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Swiss Medica's Patient Guide to MSC Therapy

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Introduction: Why This Guide Exists

Swiss Medica is a medical group focused on regenerative medicine and supportive rehabilitation programs for international patients. In our clinical practice, we work with **mesenchymal stromal cells (MSCs)** and other biologically based approaches that are actively studied in modern medicine.

Our approach to MSC-based therapies is cautious and evidence-aware. Research in this field is ongoing, and certain applications have shown promising results in early clinical studies. However, we do not view MSC-based interventions as universal solutions or replacements for appropriate standard medical care. Treatment decisions at Swiss Medica are guided by diagnosis, disease stage, overall health status, and a balanced discussion of potential benefits, limitations, and risks.

We created this guide because people searching for stem cell therapy often encounter information that is confusing, contradictory, or presented without sufficient scientific context.

The same term is used to describe different types of cells, different levels of evidence, and different standards of medical practice. As a result, it can be difficult to distinguish between established treatments, investigational approaches, and unsupported claims.

HOW TO USE THIS GUIDE

This guide is intended to provide clear, structured information to help patients and families better understand the current landscape of MSC therapy and to support informed decision-making.
It does not replace consultation with qualified medical professionals.

You may use this guide to:

- Learn how different stem cell types differ from one another
- Understand the basic biology and proposed mechanisms of mesenchymal stromal cells
- Learn how MSC-based products are prepared and evaluated for safety
- Recognize the difference between realistic expectations and unsupported claims
- Prepare thoughtful questions for discussions with medical providers when considering regenerative treatments

Part 1. Understanding MSC Therapy—How It Works, What Affects Results, and What to Expect

1) WHAT DOCTORS MEAN BY ‘STEM CELLS’

The term “stem cell therapy” is often applied to very different types of cells. For patients, this creates a genuine challenge: treatments that sound similar may differ significantly in their biological mechanisms, safety profiles, regulatory oversight, and expected outcomes.

One helpful way to reduce confusion is to distinguish between the three most common types that are often grouped together under the single label of ‘stem cells.

1) Blood-forming stem cells (HSCs)

Hematopoietic stem cells (HSCs) are responsible for producing blood and immune cells. They are found in bone marrow, peripheral blood, and umbilical cord blood.

HSCs represent an established and well-regulated area of medicine. Treatments such as bone marrow transplantation are considered standard care for certain blood cancers, immune disorders, and other hematologic conditions.

2) Pluripotent stem cells (ESCs and iPSCs)

Pluripotent stem cells have the capacity to develop into nearly any cell type in the body.

- ESCs (embryonic stem cells) are derived from early-stage embryos, typically created through in vitro fertilization (IVF) and donated for research with informed consent. Because of their origin and biological properties, their use raises ethical and regulatory considerations in many countries.
- iPSCs (induced pluripotent stem cells) are created by reprogramming adult cells to return to a pluripotent state.

Because of their biological complexity and potential risks, most pluripotent stem cell–based approaches remain in experimental stages or early clinical trials conducted under tightly controlled research conditions.

3) Mesenchymal stromal cells (MSCs)

MSCs are multipotent cells primarily involved in immune modulation and tissue-supporting functions. They are typically derived from sources such as bone marrow, adipose (fat) tissue, umbilical cord tissue, and other connective tissues.

MSCs are the main focus of this guide. They occupy a distinct position within the broader stem cell field. They are neither pluripotent cells capable of forming any tissue, nor are they equivalent to well-established hematopoietic stem cell transplants used in blood disorders.

MSC-based therapies are being studied across many conditions. In some cases, they are used clinically under specific regulatory frameworks, while in many others they remain investigational.

Their role is best understood not as universally established or purely experimental, but as context-dependent—defined by the specific condition, the product used, and the level of available clinical evidence.

Before evaluating any clinic's claims, consider asking:

- What type of cells are being used and where do they come from?
- What condition is this treatment intended for?
- How are safety and quality ensured?
- What results should I realistically expect?

2) WHY MSCs ARE USED IN REGENERATIVE MEDICINE

The word 'stromal' in the name 'mesenchymal stromal cells' is important because it refers to the supportive environment around cells within tissues. This helps explain a key difference: while stem cells are often thought of as cells that "turn into" other tissues, MSCs are mainly involved in **supporting and regulating the tissue environment**.

While MSCs do have the capacity to differentiate under natural biological conditions, in clinical practice this effect is currently not reliably reproducible or significant.

A practical way to understand MSCs is to think of them as **biological communicators**. They release signaling molecules and interact with immune and structural cells within tissues, helping regulate inflammation and **support tissue repair processes**.

Because dysregulated or chronic inflammation is a common feature in many complex conditions—including neurological, autoimmune, and degenerative diseases—this signaling activity is a key area of interest in MSC research.

MSCs are better understood as biological communicators than as literal building blocks.

They cannot rebuild damaged organs on demand, reverse advanced disease independently, or produce identical results in every patient.

3) HOW MSCs WORK IN A HUMAN BODY

Current research suggests that the primary mechanism of action of MSCs is paracrine signaling. Rather than integrating into tissues and replacing damaged cells, MSCs release a wide range of bioactive molecules that influence surrounding cells and the local tissue environment.

These bioactive molecules include:

- **Cytokines and growth factors**, such as vascular endothelial growth factor (VEGF), which supports blood vessel formation, and hepatocyte growth factor (HGF), which is involved in tissue repair processes.
- **Extracellular vesicles (including exosomes)**, which are small membrane-bound particles that carry proteins and genetic material capable of influencing neighboring cells.

