BERNARD GERSH: Hello, I'm Bernard Gersh from the Mayo Clinic. And with me today is Dr. Allan Jaffe, professor of medicine. He's known around the Mayo Clinic as Dr. Troponin, and he's really going to talk to us about high-sensitivity troponins. Welcome, Alan.

ALLAN JAFFE: Thank you, Bernard.

BERNARD GERSH: Could I just ask you, before you get onto the high-sensitivity troponins, just tell us, very briefly, how should we use troponins in the diagnosis of acute myocardial infarction-- not the high-sensitivity, just the standard troponin assay, because there's a lot of confusion. And I think people feel-- some people feel that everybody with an elevated troponin has a myocardial infarction, which is not the case.

ALLAN JAFFE: That's clearly not the case. And the first thing is you need the right clinical scenario-- symptoms, electrocardiographic changes, or at least suspicion. So that there may be in diabetic, or in older individuals, could be atypical, an atypical presentation, but nonetheless, a high clinical suspicion. Then you need an elevated troponin above the 99th percentile, and it's critical that you use that cut-off value.

BERNARD GERSH: And that depends on a particular lab, or a particular assay, or both?

ALLAN JAFFE: The assays vary, and so it depends on the assay, what the 99th percentile is, and then you want to see a rising or a falling pattern of values-- that's what indicates that something going on is acute. If the values are not changing, the likelihood that that's an acute event, whether it's acute myocardial infarction, or sepsis, or pulmonary embolism, is much, much less.

BERNARD GERSH: So an elevated troponin is bad news in whatever setting it occurs. It's always an adverse prognostic [INAUDIBLE].

ALLAN JAFFE: Absolutely.

BERNARD GERSH: But if you're going to call it myocardial infarction, it's going to have to be in a clinical context. There has to be other grounds for suspecting MI and a change in troponins.

ALLAN JAFFE: Absolutely.

BERNARD GERSH: So now take us to the high-sensitivity troponins, because some of us are frightened of it. We're frightened of troponins, and now the high-sensitivity troponins are really getting us nervous. So tell us about those, Allan. How are they going to change the background--

ALLAN JAFFE: Well, there's a little bit of confusion that I think we ought to clear up right to start, which is that there's several ways in which troponin can be used more sensitively. One is to simply start using the recommended guideline cutoff on the 99th percentile. And there have been a bunch of recent papers where that's been done. It improves sensitivity, it improves specificity, and it saves lives. And there are very good documentation with the assays we're using today.

BERNARD GERSH: How does it improve specificity? I would have thought, if anything, it might cause more false positives?

ALLAN JAFFE: Well, it causes more elevations, but if one then utilizes a changing pattern, you can identify then more-- and the appropriate clinical circumstance, you actually end up identifying more of the right sorts of people.

BERNARD GERSH: So we're going to have more diagnoses of myocardial infarction, clearly?

ALLAN JAFFE: Well, that's with the standard assays. A second way you can get more sensitivity is by having the assays get more sensitive. And those assays are not yet approved in the United States, but they have been approved in the rest of the world and they're coming.

BERNARD GERSH: OK, so--

ALLAN JAFFE: And those assays will be much more sensitive than the ones we're using now.

BERNARD GERSH: Right, so we will end up with more myocardial infarctions--

ALLAN JAFFE: No question.

BERNARD GERSH: No question. Do we know, are there studies that tell us that the prognosis of a myocardial infarction diagnosed on the basis of a high-sensitivity troponin is worse than that with a standard troponin? Or do we know whether it's the same? Or do we know whether it's less serious? In other words, I'm not talking about the patient with STEMI, STEMI's [INAUDIBLE]--

ALLAN JAFFE: Absolutely.

BERNARD GERSH: I'm talking about the patient who comes in with an non-ST elevation MI, who you would have missed with the standard assays, but now you're going to pick up a rise and a fall, and you're going to call them myocardial infarctions. Do we know that their prognosis will be better or worse, or the same?

ALLAN JAFFE: We do know that the prognosis of individuals, even with high-sensitivity troponin assays, that have just minor elevations, that have a rise and a fall, are clearly worse than those who do not.

BERNARD GERSH: That's with high-sensitivity.

ALLAN JAFFE: With high-sensitivity-- what we don't know yet is something that we know very well with the standard assays, which is that therapy makes a marked beneficial impact.

BERNARD GERSH: Right, and I guess the other thing, Allan, I need to ask you is, in a number of our risk scores, the Timi risk score and the Grace risk score, we use troponin elevation's standard assay. We don't know yet how these are going to be integrated into the new risk scores.

ALLAN JAFFE: That's correct. And as a matter of fact, my own surmise is that this will change to some extent, because as we get more sensitive--

BERNARD GERSH: What do you mean, change?

ALLAN JAFFE: That the prognostic significance will change a little bit. Because I think as opposed to seeing mostly plaque rupture events, which is what you see with higher values, we're going to start seeing more subtle MIs, albeit, that are fixed coronary disease with supply-demand imbalance, endothelial dysfunction. And so the mix between those who have obstructive coronary disease that is acute, and either chronic coronary disease, or none-obstructive coronary diseases and etiology may change. And so my suspicion is that the next iteration, when we get the high-sensitivity, we're going to have to be more selective. And we're not going to be able to rely on everybody gets aggressive anticoagulation and invasive strategy.

BERNARD GERSH: Allan, quickly-- lastly, if you take people without an acute coronary syndrome, just people walking around, ostensibly, reasonably healthy, we know that having an elevated high-sensitivity troponin in people with stable coronary disease is a bad prognostic factor. What are we measuring-- apoptosis, micro-cell death? I mean, it's incredibly powerful in people with stable disease. What are measuring?

ALLAN JAFFE: Well, we're probably measuring a variety. It's an integrator, therefore. So we're probably measuring apoptosis. We're probably measuring some intermittent cell death from intermittent subendocardial abnormalities, or ischemia. We're probably detecting some toxic effects. But the point is that even minor elevations, which can be associated with structural heart disease as well, in the absence of anything wrong with the coronary.

BERNARD GERSH: Still a bad prognostic.

ALLAN JAFFE: Are still adversely prog-- [AUDIO OUT].

BERNARD GERSH: OK, Allan, so we can conclude, I think, that the high-sensitivity troponins are coming. They're here to stay. And you basically feel they're an optimist-- you feel optimistic about them as an addition to our clinical diagnostic armamentarium. Is that correct?

ALLAN JAFFE: I do. I think that if we can educate clinicians how to use them properly in the right clinical setting, to look for a rise and a fall, and to appreciate the fact that every elevation is not due to acute coronary disease, I think we'll have a winner. If we don't, we're going to fight these continual problems of what is an elevated troponin?

BERNARD GERSH: Well, we're going to keep having you back to educate us.

ALLAN JAFFE: Glad to come any time.

BERNARD GERSH: Thank you for joining us.