

Osteoarthritis Treatment with Stem Cells from
your own **Bone Marrow / Adipose Tissue**



Osteoarthritis

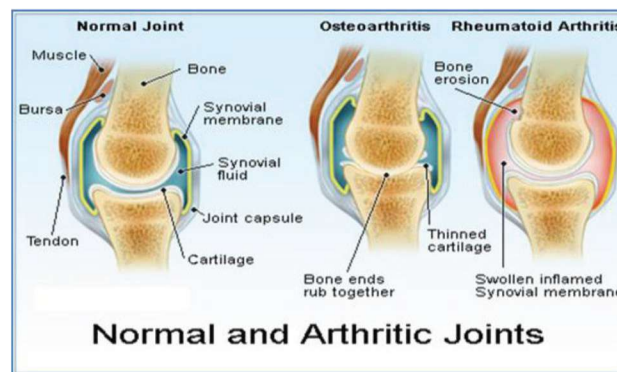
Osteoarthritis

Osteoarthritis is a joint disease, causing the cartilage to break down and bones to overgrow as cysts. Joints are the common class of synovial joints including ankle, elbow, knee etc. These joints are formed between the two or more bones wherein the bones can move only in one axis to flex or extend. Each bone of the joints is capped with the thin layer of smooth hyaline cartilage to reduce the friction and to absorb the shock of the joints being compressed. There are two largest and complicated joints in our body which are evolved to be incredibly strong and durable while maintaining the wide range of motion necessary for locomotion.

These are Knee Joints and Spine. Although Arthritis can affect any joint of the body, its leading targets are knees and spines. It is one of the leading causes of disability affecting 1 out of 10 people. The sporadically occurred osteoarthritis is known as primary OA and the one occurred due to some cause is known as secondary OA. It is generally the result of natural aging process of the cartilage, involved as the main factors in OA.

With the age advancements, the water content of the cartilages increases and the protein content of it decreases, eventually causing them to flake or forming tiny crevasses. In the advance stage of the disorder, there is a total loss of these cartilages and thereby the cushion between the bones, causing them to irritate or inflamed due to increased friction between the two.

The inflammation can also cause joints pains or swelling and stimulate the outgrowth of new spur or cyst around the joints. The disorder occasionally can develop in multiple members of the family, implying a hereditary basis for the condition. The secondary OA is the general outcome of other conditions such as obesity, trauma or surgery and other hormone disorder.



What is the prognosis?

Staying physically active and maintaining healthy lifestyles are the keys to stay away from the problem. Though the symptoms associated with the disease

initially develop very smoothly or gradually and tend to get worse in that later part of its advancements.

As at first there may be a soreness or stiffness that seems more likely a nuisance than medicinal concerns.

Other common symptoms include sore or stiff joints, pain that is worse after activity or towards the end of the day. The pain increases to the extent that it may become difficult to walk, climb the stairs, sleep or perform the daily activity.

Is there any treatment?

There is no cure for osteoarthritis, but there are treatments available to relieve the pain such as medicines, physiotherapy or surgery as the last option. People with OA find it very difficult to cope up with its conditions and hence are looking out for other alternatives which can practically make them free from any medicinal obligations.

