DR. CHRISTOPHER CALAPAI

STEM CELL THERAPY
Opening the door to a new universe
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Stem Cell Therapy/
Opening the door
to a new universe
By Christopher Calapai, D.O.

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Stem cells are unquestionably some of the most amazing cells in the human body. These are undifferentiated cells that do not have a direct “blueprint” or specific destiny. They can become differentiated into specialized cells anywhere throughout the body.

They are classified as two different types of cells, those that are from embryonic origin and those called adult stem cells.

In the developing embryo, these cells differentiate into ectoderm, endoderm and mesoderm. These give rise to our spine, nerves, and all our organs. Adult stem cells are primarily used to repair, replenish and regenerate tissues.

Historically, stem cells can come from a variety of tissues. These include umbilical cord, fetal tissue, bone marrow, or the best sources which are adipose or fat cells.

Adipose-derived stem cells have the highest numbers of cells when collected and tested compared to all others. This is by far the preferred method of stem cell therapy because of sheer numbers, and the fact that they are coming from your own body. This is called autologous therapy.

Stem cell research in this country has been in existence for over 60 years. There are a wide range of studies and articles describing its dramatic benefit for chronic diseases. Many of these publications are available for you to read on my website.

In performing stem cell therapy, extremely strict guidelines must be followed in coordination with a specialized clinical trial review board. This ensures accuracy, sterility, and quality control of the procedure. This information gathered from the procedure, including various forms of documentation, can be used for medical publication at a later date.

Physician notes and procedure, as well as a questionnaire filled out by patients periodically, are part of this process. This makes the highest level of procedure and documentation possible.

The following cases are actual patients seen in my office, that underwent stem cell therapy for a variety of disorders. Of course, I am unable to use names or any personal information from the patients,
but these are documented cases and documented comments directly from patients or from family members as to their response and improvement.

All the patients that I treat with stem cells document their symptoms and problems before treatment in their own words and their own handwriting. Their improvements are documented and these are part of our chart record.

All of these patients will be followed up year to year, to document improvement and results, this is all part of the clinical trial protocol.

**Case 1: Alzheimer’s Disease**

This is an 80-year-old female patient diagnosed with Alzheimer’s disease by her neurologist. She was treated with stem cell therapy in August, 2014. During office visits the patient did not talk much. According to her son and daughter-in-law, she was in a steep decline before coming to the office.

After stem cell therapy was done, her son wrote an outline of her improvement. The patient had a stem cell therapy done in the morning and on the same day there was a noticeable improvement as the family was driving home in the car on August 21, 2014.

She engaged in continuous conversation all the way back home. They stop for dinner and the patient opened and read the menu and decided upon eating fish. She had been unable to read a menu or use utensils for years.

When the entrée arrived she was able to eat with a fork and a knife. This was just three hours after stem cell therapy was done. The family was astonished.

The following weeks revealed:

– The patient was reading more
– The patient had more interested in television
– The patient was more aware of her surroundings
- The patient was more willing to carry on conversations with the family
– The patient was more agreeable and flexible
– The patient has a much better attitude
- The patient continues to improve
- The family is extremely happy with her progress.

**Case 2: Asthma /COPD**

This is a 72-year-old male patient with a chronic history of asthma /COPD. He had progressive difficulty breathing, with even the simple activities over the past several decades. The patient was on inhalers and pills two to three times daily, and occasional steroid treatments.

The patient underwent stem cell therapy in June, 2014, and had slow but progressive benefits month to month.

At roughly five to six months after stem cell therapy, he did not use any asthma, nebulizers, breathing treatments or steroids at all.

His breathing is completely clear. The patient is able to walk two miles a day, without any wheezing or any shortness of breath.

**Case 3: Chronic Back Pain**

This is a 70-year-old male who had chronic back pain for many, many years. The patient had used chiropractic treatment belts and supports, as well as numerous pain medications.


The patient reported and documented in his own handwriting that within two weeks of doing stem cell therapy his back pain is completely gone. His hand-written note documents this in our chart.

