



Article: J. Neumann and N. Sorensen, et al.
Immediate Rule-Out of Acute Myocardial Infarction Using Electrocardiogram and Baseline High-Sensitivity Troponin I.
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Guest: Drs. Neumann and Sorensen are resident physicians at the Dept of General and Interventional Cardiology at University Heart Center, Hamburg, Germany.

Bob Barrett: This is a podcast from *Clinical Chemistry* sponsored by the Department of Laboratory Medicine at Boston Children's Hospital. I'm Bob Barrett.

When patients with chest pain present to the emergency department, it's necessary to quickly and accurately determine who is having an acute myocardial infarction. This has traditionally been done using serial measurements of troponin which may be separated by hours. However, advances in assay sensitivity may now enable use of a single troponin measurement when combined with electrocardiogram to rule out acute myocardial infarction.

The January 2017 issue of *Clinical Chemistry* includes a report describing the effectiveness of this approach. Two of the authors join us for this podcast.

Dr. Johannes Neumann and Dr. Nils Sorensen are resident physicians at the Department of General and Interventional Cardiology at the University Heart Center, Hamburg, Germany. Both doctors are members of the biomarkers and acute cardiac care study team, which investigates the use of biomarkers in patients with suspected acute myocardial infarction. And Dr. Neumann, we'll start with you. Why is it important to very quickly rule out acute myocardial infarction in the emergency department?

Dr. Neumann: It is important because of the number of patients who are presenting to the testing unit or to the emergency department who actually have chest pain is increasing within the past years, while the number of myocardial infarction is pretty much staying the same. So it is important for our doctors in the emergency department to deal with crowded emergency departments and to enable a rapid rule out of acute myocardial infarction to detect those patients who are at low risk and to discharge those patients for ambulant care.

Bob Barrett: So would it be enough to just measure high sensitivity troponin and evaluate the ECG even without seeing the patient?

- Dr. Sorensen: Well, of course not. It's recommended in the ESC (European Society of Cardiology) Guidelines that clinical evaluation is one of the most important tools we have, and is of course part of the evaluation of the patient. But what our data shows is that patients with a low risk ECG and with a very low high-sensitive troponin-I are very unlikely to have myocardial infarction, and if there are no contradicting clinical impressions, then we think an immediate release from the hospital might be possible.
- Bob Barrett: What about early presenters that present rapidly after symptom onset to the ED?
- Dr. Neumann: Actually, those patients who have a very short duration of chest pain symptoms, they are a special group and most studies, or nearly all studies, who investigated different diagnostic algorithms have only a small percentage of patients with early symptom onset. So the data on these patients is pretty rare and therefore, the current ESC Guidelines actually recommend the rapid rule out, so baseline of one-hour algorithm, is only valid for those patients who have chest pain symptoms of more than three hours. So this is also actually the recommendation for clinical use. Nevertheless, in our study, we also investigated the performance of a very low troponin cutoff and a low risk ECG in those patients with early symptom onset, and it performed well in these patients.
- Bob Barrett: Well, finally, there have been various papers within the past years reporting different diagnostic approaches for patients with suspected AMI. What do you think will be the next big step?
- Dr. Sorensen: Okay. With the current ESC Guidelines, they are still not very much implemented in the clinical use all over Europe and we don't need to talk about the U.S. But one major part in that could be that we're still lacking randomized controlled data because all available studies so far analyze their patients and tested them prospectively in the emergency department, but real release immediately or even after one hour hasn't been done yet and hasn't been compared to clinical standards. So that might be one thing which will be coming in the future and we're planning on that as well, to do a randomized control trial and to see if it's really possible to release the patients.
- Bob Barrett: Dr. Nils Sorensen and Dr. Johannes Neumann are resident physicians at the Department of General and Interventional Cardiology at the University Heart Center in Hamburg, Germany. They have been our guests in this podcast from *Clinical Chemistry*. I'm Bob Barrett. Thanks for listening!