

HEALTH EXCLUSIVE:

# Stem Cell Therapy

**S**tem cell therapy is becoming a renewable natural resource for treating a multitude of canine conditions. Because the stem cells are autologous (harvested from the animal to be treated), fewer ethical issues surround it compared to the use of embryonic stem cells in human medicine.

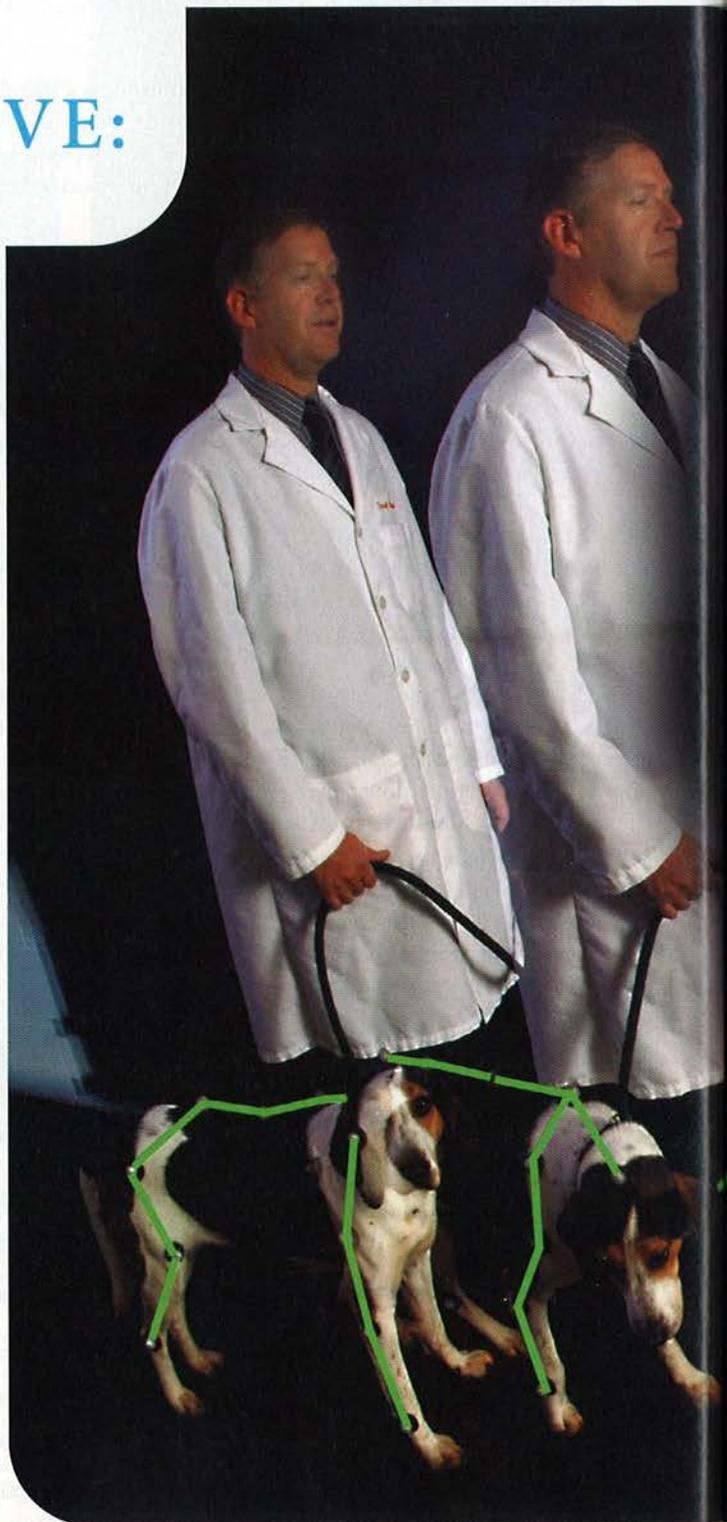
"Stem cell therapy rejuvenates joints, reduces pain and increases flexibility, which enables the animal to do things it used to do," says Robert J. Harman, D.V.M., M.P.V.M., CEO and co-founder of Vet-Stem Inc. in Poway, Calif. "The treatment can change a dog's lifestyle."

In 2004, Vet-Stem introduced the first veterinary stem cell service in the United States. The only other company that is significantly involved in the United States is Medivet (they provide a do-it-yourself kit to veterinarians).

Initially, the therapy was used in the equine industry to treat horses with tendon or ligament injuries. Vet-Stem began working with select clinics to treat dogs with osteoarthritis and orthopedic soft-tissue injuries. Today, more than 2,300 veterinarians in the United States and Canada are certified with Vet-Stem to perform stem cell treatment.

Stem cells act as a repair system for the body. Although stem cell therapy has been used primarily to treat dogs with arthritis and partial tears of cruciate ligaments, there is significant potential for treating other conditions. Vet-Stem is part of an international effort that is exploring ways to use stem cells for treating other conditions, including neurological, heart, kidney, liver and immune-mediated diseases.

