

**DANIEL T. LACKLAND:** As we looked at it, in JNC 7, it developed a category called pre-hypertension. And people weren't sure what that actually meant. And at that time, it meant that you should recognize that this was a person at greater risk to develop hypertension, and you should put in prevention strategies-- in particular, non-pharmacological therapies, in particular, with diet.

But still, what does pre-hypertension mean? What does-- and pretty much any of the nomenclature. I mean, we're all pre-dead. What exactly does that mean? And so there was a little confusion as to what did you do and how were the therapies.

With the new guidelines, with the 2017 guidelines, they thought, well, we do know that risk of blood pressure increases with every level. So the risk of outcomes, of stroke, of heart disease, of kidney disease, increases as blood pressure raises. And so we had those different categories.

And so with the new guidelines, they chose to go with this stage I that includes a systolic blood pressure of 130, which would have been pre-hypertensive in JNC 7, is now considered stage I hypertension.

The treatment would be the standard ones, going through the pharmacological therapy. There are algorithms that will take an individual clinician through, that they would start this. But they think the key is that if you have determined that that is the blood pressure of an individual, a systolic of 130, then you would want to initiate therapy and begin to lower blood pressure.

Another new part with the guidelines that was added was looking at risk, and in particular, cardiovascular and stroke risk. Historically, we've kind of looked at, well, here's the value. And so we'll treat according to what the actual blood pressure value is. And you're still doing that, but now you're adding in this risk.

And so an individual that's been determined to have a cardiovascular risk-- and that would be a risk score that is higher than, basically, 10%-- then you would want to treat that person more aggressively. So you would begin at that 130 level. That would be the part that we would want. And we're working to certainly lower blood pressure, but to decrease the risk of that individual with the elevated blood pressure, for cardiovascular disease and stroke.

A person who has a high cardiovascular risk score that's been determined from all of their different types of risk patterns, including age, is going to be more likely to have an event. So they would actually benefit greater from lowering the blood pressure. So you would want to identify the risk and the blood pressure level, and recognize that that's a person that has the potential to have a better benefit of lowering the blood pressure and preventing the adverse outcomes from occurring.

I think most of the evidence from the clinical trials, the most recent ones, have really suggested the benefit of a dual therapy, even a fixed-dose combination. In general, it makes intuitive sense that if you take-- you can start two drugs at a lower dose, and then you're avoiding the adverse side effects that you see with some of the drugs. And so it makes intuitive sense, the dual combination.

We've also seen that multiple drugs, combination drugs, tend to have a better effect at lowering blood pressure. And they have a better effect at lowering blood pressure. And so the combination therapy is starting out that it's a good-- and these guidelines will support the combination therapy as a good way to go.

You do see some variation based on ethnicity. For example, for African Americans, you do see that there's a recommendation that a calcium channel blocker or a diuretic be used in the combination or used in the therapy. But in general, the pharmacological therapies are laid out in the algorithms fairly straight for most anyone with blood pressures that are elevated.

We're seeing it over and over again as we think about blood pressure measurement. Where was the blood pressure done? More and more studies are kind of showing [INAUDIBLE] is the less accurate measurements are those that you see in the office, and typical because of all the anxieties, the hurriedness and whenever, the protocol. But that's where we base a lot of information.

We're starting to see more and more studies that are saying that the more measurements that we have, the better-- that certainly is there-- but also that home blood pressure, that out-of-office blood pressure, is so very, very important. That allows us to think about things like white-coat hypertension if we have these multiple values.

It also identifies a certain risk for an individual, if we have multiple values, we have out-of-clinic values, where we're able to look and say, OK, this is what a person's blood pressure typically is. And if that's a higher blood pressure, that's a person that has a particular risk that we want to look at.

As we're beginning to see technology, as we're beginning to see digital blood pressure monitors and stuff, it makes it much more easy for an individual patient, as well as anyone, to take their blood pressures and to monitor their blood pressures in a regular way.

We're able to provide that technology, we think. And that might be something that the clinicians want to do, is to get their patients with home blood pressure monitoring, putting them in, understanding their knowledge of the procedures so that they can trust the values that are being brought in. With that, that really does help with blood pressure monitoring. It helps with blood pressure control.

By encouraging it, it also helps with the adherence of the therapy, as well as setting up with those individuals. So we think that this might be one of the best things that we can see going on now, is out-of-clinic blood pressure measurement and home blood pressure monitoring.

I think the key takeaway message for this set of guidelines is that these are evidence-based based on the studies that we currently have. There certainly are some gaps, and there certainly will be continued work on fulfilling those gaps so that we can refine minor parts in the guidelines and maybe a little bit better definition and how we're going to treat.

But the real take-home message is the benefit that we receive from lowering blood pressure. We are reducing risk of stroke. We're reducing the risk of heart disease. We're reducing the risk of heart failure, with a good, accurate treatment of blood pressure. That's the [INAUDIBLE]. Keep our foot on the pedal, and let's keep lowering blood pressure.