**Case 4: Parkinson’s Disease**

This is a 73-year-old female who was diagnosed six years ago with Parkinson’s disease. She was on various medications for Parkinson’s and hypertension.

The patient did stem cell therapy in December, 2014. She had intravenous and nasal application.

Within the one-month follow-up, the patient described that she’s doing much better. She’s walking a great deal more, she described that her feet don’t stick to the ground as before.
The patient can open bottles now, though she couldn’t before. She’s feeling more strength in her shoulders. She’s able to do more housework and errands.

The patient feels happier, and has less in the way of tremors, and much less stiffness. She started going back to the gym and was able to start doing some jogging. She reported that she no longer experiences foot drop.

Case 5: Diabetes

This case is a 40-year-old male who has been diabetic for over seven years. He is on oral medications as well as Victoza injections. His fasting blood sugars were over 250 - 300.

Stem cell therapy was done in late July, 2015, and gradually, over three weeks, the patient’s blood sugar declined by 100 points. The patient had not started exercise or the low-carb diet as yet.

I have decreased his medication dosage accordingly and expect him to be off medication in the very near future.

Case 6: Shoulder Pain

This patient is a 55-year-old lady with severe left-shoulder pain over the past five to six years. The MRI revealed arthritis. She was unable to do any sports or most of her daily activities. She had severe pain trying to put on a jacket.

Stem cell therapy was done October, 2014, and within three weeks the patient said that her pain had decreased by half.

By the second and third month, the patient reported being able to ride her bike and had very good range of motion. She had no pain reaching for objects and was able to sleep without pain. She had no problems in styling her hair. Now she’s able to swim and ride her bike for 25 miles. She has complete range of motion.

Case 7: Osteoarthritis and Shoulder Pain

This is an 80-year-old patient with severe shoulder pain and osteoarthritis in a variety of her joints. She had muscle pain in her neck and back, as well as muscle cramps. She has chronic fatigue and COPD. She has had a consistent shortness of breath for the past few years.
Stem cell therapy was done in May, 2015, and over the course of the month, the patient describes her shoulder pain as having decreased progressively by 75 percent. She has experienced a significant decrease in muscle aches, pains and spasms. She is now able to shop and do her daily activities without extreme fatigue or shortness of breath.

**Case 8: Multiple Sclerosis**

This is a 38-year-old woman with an MS diagnosis from 1999. The patient was in a wheelchair that’s motorized as she was unable to walk. She also had trigeminal neuralgia and arthritis in her joints. She had been going for physical therapy with very little response. Stem cells were done on July 29, 2015. Intravenous as well as intranasal therapy were performed.

On August 19, 2015, the patient presented to the office with her husband. She described doing far better. She has a significant increase in energy. She’s able to walk at her physical therapy facility on her own for 300 feet!! She was not able to do this before the stem cell treatment. Both she and her husband are extremely happy.

**Case 9: Chronic COPD**

This is a 58-year-old woman who had chronic COPD for many years. She’d been using oral medications and inhalers for over 10 years. She also had rheumatoid arthritis. She felt that her disorders were getting worse progressively.

On August 4, 2015 she underwent stem cell therapy intravenous as well as with a respiratory nebulizer.

She returned to the office for follow-up on August 25, 2015. She described that she can wake up now without coughing. Her breathing is dramatically improved. She has not been using her inhalers. She stated that she’s amazed that in just three weeks she’s had so much improvement.
INTRODUCTION TO THE IMPORTANCE OF STEM CELLS

Stem cell research has come a long way since it began in the 1950s. Today, researchers, scientists and healers are excited about what’s been happening in the area of regenerative therapies that is changing the course for many degenerative diseases.

Because stem cells have the ability to regenerate tissues, cures for many diseases are becoming possible for the first time.

All stem cells have these properties in common:

1) They can divide and renew themselves for long periods of time.

This is different from many other types of cells, such as blood cells, muscle cells and nerve cells. Stem cells can create a population of millions over a period of months.

2) They are unspecialized cells.

They do not have tissue-specific structures but they can generate specialized cells such as blood cells, heart muscle cells and nerve cells.

