Stem Cell Care India

A GUIDE FOR PATIENTS

STEM CELL IMPLANTATION (DELIVERY METHOD)

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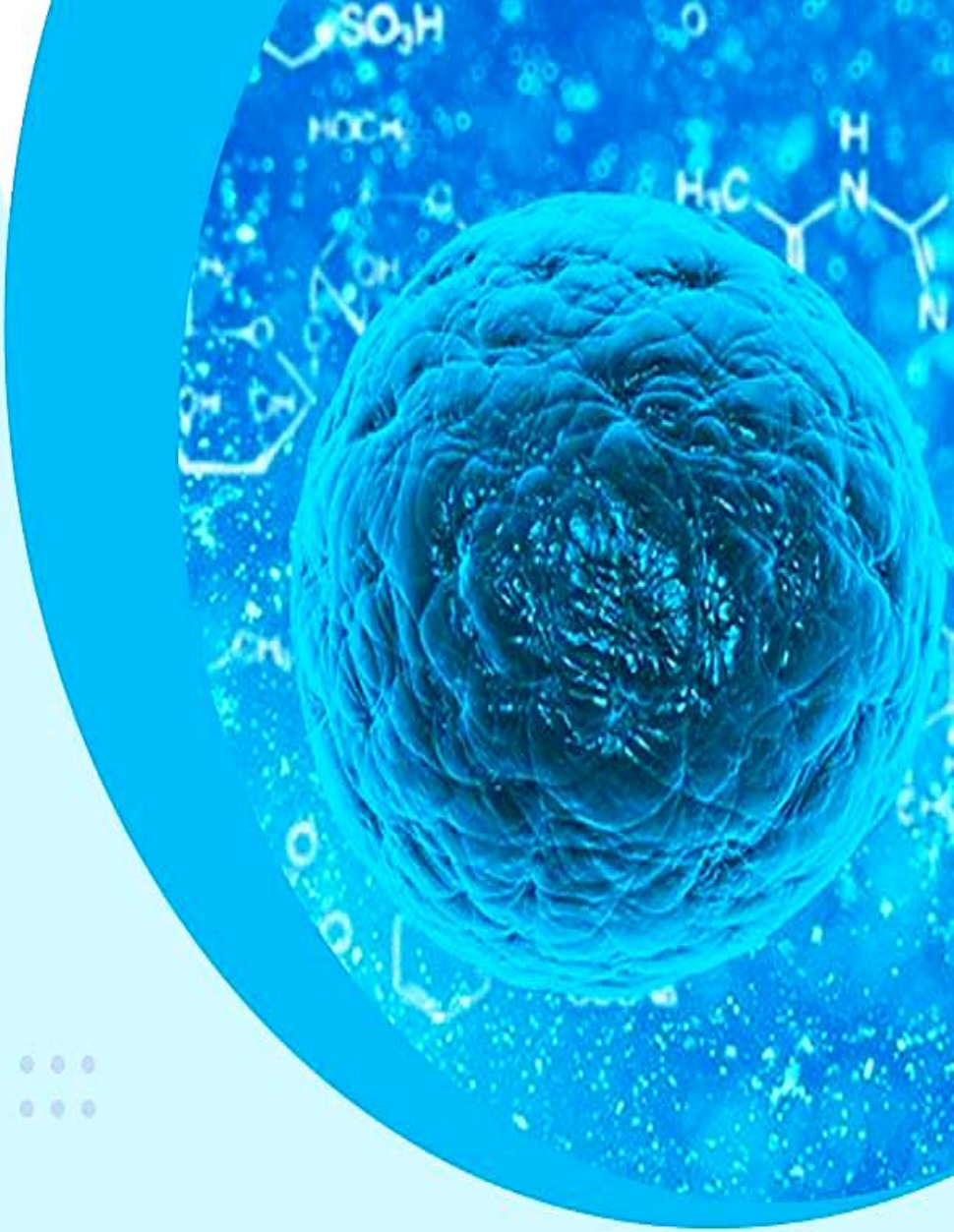

STEM CELL IMPLANTATION

The doctors in our hospital use Several injection methodologies to Deliver stem cells. Reliant on every Patient's specific disorder, one or Several methodologies of delivery Will be used during a standard treatment Sitting in an attempt to maximize safety and efficiency. It is vital to remember Our protocols always prioritize security first and the immunization The procedures provided are a little invasive but still very concentrated on Delivering the stem cells as close as possible to the injury location. For more For info regarding the diverse injection approaches, please take a look below.