This combined signaling activity—often referred to as the MSC "**secretome**"—affects several interconnected biological processes:

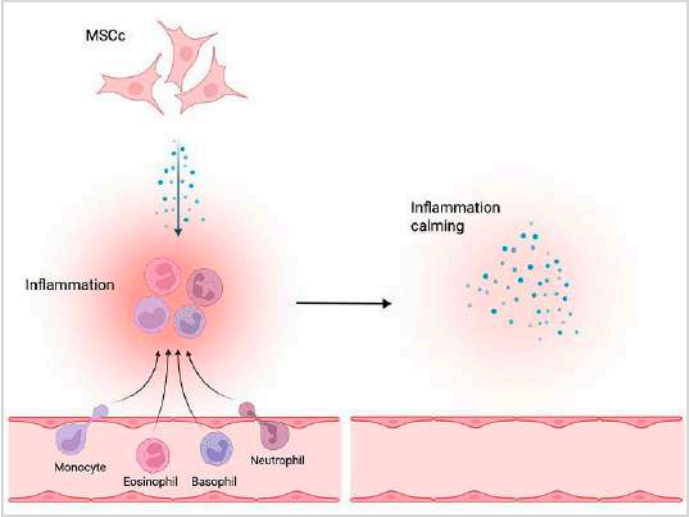
1) Immunomodulatory effects

MSCs can detect signals associated with tissue stress or injury and interact with immune cells to help regulate their activity. They help shift the environment from an aggressive, pro-inflammatory state to a pro-repair state.

Laboratory studies suggest that MSCs secrete factors (such as indoleamine 2,3-dioxygenase and prostaglandin E2), which are associated with:

- Reduced activity of certain pro-inflammatory T-cell populations (such as Th1 and Th17 cells)
- Increased activity of regulatory T cells (Tregs), which help moderate immune responses

The overall effect is not suppression of the immune system, but modulation toward a more balanced state.



2) Anti-inflammatory effects

Through the release of cytokines and other signaling molecules, MSCs may help shift the tissue environment from a highly inflammatory state toward a more regulated one.

This includes influencing inflammatory pathways and reducing the intensity and duration of inflammatory responses, which is considered important in many chronic conditions.

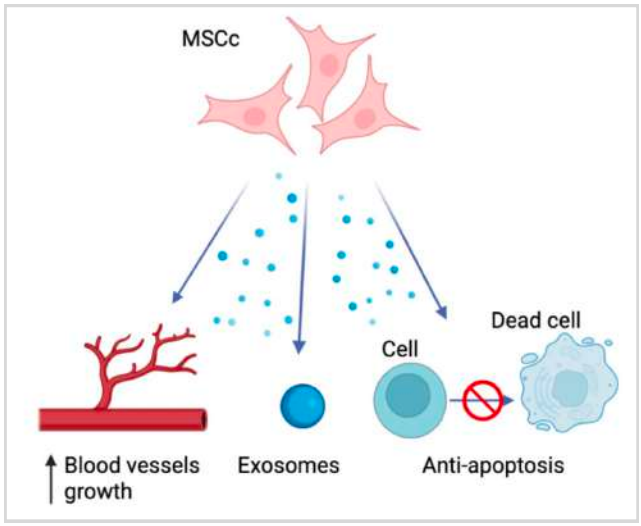
3) Pro-regenerative (tissue-supporting) effects

MSCs may support tissue repair by creating conditions that are more favorable for recovery.

Their secretome includes growth factors and extracellular vesicles (such as exosomes) that can:

- Support formation of small blood vessels (angiogenesis), e.g., via VEGF and angiopoietin-1
- Reduce premature cell death (apoptosis)
- Modulate pathways involved in scar tissue formation (fibrosis)

These effects are often described as "trophic," meaning the cells support the environment rather than replace damaged structures directly.



4) WHY MSC THERAPIES CAN LEAD TO DIFFERENT RESULTS

While many MSC mechanisms are well described in laboratory settings, their behavior in the human body is more complex and can vary.

Some factors are individual and cannot be changed, including:

- Disease stage and severity
- Overall health and immune status
- Coexisting conditions

Other factors depend on **how the therapy is designed and delivered**, including:

- Cell source
- Manufacturing and quality control
- Dose and administration strategy
- Treatment schedule

Understanding this distinction helps explain why results may differ and why **treatment protocols matter**.

5) WHAT INFLUENCES THE QUALITY AND CONSISTENCY OF MSC THERAPY

The way MSC-based therapies are prepared and delivered plays a major role in their consistency and safety.

Cell source

The tissue source is not a minor technical detail. MSCs can be derived from different tissues, which may influence their biological properties.

In **autologous use** (patient-derived), cell quantity and functional quality may be affected by age, chronic disease, or prior treatments.

In **allogeneic use** (donor-derived), donor selection and production can be standardized, but require strict screening and quality control.

Manufacturing and quality control

How the cells are prepared and tested affects how well they function and how consistent they are.

Key aspects include:

- **Viability** — how many cells remain alive and functional
- **Biological activity** — how effectively the cells can signal and interact with the body
- **Reproducibility** — how consistent the product is between batches

Well-defined laboratory protocols are essential to maintain these characteristics.

Storage and handling

Some MSC products are used fresh, while others are cryopreserved (frozen and later thawed).

Cryopreservation can be reliable when properly validated, but it requires strict control of freezing, storage, and thawing conditions to preserve cell function at the time of administration.

How quality control is applied in practice

In structured medical settings, these factors are managed through defined protocols.

At **Swiss Medica**, this includes:

- Controlled laboratory production with sterility measures
- Monitoring of cell characteristics (such as viability, identity and proliferation)
- Defined testing for contamination and safety
- Standardized storage and handling procedures

At Swiss Medica, cells may be donor-derived or patient-derived, depending on the protocol. After collection, they are expanded, tested, and prepared for administration.

