

## **Transcript of Sound Bites for:**

### **Raymond Iezzi, Jr., M.D., Mayo Clinic Ophthalmologist & Eye Surgeon**

(Iezzi pronounced: eye-Eh'-zee)

#### **1) On Patient Allen Zderad (zur-Ad') (trt :39)**

**/// SOT** "I would like to say I think he's a remarkable man, when you consider what he's overcome in dealing with his visual disability. I'm just humbled and tremendously impressed by him. I think he's an inspiration to us all. To be able to have offered him the retinal prosthesis to enhance what he can already do was great honor for me. It's something that we've worked for decades to develop and Mr. Zderad, I think, is the perfect candidate. His attitude and enthusiasm are contagious and I think that those qualities are going to help him in his rehabilitation process."

#### **2) About the disease the implant is designed to treat (trt :50)**

**/// SOT** "So, Mr. Zderad has a condition called retinitis pigmentosa. It's an inherited disease that involves the degeneration of a cell type in the retina called photoreceptors. These photoreceptors are sort of like the pixels in our eyes. Over the course of time we lose our light sensitive cells that respond to low light and so we can become night blind when we have this condition early on, and in a subset of patients, they go on to losing all of their sight, including their central vision. So, Mr. Zderad has this condition and that's exactly what this device was designed to help. The retina in these patients is relatively healthy except for the photoreceptors and so what we're trying to do is replace the function of these lost photoreceptors with the retinal prosthesis."

#### **3) How the device is implanted into the eye? (trt :55)**

**/// SOT** "It's a very delicate device and it's an array of electrodes that actually have to lay on a curve surface in the back of the eye where the retina is. So after many years of development and practice, I've developed a lot of skill in this area, and basically, we place an electronics package around the eye, fixate that electronics package and then we enter through the eyewall, through the white part of the eye with an electrode that's six by ten electrodes. So patients have 60 points of stimulation, and that electrode lays upon the retina through a cable that we carefully secure and then we put a patch graft over the incision that allows this device to enter the eye. So there's actually a portion of the device that's outside of the eye and a portion of the device that's inside of the eye on the retinal surface."

#### **4) How the device allows the patient to "see" (trt :39)**

**/// SOT** "So, Mr. Zderad has a pair of glasses that have a camera directly in the center of the bridge of the nose, and that camera requires a small belt pack computer. so the images from the camera go down a cable that's worn on his belt or across his shoulder strap and this computer analyzes the images and then sends them to a transmitter, processed, and the transmitter beams visual information into the implant, which is around the eye, and the implant interprets that and sends series of impulses to the retina which are then interpreted as vision by the brain."

### **5)Recreates an artificial vision for patients (trt 1:23)**

**/// SOT** “Mr. Zderad is experiencing what we call artificial vision. It's not like any form of vision that he's had before. He's receiving pulses of electrical signal that are going on to his retina and those are producing small flashes of light called electro-phosphenes. These small flashes of light are sort of like the points of light on a scoreboard at a baseball game. So, Mr. Zderad has only 60 of these, but by moving his head and using his visual memory and all of his cognitive skills and his remarkable capacity to get around, Mr. Zderad can reconstruct a scene. He can reconstruct objects. He can identify how tall somebody might be, where they're standing in a room, perhaps how many people are in front of him. He can identify the edges of doors so that he can get through them. He can see handles of refrigerators and he can identify where his plate and where his cup is on the table. So, Mr. Zderad is now in a period of active learning. You know, in some respects, it's almost a big responsibility. Certainly, he's now learning to interpret his new sense, his artificial vision sense, and this is enabling him to incorporate this technology into his daily routine.”

### **6)The potential future of the technology (trt :55)**

**/// SOT** “I would like to see this technology extended to patients who have lost their eyes. We have soldiers who have had terrible trauma and have lost their sight. We have diabetic patients who have lost both -- both of their eyes due to their advanced disease, or patients with advanced glaucoma. If we could extend the reach of this technology to care for those patients, I think we would really see a true maturation and that would require that we bypass the eyes altogether and go directly into the brain with this kind of technology. I think I -- I think we're going to see that happen in our lifetime. In addition, while Mr. Zderad has 60 points of stimulation, if we were able to increase that number to several hundred points of stimulation, I think we could extend the technology so that patients could recognize faces and perhaps even read.”