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WHAT **PARENTS** SHOULD KNOW ABOUT **STEM CELL THERAPY** FOR **AUTISM**

Stem cell therapy for autism is still an evolving field and is considered experimental by the medical community. However, there are many centers currently operating that offer stem cell therapies and each clinic promotes its own therapeutic approach, which creates a lot of confusion among parents about how to compare their treatment options.

The purpose of this article is to clearly explain the characteristics of stem cell therapy for autism, either with cord tissue-derived mesenchymal cells or with the patient's own autologous cells.

It is not our intention to disregard other types of stem cell therapy for autism, but we are going to mention the types of stem cell therapy that patients in North America are most likely to try, in North America are most likely to try. Therefore, we will provide an in-depth explanation of these therapies. Given the complexity of the topic, this explanation may be lengthy; however, it is organized into sections to facilitate reading.

HOW DID STEM CELL THERAPY FOR **BRAIN DISORDERS** START?

The idea to use stem cell therapy for autism began with stem cell therapy for cerebral palsy, which in turn began with stem cell transplants for metabolic disorders. Over the years 1995 to 2007, the team working with Joanne Kurtzberg, MD, at Duke University performed over 100 cord blood transplants for children with rare metabolic disorders.**The published results were a breakthrough: Not only did their cognitive function stop declining, it actually improved**. The cognitive improvements in patients with metabolic disorders led to the hypothesis that a similar treatment might help children with neurodevelopmental disorders, like cerebral palsy and autism.

Starting in 2005, Duke University ran a series of studies that involved giving cord blood stem cells to children with cerebral palsy, initially by giving the children their own (autologous) stem cells, and later by using donor cord tissue derived stem cells. Other researchers have also run clinical trials treating cerebral palsy with stem cell therapy, either using cord blood or other types of stem cells. **This research is ongoing, but several papers have been published demonstrating that stem cell therapy for cerebral palsy yields significant improvements in the treatment group versus the control group.**

WHERE DOES **AUTISM** FIT IN?

The success of stem cell therapy for cerebral palsy has inspired stem cell therapy for the much more common condition of autism. Although they are both neurodevelopmental disorders, there are important differences between cerebral palsy and autism.

Autism spectrum disorder (ASD) usually is not diagnosed until the child is a few years old, based on difficulties with language and social skills, and behaviors that are rigid or repetitive. The percentage of children with autism has been rising in developed countries; over the span of one decade in the United States the prevalence of autism has gone from 1 in 125 to the latest statistic of 1 in 60 children. We are at the point where everyone with young children knows somebody who has a child with autism.

Autism spectrum disorder is known to have multiple risk factors and paths of development, leading neurologists to refer to it as a "heterogeneous" disorder. For some children there is a genetic component to autism: over 1000 candidate genes have been associated with autism, autism is known to run in some families, and twins and siblings are more likely to both have autism. Multiple environmental risk factors have also been associated with autism, including parental age, maternal health during pregnancy, heavy metal exposure in early childhood, and many others. Although the theory that "vaccines cause autism" has been conclusively disproved, we do know that children with autism are more likely to have heightened immune system activity and neuro-inflammation in the brain. There is a saying in this community that, "If you have met one person with autism, then you have met one person with autism" because no two cases are alike.

WHY TREAT **AUTISM** WITH **MESENCHYMAL STEM CELLS (MSCs)**?

