

THE *Be*TER LeTTER

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FALL, 2005

Maggot Therapy Workshops on the Go - June workshop held in Tucson; next stop: Your Town?

The Maggot Debridement Therapy (MDT) workshop, held June 25 in Tucson, AZ, had approximately 30 attendees and 5 vendors participating in the course. The morning was filled with lectures on wounds, wound-healing, maggot therapy, and other wound healing techniques. After a buffet lunch, attendees had their chance to apply what they had learned by making MDT dressings on "wounded" mannequins.

As usual, the course faculty comprised of BTER Foundation members and local experts. Instructors included **Ronald Sherman** and **Randall Sullivan** from the BTER Foundation, along with **Mary Crenshaw** (Wound Care Coordinator at Cornerstone Hospital of SE Arizona in Tucson), **Dr. Karl Hekimian** (Aesthetic Surgery of Tucson), **Dr. Brent Nixon** (Adjunct Professor at the University of Arizona College of Public Health and Clinical

Director of Podiatry at the Southern Arizona Veterans Affairs Health Care System), and **Dr. Mordechai F. Twena** (San Rafael Medical Center, Tucson, Arizona).

Attendees meandered through the exhibit area to learn about new wound care products and to talk with representatives from **Celleration**, **KCI**, **ROSS Products Division** of Abbott Labora-

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Doing it! – MDT Workshop attendees listen to speakers and read their syllabi at the Tucson, AZ, conference on June 25, 2005. Workshop was co-sponsored by Cornerstone Hospital of Southeast Arizona and the University of Arizona College of Medicine at the Arizona Health Sciences Center.

Veterinary Hirudotherapy & Equine Laminitis

By Dr. Sagiv Ben-Yakir, BSC, DVM, MRCVS, CVA, CVHomotoxicology

Veterinary hirudotherapy is the application of medicinal leeches (*Hirudo medicinalis*) for therapeutic purposes in animals. The application of leeches is one of the oldest recorded veterinary medical treatments. Until the early 20th century, the application of leeches was considered to be a standard medical practice for a variety of animal illnesses. Hirudotherapy fell out of favor as a veterinary remedy, as it did in human medicine, but is once again

being investigated and applied for a variety of illnesses that are not easily treated by other methods.

Acute equine laminitis is inflammation of a horse's lamellae (also known as laminae). These are delicate anatomic structures that connect the foot bones to the inner wall of the hoof. Horses depend on their hooves to stand upright, just as humans depend on their feet. With severe laminitis, horses

lose their ability to stand or move; instead, they are forced to lie down. A horse with laminitis of just one limb can soon develop the disabling condition on its other limbs when the animal shifts its weight to its healthy limbs in order to avoid pain in the affected limb. This abnormal redistribution of weight can lead to the development of laminitis in the horse's previously healthy limbs.

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Ronald Sherman, MD —
BTER Foundation Board of
Directors.

Chairman's Message - 2004 in Review

The BTER Foundation is now 2 years old. Like my own young children, the Foundation is still defining its identity and pushing the boundaries of what it can accomplish.

Despite being so young, the Foundation has hit the ground with a strong start, providing patient assistance grants to the uninsured, publishing the first issue of this newsletter, and putting together the first of many Maggot Therapy Workshops.

The Board of Directors dream and plan for the Foundation's future — a future of even greater achievements in patient assistance, therapist edu-

cation, and biotherapy research.

The 2004 Annual Report is now available on the BTER Foundation internet site for you to see what we have done and what more we plan to accomplish in the coming year.

Because the Foundation is still maturing, it needs continued guidance and nurturing. Just as people depend on the Foundation, the Foundation depends on its clients, supporters, and benefactors. You give the Foundation life, and instill within it your desires and your hopes. As you review our accomplishments during the Founda-

tion's 2nd year, we hope that you will see us becoming the Foundation that you want. We think you will be pleased with the work already accomplished, excited about the challenges and opportunities that still lie ahead, inspired to stick with us and help us grow, and comforted by the fact that — through the BTER Foundation — you, too, can help us help others.

- RA Sherman

Note: The full 2004 Annual Report can be downloaded from the BTER Foundation website:

www.BTERFoundation.org

Editorial -

Veterinary Biotherapy ?



Readers of this issue of The BeTER LeTTER will observe that it is dedicated to veterinary applications of biotherapy. And why not? Usually we use the term "biotherapy" to describe applications of animals to treat or diagnose human illness. But many of the same animals are equally capable of treating illness in other animals.