Before use, each batch undergoes checks such as:

- Sterility testing (to rule out bacterial or fungal contamination, including mycoplasma)
- Endotoxin testing (to detect bacterial toxins that could cause fever or inflammation)
- Identity confirmation (verification of characteristic MSC markers such as CD73, CD90, and CD105)
- Viability assessment (measurement of the percentage of living cells at the time of release)

For donor-derived products, multiple rounds of screening and testing are performed at the batch level prior to clinical use.

These processes are designed to ensure safety and consistency, although they do not guarantee a specific clinical outcome in every case.

At **Swiss Medica**, patients are informed about the source of the cells, as well as the quality and safety measures applied, including documented screening, sterility testing, and product release criteria prior to administration.

6) WHY DOSING AND TREATMENT SCHEDULES CAN VARY

MSC-based therapies do not follow a single fixed dose or schedule. Instead, treatment plans are adjusted based on several factors—similar to many conventional medical treatments.

Dosing and the number of administrations may vary depending on:

- **The treatment goal** (for example, systemic vs. localized effects)
- **The route of administration**
- **Disease severity and duration**
- **Individual patient factors**, such as age, weight, and overall health

In some cases, a single administration is used, while in others, repeated treatments are planned to support longer-term effects.

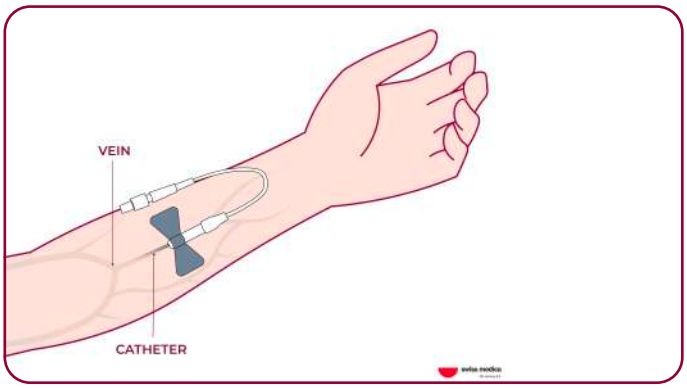
In clinical practice, protocols are typically designed based on safety, treatment goals, patient characteristics, and available clinical experience.

7) HOW MSCs ARE ADMINISTERED–AND WHY ROUTE MATTERS

MSC-based treatments can be delivered through different routes. The route of administration can influence how the product distributes in the body, how the procedure feels, and what monitoring is appropriate.

Intravenous (IV) administration

IV administration is one of the main delivery routes. Patients receive a slow infusion, typically over 20–40 minutes. The procedure is similar to other intravenous treatments and is generally well tolerated.



Because the cells enter the bloodstream, they can distribute throughout the body, contributing to a more systemic effect. This route is often used when the clinical goal involves systemic signaling or immune modulation—for example, in programs for **multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS)**, and **ASD**.

After entering the bloodstream, a portion of the cells transiently localize in the lungs —sometimes referred to as the “first-pass effect”—before interacting with circulating immune cells and other tissues.

In some pediatric cases—including certain patients with autism—short-acting sedation may be considered to allow the procedure to be performed safely and with minimal distress. This is assessed individually and is not standard for all patients.

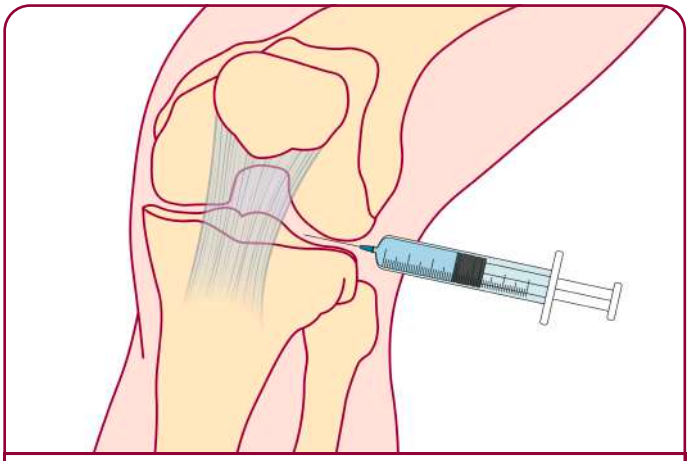
Local administration

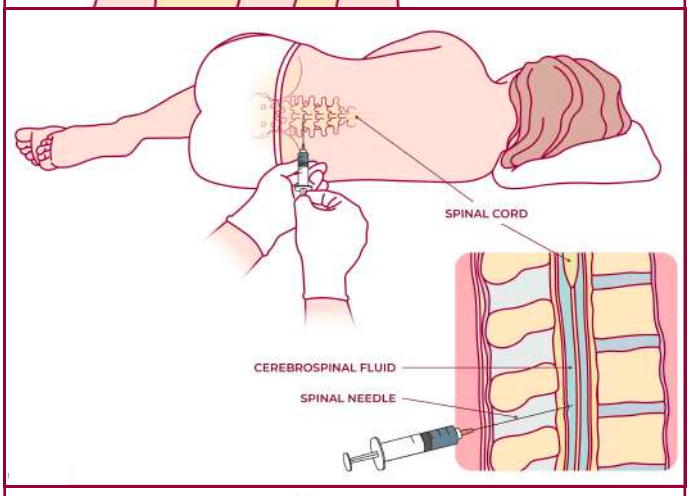
Local administration involves delivering the product to a specific anatomical site, such as:

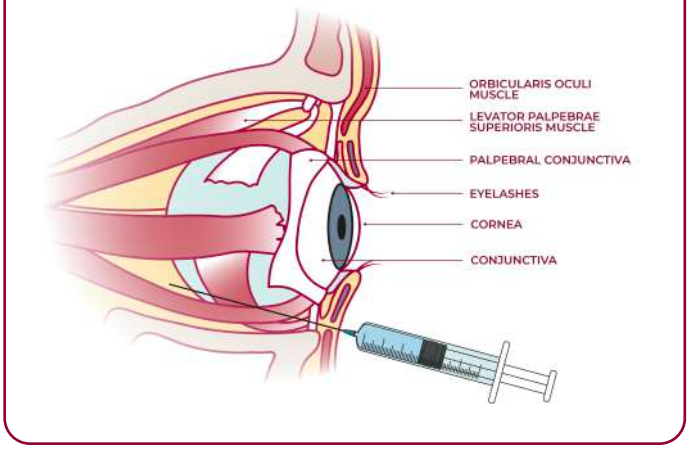
- Into or around a joint
- Into the intrathecal (spinal fluid) space
- Into another targeted tissue area

The rationale is to position the cells closer to the area of interest, where their signaling activity may influence the local tissue environment.

