- My name is Professor Geoff Strange from the University of Sydney, Australia. I'm the chief investigator of the largest echo study in the world, the National Echo Database of Australia.

**Importance of this research**

So, we have been working on producing an artificial intelligence decision support software for the detection of aortic stenosis. Aortic stenosis is underdiagnosed globally. At best, we're transferring less than 70% of patients on to receiving their aortic valve repair, or replacement, sorry. And we need to work better with our echocardiographic colleagues to identify the right patients, at the right time to go to the heart valve team.

**AI technology**

Yeah, so we've developed an artificial intelligence decision support software that uses a modified mixture density network, neural network, which is a fed forward network that takes the Gaussian distribution of outputs of all the echo variables, all of the structural changes in the heart, and it uses all of that information to predict those patients that will have a poor outcome with aortic stenosis.

**Study design & eligibility criteria**

So, the study design is a clinical cohort study of real-world echocardiographic data, fed into a neural network that derives the multi-dimensional relationships between ventricular response, atrial response, and the pulmonary circulatory response to a stenotic or stiff valve. And the way that the artificial intelligence works is it takes that multi-dimensional relationships and gives a probability output that the patients will have a risk stratification, either severe, moderate, or low risk, for a mortality event within one to five years.

**Key findings**

Yeah, so we're excited to present our artificial intelligence decision support software at the hot line session at ESC on Sunday the 28th. We're presenting data on 1 million echocardiograms on more than 630,000 individuals where we've trained an artificial intelligence algorithm to risk stratify patients with severe, moderate, or low risk aortic stenosis phenotype.

**Challenges in real world applications**

Aortic stenosis, as I said, is very underdiagnosed. We estimate that less than 10% of patients are making their way through to the heart valve team for a decision on what valve strategy to put into patients. So, what we need to do is reframe the way that we're communicating the results from echocardiography. And in doing so, add an artificial intelligence algorithm to identify the right patients to go through to the heart care team at the right time.

**Call to action**

I think the time has come for a change in echo reporting. We need a call to action for our cardiology colleagues to know when to act, who to act on. We've currently got a dichotomy of guidelines that leaves people either not treated or sent for treatment. And it's a spectrum of disease. And the use of this multidimensional artificial intelligence module actually allows clinicians to understand the sequelae of what's happening in the ventricle. Its response, the atrial response, and the pulmonary circulatory response to that stiff valve. And having this algorithmic decision support software is going to aid in that call to action for those people interpreting echo reports.