Within these pages, readers will discover how maggots and leeches are both being applied to treat animal wounds. Much of the work so far is being done with horses (equines). This may be due to the economic value and relative costs of care for horses, which often receive more health care dollars per

animal than dogs or cats or other pets. But once the benefits of maggots and leeches are demonstrated in horses and livestock, it will only be a short period of time before pets can be treated similarly. Someday the neighborhood pet store may even sell medicinal maggots next to the fishing bait, and medicinal leeches next to the water snakes.

~ RA Sherman

Biotherapy in the News

Maggot Debridement Therapy Trial from Mexico Wins Award — A team of researchers from Mexico City, led by Dr. Jose Contreras-Ruiz and Dr. Judith Dominguez-Cherit, received the “Young Investigators Award” for their study of maggot therapy at the combined meetings of the 18th Annual Symposium on Advanced Wound Care and the 15th Annual Medical Research Forum on Wound Repair held in April 2005. The study, entitled “Maggot therapy and infection control in venous ulcers: a comparative study,” was a comparative trial of maggot

debridement therapy (MDT) vs. conventional surgical curettage and application of silver sulfadiazine in patients with venous ulcers. Both patient groups received standard compression and regular care and were blindly evaluated. Bacterial burden was assessed by means of quantitative biopsies. Although the trial was small (only 10 patients per group), the results suggested that MDT was as effective as standard medical and surgical wound care in achieving debridement and wound healing. Furthermore, bacterial burden was significantly lower in the MDT group.

Anxiety, pain, and the large amount of wound exudates (drainage) were the main drawbacks of MDT compared to standard care.

The Young Investigators Award is an important achievement for this research group and for the field of biotherapy. The researchers are based in a developing country where resources are scarce. They completed a prospective controlled clinical trial of maggot therapy, which is also scarce. The authors will be submitting the study for publication in the coming months, a valuable stepping-stone

toward better understanding and acceptance of MDT among the scientific community.

The Symposium on Advanced Wound Care and the Medical Research Forum on Wound Repair are premier opportunities to interact with knowledgeable, committed leaders in the field of wound care. The joint meeting, held this year from April 21 to 24, provided educational opportunities to members of the research and clinical care communities, as well as others interested in wound care.

Veterinary Hirudotherapy & Equine Laminitis

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The severity and extent of the anatomical changes that occur within the first few hours or days may lead a medical team to consider euthanasia because of the horse's severe pains as well as its likelihood to suffer a chronic form of the disease (if the animal survives the acute phase), which can be permanently disabling.

This condition is considered to be the second most common killer of horses after gastrointestinal colic. For the year 2000, the USA National Animal Health Monitoring System (NAHMS) reported that 13% of all horse establishments had a horse with laminitis, where 35% of these animals died or had to be put down. The initial

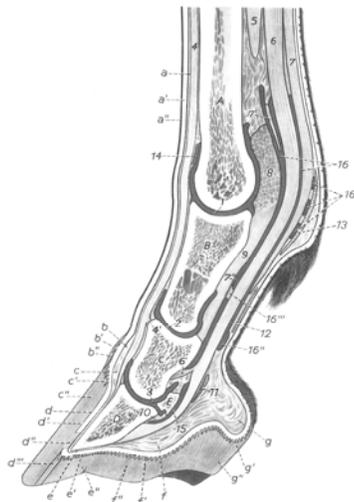
trigger of laminitis remains in question, but one likely explanation is that it is initiated by endotoxins from elsewhere in the body (for example, from an infected uterus or intestine). Endotoxins are molecules in the wall or coating of bacteria which can be toxic when released into the bloodstream. These toxins cause vasoconstriction (narrowing of blood vessels), thereby increasing the local pressure within and just behind those blood vessels (elevated hydrostatic pressure). Fluid bathing focal areas (“compartments”) of tissue is blocked from returning to the high pressure vessels, resulting in a response of higher pressure around the soft tissues with the narrowed blood vessels. This causes a condition known as

“compartment syndrome.” This process impedes the flow of blood to the lamellae, causing the lamellae to die from lack of blood flow (ischemic necrosis).

It has also been postulated that acute laminitis may result from a horse's own immune response to the circulating endotoxins, aside from the constriction of blood vessels. Antimicrobial enzymes released by the immune system in response to these endotoxins could dissolve the lamellar connections (a complication that can be thought of as “collateral damage”). Either one or both of these processes could occur simultaneously.

