



CLIENT REPORTED OUTCOMES

PARKINSON'S DISEASE

This study overview illustrates the benefits seen using one's own MSCs, cultured by Celltex, to help alleviate symptoms of Parkinson's disease.

DISCLAIMER: The Celltex study on Parkinson's disease is being shared with you at your request. It reflects actual outcomes from individuals who received therapy using Celltex-produced mesenchymal stem cells. The study shows positive results for these individuals. It is important to note that the study is not scientific. No representation is being made that you or any other individual would get similar positive results. You should consult with your physician on what is best for you. Please call us if you wish to find out more about Celltex and the positive results individuals are having as reflected in this study.

STEM CELLS AND PARKINSON'S DISEASE: HOW IT WORKS



Parkinson's Disease (PD)

PD is a neurodegenerative condition affecting dopamine-producing neurons in a structure of the brain called the substantia nigra, resulting in a loss of motor function and a range of other symptoms.

Current PD treatments use pharmaceuticals to artificially increase the level of dopamine in the brain to compensate for the loss of neurons.

While this treatment does help preserve motor function for some time, the need to continually increase the dosage means that patients inevitably reach a point where medication is either no longer effective or needed at a dosage where adverse side effects become apparent.^[1,2]

Why Mesenchymal Stem Cells?

Mesenchymal Stem Cells (MSCs) are a unique, naturally occurring type of stem cell shown to potentially help improve impaired motor function caused by PD.

MSCs are also known to have anti-inflammatory and neuroprotective properties that could help protect surviving neurons from further harm.

Finally, MSCs possess regenerative properties that could help re-elevate dopamine levels in the brain.^[3]

While this doesn't represent a potential cure for PD, it does present a potential avenue for alleviating symptoms and further maintaining quality of life.

This study overview illustrates the benefits seen using one's own MSCs, cultured by Celltex, to help alleviate symptoms of PD.

Data is based on reported outcomes of Celltex clients with PD.

Overview based on study conducted by the Celltex Research & Development Team: *Safety Registry Study Series using Autologous Adipose-Derived Mesenchymal Stem Cells, Parkinson's Disease, 2021.*

CLIENT REPORTED OUTCOMES FOR PD

Study Overview

Celltex conducted a registry study based on the reported results of our clients with PD.

The study utilized a number of survey methods to assess the reported results of clients with PD who received MSC therapy between March 2012 and December 2020.

Survey Tools

Clients were given four surveys, each meant to measure the impact of MSC therapy in a different way. **The average client saw improvements in at least two of the four surveys.**

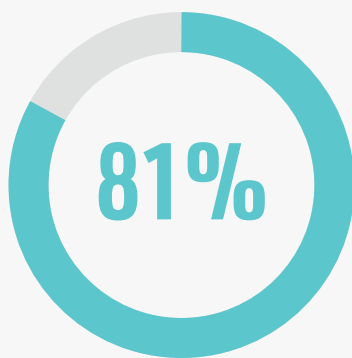


4 VALIDATED HEALTH SURVEYS WERE USED TO COLLECT DATA:

3 surveys were completed by clients themselves

1 survey was completed by clients' physicians

The most compelling data came from this physician-submitted survey



OF CLIENTS WITH PD
INDICATED IMPROVEMENT ON
AT LEAST ONE SURVEY

Overall, most respondents reported improvements on at least one survey.

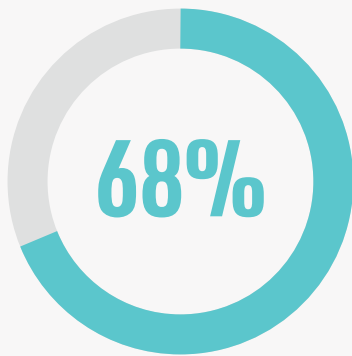
While most clients saw improvement in at least one survey, each survey evaluated the client's experience differently – **meaning improvements were individualized, with each client seeing different improvements across different areas.**

KEY FINDINGS

Physician-Validated Results

The Unified Parkinson's Disease Rating Scale (UPDRS) is a standardized assessment used by physicians to quantify the disability level of a patient with PD.

