

# Intravenous plasma therapy in a 5-year-old with cerebral palsy symptoms

**Keywords:** Brain derived neurotrophic factor (BDNF), Intravenous, plasma, plasma growth factors, neurogenesis, autologous, cerebral palsy

**Abstract:** The use of platelet-rich plasma has been a common alternative treatment within the field of regenerative medicine. With over 30 years of use and thousands of published research articles in various disciplines and treatment applications, the safety and efficacy of local administration (site specific) PRP is well understood. However, the intravenous administration of plasma treatments and the extent of its treatment benefits is not known. Here, we report the case of a 5-year-old cerebral palsy patient who received a dose specific intravenous plasma.

**Case Report:** This case report highlights the rapid and significant improvement to speech, gross motor movements, and muscle control in a pediatric cerebral palsy patient following intravenous injection of the TruDOSE™<sup>1</sup> plasma treatment. Care givers, teachers, and close friends were purposely not made aware of the child's treatment. The current case report is being written following 3 month follow up.

**Patient Information:** Since birth, the mother describes a history of different medical intervention, different imaging modalities and different specialists, however no official diagnosis. The mother describes her daughter as a happy child that lacks overall body strength to stand and walk, development delays and constant drooling. Despite her daughter's condition, the single mother seemed high spirited and determined to help her daughter. At the time of treatment, the patient was examined and treated by a pediatric heart specialist. The clinical assessment is as follows:

**GEN:** She sits in a stroller, drooling, and nonverbal. **HEENT:** normocephalic, atraumatic **CHEST:** Lungs clear to auscultation bilaterally **COR:** RRR, normal S1S2, no murmur was noted. **ABD:** PEG in place, normal bowel sounds. **EXT:** Feet edematous with 2+ Dorsalis Pedis **NEURO:** alert, babbling, DTR's diminished, no hypertonicity.

**Therapeutic Intervention:** The patient required light sedation using Versed. Following sedation, the patient received a TruDOSE™ intravenous plasma treatment with no adverse events observed. **Ten minutes after the injection, the child began making guttural noises, was extremely interactive with the physician, able to keep eye contact and began mimicking sounds. Her mother began saying the word "Hi" repeatedly and asked her daughter to say "Hi", to which she did.** The mother was encouraged to begin immersing her daughter constantly with words, sounds, etc. to amplify treatment effects (at home immersion treatments).

**Clinical Progression:** The mother was instructed to take serial videos of the immersion treatments and have a clinical follow up at 3 months with the treating pediatric physician.

- **Five hours** after treatment, the mother records video interaction with her older sister audibly saying the word "OK".
- **72 hours:** Report from mother: *"Drooling has completely stopped and lost 1 inch from waist. It's like she's drowning in her clothes. Does not tilt head down and move her eyes to look up... she looks up normally like we do. She's clapping less (stimming) and less jerky and she has almost stopped putting her hands in her mouth."*
- **96 hours:** *"First day back at school. No drooling. Her bib was completely dry. I would have to send 3 bibs daily and a hand towel that usually come home soaking wet. Completely dry!"*
- **Day 6:** *"She's taking directions. When I say "arms up" she can do it. Before it was such a task trying to get her dressed but it's a lot quicker and easier now. She's way more excited and engaged with people and she looks more mature like a regular 5-year-old. Definitely the muscle tone in the face has changed. The hands in her mouth has completely stopped."*
- **Day 30:** *"I definitely think she has grown taller, and her muscles have grown. She can now stand without assistance and usually sits down after 30 seconds but now she doesn't get tired when she's standing."*
- **Day 35:** *"Her teacher called and couldn't believe her progress. She now grabs objects with two hands, knows two words 100% of the time and started crawling over to other students, standing up on her own, and trying to communicate/ interact with other kids. I finally told the teacher she had a procedure done. Based on this conversation, I requested the school take her braces off, sell the wheelchair, just use her gait trainer."*