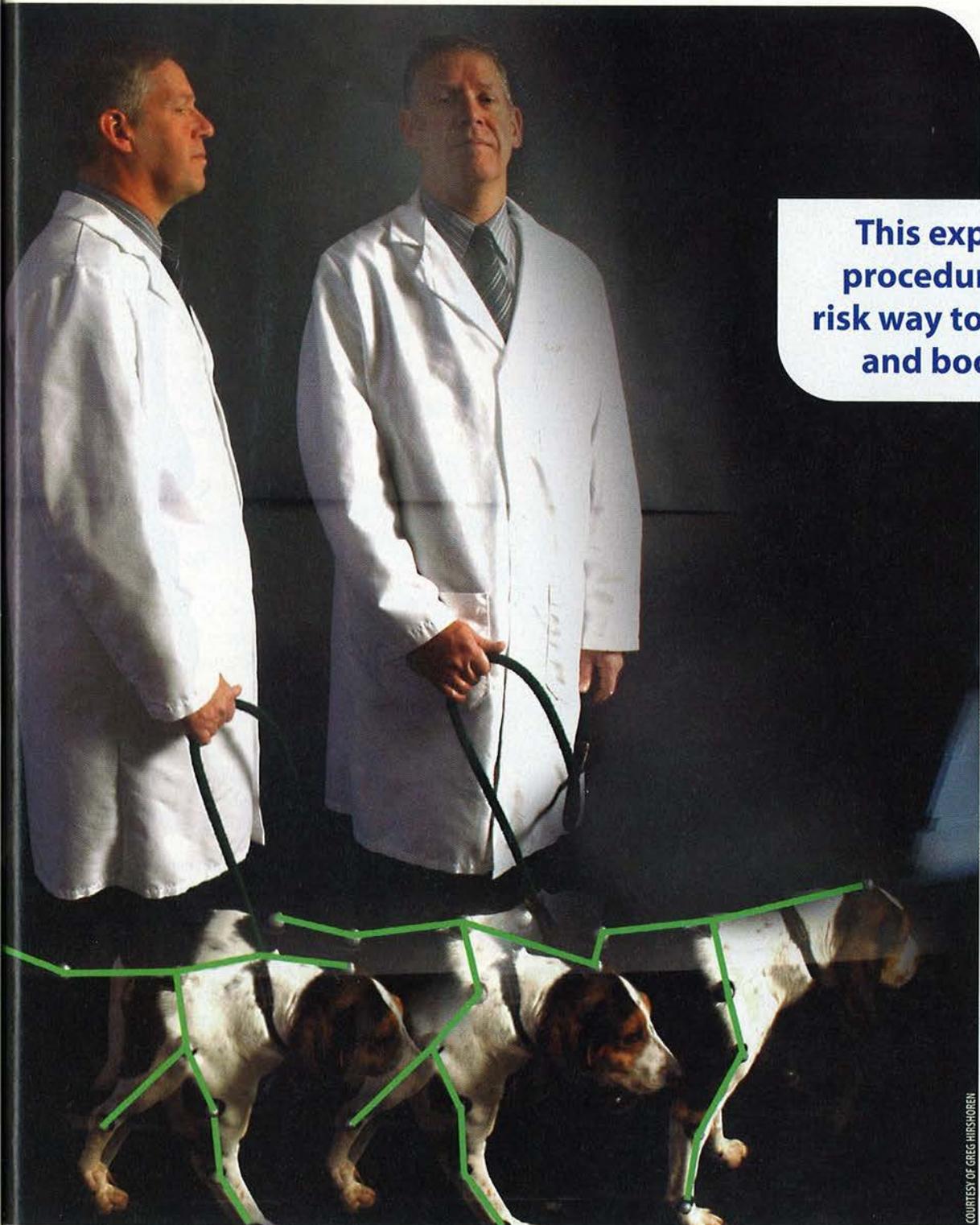
"Stem cell therapy is a dynamic field that changes monthly," says Darryl L. Millis, D.V.M., professor of ortho-



pedic surgery and director of surgical service for the department of small animal clinical sciences at the University of Tennessee College of Veterinary Medicine in Knoxville. "We are still years away from clinical applications, such as reconstructing organs, but experimentally, researchers are doing a lot of neat things with stem cells."

## A revolutionary treatment

This cutting-edge therapy centers on removing a dog's stem cells, which are found in its body fat. Approximately two tablespoons of fat are surgically collected from the area



**This experimental procedure is a low-risk way to ease pain and boost health.**

**BY MEREDITH WARGO**

Darryl L. Millis, D.V.M., walks a dog across a force plate, measuring the weight the dog places on each leg. The green lines indicate joint connectivity.