Patients may experience brief pressure during the procedure and mild soreness afterward. Temporary fatigue has been reported in some cases.







Premedication before administration is not routinely required, although protocols may vary.

Monitoring and follow-up

Monitoring is an important part of any MSC-based treatment program.

At Swiss Medica, this typically includes:

- Assessment before treatment
- Observation during and after administration
- A defined follow-up plan
- A process for documenting and reporting any adverse events

Patients are monitored during and after administration, including basic clinical parameters (such as pulse, blood pressure, and temperature), and are given guidance on reporting any delayed symptoms.

Follow-up is important because responses, when they occur, may develop gradually over time.

Part 2. Safety and Evidence in MSC Therapy—What is Known and How to Interpret It

8) SAFETY AND SIDE EFFECTS: WHAT IS KNOWN AND WHAT TO CONSIDER

MSC-based therapies are sometimes described as “natural,” but in medicine, safety is never assumed.

When proper protocols are followed, MSC-based treatments are generally considered to have a **favorable safety profile**.

What helps make treatment safe

Safety depends on how the therapy is prepared and delivered.

This includes:

- Careful selection of patients
- Strict laboratory and sterility standards
- Well-defined treatment protocols
- Properly performed procedures

These steps are designed to reduce risks and ensure consistency. Patients should feel comfortable asking how these safety measures are implemented before proceeding with treatment.

In structured medical settings, like Swiss Medica, risks are minimized through defined laboratory standards, sterile techniques, and standardized clinical protocols.

Common short-term reactions

Some people experience mild temporary reactions in the hours or days after treatment.

These may include:

- Fatigue
- Headache (more common after spinal/intrathecal administration)
- Low-grade fever or chills
- A mild flu-like feeling
- Local soreness or swelling (if injections are used)

Some patients may also experience temporary irritability or agitation for a short period (from a few days up to a couple of weeks).

The side effects usually pass on their own. However, clear communication about what to expect helps reduce unnecessary concern and allows patients to respond appropriately if symptoms arise.

When MSC therapy may not be appropriate

Eligibility for stem cell therapy is determined on an individual basis, and this type of treatment should not be described as universally safe or appropriate for all patients.

Treatment is generally not recommended for patients with:

- Active or uncontrolled infection
- Significant medical instability
- Poorly controlled epilepsy
- Severe immune suppression
- Ongoing cancer or unresolved oncologic concerns

Patients with complex medical histories may require additional evaluation before any procedure is considered.

Cancer risk: a common question

Many patients ask whether MSC therapy increases the risk of cancer.

Current clinical data have not shown a clear link between properly manufactured MSC products and the development of new cancers. However, long-term data are still being collected.

Because MSCs influence immune signaling and tissue environments, caution is often exercised in individuals with:

- Active cancer
- Elevated risk of tumor recurrence

9) HOW TO UNDERSTAND EVIDENCE IN STEM CELL THERAPY

The term “stem cell therapy” is often used broadly, but in reality, it does not describe a single, uniform treatment. To make sense of different claims about stem cell therapy, it helps to understand how medical evidence is evaluated.

How doctors evaluate treatments

In medicine, treatments are not considered effective just because they sound promising or are widely discussed. They are evaluated through clinical research.

The key question is simple:

Does this specific treatment help patients with a specific condition?

To answer this, studies are done in stages:

- Early studies look at safety and whether the treatment can be used reliably
- Later studies look at whether it leads to real, measurable improvements

These improvements might include changes in symptoms, physical function, test results, or quality of life.

Because many conditions naturally change over time—or are treated with multiple therapies at once—it is not always easy to know what caused an improvement. This is why controlled studies (with comparison groups) are important.

Where MSC-based therapies stand today

MSC-based therapies are still an active area of research. Their status is not the same for every condition.

In some specific cases, cell-based treatments have been approved under strict medical and regulatory standards.

However, for many conditions—especially neurological, autoimmune, and degenerative diseases—MSC-based therapies are still considered **investigational**.

This means:

- There is scientific and early clinical evidence suggesting potential benefits
- But strong, consistent proof from large clinical studies is still developing

Why you may see different claims

You may come across MSC-based therapies in different settings, such as:

- Clinical trials
- Specialized medical programs
- Approved treatments for specific conditions

These are not the same.

A treatment can be offered in a clinical setting even if it is still being studied. And approval for one condition does not mean it is approved for others.

What this means for you

The most important thing to understand is this:

There is no single answer to the question "Does stem cell therapy work?"

A more useful question is:

"What evidence exists for this specific treatment for my condition?"

Understanding this helps you:

- Interpret information more clearly
- Ask more precise questions
- Make more informed decisions

MSC therapy should not be described as universally effective or ineffective. Its potential role must be evaluated within the context of a particular clinical situation and supported by evidence appropriate to that condition.

Part 3. MSC Therapy by Condition—What Research Shows and What It Means

Many patients explore MSC-based therapies because they are looking for additional options, especially when living with chronic or progressive conditions. Research into mesenchymal stromal cells (MSCs) now spans a wide range of diseases.

