A new clinical trial is laying the groundwork to help transform medical care for patients with hearing loss. This innovative study, held at Children’s Memorial Hermann Hospital in Houston, Texas, will evaluate an infusion of a child’s own (autologous) cord blood stem cells to treat acquired hearing loss. It follows the publication of promising preclinical data and several ongoing trials evaluating autologous cord blood infusions in novel cellular regenerative therapies.

Approximately 15% of children in the US suffer from low or high-frequency hearing loss. The most common type of hearing loss, especially at high frequencies, is sensorineural, which is typically caused by damage to a type of cell in the inner ear or cochlea called a hair cell. The damage can result from a myriad of causes, including illness, medications, noise exposure, birth injury, head trauma, and genetic syndromes.

A child’s ability to hear impacts the development of language skills, and impairments can lead to poor academic and social development. No existing therapy has the ability to repair sensorineural damage. Rather, current intervention focuses on using cochlear implants to improve hearing. Yet this intervention carries surgical risks and shows varying degrees of impact.

Researchers at Children’s Memorial Hermann Hospital are working to develop a new therapeutic option that utilizes cord blood stem cells to stimulate cellular repair to restore hearing. The inspiration for the trial arose from research using an animal model of hearing loss caused by damage to the hair cells from exposure to high intensity noise or an ototoxic chemical. The researchers found that animals treated with an intravenous infusion of cord blood showed dramatic repair of the cochlear damage marked by regrowth of the hair cells. There were no signs of cochlear repair or hair cell regeneration in the animals treated with a placebo control. They concluded that their study suggests a potential therapeutic strategy using cord blood in hearing rehabilitation therapies.

Building on this research, Dr. James Baumgartner and colleagues are investigating a first-of-its-kind intervention using autologous cord blood infusions for children with hearing loss. Their primary objective is to determine safety, and secondarily they hope to show functional, physiologic, and anatomic improvements following the intervention. The trial will enroll ten patients aged 6 weeks to 18 months who have their own cord blood stored at Cord Blood Registry® (CBR®) and suffer from acquired sensorineural hearing loss. This study marks the third clinical trial held in partnership with CBR, following a trial at the University of Texas Health Science Center for traumatic brain injury and a trial at Georgia Health Sciences University for cerebral palsy.