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1. INTRAVENOUS INJECTION

The intravenous injection (IV) can be defined as the infusion of liquid elements straight into a vein. IVs allow healthcare specialists to administer fluids, blood products and medicines straight into a patient's bloodstream via a small tube. This permits speedy absorption and precise control over the dosage of the element administered,

which is imperative for a multiplicity of medical processes. As stem cells can be taken by the circulatory system to every region of the body, they will stroll to the location of injury or disease.

❖ INFUSION STEPS

- The IV tubing is being set up suitably and two IV bags (saline solution and stem cells) are being suspended on a raised stand.
- The inoculation site (where the IV will be inserted) is being sanitized.
- The IV catheter (IV catheters are fixed over the needle used to puncture the vein) is removed from its sterile wrapping and the needle is then inserted into the vein.

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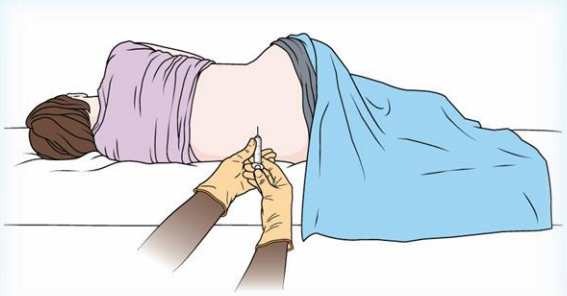
- The shielding cover is being removed from the end of the IV tubing and is cautiously inserted into the catheter hub. A piece of tape is placed over the catheter hub to protect the IV.
- The nurse checks on the movement of fluid into the vein during the whole process which lasts 30 to 60 minutes. If the patient feels any uneasiness during or after the process, the medical staff on-site should be alerted immediately.
- Once the infusion is done, the nurse closes the roller clamp to stop the torrent of fluid. She places a clean piece of gauze over the IV site and applies elusive pressure as the catheter is drawn out.
- Patients are requested to press sterile cotton wool onto the immunization site for at least 5 minutes.

2. INTRATHECAL INJECTION



The Intrathecal Administration encompasses an injection made into the spinal canal so as to access the cerebrospinal fluid (CSF) and by extension, the central nervous system. This type of administration permits delivering the stem cells to the brain and spinal cord in an easier and more effective way. Before the injection, a lumbar puncture (LP) is implemented in the first place so as to extract a little quantity of CSF and exchange it with the stem cells.

❖ INFUSION STEPS

- The patient is asked to not eat after 10 PM the day before the process.
- Patients will be relocated into a surgical operating suite where the doctor supported by two nurses, will give the injection.
- Patients will be placed on their side with their backs near the verge of the table or bed. A nurse will then help patients in bending their knees towards their belly and stretching their head to the chest in a fetal position. This position aids to separate the vertebrae so that the needle can be put in more straightforwardly.

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- The doctor will first scrutinize the patient's lower back and mark the appropriate insertion site (between two lumbar vertebrae from L2 to L5).
- The region is then cleaned with an antiseptic and a local anesthetic is introduced beneath the skin to numb the zone where the needle will be inserted into the spinal canal.
- Once the needle is in the accurate position, the stylet from spinal needle is then withdrawn and about 2 ml of cerebral spinal fluid is gathered.
- The stem cells (around 1ml) and saline solution (around 1 ml) will then be administered respectively via the needle into the cerebral spinal fluid.
- The process is completed by withdrawing the needle with the reinserted stylet while giving pressure on the perforation site. Placement of the needle, accompanied by the infusion, is normally concluded in 20 minutes to hour.
- All patients are asked to lie flat for 4 to 6 hours after the process to sidestep any provisional side-effects such as headaches, nausea, fevers, vomiting and/or pains in the legs. These symptoms are believed to be an outcome the change in fluid volume within the spinal canal. Even lying flat, some patients may still develop this uneasiness. These may last for up to 48 hours. Patients should inform the doctors if they have a very severe headache, unbending neck, loss of sensation under the puncture zone, or any leakage from the injection zone.