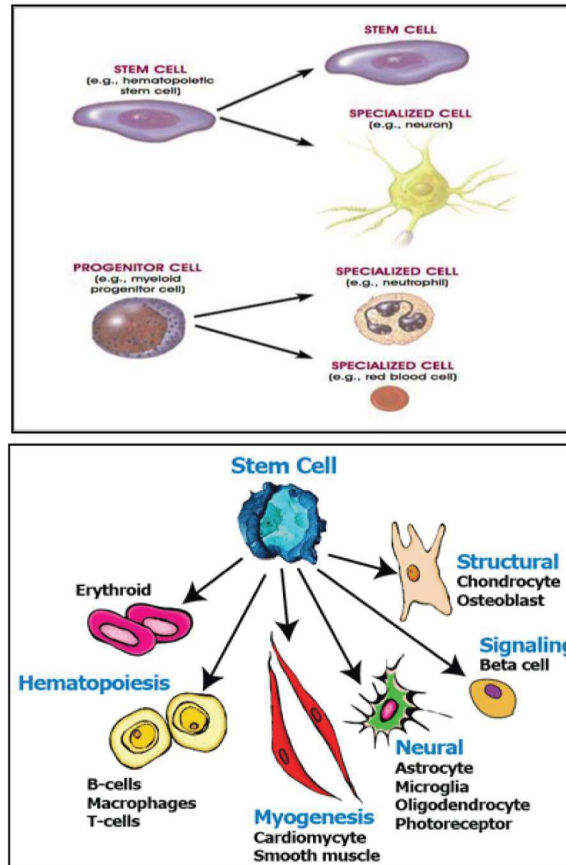
Thanks to the science of stem cells! Stem cells treatment for osteoarthritis has definitely made a strong sense in the field of regenerative medicine. These cells can be directed to be any cells of the body and hence even cartilages.

About Stem Cells

Stem cells are basically the “Master Cells” of the human body. These unspecialized cells lie dormant throughout the life and get activated when signals elicit from the site of injury. Upon enlivening they get navigated to the site of injury with the help of strong immune response stimulated by the body. At the site with the help of a programmed cell division they get differentiated into the specialized tissue specific cells. These newly formed daughter cells will be replaced for the damaged one, thus ceasing further progression of the diseased cells.

Thus, stem cells are known to be vital to the body due to their exclusive characteristics such as:

1. Undifferentiated cells capable of giving rise to any tissue specific cells.
2. Capability of prolonged self renewal having an unlimited life span and thus maintaining their number intact.
3. The ability to trigger the secretion of certain hormones and grow factors at the site of injury to facilitate damage repair.



Types of Stem Cells

With respect to their origin these Stem cells are broadly classified into two main naturally occurring cell types such as **Embryonic stem cells** and **Adult stem cells**. The third one is reprogrammed in the lab to satisfy ethical as well as scientific demands; they are named as **Induced Pluripotent stem cells**.

Embryonic Stem Cell

These cells are the most preliminary cells isolated from the inner cell mass of the blastocyst of pre-implantation stage embryos. With their unlimited expansion capacity and ability to differentiate into almost all cell types of the body; earlier they were considered as the potential sources of the regenerative medicines. But the increasing burden of ethical speculations and animal studies showing abnormal occurrence of tumor ex vivo rendered them ineffective for the therapeutic application.

Adult Stem Cells

These cells are settled in adult body organs. They are less controversial due to their ease of isolation

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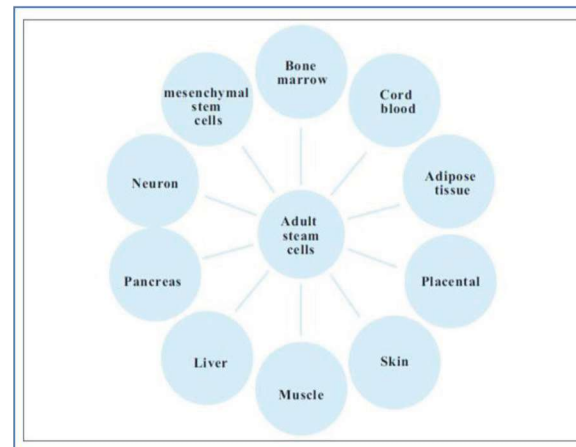
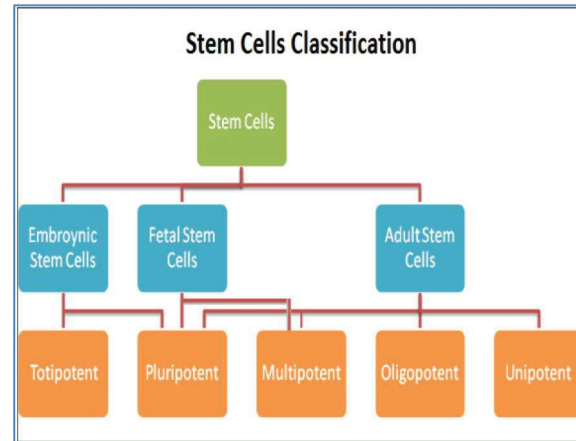
and their production does not require any destruction of embryo. These cells pose a very low or no risk of immune rejection when applied as therapeutic.

