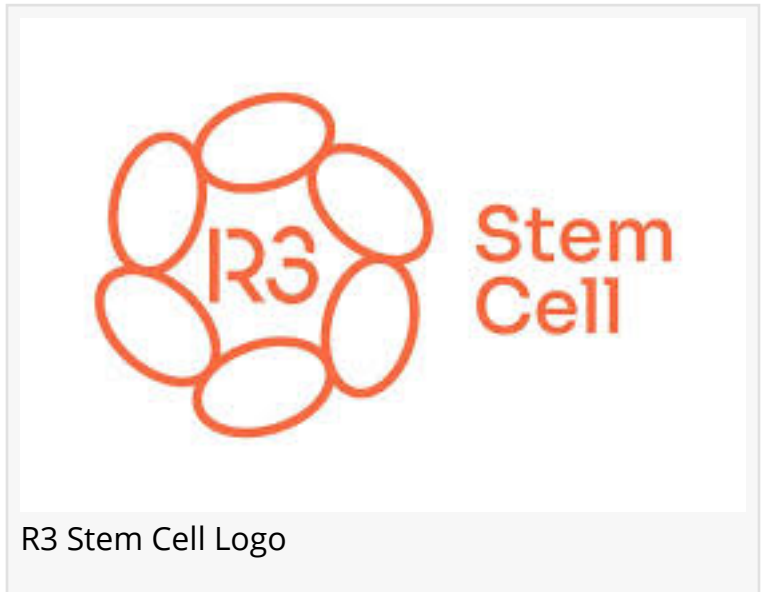


R3 Stem Cell Researchers Publish Systematic Review of Intranasal Regenerative Biologics for Neurological Disorders

The publication reviews intranasal stem cells for neurological conditions, finds no serious adverse events, and lays out what future controlled must standardize

SCOTTSDALE, AZ, UNITED STATES, October 19, 2026 /EINPresswire.com/ -- Researchers from R3 Stem Cell's Department of Research and Development have published a systematic review in *Frontiers in Drug Delivery* that brings together the human clinical evidence on delivering regenerative biologics through the nose to treat neurological disorders. It is the first systematic synthesis to cover this literature across the full range of neurological conditions, biologic types, and delivery methods.



“

Intranasal stem cell and exosome delivery is one of the most compelling ideas in regenerative neurology, so we evaluated the literature with regards to safety and effectiveness.”

David Greene, R3 CEO

The review, “Intranasal delivery of regenerative biologics for neurological disorders: a systematic review of clinical studies,” was published October 16, 2026, in the journal's *CNS Drug Delivery* section. It examined mesenchymal stromal cells (MSCs), neural stem cells, exosomes and other extracellular vesicles, secretome and conditioned medium, and breast milk-derived preparations administered intranasally. Intranasal delivery is a minimally invasive route that uses the olfactory and trigeminal nerve pathways to reach the central nervous system, bypassing the blood-brain barrier that blocks most intravenously

delivered biologics from reaching the brain.

The key findings were impressive. After screening more than 18,600 records from PubMed, Google Scholar, ClinicalTrials.gov, and the Chinese Clinical Trial Registry covering January 2015

The review is equally clear about how early the field remains. Most studies were small and uncontrolled. Doses were reported in seven different ways, including cells, cells per kilogram, particles, micrograms of protein, milliliters, percentage concentrations, and vial counts, which makes cross-study dose comparison impossible. Five different delivery techniques were used, from nasal sprays to neuroendoscopic placement, and no study measured how much product was deposited in the nose or reached the brain. Only Alzheimer's disease, [stem cells for Parkinson's disease](#), and intraventricular hemorrhage in preterm

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Intranasal delivery of regenerative biologics for neurological disorders: a systematic review of clinical studies

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Introduction: Intranasal delivery is a minimally invasive route for administering regenerative biologics to the central nervous system while bypassing the blood-brain barrier. Human clinical evidence for this approach across neurological disorders remains dispersed across multiple disease areas, biologic classes, dosing frameworks, and delivery methods, limiting field-level synthesis. This study was conducted to systematically evaluate the safety, dosing characteristics, delivery method heterogeneity, and disease-specific direction of effect of intranasal regenerative biologics, including mesenchymal stromal cells (MSCs), neural stem cells (NSCs), exosomes, secretome and conditioned medium, breast milk-derived biologic preparations, and related regenerative products, in patients with neurological disorders.

Methodology: An International Prospective Register of Systematic Reviews (PROSPERO)-registered systematic review was conducted and reported in accordance with Preferred Reporting Items for Systematic Reviews and Meta-

cohort. Twelve of the 18 cohorts were linked to a trial registration, and only four registered trials used formal independent safety monitoring.

“Intranasal delivery is one of the most compelling ideas in regenerative neurology, and right now it is also one of the least standardized,” said David L. Greene, MD, PhD, MBA, Founder and CEO of R3 Stem Cell and a co-author of the review. “We set out to give the field an honest baseline: what the human data show about tolerability so far, where the evidence is thin, and exactly what future trials need to measure so we can learn whether these therapies truly work. Patients deserve that rigor.”

Fifteen of the 18 cohorts reported clinical improvement and one reported stabilization. The authors caution, however, that these results should not be read as evidence of efficacy: without control groups, placebo response and the natural course of disease cannot be ruled out. They conclude that intranasal regenerative biologics remain investigational and that adequately powered, controlled trials are needed before clinical adoption can be considered.

To get there, the review recommends standardized units for dose reporting, consistent adverse-event classification, shared outcome measures within each disease area, clear characterization of delivery techniques, and measurement of nasal deposition and, where feasible, central nervous system bioavailability.

“Every group working in this space is effectively speaking a different language on dose and delivery,” said Umm E Habiba, co-first author and researcher in R3 Stem Cell’s Department of Research and Development. “Our hope is that this review becomes a practical framework for designing the next generation of trials, so the results can finally be compared and built upon.”

The review was prospectively registered with PROSPERO (CRD420261381627) and reported according to PRISMA 2020 guidelines, with synthesis following Synthesis Without Meta-Analysis (SWiM) recommendations. Two independent reviewers extracted data and assessed risk of bias using Cochrane RoB 2, ROBINS-I, and the Joanna Briggs Institute critical appraisal checklists for case series and case reports. Because of the heterogeneity across conditions, products, and outcome measures, results were synthesized narratively rather than pooled.

The authors are Umm E Habiba and Iqra Sarwar (co-first authors), Sabiha Shamim of R3 Stem Cell Research, and David Lawrence Greene, MD, PhD, MBA. All authors are employed by R3 Stem Cell LLC or R3 Medical Research LLC, as disclosed in the publication. The work received no external funding.

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About R3 Stem Cell

R3 Stem Cell is a multinational regenerative medicine provider with more than 80 Centers of Excellence across eight countries. Through its Department of Research and Development and affiliated research entities, R3 conducts and publishes clinical research, including IRB-approved observational safety data collection, to advance the evidence base for regenerative therapies. R3

Stem Cell's centers of excellence globally have performed over 30,000 regenerative procedures to date, including with [intranasal stem cell therapy](#).

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