3. INTRAMUSCULAR INJECTION

An intramuscular (IM) injection is a shot of medicine given to a muscle. Intramuscular injections of stem cells can help patients with muscular dystrophy to get better health advantages. These injections are given directly into the muscles of the affected areas. Upon admission, the physicians will scrutinize the patient and decide how many stem cell packets should be inoculated locally into the affected muscles. The delivery method has also been applied to treat lower limb ischemia and diabetic foot.

❖ INFUSION STEPS

- The patient is requested to take the appropriate posture to access the affected muscles fluently.
- The injection location is sanitized. Stem cells are given by a syringe (There are 3 portions of a syringe: the needle to go into the muscle, the barrel to hold the medicine, and the nozzle to get medication in and out of the syringe).

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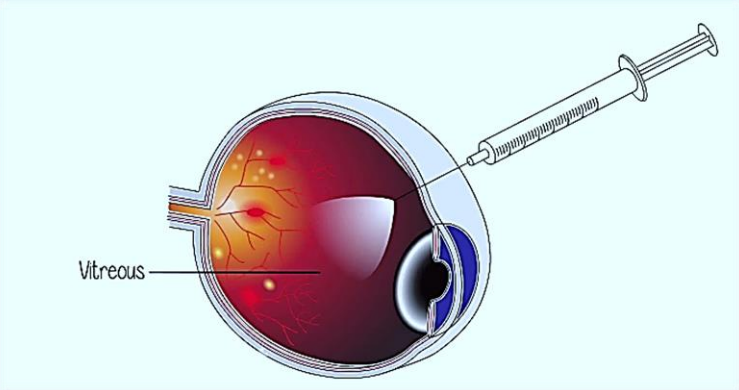
- The nurse temperately presses on and pulls the skin around the inoculation site so that it is slightly tight. The needle is inserted in the affected muscle and the stem cells are shot up gradually.
- Once the injection finishes, the injection site is pressed with dry cotton and the needle is dragged out quickly simultaneously. A piece of gauze is then placed at the injection site.

4. Intra-arterial administration via catheter

Intra-arterial infusion of stem cells is performed through a thin catheter inserted into the patient's artery. Before infusion, the catheter is carefully directed toward the targeted area to ensure maximum cell delivery for optimum efficiency. This route of administration is generally preferred for vascular organs such as the kidney, heart, and pancreas.

5. Intravitreal Infusion



The inside of the human eye is filled with a jelly-like fluid known as “Vitreous humor ”. An intravitreal injection is a direct shot of stem cells into the vitreous structure near the retina, at the back of the eye. The entire procedure takes no more than 15-20 minutes.

The intravitreal drug delivery has become the most reformed technology in treating some of ophthalmic conditions such as macular edema, retinal vein occlusions, etc. These are the conditions wherein a single dose administered through the intravitreal region is more effective than repeated injections through retrobulbar mode.

❖ INFUSION STEPS

- The procedure requires dilation of the pupil by placing specific eye drops in the eyes.
- Once pupils are dilated, the patient will be allowed to lie comfortably, and anesthetic drops will be provided.

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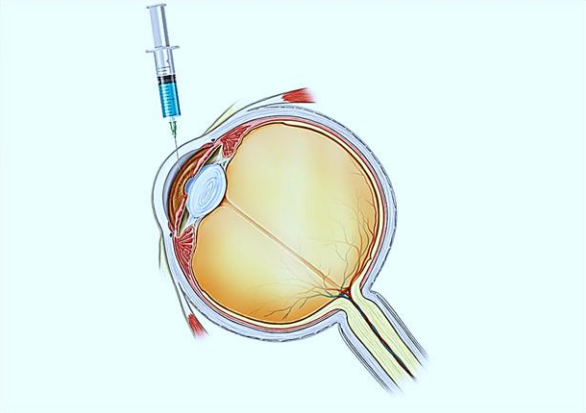
6. Retrobulbar Injection

- After cleaning both the eyes and the eyelids using the iodine antiseptic solution, the eyes are kept open during the entire procedure with the help of a small device.
- A shot of stem cells will be injected directly into the vitreous region with the help of a small needle; a patient may feel a slight pressure on the eye without any pain.
- The eyes will be checked properly and some antibiotic ointment might be placed in the eyes if required.



Retrobulbar injections (RB) are usually used worldwide to offer local anesthesia in the retrobulbar zone (behind the eye). During our stem cell treatment process, this set of injections is used to deliver stem cells as close as possible to the optic nerve and retina to target the site of injury better.