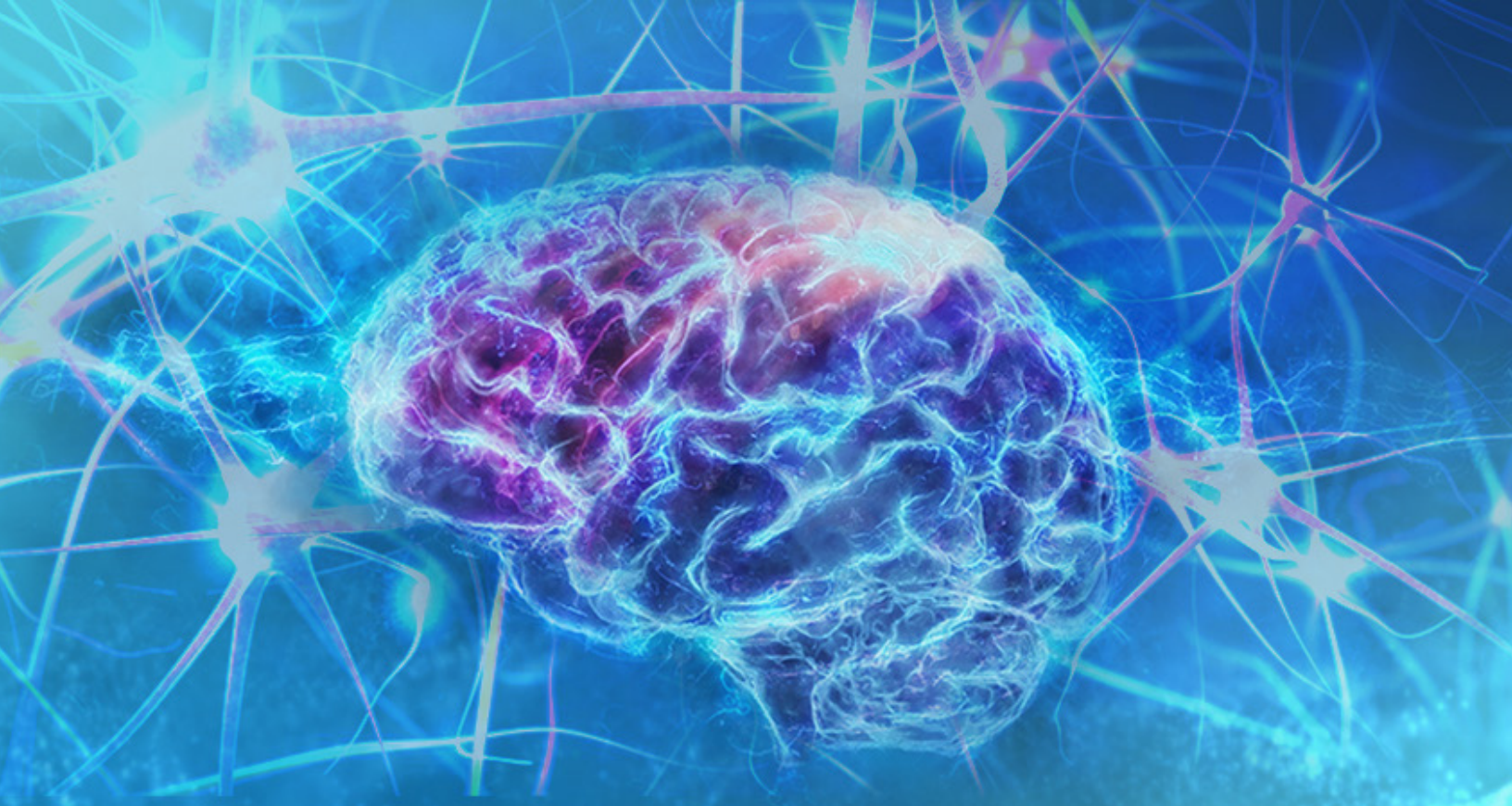
Based on laboratory studies and clinical trials for other conditions, MSCs are the leading cell type used to treat auto-immune disorders and inflammation. The primary sources of the MSCs in clinical trials are bone marrow, fat tissue, and umbilical cord tissue. By any name, MSCs are the most popular cell type in regenerative medicine because, on top of their potential to treat any type of inflammation, they have also been considered to be “immune privileged”. Being immune privileged means the cells do not trigger the patient’s immune system to recognize them as foreign. **When MSC from a donor are given to a patient, no testing for donor-patient matching is required. This has the enormous practical advantage that a clinic can obtain MSCs from unrelated donors and use them to treat all their patients.** The latest immunology research on MSCs shows that they are not 100% immune privileged, in fact, it would be more accurate to say they are “immune evasive”. Careful testing reveals that after receiving MSCs from a donor, many patients do develop antibodies against the donor. Fortunately, these antibodies exist at a very low level that does not cause symptoms, and it is still unknown how long they persist. Overall, MSCs have an excellent safety record, and over the past decade tens of thousands of patients have received MSCs from unrelated donors without experiencing a graft versus host reaction to MSCs injections or infusions.

WHAT MAKES A **MESENCHYMAL CELL** SO IMPORTANT

One of the main functions of MSCs is to maintain cell balance, and also to replace cells that have become sick or are dying through apoptosis. Additionally, under pathological conditions, these cells have the potential to regenerate damaged tissue.