In the sections that follow, we review selected diagnoses in which MSC-based approaches have been studied. The purpose is to explain what research suggests, where uncertainty remains, and how these findings are currently interpreted in medical contexts.

Including a condition in this guide does not mean that MSC therapy is established as standard treatment for that diagnosis. Patients should understand MSC therapy as a complementary biological amplifier to standard medical care.

Our goal is to provide balanced information so that discussions about MSC therapy can take place with realistic expectations and a clear understanding of both potential benefits and limitations.

AUTISM SPECTRUM DISORDER (ASD)

Autism spectrum disorder is a neurodevelopmental condition that affects communication, social interaction, and behavior. Progression is variable; many children benefit from structured educational and behavioral interventions, and some require medical support for associated symptoms.

Why MSCs are being studied here

MSCs are being studied in autism spectrum disorder (ASD) because some research suggests that biological processes such as inflammation and immune imbalance may play a role in some individuals.

MSCs are of interest because they release signaling molecules that can:

- Help regulate inflammation
- Influence how the immune system interacts with the brain
- Support a more balanced tissue environment

Some researchers are also exploring whether these effects may indirectly support brain function, including processes related to communication between nerve cells and the brain's ability to adapt over time (neuroplasticity).

Importantly, MSC therapy is not intended to "rebuild" or "rewire" the brain. Instead, it is being studied for its potential to support underlying biological processes that may be involved in ASD in certain cases.

What clinical studies have reported

Within Swiss Medica's internal program, outcomes were tracked with clinical monitoring and functional measures. In that research, about 80–85% showed measurable improvement, about 60–70% had clinically meaningful progress in multiple domains, and around 10–15% had minimal or no observable change. Communication gains were reported in ~65–70%, and social interaction improvements in ~60%. Behavioral and

sensory regulation improvements (e.g., reduced hyperactivity/irritability/sensory overload) were reported in ~55–65%.

Limitations remain important: these figures describe a specific program and do not mean the same results will occur in every setting or patient.

What realistic outcomes may look like

It is crucial to understand that MSC therapy is not a “cure” for autism but a biological support strategy. Realistic outcomes often involve symptom modulation—such as:

- better digestion and tolerance to a wider variety of foods; growing interest in trying new foods.
- more adequate behavior in daily situations; ability to wait patiently; better understanding of parents’ requests; easier family outings to new places together.
- more functional communication, including asking for desired items or activities.
- developing interest in new toys and activities.
- improved independence (e.g., getting dressed independently) and better progress with potty training.

These changes, when they occur, typically become noticeable within 3 to 6 months post-treatment. However, response is highly variable and depends on the child’s baseline profile and the intensity of concurrent behavioral therapy.

AMYOTROPHIC LATERAL SCLEROSIS (ALS)

ALS is a progressive neurodegenerative disease that targets motor neurons in the brain and spinal cord, leading to muscle atrophy, loss of motor function, and eventually respiratory failure. Current FDA-approved treatments provide only modest extensions in survival time, leaving a significant clinical gap in managing disease progression.

Why MSCs are being studied here

In ALS, the microenvironment surrounding motor neurons becomes disrupted due to oxidative stress and neuroinflammation. MSCs are investigated not to replace lost neurons but to serve as “biological factories” that secrete neuroprotective factors and anti-inflammatory cytokines. The goal is to modulate this “hostile” environment, potentially slowing the rate of neuronal decay and preserving muscle function for a longer period.

What clinical studies have reported

Recent clinical trials have primarily focused on the safety of repeated injections, including intrathecal administration and intramuscular injections.

Several mid-stage (Phase II) trials evaluated whether MSC-based treatment could influence the rate of disease progression. In some studies, a subgroup of patients whose symptoms were worsening more rapidly—sometimes referred to as “fast progressors”—showed a temporary slowing of functional decline. This was measured using a standardized clinical tool called the ALS Functional Rating Scale–Revised (ALSFRS-R), which tracks speech, mobility, breathing, and daily activities.

Many researchers agree that MSC-based approaches in ALS appear to have a favorable safety profile in controlled settings. Their effect on long-term disease progression and survival, however, remains an area of ongoing investigation.

What realistic outcomes may look like

For ALS patients, success is defined as stabilization or a measurable slowing of decline rather than the restoration of lost movement. Realistic expectations should focus on maintaining the current quality of life and functional independence for as long as possible. Possible outcomes may involve the following:

- Enhanced mobility and a reduction in the physical restrictions that limit daily activity.
- A lowering of pathological muscle tone, which often leads to reduced discomfort and easier movement.
- Stabilization of the nervous system's response patterns, contributing to better motor coordination.
- Greater physiological and mental stamina, allowing patients to engage more fully in social and professional life.
- Progress in swallowing safety and the clarity of word pronunciation.

The timeframe for observing a shift in the progression slope is usually 3 to 6 months. Responses are significantly influenced by the stage of the disease at which therapy is initiated, with earlier intervention generally showing more consistent potential.

MULTIPLE SCLEROSIS (MS)

Multiple sclerosis is an autoimmune-mediated disorder where the immune system attacks the myelin sheath (the protective coating that surrounds nerve fibers in the brain and spinal cord) of the central nervous system, causing focal lesions and progressive neurological impairment. Standard disease-modifying therapies (DMTs) are effective at reducing relapses but are often less successful at promoting repair or addressing the progressive phases of the disease.

Why MSCs are being studied here

First, they may help calm down the immune system, which in MS mistakenly attacks the protective covering of nerves (myelin). This could involve reducing inflammation, improving how immune cells behave, and helping protect the blood–brain barrier—the body's natural defense that controls immune access to the brain and spinal cord.

Second, MSCs may help create a better environment for the body to repair damaged myelin. Although the body can repair myelin to some extent, this ability often decreases over time in people with MS.