Since they are present in an adult fully grown organ, they are capable of differentiating cell of their lineage only contrary to the embryonic stem cells giving rise to all lineages. Apparently these cells can be directed to become specific cells with the addition of specific growth factors. These properties make them attractive candidates for the therapeutic application in the contemporary field of regenerative medicine.

Induced Pluripotent Stem Cells (iPSCs)

These are adult somatic cells genetically reprogrammed in vitro to an embryonic stem cell like state by being forced to express gene such as OCT-4; important for maintaining Pluripotent property of embryonic stem cells. Although the technology is still in a juvenile state; additional research is needed to use them in transplantation medicine.

Out of the different types mentioned above Adult Autologous Stem cells are known as the most potent and versatile. They are thus the most opted cell sources due to easy isolation, demonstrative plasticity and minimum ethical barricades.



Examples of Autologous stem cell sources are Bone Marrow, Adipose Tissue etc. and we have achieved ultimate expertise over it.

The Advancells Osteoarthritis Treatment

Advancells uses very comprehensive and individualised treatment pattern, by obtaining stem cell from two sources adipose-derived stem cells (ASCs) and bone marrow-derived stem cells (BMSCs). Through our multidisciplinary team of specialists; we are giving the best treatment possible to improve recovery.

The entire procedure consists of following phases:

Pre Treatment Assessments, Stem cell procedure, Stem cell Implantation and Rehabilitation.

Objectives of the Treatment

The objectives of the treatment are to control symptoms, improve joint functions and slow down the progression of the disease.









Type of Treatment

The procedure exploits the use of Autologous Stem Cells isolated from your own body.

Being an Autologous they are not rejected by the body and hence are completely safe and risk free. At present we are isolating stem cells from two sources such as “**Bone Marrow**” and “**Adipose Tissue**”. Both these sources are available in abundance from where stem cells can be easily isolated without many manipulations.

Once you are enrolled with us for the treatment, we will intimate you regarding the date and time of the treatment. The entire treatment plan will be divided into three parts;

1. **Inductive Support:** - Complete assistance will be given to the patient in all pre treatment procedures such as consultation, hospitalisation (If required), Assessments.
2. **Stem Cell Procedure:** - Generally the entire procedure takes around 7-8 hrs including 1-2 hrs of source aspiration, 2-3 hrs of stem cell isolation and injection of the isolated stem cells back in the body. The processing of sample is done in a state of the art class 10000 clean room facility wherein we strictly adhere to maintain quality of standards. Wherein the extracted sources undergo minimum manipulation such as been spun in a centrifuge to cull out a stem cells.

ADVANCELLS STEM CELL TREATMENTS	
Adipose Tissue Extraction	Bone Marrow Extraction
 	 
 	 
<p>Figure 1: Adipose Tissue collection procedure</p> <p>A. Application of tumescent anesthesia; B. Adipose Tissue collection by lipoaspiration C. Isolation of Stem Cells in the clean room D. Intramuscular Injection of stem cells back into patient's body.</p>	<p>Figure 2: Bone Marrow collection procedure</p> <p>A. Application of local anesthesia; B. Bone Marrow collection by needle insertion in the hip bone C. Isolation of Stem Cells in the clean room D. Intramuscular Injection of stem cells back into the patient's body.</p>

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3. **Stem cell Implantation:** - Once isolated, intensified and ready for reinstalling back into the body, we work out different mode of implantation; depending upon patient's health condition.