COURTESY OF GREG HIRSHOREN

behind a dog's shoulder blades, the chest wall or the abdomen. The sample is sent to Vet-Stem, where technicians use centrifuges to extract the stem cells from the tissue. The concentrated cells are shipped back in syringes within 48 hours to the veterinarian, who injects them into the dog's injured area. There is little danger of rejection because no foreign tissue is involved.

"Because it's the animal's own cells, the only significant risk is the surgery to collect the fat," Harman says. "Even then, it's a minor surgery, similar to a spay, and does not require much recovery time."

In more than 4,800 stem cell injections in dogs, only 0.1 percent reported an adverse event that was related to the injection. None of the events (all local swelling) resulted in the dogs becoming sick.

After the collection and processing, Vet-Stem saves and stores some of the cells for additional treatments of the existing injury or treating other conditions in the future. One single collection of fat provides a lifetime supply of stem cells for a dog.

The number of stem cells that can be extracted from the fat of any particular dog is related to age, breed and

## When is stem cell therapy right?

Your dog may be a good candidate for regenerative medicine if it:

- Can't tolerate or doesn't respond well to pain medication
- Is not a good surgical candidate due to age or health
- Has arthritis in one or more joints
- Is likely to need long-term pain medications

— M. W.



Millis examines a dog's elbow joint, checking for range of motion and discomfort.

health history of that dog. A single collection from a dog provides, on average, 4.3 doses of stem cells for that dog. After they utilize those doses, Vet-Stem can grow a lifetime supply of stem cells in their laboratory. The number injected into an injury is customized to the particular dog and size and number of injured locations. This is customized by a consultation between the Vet-Stem veterinarians and the attending veterinarian for the patient.

For a fee, Vet-Stem banks the extra cells in a cryopreservation system of liquid nitrogen, which provides safe storage. The cells may only be used for the donor animal and are not modified in any way. When an animal passes away, the cells can be destroyed or donated to a research-and-development program.

### The impact of stem cells

Since 2004, more than 7,500 animals, including 3,300 dogs, have been treated with Vet-Stem regenerative cells. In a blinded, controlled study of osteoarthritis in dogs conducted by Vet-Stem, the treated dogs showed improvement in lameness compared with the placebo (saline injected) controls (Black, D.V.M., Ph.D., *Vet Ther.* 2007; 8[4]: 272-284). In a random survey, more than 80 percent of owners said stem cell therapy improved the quality of their dog's life.

It's not a quick fix or a guaranteed cure, but some dogs that receive stem cell therapy enjoy a prolonged benefit that lasts years. Other dogs, usually older ones with more severe

arthritis, might need periodic treatment (depending on the extent of the injury and the age dog's age). The need for repeat injections varies depending on each animal's condition, activity level and overall health.

Some owners are reluctant to try stem cells as the first line of therapy for treating the early stages of arthritis in their pets. "The dogs that we typically treat are those that have gone through all the basic treatments and the owners are still not getting the response they would like," Millis says. "About three-quarters of the dogs respond well, showing fewer signs of pain and being much more active." The other 25 percent do not respond to the treatment.

### Added benefits

One of the goals of stem cell therapy is to discontinue or decrease the use of pain pills and anti-inflammatory medication after treatment. "When we look at our patients 90 days after treatment, one-third of the dogs are entirely off their medications, one-third are on a reduced dosage and one-third have stayed the same," Harman says. He adds that the numbers are almost exactly the same one year after treatment.

"People hear the words stem cells and think that we're going to re-grow joints or cartilage," Millis says. "Although we're not necessarily re-growing cartilage, we are providing a positive environment that may promote growth and repair of existing tissue."

#### For more information, contact:

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Vet-Stem allows the use of stem cells in a compassion-use program. If a dog is diagnosed with a serious ailment, but no research supports the commercial use of stem cells for treating it, a veterinarian can request using stem cell therapy as a trial treatment. If the owner understands that nothing substantiates the outcome of the treatment, but is willing to take a chance, the procedure will be approved.

"We learn a lot from these types of situations," Harman says. "After five or 10 similar incidents, it's not just accidental or anecdotal. We then conduct a formal clinical trial. If the use for stem cells proves to be safe and effective, we will recommend the therapy."

The cost of stem cell therapy runs between \$2,000 and \$3,000, which includes the fat-collection surgery, stem cells, injections, anesthesia, follow-up examinations and the first year of cell storage. After the first year, there is an annual fee of \$150 for ongoing banking. Many pet insurance companies will cover the treatment if the condition is arthritis or tendon-related injuries and not pre-existing or related to a congenital disorder.

"There are so many more options now to treat arthritis in small animals," Millis says. "I would hope that very soon the day will pass where an animal is put to sleep just because it has arthritis." **DW**

*Meredith Wargo is an award-winning freelance writer in Houston.*



**Veterinarians hope stem cell therapy will keep fewer dogs from being euthanized because of pain-related issues.**

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