Of all the data collected in our study, the most compelling came from this physician-completed survey tool.



OF CLIENTS' PHYSICIANS NOTED IMPROVEMENT IN THE CLIENT'S DISABILITY LEVEL

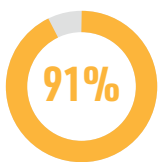
The majority of respondents' physicians reported an objective improvement.

Of the clients whose physicians completed the UPDRS for this study, 68% had noted improvement in their disability level following MSC therapy.

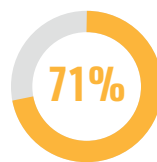
Client-Reported Impact

In addition to the physician-submitted results, clients were also asked to characterize whether they thought MSC therapy had helped them.

WHEN CLIENTS WERE ASKED THEIR OPINIONS REGARDING MSC THERAPY:



would recommend MSC therapy to others.



felt their need for medication remained the same or decreased.

IMPACTING THE SYMPTOMS OF PD

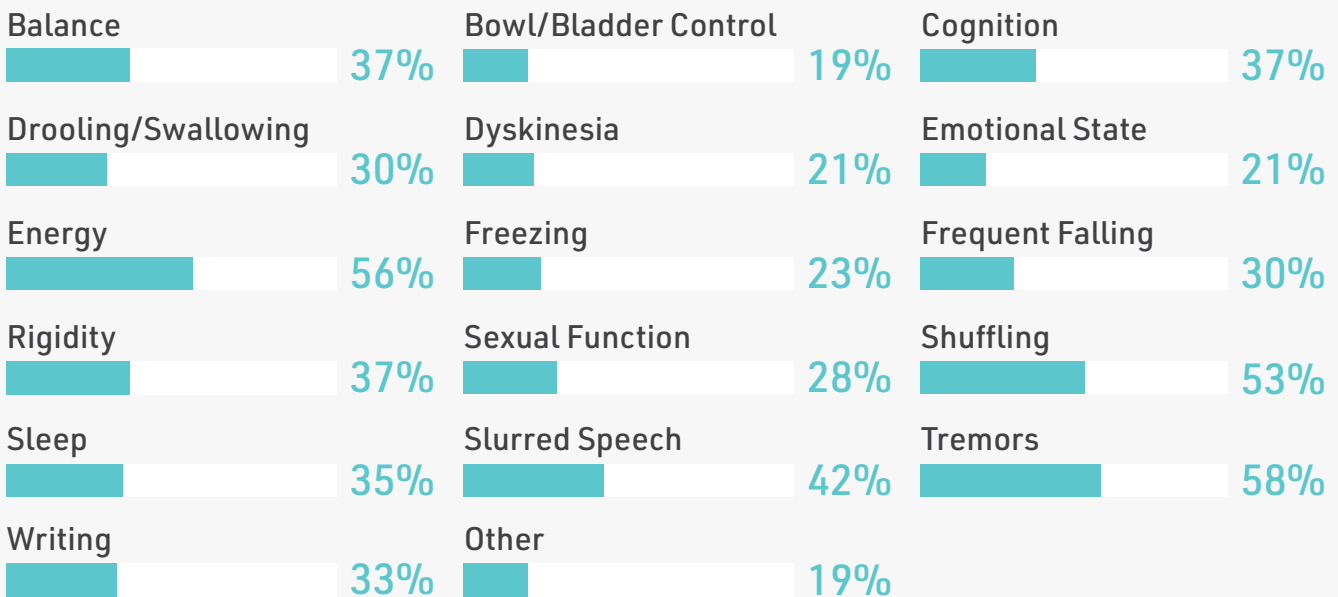
What We've Learned

While each client experienced individualized improvements across different areas, most reported that the severity of their PD symptoms had reduced in some way.



Frequency of Symptom Improvements for PD Clients

The chart below represents the percentage of respondents that reported seeing improvement for the indicated symptom. Not every individual had every symptom.