What clinical studies have reported

Research suggests that MSC therapy is generally well tolerated by people with multiple sclerosis.

Studies have also shown promising signs of reduced inflammation in the brain, visible on MRI scans.

In some patients with relapsing-remitting MS, treatment has been associated with fewer relapses, meaning fewer episodes of symptom worsening.

In progressive forms of MS, results have been more variable. However, some patients may experience a slower progression of disability after treatment. Outcomes can differ from person to person and may depend on factors such as age and how long the disease has been present.

What realistic outcomes may look like

Examples of improvements reported in clinical practice include:

- Enhanced ability to move more freely and improved motor coordination
- Less muscle numbness
- Improvement in cognitive functions (e.g., focus, mental clarity)
- Fewer flare-ups of symptoms
- Relief from chronic fatigue
- Better overall quality of life and physical fitness

Many patients report a period of noticeable improvement within 3 to 6 months after treatment. Factors such as disease stage, baseline inflammatory activity, and overall health may influence how a patient responds to treatment.

PARKINSON'S DISEASE

Parkinson's disease is a progressive neurodegenerative disorder characterized by the loss of dopaminergic neurons in the substantia nigra, leading to motor symptoms such as tremors, rigidity, and bradykinesia. Standard treatments, primarily levodopa-based therapies, focus on symptomatic relief by replacing depleted dopamine but do not halt the underlying neuronal attrition or disease progression.

Why MSCs are being studied here

MSCs are studied for their ability to secrete neurotrophic factors (such as BDNF and GDNF) that may support the survival of remaining dopaminergic neurons. Also, their ability to change the immune response is intended to reduce long-lasting inflammation and oxidative stress, which are known to speed up the death of nerve cells in the brains of people.

What clinical studies have reported

Clinical data from Phase I and II trials indicate that MSC administration via intravenous or intrathecal routes is safe and feasible. Some studies have observed a temporary stabilization of motor scores (UPDRS scale) and improvements in non-motor symptoms, such as sleep quality and mood. However, large-scale, double-blind trials have yet to consistently demonstrate a long-term disease-modifying effect or the ability to significantly reduce the required dosage of standard medications.

What realistic outcomes may look like

In clinical experience at Swiss Medica, Parkinson's patients have reported lasting symptom improvements, with many describing gradual relief after the initial procedure.

Positive effects reported by patients may include:

- Reduced pain and discomfort
- Improvement in symptoms such as tremors and coordination
- Less muscle stiffness, with better flexibility and ease of movement
- Increased strength and endurance

Any observed benefits—such as reduced "off" time or improved mobility—often become noticeable within **3 to 6 months**, although response varies and may be more pronounced at earlier clinical stages. With ongoing treatment, some patients report additional gains, including better movement control.

ARTHRITIS

Arthritis is a degenerative musculoskeletal condition involving the progressive breakdown of articular cartilage and underlying bone, often accompanied by chronic synovial inflammation. Typical management focuses on pain suppression through NSAIDs, physical therapy, or corticosteroid injections, which manage symptoms but do not address the metabolic imbalance within the joint environment.

Why MSCs are being studied here

In orthopedic applications, MSCs are utilized for their potent anti-inflammatory and "chondroprotective" activity. When delivered locally (intra-articular), MSCs sense the inflammatory signals within the joint and respond by releasing bioactive molecules that inhibit cartilage-degrading enzymes. The focus is on shifting the joint environment from a catabolic (breaking down) state to an anabolic (building up) state, potentially preserving existing tissue and reducing pain.

What clinical studies have reported

Numerous clinical trials and meta-analyses have documented significant pain reduction and functional improvement in patients with knee and hip osteoarthritis following MSC injections. MRI follow-ups in some studies have shown evidence of cartilage stabilization and reduced subchondral bone edema.

Despite these positive trends, the "regrowth" of a full layer of hyaline cartilage remains elusive, and outcomes for spinal osteochondrosis are generally more variable due to the complex mechanical load on the intervertebral discs.

What realistic outcomes may look like

Examples of improvements reported in clinical practice include:

- Less inflammation and pain
- Better mobility (walking, standing up, bending, stairs)
- Improved joint/spine function and better tolerance of daily physical load
- More independence in everyday activities (self-care, household routines, staying active)

Changes after MSC therapy usually develop gradually and often become most noticeable within 3–6 months after injection. For some patients, this functional shift may help postpone more invasive procedures, depending on the overall clinical picture.

Outcomes are strongly influenced by the degree of structural damage (e.g., OA grade) and body mass index, since ongoing mechanical load can limit the durability of anti-inflammatory effects.

SPINAL CORD INJURY (SCI)

Spinal cord injury involves damage to the white matter or myelinated fiber tracts that carry signals to and from the brain, resulting in varying degrees of paralysis and sensory loss. Standard medical intervention is currently limited to acute stabilization and long-term physical rehabilitation, with very few options for restoring neurological connectivity once the secondary injury phase (inflammation and scarring) has set in.

Why MSCs are being studied here

MSCs are investigated in SCI for their ability to modulate the aggressive

inflammatory response that follows the initial trauma, which often causes more damage than the injury itself. By secreting anti-fibrotic and neurotrophic factors, MSCs may help reduce the formation of the glial scar and promote "neuroplasticity"—the ability of surviving nerve fibers to reorganize and bypass the site of the lesion.

What clinical studies have reported

Studies involving intrathecal or intramedullary MSC delivery have shown a high safety profile, with no significant adverse events reported. In some patients with both recent and long-term spinal cord injuries, researchers have observed improvements in movement and sensation, reflected in better ASIA scores. Some have also experienced better control over bladder and bowel function.

What realistic outcomes may look like

For SCI, the focus is on "functional gains" rather than a total return to pre-injury status.