MSCs have strong anti-inflammatory and immunomodulatory properties– **this means that the cells can both regulate the immune system and reduce inflammation**, assisting in the treatment of autoimmune and inflammatory conditions.

They also secrete a large amount of cytokines, chemokines, and trophic (growth) factors, which stimulate the endogenous MSCs for differentiation, spreading, and replication throughout the body.



WHAT **STEM CELL** RESEARCH EXISTS FOR **AUTISM**?

Autism presents as a promising candidate for stem cell therapy due to existing evidence indicating that certain types of stem cells, when administered intravenously, can enhance the overall regulation of the immune system and neural connectivity in the brain. However, clinical trials for autism are trailing behind the research conducted on cerebral palsy.

Between 2011 and 2018, there were 70 stem cell clinical trials worldwide for cerebral palsy and closely related conditions, compared to only 14 stem cell trials for autism. **Dr. Kurtzberg's team at Duke launched their first autism clinical trial in 2014 treating children with their own cord blood**. The published results show significant improvements on the Vineland Adaptive Behavior Scale (VABS) as well as clinician-measured scales.

Improvements were much better in children that started with a non-verbal IQ at or above 70. A similar study at Sutter Health in California, using a lower cell dose, did not find significant improvements.

QUESTIONS PARENTS **SHOULD ASK** OF CLINICS OFFERING **STEM CELL THERAPY FOR AUTISM**

For parents seeking stem cell therapy for autism, here are some questions to ask:

- **Ask if the person who is delivering the infusion has been trained** to manage adverse reactions to transfusions. This is a basic safety issue.
- **Find out what type of “stem cells'' you will be receiving.**
- **Find out the dose of the stem cells**. If the dose your child receives is significantly lower than the recommended by the clinical trials. then it may not be enough to produce noticeable gains.
- **Demand to know the identity of the laboratory** that is providing the stem cells.
- **Next, contact the laboratory directly and ask to see independent third party testing of their product**. You should not pay thousands of dollars for “stem cells'' without confirmation that you are actually getting viable stem cells. Any laboratory that has confidence in their product should not hesitate to provide a third party testing report.

- **Ask how the cells will be shipped** to the clinic and handled prior to therapy.
- **Live stem cells have to be kept under cryogenic conditions** until shortly before they are delivered to the patient.
- **Study independent sources of information** about the proposed therapy.
- **Do not rely solely on testimonials, videos, and books** from the clinic that wants you to purchase their services.
- **The International Society for Stem Cell Research (ISSCR) has created a website for patients that provides guidance on "What to Ask"**. Read and review any contract carefully.

WHERE CAN PARENTS GET **AUTISM THERAPY NOW**?

Many parents today are seeking stem cell therapy for a child with autism at the **Cellular Hope Institute located in Cancun, Mexico.** The clinic provides therapies using specially screened and processed mesenchymal stem cells (MSCs) sourced from umbilical cord (UC) tissue that has been donated after normal, healthy births.

Once accepted and scheduled for treatment, the family travels to Cancun and the clinic provides the stem cells. Both the clinic and accompanying laboratory in Cancun are fully licensed by the national medical authorities, COFEPRIS, and adhere to international standards.

Parents can feel confident that the therapy is legal, the stem cells are sourced and prepared in an affiliated laboratory, and the clinic is highly experienced. **The waiting list at Cancun is only a few weeks, which is important to parents who want to try stem cell therapy while their child's brain is still developing.**

Cellular Hope Institute provides families with a comprehensive five-day package that includes expedited customs clearance and a hotel room.

The price ranges from around $13,000 to $18,000 depending on the child's weight. For children with autism, the first day of the treatment, a Monday, is dedicated to intake testing. From Tuesday through Friday, the child receives daily intravenous infusions of stem cells suspended in sterile solution. The four infusions deliver a total dosage of 40 to 80 million UC-MSCs, depending on the child's weight.

Parents contemplating autism therapy at Cancun are encouraged to rule out other conditions that can cause autism symptoms, such as genetic disorders and heavy metal poisoning. **Normal blood test readings for heavy metals are mandatory before enrolling for therapy.** Parents wishing to learn more about autism therapy at the Cellular Hope Institute in Cancun can visit the autism treatment page on the clinic's website. **https://cellularhopeinstitute.com/autism/**

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