

Pediatric Stem Cell Therapy

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Pediatric stem cell therapy is an emerging field in medicine utilizing the regenerative potential of stem cells to treat a wide range of diseases and conditions. Stem cells, known for their ability to regenerate healthy cells to replace diseased cells, offer the ability to restore the function of damaged tissues in children with genetic disorders and neurological diseases¹. This innovative approach holds promise to push past the limitations of traditional medicine, offering new hope to conditions previously thought to be untreatable. On the other hand, this new technology brings its own set of controversies. Pediatric stem cell therapy involves the harvesting of embryonic stem cells. This process often requires the destruction of human embryos, which many deem morally unacceptable. Despite this challenge, pediatric stem cell therapy holds the potential to revolutionize treatment options for children with chronic and/or previously untreatable conditions.

Stem cell therapy has been used as an emerging treatment for cancerous diseases studied to treat type 1 diabetes, Parkinson's disease, amyotrophic lateral sclerosis, heart failure, and osteoarthritis. There are two special qualities of stem cells: their regenerative qualities and their ability to transform into other cells that do different things. Healthy stem cells are typically harvested from bone marrow and infused into the body to stimulate cell growth. These unique undeveloped cells are then used to create different types of cells necessary for the treatment of both cancerous and non-cancerous conditions. Patients undergoing chemotherapy experience the death of many blood cells during the process. Stem cell treatment would take the immature

¹ Mayo Clinic Staff. (2024, March 23). Stem cells: What they are and what they do. Retrieved from Mayo Clinic website:
<https://www.mayoclinic.org/tests-procedures/bone-marrow-transplant/in-depth/stem-cells/art-20048117>

cells found in the bone marrow and create new blood cells for the body to process. There are two types of stem cell transplants: autologous transplants, when a patient's own stem cells are collected and reintroduced into the patient's system, and allogeneic transplants, when stem cells are collected from a tissue-matched donor². The long term goal for stem cell therapy is to create cells found on the spine, such as neurons. This treatment could potentially be the cure to paralysis and neurodegenerative diseases such as Alzheimer disease.

Controversy begins in the type of stem cells doctors and patients choose to use for therapy. Adult stem cells or adult cells altered to behave like embryonic stem cells are kinds of stem cells that can be selected. Adult stem cells are found in bone marrow and fat but have limiting regenerative qualities. The most effective and usable stem cells are those of embryonic stem cells. These cells come from an embryo between 3-5 days old which in this phase is called a blastocyst comprised of 150 pluripotent cells.]³The controversy is stemmed in the fact that these cells are taken from early-stage embryos, meaning this type of transplant essentially destroys an embryo⁴. There have been incredibly strict guidelines that have been put in place in order to avoid any political conflict. While adult stem cells are incredibly useful and have been working, embryonic stem cells are much more effective, though their use raises ethical concerns due to the destruction of embryos. stem cell research is still in its early phases but has the

² Stem Cell Transplant | Boston Children's Hospital. (n.d.). Retrieved from www.childrenshospital.org website:

<https://www.childrenshospital.org/treatments/stem-cell-transplant>

³ Mayo Clinic Staff. (2024, March 23). Stem cells: What they are and what they do. Retrieved from Mayo Clinic website:

<https://www.mayoclinic.org/tests-procedures/bone-marrow-transplant/in-depth/stem-cells/art-20048117>

⁴ Mayo Clinic Staff. (2024, March 23). Stem cells: What they are and what they do. Retrieved from Mayo Clinic website:

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potential to be the future of medicine for regenerating and repairing destroyed cells. This treatment offers a new hope to children with chronic or previously untreatable conditions.

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