Examples of improvements reported in clinical practice include:

- Enhanced sensation and greater body awareness
- Reduced pain and discomfort
- Improved muscle strength and reflexes
- Better urinary and bowel control
- Higher quality of everyday life and overall well-being
- Greater confidence returning to sports and physical activity

Improvements in nerve function usually take time and often require 3 to 6 months of intensive rehabilitation alongside treatment. Results can differ from person to person, depending largely on the severity of the injury and how much time has passed since it occurred.

NEUROPATHY

Neuropathy, specifically peripheral neuropathy, refers to damage or dysfunction of one or more peripheral nerves, typically resulting in numbness, tingling, muscle weakness, and chronic pain. Whether it's caused by issues like diabetes, chemotherapy, or physical injury, neuropathy often gets worse as the protective covering of the nerve or the nerve itself breaks down, and usual treatments mainly aim to relieve the pain.

Why MSCs are being studied here

MSCs are of interest in treating neuropathy due to their ability to address both the inflammatory and degenerative components of nerve damage. They release a variety of neurotrophic factors, such as Nerve Growth Factor (NGF), which may support the survival and repair of damaged peripheral nerves. Furthermore, their systemic immunomodulatory effect can help reduce the chronic "low-grade" inflammation that often prevents natural nerve regeneration.

What clinical studies have reported

Clinical research, particularly in the field of diabetic neuropathy, has shown that local or systemic administration of MSCs can lead to a measurable reduction in neuropathic pain scores and improved nerve conduction velocities. Studies indicate that the therapy is safe, with a low risk of complications. However, while some patients report a restoration of sensation, the evidence for complete structural nerve regeneration in long-standing chronic cases is still limited and requires further long-term validation.

What realistic outcomes may look like

The primary goal for neuropathy patients is symptom modulation—specifically, a reduction in the intensity of “burning” or “electric” pain and a potential increase in tactile sensitivity. These improvements can lead to better mobility and sleep quality.

Examples of improvements reported in clinical practice include:

- Enhanced sensation and greater body awareness, such as regaining the ability to feel the ground and move with increased physical confidence.
- Lessening of chronic “burning” or “electric” sensations, leading to better sleep and less reliance on analgesics.
- Improved muscle strength and better coordination, which can make daily activities like writing or walking easier and more comfortable.
- Better control over bladder and bowel function, which can greatly improve independence and overall quality of life.
- Greater confidence in returning to physical activity, allowing participation in walking, sports, or hobbies that were previously limited.

Results typically begin to manifest within 3 to 6 months. It is important to note that outcomes are highly dependent on the underlying cause of the neuropathy and the extent of irreversible axonal loss prior to treatment.

POST-STROKE RECOVERY

A stroke causes an abrupt interruption of blood flow to the brain, leading to tissue injury and a cascade of secondary damage (inflammation, swelling, and disrupted neural signaling). As a result, patients may experience weakness or paralysis, impaired coordination, speech and swallowing difficulties, and cognitive or emotional changes. Even with standard rehabilitation, recovery can be incomplete —especially after moderate-to-severe strokes—which is why additional supportive approaches are being studied for their potential to and contribute to functional improvement.

Why MSCs are being studied here

After a stroke, the brain’s ability to recover is influenced by factors such as inflammation, oxidative stress, damage to small blood vessels, and changes in neural connections. MSCs are being studied not to replace lost neurons directly, but to act as “biological factories” that release protective and regulatory factors. The aim is to reduce inflammation, support tissue repair, and enhance neuroplasticity—helping create a more favorable environment for recovery, especially when combined with structured rehabilitation.

What clinical studies have reported

In controlled studies, MSC therapy has generally shown a favorable safety profile. Mid-stage research suggests that it may support recovery by reducing inflammation and promoting the brain’s natural repair processes. As a result, some patients may experience improvements in function and independence, measured using standard clinical scales that assess mobility, daily activities, and neurological symptoms. However, optimal timing

(acute vs. subacute vs. chronic), dosing, route of administration, and patient selection remain active areas of investigation.

What realistic outcomes may look like

Examples of improvements reported in clinical practice include:

- Improved mobility and motor coordination, supporting greater independence in everyday activities
- Clearer speech and better self-expression, making communication easier
- Faster recovery of lost functions, helping some patients regain abilities more quickly as the brain recovers.
- Stronger muscles and steadier movements, improving control of arms and legs and making motion smoother

In post-stroke recovery, “success” is usually defined as meaningful functional gains and increased independence, not a guaranteed full return to pre-stroke abilities. Changes—when they occur—are typically observed over weeks to months, and outcomes depend strongly on stroke severity, time since stroke, rehab intensity, and individual biology.

ADDITIONAL CONDITIONS UNDER INVESTIGATION

In addition to the conditions discussed in detail in this guide, MSC-based therapies are being explored across a broad range of medical areas.

On our website, conditions are grouped into categories such as:

- Neurological disorders
- Autoimmune and inflammatory diseases
- Musculoskeletal and orthopedic conditions
- Cardiovascular and metabolic disorders
- Post-injury and post-surgical recovery
- Age-related and longevity-focused applications

For many of these conditions, available data range from laboratory research to early clinical studies. In controlled clinical settings, MSC-based products have generally demonstrated a favorable short-term safety profile, though long-term data continue to evolve and outcomes may vary depending on patient characteristics and protocol design.

Inclusion of a condition on our website reflects areas of scientific investigation and clinical interest. It does not imply that MSC therapy is established as standard care for every diagnosis listed. Individual evaluation is essential before considering any cell-based intervention.

Part 4: How to Evaluate an MSC Therapy Offer

MSC-based therapies are offered in many medical settings worldwide. Because evidence, protocols, and regulatory frameworks vary, patients benefit from asking clear questions before making a decision.

The following framework may help guide those conversations.