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❖ INFUSION STEPS

The whole procedure is quick and safe (as described below) and normally allows our patients to get more benefits from the treatment. Please note that retrobulbar inoculations will only be provided to patients older than 11 years old. The final decision will be made by the attending doctor upon admission to the hospital.

- The patient is requested to lie down. Antiseptic is then cautiously applied on the skin from the lower eyelid margin to the lower orbital rim, respectively.
- The patient is asked to look in the direction of the opposite side of the eye being treated and look slightly up. If the inoculation is done for the right eye, the patient should look at the top left side and vice versa.
- A thin needle is then inserted upright about 2 millimeters deep in the quadrant between the outside 1/3 and inside 2/3 of the lower orbital rim.
- The needle passes the equator of the eye sphere and is then focused towards the upper nasal site until it is about 3 centimeters in depth. Stem cells are then be inoculated into the retrobulbar space.
- Once the vaccination is done, the needle is slickly removed and the ocular globe is repeatedly compressed with sterile bandages for numerous minutes.

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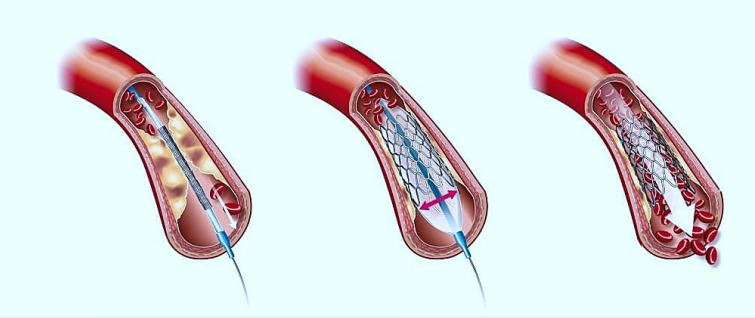
Generally, the entire procedure is completed in about 15 minutes and the inoculation itself is done in a few seconds.

7. LIBERATION ANGIOPLASTY FOR MULTIPLE SCLEROSIS CCSVI



- **CCSVI Treatment Step 1 – Liberation Angioplasty**

Liberation Angioplasty is a very critical process. X-ray scanning is used to guide the catheter with the balloon tip to the affected area or veins. Once it reaches the targeted area, the tip expands resulting in the widening of the stenotic area. The entire process takes around 90 minutes. Then the patients are kept in a recovery room for around 4 hours to ensure that there is no bleeding from the catheter insertion tract.

- **CCSVI Treatment Step 2 – Insertion of Stem Cells**

After the first step of liberation angioplasty, the blood flows with ease through the stenotic veins. This is essential in order to determine the effective potential of the stem cells introduced to transform into specialized cells necessary for regeneration or repair of damaged tissue of the brain or the spinal cord. This procedure can also reduce inflammation throughout the body. Many of the patients have reported that the recovery is extremely fast after this treatment.

8. INTRA-DERMAL ADMINISTRATION

- Intra-derma administration around wounds: This specific method is used in case of open sores such as diabetic foot or pressure ulcers. It encompasses infusion of stem cells straight into or around the wound zone, i.e. the inoculation into the dermal layer of the skin. This layer is the most favored layer beneath the epidermal layer of the skin, as it is an extremely vascularized layer, encompassing dense.

blood vessels, immune cells, and dermal dendritic cells. This way infused stem cells will quickly elicit and fortify the body's natural healing signals for quicker retrieval

- Intra-dermal administration around the hair follicles: Platelet-rich plasma is blended with the patient's own adipose tissue stem cells extract at the time of infusion. The scalp is insensated with the application of local anesthesia and the PRP accompanied by the stem cells is infused around the follicles with the assistance of small micro needles. This intra-dermal, local application of PRP with stem cells can fast-track the healing procedure around the follicles instantaneously. The methodology can stimulate the innate stem cells and

provide the strength, support, vivacity and resilience to the follicles; which will be useful in producing new hair strands naturally.