In their unspecialized states they can’t carry out specialized roles. They can’t help to pump blood as a heart muscle cell would. They can’t transport oxygen molecules in the bloodstream like a red blood cell does.

But the specialized cells they give rise to can carry out those specialized functions. They can renew themselves via cell division, even after they have been inactive for a long time.

3) They can generate specialized cells.

This process is called differentiation. Stem cells have the ability to develop into different cell types in early life and during growth. Many of them provide internal repair.

They can divide indefinitely, replenishing brain cells, muscle cells and red blood cells and other cells that are more specialized. They
can become cells that are organ- or tissue-specific with specialized functions, under certain conditions.

In bone marrow and the gut, and in some other organs, stem cells repair and replace damaged tissues by regularly dividing. In some organs like the heart and pancreas, stem cells can divide, but this only happens when certain conditions apply.

Embryonic stem cells have the greatest versatility of all stem cells.

In 1998, a method of deriving human embryonic stem cells from human embryos was devised. Cells were then grown in a laboratory. Initially these embryos were used for in vitro procedures for reproduction purposes. Afterward they were used in research with the donor’s consent.

In 2006, it was discovered that some adult cells could be brought to a stem cell type of state by genetic reprogramming. These are called pluripotent stem cells (iPSCs).

Adult stem cells are also called somatic stem cells. These are cells of the body, as opposed to say eggs or sperm cells, or germ cells.

Adult stem cells show up in more tissues than had been previously believed. Adult stem cells have been found in blood vessels, bone marrow, gut, heart, liver, ovarian epithelium, peripheral blood, skeletal muscle, skin, teeth and testes.

Adult hematopoietic (blood-forming) stem cells from bone marrow have been used successfully for four decades. It is posited that these cells might be useful for transplantation of various types.

One important type of stem cell is the fat- or adipose-derived stem cell which is also called an adipocyte. In people who have degenerative health conditions, these cells may not be released naturally.

But they can be used to great benefit once the cells have been extracted, concentrated and then administered to people suffering from many degenerative diseases.

Adipose-derived stem cells (ADSCs) are tremendously useful because they can develop into new tissues. They can also suppress the pathological immune responses typical of autoimmune conditions.

ADSCs have been used in treatment of autoimmune multiple sclerosis, osteoarthritis and rheumatoid arthritis.
Adipose tissue has been found to be a rich source of mesenchymal stem cells. One gram of fat contains more than 500 times the mesenchymal stem cells as could be found in one gram of bone marrow.

Mesenchymal stem cells, or stromal stem cells, give rise to bone cells, cartilage cells, connective tissue cells, fat cells and pancreatic islet cells. Mesenchymal stem cells are in the pulp of baby teeth, the blood of umbilical cords, fat and muscle.

Mesenchymal stem cells are called multipotent cells. This is because they have the tremendous ability to develop into multiple tissues. Stem cells are fertile ground for treatment of diabetes, heart disease and other diseases.

Stem cells have already been used to generate chondrocytes, osteoblasts and osteoclasts (cells found in healthy bone tissue). Research on animal models testing the functionality of \textit{in vitro} cells have seen promising success in this area.

It’s hoped that effective treatment may become possible for such usage as regeneration of bone from bone marrow stroma, and development of insulin-producing cells for type 1 diabetes, and the developing of cardiac muscle cells for the repair of damaged heart muscle after a heart attack.

Research is needed to learn more and to devise more efficient ways of generate large numbers of adult stem cells for therapeutic uses.

\textbf{Sources:}

Embryonic stem cells for osteo-degenerative diseases.

Stem Cell Basics

Stem Cell Basics: II. What are the unique properties of all stem cells?

Types of Adult Stem Cells
http://www.cellmedicine.com/types-of-stem-cells
Mesenchymal Stem Cells

http://www.nationalstemcellfoundation.org/what-stem-cells-do/
mesenchymal-stem-cells

Stem Cell Basics: IV. What are adult stem cells?


CHAPTER 1
ARTHITIS AND JOINT DEGENERATION, AND STEM CELL THERAPY

There are more than 100 types of arthritis. What these all have in common is chronic joint, bone and muscle pain, along with swelling and stiffness.