SIGNS OF A STRUCTURED AND RESPONSIBLE PROGRAM

Patients may expect clear answers to questions such as:

What specific type of cell or MSC product is being used?

The clinic should be able to explain the cell source (autologous or donor-derived), how the product is manufactured, and what testing is performed.

What clinical evidence supports this use?

The discussion should reference published research relevant to the specific condition and protocol—not general statements about “stem cells.”

What monitoring and follow-up are included?

Patients should receive a clear follow-up plan and instructions for reporting concerns.

How are safety and quality verified?

Information about sterility testing, identity confirmation, and viability assessment should be available.

What screening determines eligibility?

Treatment decisions should follow medical evaluation rather than diagnosis alone.

SITUATIONS THAT WARRANT CAUTION

Patients may wish to seek clarification or reconsider if:

- Outcomes are guaranteed or described as cures for complex chronic diseases
- The same identical protocol is promoted for many unrelated conditions without explanation
- The clinic cannot describe product sourcing or quality-control measures
- Risks, limitations, or uncertainty are minimized or dismissed
- Pressure tactics or time-limited financial incentives are used in place of medical discussion

MSC therapy should be evaluated as a specific product, used for a specific condition, within a defined medical context.

Patients are encouraged to ask questions, request documentation where appropriate, and take time to consider available options before proceeding.

Part 5. Glossary, Resources and References

GLOSSARY

Below are brief explanations of terms used throughout this guide.

Mesenchymal Stromal Cells (MSCs)

A type of adult cell studied for its ability to modulate immune activity and influence tissue repair processes through biological signaling.

Autologous

Cells derived from a patient's own body.

Allogeneic

Cells derived from a donor and processed for clinical use.

Immune Modulation

The adjustment or regulation of immune system activity, rather than complete suppression.

Neuroinflammation

Inflammatory processes affecting the brain or spinal cord.

Remyelination

The repair of myelin, the protective covering around nerve fibers.

Paracrine Signaling

The release of biologically active molecules that influence nearby cells.

Clinical Trial Phases

Phase I focuses primarily on safety.
Phase II evaluates safety and preliminary effectiveness.
Phase III compares the therapy to standard treatment or a placebo in larger groups.

Investigational Therapy

A treatment that is still being studied and has not been established as standard care for a specific condition.

Standard of Care

Treatment widely accepted by medical professionals and supported by strong clinical evidence.

Adverse Event

Any unintended medical occurrence during or after treatment.

Blood–Brain Barrier

A protective system that regulates which substances can enter the brain from the bloodstream.

ATMP (Advanced Therapy Medicinal Product)

A regulatory classification in certain regions for advanced biological therapies, including cell-based products.

HOW TO REVIEW CLINICAL RESEARCH

Patients who wish to explore published research may consult:

ClinicalTrials.gov

A public registry of ongoing and completed human clinical trials involving MSCs, including trials for conditions such as ALS, ASD, osteoarthritis, and more. This resource helps identify:

- Trial phase
- Recruitment status
- Study size
- Primary outcomes

Search by condition + "mesenchymal stromal cells" to review trial phase, design, and status.

PubMed (pubmed.ncbi.nlm.nih.gov)

A database of published medical research articles. When reviewing articles, patients may wish to consider:

- Whether the study involved humans
- The number of participants
- Whether a control group was included
- Whether results were peer-reviewed

SELECTED REFERENCES AND FURTHER READING

1) Safety of MSC Therapy in Humans

- Yang et al. (2021) performed a meta-analysis of 62 randomized clinical trials involving MSC therapy across multiple human disease indications. They found no serious adverse events directly linked to MSC administration, though transient fever and mild symptoms occurred.

2) MSCs in Multiple Sclerosis (MS)

- A systematic review of MSC therapy in MS patients found that MSC administration was generally safe and associated with neuroprotective and immunomodulatory effects; while some reports noted decreased lesion activity and improved clinical scores in small studies, optimal protocols and long-term benefits remain uncertain.

3) Clinical Trials in Amyotrophic Lateral Sclerosis (ALS)

- Lin et al. (2022) provide a review of cellular therapy approaches in amyotrophic lateral sclerosis (ALS), including discussion of clinical studies involving MSCs, mechanisms under investigation, and the challenges and limitations of current research. This review highlights that the safety and efficacy of MSC therapy in ALS remain under active debate and investigation.

4) Mesenchymal Stem Cells in Autism Spectrum Disorder (ASD)

- Early clinical studies, including intravenous allogeneic umbilical cord MSC administration in children with ASD, reported that the treatments were well tolerated with no serious treatment-related adverse events and some exploratory signals of symptom change, supporting further investigation in larger trials.

5) Clinical Research in Parkinson's Disease

- A Phase II placebo-controlled clinical trial of allogeneic MSC infusions in patients with mild to moderate Parkinson disease reported safety in repeated administrations and explored potential motor function changes compared with placebo; further research is ongoing to clarify reproducibility and durability of effects.

A FINAL NOTE

MSC-based therapies remain an active area of scientific research, and our understanding continues to evolve. Interpreting scientific findings can be complex, which is why patients are encouraged to discuss their options with qualified regenerative medicine specialists and take time to carefully evaluate available information.

Choosing a reliable and experienced clinic is also essential. Since 2011, **Swiss Medica** has continuously refined its treatment protocols, leading to the development of more than **30 cell-based regenerative products** within its laboratory. This diversity allows the team to select the most appropriate treatment approach for each patient, based on their condition, health status, and individual needs.

The clinic's experience includes over **10,000 treated patients** across a wide range of conditions, including more than **3,000 cases related to autism spectrum disorders**. Treatment approaches often combine cell-based therapies with rehabilitation to help optimize outcomes. This experience helps guide clinical decisions while maintaining a strong focus on patient safety and individualized care.

Explore more on our website or request a **free online consultation with a doctor**.

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