



Research Can Help The Blind to See

As a young doctor, Dr. José-Alain Sahel dreaded telling blind children and their parents there was nothing that could be done to help them see.

The parents sometimes would scream at him. Patients would vent and cry. Dr. Sahel himself was deeply frustrated. He couldn't accept there was no way to help them. So he set out to find one. "I thought the only answer could come from research," he said.

Dr. Sahel, Chairman of the Department of Ophthalmology at the University of Pittsburgh, has spent the last four decades on pioneering research that has led to retinal implants, gene therapy, optogenetics, and other treatments for blindness. Now he and his team are embarking on research to help people whose vision was long considered a lost cause – those with irreparable damage to the optic nerve. His team will conduct a clinical trial, implanting electrodes into the visual cortex of their brains.

After an initial grant supporting the creation of a team of innovative scientists working on cortical vision, the Richard King Mellon Foundation last year awarded \$300,000 to the Eye & Ear Foundation to help them apply for FDA approval and to recruit three blind patients to test the efficacy of the brain-implanted neuroprosthetic device, with the joint support of UPMC and its Beckwith Institute.

The patients in the trial will wear glasses with a video camera attached to a transmitter that will send the visual information to the cortex of the brain.

The technology will not change a blind person's vision from total darkness to technicolor clarity. But even limited sight restoration holds the promise of life-changing positive impacts. Dr. Sahel predicts that the technique will allow patients to see the outlines of objects and read letters and words. "The ultimate goal is that the patients will recognize faces and emotions enough to communicate with their families and friends," he said.

The team will screen applicants for the clinical trial to make sure they have realistic expectations of how much their vision will improve. He

called the people who volunteer for such studies "the real heroes" for their bravery in volunteering to push the biomedical frontier.

The procedure will provide hope to people who have irreparable optic nerve damage through accidents, tumors, glaucoma or traumatic injuries.

"We see soldiers coming home after a blast that just destroyed their eyes. You really want to do something for these people," said Dr. Sahel, who is still closely working with the Institut de la Vision in Paris.

That has been the motivation for Sahel since he was a medical resident at the University of Strasbourg in France. During a rotation in ophthalmology, the surgical team tested the vision of young patients, and the then 25-year-old Sahel was given the unenviable job of telling the parents when a child was found to have permanent vision loss. He remembers the parents of a one-year-old boy being furious at him.

"I tried to be nice, but you cannot be nice when you say that. People hate you. They just hate you. It had a real impact on me."

After completing medical school and becoming an ophthalmologist, he devoted himself to research at the University of Strasbourg. Several years after delivering the crushing news to the parents of that one-year-old boy, he was surprised when they visited him at the university, expressing gratitude for his work.

Dr. Sahel, who has received international acclaim for his research, said those moments are the most rewarding aspect of his work.

"I thought my eyes were dead," Dr. Sahel recalled another patient telling him. "Now they're alive again."

With his current research on brain-implanted electrodes, he wants to give the same type of hope to people who are resigned that they will never see again, due to irreparable damage to the optic nerve. Because what always was seen as irreparable may no longer be. "The main thing is there is a path forward. It's not desperate. It's not the end."



Pictured: Dr. José-Alain Sahel, Chairman of the Department of Ophthalmology at the University of Pittsburgh