

**Mayo Clinic News Network**

**Title: Bionic Eye - Date: April 2015**

Intro: Allen Zderad thought darkness had invaded his world to stay. He’s among the one-in-4,000 people who are born with retinitis pigmentosa, a degenerative eye condition. While not all patients will lose their sight entirely, a “bionic eye” may help some of those who do. For the Mayo Clinic News Network, here’s Dennis Douda with Allen’s story.

Video	Audio
<b>Total running time [6:34]</b>	/// NATS
Allen Zderad speaking	<b>“Yeah, I want to walk through the center of the door without any assistance. Okay.”</b>
Dennis Douda speaking	The next step Allen Zderad takes will be one of the greatest strides forward in his life.
Allen Zderad speaking	<b>“Right there!”</b>
Dennis Douda speaking	One that allows him to see his future in an entirely new way.
Sound of Allen crying	<b>(Sound of Allen crying)</b>
Raymond Iezzi speaking	<b>“You just saw your first sunshine..”</b>
Graphic Title: Raymond Iezzi, Jr., M.D. Mayo Clinic Ophthalmology	<b>“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.“</b>
Technician speaking	<b>“Ready to put those on?”</b>
Dennis Douda speaking	Mayo Clinic ophthalmologist and retinal surgeon Raymond Iezzi has made it his life’s mission to try to restore vision.. even artificial vision.. for people like Allen.
Dr. Raymond Iezzi speaking	<b>“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.”</b>
Dennis Douda speaking	The prosthesis is basically a bionic eye. While <b>decades</b> of research have convinced Dr. Iezzi it’s possible, <i>this next moment</i> convinces him that it’s also <i>essential</i> .
Allen Zderad speaking	<b>“There! YEAH! What do you see?” (time for tears and hugs)</b>
Dennis Douda speaking	With family members in tears, Allen is given his first glimpse of his wife Carmen in more than 10-years.

Technician speaking	<b>“This is what his camera is capturing right now, this is the frame.”</b>
Dennis Douda speaking	While the bionic system’s interpretation of what Allen looks at may seem rough and pixilated to others, for Allen it is literally an eye-opening revelation.
Allen Zderad speaking	<b>“Oh, okay, it’s going to take, yes, interpretation of the shape of the light that’s flashing. Okay. Because, it’s a pulsing light. It’s not like regular vision where it’s constant. It’s the flash and I’ve gotta be able to interpret the changes and shape. Okay. Let’s do it again, okay? Yes! (laughter) I picked you up! Oh! (Tears, crying) “It’s crude, but it’s significant. You know, it’ll work.”</b>
Dennis Douda speaking	Allen knew his restored vision would be limited. ... While a sighted person would see this hallway like this, Allen’s bionic eye converts the scene into flashes of light.
Dr. Raymond Iezzi speaking	<b>“These small flashes of light are sort of like the points of light on a scoreboard at a baseball game.”</b>
Dennis Douda speaking	To try to imagine how it might look to Allen, Dr. Iezzi says to picture contrasting light and dark blocks on a grid.
Dr. Raymond Iezzi speaking	<b>“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.</b>
Dennis Douda speaking	How it works is a bio-engineering marvel, starting with the half-centimeter-wide electronic strip Dr. Iezzi placed inside Allen’s eye.
Dr. Raymond Iezzi speaking	<b>It’s a very delicate device and it’s an array of electrodes that actually have to lay on a curved surface in the back of the eye where the retina is. 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. 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.”</b>
Dennis Douda speaking	Called the Argus II, the system is designed by Second Sight. Animation shows how 60 electrodes on a tiny grid stimulate the

	retina's cells with patterns of pulses, thus sending signals to brain.
Allen Zderad speaking	<b>“Right here in the center over the bridge is where the camera is that's picking up the images. The front piece is a radio frequency antenna and the back piece is part of a video processing unit.”</b>
Dennis Douda speaking	Several weeks after his operation, Allen says his ability to interpret the system's visual images is continually improving.
Allen Zderad speaking	<b>“I feel more confident in being able to navigate around furniture items, chairs and tables.”</b>
Dennis Douda speaking	Allen says moments of newfound appreciation often surprise him, even during routine tasks, such as assembling his favorite breakfast egg sandwich.
Allen Zderad speaking	<b>“The revelation as it were, was the fact that when I turned to look at the frying pan I could tell that the eggs had turned white as a result of the cooking. And that was a very new experience for me.”</b>
Graphics Title: Carmen Zderad Allen's Wife	<b>“I think it'll help him to navigate better and just to enjoy a whole lot more in life. I mean. not that he doesn't enjoy life now, but – This is just really cool.”</b>
Dennis Douda speaking	Back to that morning when Allen's bionic eye was first activated. He wasn't the only one inspired by its potential So was another one of Dr. Iezzi's Retinitis Pigmentosa patients, a teenage boy named Caleb, who also happens to be - Allen's grandson. Should Caleb ever need it, the Dr. says, the technology will only get better.
Dr. Raymond Iezzi speaking	<b>“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.”</b>
Allen Zderad speaking	<b>“So, I hope it's an encouragement to him to realize that. And I think that's a pretty exciting thing about the future for him.”</b>
Dennis Douda speaking	Legally blind for most of his life, Allen says he adapted extremely well as the last rays of light gradually faded to darkness. But, he admits, this day was definitely the answer to a prayer.

Graphics Title: Allen Zderad Bionic Eye Patient	<b>“There’s always that desire to say, what would it be like if I could appreciate more of the things that are in my environment and enjoy participating more fully. Because part of the issue is you lose contact with the world around you.”</b>
Dennis Douda speaking	One step at a time, Allen says he can’t wait to <i>see</i> what’s ahead.
Allen Zderad speaking	<b>“Whoop, I can see with my eyes closed!” (laughter) “It’s gonna be an exciting journey.”</b>
Dennis Douda speaking	For the Mayo Clinic News Network, I’m Dennis Douda.

**Anchor tag:** Dr. Iezzi says other promising areas of research are sight systems that bypass the eye entirely and send signals directly to the brain. Or the possibility of reprogramming other cells within the retina to do the job that the diseased cells no longer can. One more interesting note; it was actually Allen’s grandson Caleb who connected him with Dr. Iezzi in the first place.

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