

# Stem Cell Therapy

By Dr. Kevin Conrad, DVM

Stem cells are primitive cells that are present in every tissue. These cells are trophic factories implying they are cell renewing and can develop into any type of tissue.



Embryonic Stem Cells are more complicated; they prefer to form whole bodies and not just repair tissue. They have a tendency to form teratomas i.e. growths containing hair, teeth, bone, etc. They are classically used as an allograft where stem cells from the same species are used in different individuals. Thus rejection of the foreign genotype is common.

Adult stem cells can be used as autologous grafts, meaning cells from the individual are used for itself, i.e. same species, same individual.

Stem cells provide five mechanisms of repair:

1. Trophic differentiation to become necessary cells for repair.
2. Reduce inflammation to the damaged tissue.
3. Stimulate growth factors which increases blood flow, reduces scarring and blocks cell death after stimulation of resident cells.
4. Provide a homing sense to an injured site
5. Stimulate the immune system to improve healing.

Adipose (fat) tissue is used because:

- It has a very high cell count
- Is easy to access
- Will continue to renew itself
- May be used readily as an autologous graft with minimal preparation
- Low risk of rejection
- Provides a rapid turn around, i.e. no wait time for culturing

### **Current and potential uses of stem cell therapy in veterinary medicine**

Osteoarthritis

Hip dysplasia

Knee damage from anterior cruciate ligament rupture

Other ligament or tendon damage

Post surgical failures

Hepatic disease

Renal disease

Wound healing

Inflammatory bowel syndrome

Autoimmune skin disease

Immune mediated thrombocytopenia

Cardiovascular or ischemic disease

Spinal disease

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Editor's note:

Dr. Conrad recently performed surgical stem cell therapy on a For Paws Hospice patient named Buddy, a seventy pound, eight year old male Golden Retriever. Buddy had a torn ACL and suffered from degenerative hip disease due to an earlier accident.

The procedure consisted of four injections of stem cell material extracted from fat cells harvested from Buddy's belly fat.

Four stem cell injections were administered to Buddy forty-eight hours following the cell harvest procedure in four sites: both back knees, hip and a final injection systemically.

The laboratory which extracted the stem cell medium retains several samples of Buddy's stem cells in liquid nitrogen which remain available for followup therapy.

Buddy is now undergoing a regimen of therapy to strengthen as well as promote the healthy growth of new tissue at those injured sites. He is expected to make a full recovery and again be able to walk with his owner.

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Dr. Conrad is a member of For Paws Hospice Board of Directors and a practicing veterinarian in Clearwater, FL