Varied Administration

In addition to tracking clients' reported results with MSC therapy, this study looked into how each client received MSC therapy and to what frequency. Additional studies are needed to adequately answer whether one route of administration is more promising than another for alleviating PD symptoms.

ADMINISTERING STEM CELL THERAPY

While the type of administration and frequency of therapies often varies based on a client's specific circumstances – **each respondent received at least one IV infusion during this study.**



Routes of Administration

How MSCs are administered into the body varies based on physician recommendation and the individual client's needs.

Intravenous (IV): The MSCs are infused into the body through an IV. This is the most common route of administration.

Intranasal (IN)

The MSCs are infused through the nasal passage.

Intrathecal (IT)

The MSCs are administered through an injection into the spinal canal.

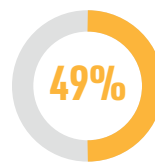
Combining Routes

IV infusions are often accompanied by another route of administration. **92%** of surveyed clients received an IV infusion combined with at least one other route of administration.

IN ADDITION TO RECEIVING AN IV INFUSION:



of respondents received therapy **via IN** at least once.



of respondents received therapy **via IT** at least once.

MOVING FORWARD

Safety of MSC Therapy

There were no severe adverse events to MSC therapy in this registry study of Celltex clients with PD.

In fact, Celltex-produced MSCs have been used in over 10,000 therapies across various disease categories with no severe adverse events.

More Research is Crucial

Using MSCs to help alleviate the symptoms of PD certainly has potential, but more research is still a priority.

MSC therapy may already be an option for some. Learn more at [CelltexBank.com/Therapy](https://www.celltexbank.com/Therapy).

The Celltex Difference

Stem cell banking is the critical first step in the MSC therapy process that separates Celltex from other stem cell companies. Stem cell banking with Celltex involves (1) extracting a one-time sample of an individual's fat tissue, (2) isolating MSCs from that sample, (3) expanding the pure MSCs in quantity, and (4) cryopreserving a lifetime supply for future therapeutic uses.

Celltex's technology enables an individual's stored MSCs to be expanded into quantities exponentially greater than that of current same-day stem cell clinic offerings, greatly increasing the potential for positive results when therapeutic application is necessary.

This difference in cell quantity, along with the compatibility from using one's own cells, contributes to the superior quality of Celltex-produced MSCs. **Celltex-produced MSCs have the potential to succeed where same-day stem cell therapies have failed before.**

YOUR NEXT STEPS

Take Our Virtual Consultation

Visit [CelltexBank.com/PD-Eval](https://www.celltexbank.com/PD-Eval) to see if stem cell banking or therapy is right for you.

Talk to Your Celltex Representative

Here for you every step of the way, we can answer any question you might have about our process.

SUPPORTING INFORMATION

References

Overview based on study conducted by the Celltex Research & Development Team: *Safety Registry Study Series using Autologous Adipose-Derived Mesenchymal Stem Cells, Parkinson's Disease, 2021.*

Additional References:

- [1] Jankovic J. (2005). Motor fluctuations and dyskinesias in Parkinson's disease: clinical manifestations. *Movement disorders : official journal of the Movement Disorder Society*, 20 Suppl 11, S11–S16. <https://doi.org/10.1002/mds.20458>
- [2] Thanvi, B., Lo, N., & Robinson, T. (2007). Levodopa-induced dyskinesia in Parkinson's disease: clinical features, pathogenesis, prevention and treatment. *Postgraduate medical journal*, 83(980), 384–388. <https://doi.org/10.1136/pgmj.2006.054759>
- [3] Andrzejewska, A., Dabrowska, S., Lukomska, B., Janowski, M., Mesenchymal Stem Cells for Neurological Disorders. *Adv. Sci.* 2021, 8, 2002944. <https://doi.org/10.1002/advs.202002944>

Acknowledgments

We would like to acknowledge the generous contribution of those who received their own MSCs under the registry study in which this overview is based on. Their willingness to perform and submit surveys throughout repeated data collection cycles made these analyses possible.

We give our deepest thanks to these people for their contribution to help advance understanding in stem cell research.

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