adoption of this assay, let's take a look at it from the institutional perspective. What's the biggest benefit you've noticed from the adoption of Gen-5 troponin T?

Dr. Hashim:
We have one of the largest and busiest EDs in the country. We were able to reduce the ED dwell time. This is a large county safety net hospital and the contribution of this implementation was immense. We have already seen and published on the impact and the disposition of our patients presenting with chest pain, and those suspected of acute cardiac syndrome. We estimate upward of two million dollars in savings just on bed occupancy. I'm currently leading a project to accurately measure the impact on cost, and hopefully we will be able to provide a more accurate figure soon.

Dr. Caudle:
What changes or impacts have you seen across the institution?

Dr. Hashim:
I have since noticed a much-increased collaboration with clinical teams between the laboratory and the clinical team. The project really elevated the role and the value of the clinical laboratory within the institution. It increased our visibility. Many clinicians and nurses are now more aware of the lab processes, assay validations, sample quality and all of those things that go behind the scenes before the results become available in the electronic health record. Interestingly, we took more collaborative roles. In the laboratory, frequently we measure the part of the quality dependent on time for the sample testing and the quality of the samples. What we've done on this occasion in addition to teaching on hemolysis reduction that I talked about earlier, we recall the time from [when] the order was made to the time the sample was collected to the time the results became available. That is quite critical particularly if you want to have those results early enough to make a clinical decision on subsequent samples or if you want to do serial measurements or if you have a protocol to follow.

Dr. Caudle:
Before we wrap up, Dr. Hashim, do you have any parting words of advice for other systems considering the adoption of a high-sensitive troponin T?

Dr. Hashim:
So very important, lesson number one, a multispecialty team is central, leading to the success of the implementation of the process. Different areas have different needs and expectations, and those [needs and expectations] need to be addressed. We ran both generation 4 and generation 5 assays, and released only generation 4 results in the usual way, and we use the data behind the scenes for the high-sensitivity assay to develop training material, to develop the interpretation and the understanding of the assay. I think those two were central to the whole process.

Dr. Caudle:
That's a great way to round out our discussion. I'd like to thank my guest, Dr. Ibrahim Hashim, for helping us understand the adoption and impact of Gen-5 troponin T from a laboratory perspective. Dr. Hashim, it was great speaking with you today.

Dr. Hashim:
Thank you very much, Dr. Caudle, it's been a pleasure. Thank you.

Announcer Close
This program was sponsored by Roche Diagnostics, doing now what patients need next. If you missed any part of this discussion or to find others in this series, visit ReachMD.com/Troponin.

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