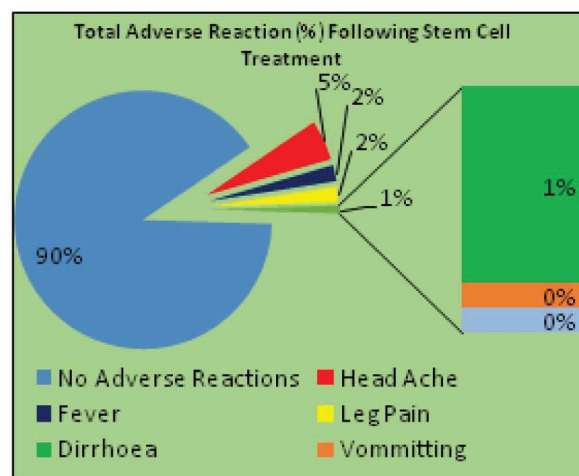
ADVANCELLS STEM CELL TREATMENT		
ELIGIBILITY CRITERIA	STEM CELL SOURCES	IMPLANTATION
Pre Treatment Assessments <ul style="list-style-type: none"> • Infectious disease testing • Physical Examination • X Ray • MRI • Arthroscopy 	<p>The source of stem cells can either be Bone Marrow or Adipose Tissue or Both depending upon the assessment .</p> <ul style="list-style-type: none"> • Bone Marrow:- 100-120 ml of bone marrow is collected from iliac crest with the application of general anaesthesia. • Adipose Tissue (Fat):- 100 cc adipose tissue is collected from the belly area with application of local anaesthesia. 	<p>Specialists exercise various input options for implanting cells back into the body depending upon physical condition and treatment demand.</p> <ul style="list-style-type: none"> • Intramuscular Injections (IV):- Infusion through muscles
Counselling		

4. **Rehabilitation:** - Post treatment, care involves reclamation therapies such as Physiotherapy, Occupational Therapy, Speech Therapy, patient's counselling etc for accelerated recovery. The follow up schedule will be provided at the time of discharge

ADVANCELLS STEM CELL TREATMENTS	
Quality Control Parameters	Post Treatment Care
Cell counting & Viability Assessments <ul style="list-style-type: none"> • Stem cell isolation and separation from unwanted cells • Number of cells recovered through Trypan Blue Viability Assessments • Percentage of Live cells • Documentation 	Rehabilitation <ul style="list-style-type: none"> • Communication & Social interaction • Psychological counselling • Evaluation • Physical Check up • Follow up
Flow Analysis /characterisation of Bone Marrow Mononuclear Cells (BMMSCs) <ul style="list-style-type: none"> • Total percentage of CD 34+ and CD45+ cells recovered 	
Flow Analysis /characterisation of Adipose Tissue (SVF Cells) <ul style="list-style-type: none"> • Total percentage of CD 73+and CD90+ and CD 105+ cells recovered 	
Our client will get a third party certificate from an internationally accredited lab for the cell count and viability.	

Possible Adverse events from the treatments

Since stem cell therapy is a minimally invasive and reasonably safe procedure, none of our patients treated so far have observed any major offshoot from the transplant, but complaints are consistent with the expected reaction to routine IV/LP injections such as fever, headache, pain, diarrhoea, vomiting and allergic reactions. Less than 5% of our patients have experienced any of these symptoms.



Follow Up

Once you have returned home, a member of our medical team will monitor your progress in given intervals via telephone and email. For your convenience, a telephone 'hotline' is always at your disposal.

General

No additional charges will be incurred unless you are required to extend your stay at the medical center as a result of complications. Costs do not include additional stem cell treatments. If another treatment is necessary, we will discuss potential options with you. You will receive an invoice one week prior to treatment. This invoice must be paid in-full before treatment can begin.

Note: If your bone marrow/adipose tissue sample is negative or the stem cells cannot be administered due to unforeseen medical circumstances, you will only be required to pay charges incurred to that point. In the case of a negative sample, it might be possible to schedule another collection.



Contact us

For more details visit: www.advancells.com or E-mail: info@advancells.com

A-102, Sector V, NOIDA-201 301

U.P – INDIA

Helpline

Helpline No. : +91 9654321400