There are two categories of arthritis: degenerative and inflammatory. Mesenchymal stem cells (MSCs) exhibit powerful effects of immunosuppression and anti-inflammation. These cells help to bring about regeneration in the local tissue environment.

MSCs are ideal to be used in therapy for degenerative joint diseases such as osteoarthritis and rheumatoid arthritis.

Osteoarthritis is degenerative, meaning deterioration occurs as time goes on, as a result of joint wear and tear. Osteoarthritis is also known as degenerative arthritis and degenerative joint disease.

There are two kinds of osteoarthritis.

Primary OA targets older adults and is linked with factors that are genetic and/or familial. Secondary OA occurs due to injury, deformity or misalignment.

Osteoarthritis is the umbrella term for a group of illnesses in which the joints degrade. This includes articular cartilage and subchondral bone.
Osteoarthritis can cause locking, stiffness and tenderness of the joints. It also causes joint pain, and sometimes can cause a build-up of joint fluid.

Cartilage may eventually offer less protection to the bone surfaces, leaving bone exposed and vulnerable to becoming damaged.

The patient will tend to gradually decrease the amount of activity due to the pain. Muscles in the area are prone to atrophy. Ligaments can loosen.

RA is inflammatory, the result of autoimmune attacks on joint lining. Swelling and inflammation are hallmarks.

Other inflammatory types of arthritis are ankylosing spondylitis, gout, juvenile idiopathic arthritis, lupus and psoriatic arthritis.

Rheumatoid arthritis affects 10 percent of the world’s population. It causes loss of function, pain, stiffness and swelling in the joints, most commonly in the fingers and wrists. RA is most common among older adults, though younger people, including children, can have it.

Unlike OA, rheumatoid arthritis can affect more than the joints. It can hit eyes, mouth and lungs, for instance. As an autoimmune condition, RA is caused by the body’s tissues being attacked by the immune system.

Arthritis most often hits people over 60, though any age or background can get it. Previously the only ways to treat arthritis have been less than ideal. The goals of these methods are to lessen pain and minimize loss of function.

This is done for some by moving less. For others who are able to be more active, exercise is beneficial.

Drug treatment (oral, on the skin, or injected in the joint) may be used in more serious cases. Surgery to realign, redesign or replace a joint is used in the worst of them.

The effects of arthritis create a sad state of affairs, but stem cell therapy offers significant healing. Research on animals using stem cells has shown tremendous results.

Stem cells help increase the healing of tissue that has been damaged, and enhance the immune system. This helps the body to fight the disease, and to minimize abnormal responses.

ADSCs reduce inflammation and repair damaged tissue. Stem cell therapy can encourage healing in articular cartilage (cartilage that lines the head of a joint).
This cartilage doesn’t have nerves or blood vessels, and has a low cell content with few chondrocytes. It repairs itself slowly.

But stem cells manufacture chondrocytes. Chondrocytes manufacture cartilage. Cell culture methods for manufacturing more chondrocytes have been improving.

ADSCs, like bone marrow MSCs, can manufacture different types of cells. ADSCs can manufacture bone, cartilage, fat cells and muscle cells. They can promote angiogenesis (blood vessel formation).

After ADSCs are isolated from fat tissue via minimal liposuction techniques, they are isolated and purified in the laboratory. In preclinical testing, a dose of ADSCs are injected into animals who have osteoarthritis.

This technique can suppress the inflammatory events, diminishing destruction of cartilage and damage to the ligaments that connect joints.

Stem cell therapy can bring healing and recovery that in the past was unheard of for those with arthritis.

Sources:

Mesenchymal stem cells in arthritic diseases
http://www.biomedcentral.com/content/pdf/ar2514.pdf

Stem Cell Therapy: Osteoarthritis
http://www.cellmedicine.com/stem-cell-therapy-for-osteoarthritis

New stem cell-based treatment for rheumatoid arthritis

Rheumatoid Arthritis

About Arthritis

Mesenchymal stem cell therapy in osteoarthritis: advanced tissue repair or intervention with smouldering synovial activation?
http://arthritis-research.com/content/15/2/112