Blindness, be it lifelong or gradual, represents a significant, life altering impairment that can result in increased risk of accidents, depression, co-morbid disability, and even premature death.

For any demographic, acquired blindness is a significant impediment to maintaining independence, yet, for children, absence or loss of sight is especially heartbreaking. In the United States, the National Federation for the Blind reports that there are currently more than 60,000 blind children.

Dr. Ken Nischal and the Department of Pediatric Ophthalmology at the University of Pittsburgh are currently working on near-term solutions to restore a sense of sight to the blind. Already, the first stage of this project has begun with the development of a research study that allows for children to experiment with a device that lets them ‘see’, and has, until recently, only been tested with adults. The BrainPort project is a promising research endeavor in the Louis J. Fox Center for Vision Restoration. Preliminary support has been provided by one of Pittsburgh’s most charitable organizations, the Jack Buncher Foundation. Bernita Buncher, Chair of the Jack Buncher Foundation, states, “as the daughter of a father who suffered with retinitis pigmentosa, a degenerative eye disease causing severe vision impairment, I am keenly aware of the profound effect the loss of sight has on one’s life.”

The BrainPort is a visual assistive device that provides some environmental awareness for those who have severe visual impairment or total blindness. The device operates by enabling perception of visual information using the sensitivity of the tongue. Generally, the device works by receiving visual input from a small camera attached to a pair of sunglasses, which then transmits the signal to a small handheld computer (about the size of a cell phone) and translates the visual information into an electrical impulse, sending it to a small tactile array that is placed on the tongue. The array, often called the “lollipop,” emits gentle electrical signals, similar to soda or champagne bubbles, in specific patterns based on the camera’s focus. The tongue is one of the most sensitive parts of the human body, with 10,000 points of discrimination per square inch. With appropriate training and motivation, users can learn to perceive shapes, sizes of objects, and even some large letters or basic words. Overall, the device can be utilized as a functional, non-surgical device, developed as an aid to the visually impaired.

Ellen Mitchell, MD is continuing the BrainPort research begun by the Department of Ophthalmology approximately five years ago. Initially, Dr. Amy Nau’s research involved the BrainPort’s use in adults. Dr. Mitchell plans to continue this research in children; hoping that their ability to uptake new concepts and skills will help them to use the BrainPort in exciting, new ways. Once this information is gathered, Dr. Mitchell hopes that parents and practitioners can determine whether the BrainPort would be a good fit for their child. The support for the BrainPort project comes at an especially exciting time for the Department of Pediatric Ophthalmology.