Bernadette Melnyk: Now it is my privilege to introduce our opening keynote speaker, Dr. Paul Whelton. Dr. Whelton is an internationally renowned physician scientist and public health leader. His pioneering work has transformed the prevention and treatment of hypertension and cardiovascular disease. He currently is the Show Chwan Health System Endowed Chair in Global Public Health at Tulane University. Dr. Whelton, welcome to today's event..

Paul Whelton: Hello, I am Dr. Paul Whelton. I am from Tulane University. I am a Show Chwan Professor Chair of Global Public Health and the immediate past president of the World Hypertension League. I am going to talk today about hypertension, the world's leading preventable cause of death, and I have no conflicts of interest.

High blood pressure is the lateral pressure created by circulating blood on the walls of the blood vessel. We can arbitrarily use categories of high blood pressure to define what we call hypertension. Typically, in the US these days that would be an average systolic blood pressure of 130 or above, diastolic 80 or above, or use of medications. Previously, we used to use 140 over 90. Whichever definition you use, you will find that the prevalence of hypertension is extremely common, especially as you get to older age. It is particularly high in non-Hispanic Black men and women. It is also very common globally, especially in middle- and low-income countries.

We know the causes for high blood pressure. They are shown on the left-hand panel here: genetic predisposition, pathophysiological abnormalities, general environmental exposures, but especially personal environmental exposures. Abnormalities of diet, physical inactivity, and alcohol consumption. That is responsible for 80 to 90 percent of hypertension. We also know the risk factors that tell you are at risk for hypertension: a high normal blood pressure, a family history of hypertension, adverse social conditions, and a variety of other factors that I am showing here. We know the causes; we know the risk factors.

We know that high blood pressure causes a lot of complications: stroke, ischemic heart disease, heart failure, kidney failure, dementia. We know that high blood pressure is one of the most important causes of death and disability-adjusted life years. It is more important than smoking, abnormalities of glucose, overweight, or birth disorders. It usually manifests clinically in one of three ways, either ischemic heart disease, stroke, ischemic or hemorrhagic, or kidney failure. It is the most common cause of

death in the United States, especially if you combine heart disease with stroke.

We know how to manage it, and typically at lower pressures we are going to stick with non-drug approaches. At higher pressures, we are going to combine that with medications. In between, we will add medications when the underlying cardiovascular risk is high. We know the non-pharms that are best proven to lower blood pressure: weight loss, healthy diet, reducing sodium in the diet, enhancing potassium in the diet, physical activity, and avoidance or moderation in alcohol intake. We know the drug approaches to use. If there are no compelling indications, agents from one of these four classes. We usually use them in combination, especially in single-pill combination. If that does not work, we add in three drugs. If that does not work, we add on a mineralocorticoid receptor antagonist. If that does not work, we go back to square one and ask is the person taking the medications and really go through a more careful appraisal or refer them to a specialist.

Since we know everything, we should be doing incredibly well, but unfortunately we are not, even at a very conservative cut point for outcome 140 over 90, higher than any guideline recommends these days. We improved somewhat up until about 2012 and then we saw a drop. We are well under 50 percent for the 140 over 90. We are much worse globally in the middle- and low-income countries where most people live: We are under 10 percent. We know the call for action. We know that we have got to do much better than this.

We can quantify what we have got to do. If you want to have 80 percent control at less than 140 systolic, you would need an average systolic of 125. It would need to be lower for 130 or 120 cut points. We know that the average right now for treated hypertension in the US is about 138. We have got to drop that average by 20 to 25 millimeters of mercury. That is a big challenge, but it can be accomplished. We can do it by applying implementation science. You get 10 to 20 millimeters of mercury, single-pill combinations, triple therapy, giving you another five to 10. New classes of oral agents are coming out. There are new long-acting injectables and device therapies, especially useful for adherence challenges. Comorbidities, if they are present, can be treated. It can often drop blood pressure dramatically. Greater use of technology, including artificial intelligence. We have a huge call to action, a big challenge, but we can achieve it and we must achieve it.

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