- **Day 40 - 50:** Two teachers report: *“she can now do things on command when prior to this she was not capable of imitating – Huge step.”* Mom reports she does not have a gag reflex anymore and the non-drooling continues.
- **Day 60:** Mom records video of walking and reports, *“she’s never used something this lightweight and been able to stand up and walk around everywhere. She would have fallen over by now. She also climbs up and eats dinner with us. Its safe to say we are buying a walker.”*

Former caretaker responds to video: *“Huge milestone. She never had this balance. She could only get up on her knees, not stand up. So, seeing her be able to balance herself, while simultaneously pushing a chair is quite a milestone.”*

- **Day 75:** *“Able to take pictures on command without the clapping (stim). Oh, and she’s grown more. I don’t know how many inches, but she has shot up again overnight.”*

**Discussion:** Neural plasticity is a phenomenon that aids brain recovery after the damage produced by events like stroke or traumatic injury. Cerebral palsy is a condition understood to be the result of a stroke in utero (in the uterus) that makes neural plasticity difficult. It has been reported and suggested the young are most likely to have more neural plasticity compared to the old, however, it is also understood that neural progress is considerably slower compared to any other tissue in the body.

Platelets within the plasma treatment provides a plethora of biological growth factors capable of controlling inflammation, regulating the immune system, and neurogenesis. In the context of neurogenesis, brain-derived neurotrophic factor (BDNF), a member of the neurotrophic family, plays critical roles in the survival, growth, and maintenance of brain and peripheral neurons. Platelets are recognized to provide the richest source of this powerful protein, and potentially represent a medicinal warehouse of factors capable of promoting tissue repair and functional restoration of neurogenesis in a condition like cerebral palsy.

Contrary to conventional wisdom, arguably, circulating platelets play the most critical role with tissue regeneration. For example, platelets are circulating the bloodstream actively looking for two things to initiate: repair and defense needs. When a host tissue signals for repair, circulating platelets are solely responsible for the initiating body’s healing cascade – a five step sequential order of events the body undergoes for any tissue repair. Moreover, the platelet intimately coordinates, participates, and oversees the entire process. Stage two, inflammation, the platelet oversees the repair activities of the body’s immune cells. If these cells are left unattended, the body experiences chronic inflammation – a state where immune cells are responding to repairs signals from the host (damaged) tissue and conducting repairs without the platelet overseeing their activities. A classic sign of chronic inflammation is swelling, in which the body is in a state of metabolic tipping point<sup>1</sup>, a state incapable of executing functional repair. As one slides towards a metabolic tipping point, the body system is forced to prioritize, which in turn forces the body to hierarchically select and prune away any cell activity or function not operating efficiently.

Based on the immediate observations and comments from the mother, one can surmise the platelet therapy had an immediate neuromodulating and inflammatory modulating effects. This can be suggested marked by the child immediately mimicking, saying the word “Ok” and the dramatic decrease in swelling at day 3. The dose specific number of cellular resources within the plasma treatment provided not only the catalyst to rebalance the metabolic state but also begin sequential systemic repair of the nervous system. In accordance with holistic doctrine and treatments, the systemic effects of the plasma therapy relies on the body’s intelligence to direct the order of repairs. By comparison, an exogenous drug therapy would be targeted and work outside of the body’s natural healing cascade. Furthermore, drug therapies must be fully metabolized by the body regardless of the metabolic state. In contrast, cellular homeostasis will devote resources to priority of need and selectively remove excess circulating cells through apoptosis. In other words, the systemic delivery relies on the body’s intelligence to direct cellular need towards priority, as it removes any excess to reestablish a new homeostatic state. Relying on the body’s intelligence could be an explanation why the plasma therapy makes permanent sustainable repairs without fluctuating effects like targeted drug therapies.

<sup>1</sup>Dosing inaccuracy has historically limited the scientific understanding and potential treatment discovery from autologous cell therapies, like plasma treatments. The TruDOSE™ Technology (Bridging Biosciences, LLC) solved this dosing inaccuracy problem whereby learning and helping providers produce dose specific treatments to individual patients. Unexpectedly, the implementation of the TruDOSE™ Technology led to the discovery of an intravenous treatment protocol (TruDOSE™). Since 2018, close to five-thousand TruDOSE™ treatments have been given and having symptom effects not described within the published literature.