- Intra-dermal Administration of PRP on the face: Platelet-rich plasma is blended with the patient's own adipose tissue stem cell extract at the time of infusion. The face is numbed with the application of local numbing cream and the PRP accompanied by the stem cells is infused at diverse points on the face such as around the eyes, lips, chin, etc. with the assistance of small micro needles. This intra-dermal, local application of PRP with stem cells can quicken the healing procedure around instantaneously. The method can stimulate the native cells for the augmented production of collagen, elimination of photo damaged cells, pigmentation's and wrinkles to give you fresh, tautened and wrinkle-free skin naturally.

- At large, a maximum of the intradermal injections are delivered inside the skin, via microneedle via Mantoux method; in which the needle will be inserted at an angle of 5-15 degree around the region.

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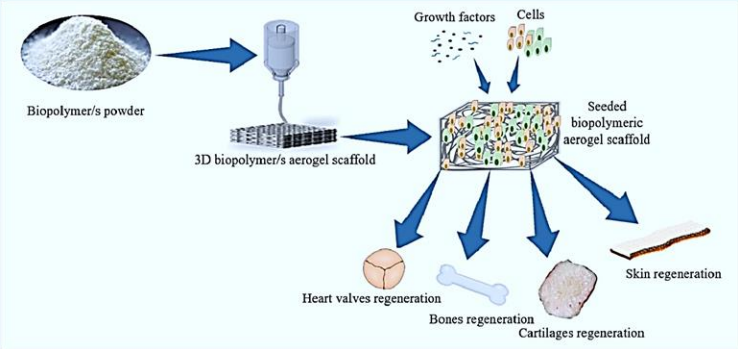
9. Tissue Reconstruction through Biodegradable Scaffolds



Through the advanced developments in the field of Tissue Engineering, regeneration of damaged tissue is possible by allowing rapid cellular integration into an optimized biocompatible scaffold.

These porous three-dimensional scaffolds essentially act as tissue regeneration templates where stem cells are implanted with PRP.

Thus, the regeneration process is systematically allowed through a triad combination of stem cells, signaling pathways, and biodegradable material.

- Different Types of Scaffolds that can be used in tissue reconstruction Autograft or Autologous Bone Graft is constructed using the patient's own bone tissue. Autograft tissue is typically obtained from the chin, jaw, lower leg bone, hip, and skull. The main advantage of an autograft is the presence of living cellular elements that enhance bone growth. However, one of the major drawbacks of autografts is the requirement of a second procedure for bone harvest

10. SURGICAL ADMINISTRATION FOR PATIENTS HAVING STROKE OR SCI

- **Allograft** or **Allogenic Bone Graft** is basically a dead bone harvested from a cadaver, which is further processed to form a framework or scaffold to support bone regeneration from the surrounding tissue. The main advantage of an allograft is its ability to support stem cell culture in the form of a good biocompatible scaffold

- **Xenograft** of **Xenogenic Bone Graft** is derived from the living bone of other species, such as cow or pig. This type of bone graft is processed at a very high temperature to avoid any potential immune rejection or contamination. Similar to allografts, xenografts can also be used as bio-scaffolds.

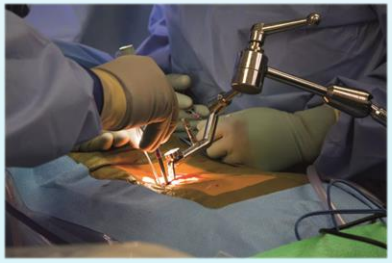
❖ BRAIN-SURGERY

Brain surgery for stem cell infusion requires a lot of modern technical equipment and tools in order to operate and infiltrate the skull (Craniotomy). A highly valued advanced brain navigation system is used in order to reduce any kind of brain tissue damage during surgery

Strict protocols of anesthesia and surgery are followed for this procedure of stem cell administration. After the surgery, patients are generally kept under observation in the care unit for a night and thereafter shifted to the normal ward, prior to being discharged from the hospital.

❖ Surgery of the Spine

Spinal surgeries for stem cell infusion are also very critical and require ultramodern technical equipment to operate and infiltrate the spinal cord/vertebrae (Laminectomy) In this procedure, after the spinal column is incised, a further incision is done on the embedded dura-mater. Following that, a pool of viable stem cells is infused using a very fine needle, and the incisions are sealed accordingly. Strict protocols of anesthesia and surgery are followed for this procedure of stem cell administration. After the surgery, patients are generally kept under observation in the care unit for a night and thereafter shifted to the normal ward, prior to being discharged from the hospital.



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