Because both of these mechanisms involve a

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Horse Left Foredigit, Fig 324 from Nickel, Schummer, Seiferle, Frewein, Wilkens & Wille: The Locomotor System of the Domestic Mammals. Springer Verlag, New York, 1986. Used with kind permission of Sprinter Science and Business Media.

Maggot Debridement Therapy for Animal Wounds

Ronald Sherman, David Ng, Eve Iversen

All animals are susceptible to injuries and wounds. Healing those wounds can be a big problem for some animals, and almost no problem at all for others. For those animals that have difficulty healing their wounds, maggot therapy is showing promise.

Hoof wounds in horses are a good example. Hoof wounds are common in horses, and they can become a serious problem. Prolonged healing and permanent lameness are common consequences. Extensive tissue destruction and structural damage can result from both the infection and the surgical treatments required to clean (debride) the wounds.

As described elsewhere in this issue of *The BeTER LeTTER*, chronic laminitis, or founder, results from the detachment of the distal phalanx (coffin bone) from the inner hoof wall, with subsequent ischemia and necrosis of the dermal lamellae. With the weight of the horse upon it, the improperly attached distal phalanx can penetrate

down into the hoof capsule, damaging the arteries and veins, crushing the structures underneath. Pain and lameness are frequent complications. The ideal treatment would be a non-traumatic debridement and killing of any infection.

Because medicinal blow fly larvae accomplish this in human wounds, a few veterinarians have sought to apply the treatment to equine hoof and leg wounds. Dr. Scott Morrison is one of those veterinarians. As head of the Equine Podiatry Center at Rood & Riddle Equine Hospital in Lexington, KY, he has used maggot debridement therapy (MDT) to treat over 100 horses with an assortment of chronic or problematic wounds, including chronic laminitis, septic arthritis and osteomyelitis, abscesses, and non-healing ulcers. He has reported that many of these wounds were cured, and many others improved enough that the animals no longer needed to be euthanized.

"Maggot debridement therapy is extremely

valuable in equine podiatry," Dr. Morrison says. "The ability of the larvae to debride a wound without disturbing the normal healthy architecture of the foot is an extremely valuable feature of this therapy. Minimizing secondary damage from debriding wounds speeds recovery time and minimizes pain and lameness and significantly improves the prognosis in horses with high scale infections."

"We have used medicinal maggot therapy primarily to treat chronic infections in the feet of horses suffering from laminitis," notes Dr. Donald Walsh, DVM, of Homestead Veterinary Hospital in Pacific, Missouri. "The maggots debride the bone and other necrotic tissue within the hoof which then allows the hoof to heal completely and the horse can then live a normal life. This has enabled us to save horses that before were euthanized because of these infections."

On the surface, it may seem like an obvious application to treat animal

wounds with maggots, just like human wounds are now treated with maggots. But MDT has rarely been reported in the treatment of animal wounds. This is probably because of concerns that the maggots could invade the animals and cause deep infestations or infections. After all, blow fly maggot infestations (myiasis) are common in animals, and many veterinarians are concerned that species found to be safe in humans may still be injurious in animals.

With more and more recent experience, veterinarians are now discovering that medicinal maggots are working safely and effectively in many different animal species. Maggot therapy has been used successfully in a wounded bull (Dicke 1953), and donkey (Bell and Thomas 2001; Thiemann 2003).

Eve Iversen studied the utility of maggot therapy by treating mule wounds in Egypt. "We found that if the proper species of fly is used MDT can be em-

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Publishing Credits

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36 Urey Court, Irvine, CA 92617
Phone: 949-509-0989
Fax: 949-509-7040
E-mail: editor@BTERFoundation.org
www.BTERFoundation.org

Editor:
Ronald A. Sherman
Assistant Editor:
Christina Hur
Contributing Writers:
Sagiv Ben-Yakir
Jose Contreras-Ruiz
David Ng
Catalina Wang

Foundation Consultants:
J. Preston
E. Iversen
Foundation Board Members:
R.A. Sherman, Director
R. Sullivan, Secretary
S.G. Kohn, Treasurer
S. Mendez, RN, CWS
P. Mitchell

Foundation Announcements

BTER Foundation 2004 Annual Report — The 2004 Annual Report is finally available on the Foundation website (www.BTERFoundation.org). Download the report and read all about the accomplishments of the past year, and the plans for the coming years. Recent publicity and financial reports also included. Contact the Foundation office if you would like a copy but do not have Internet access.

The BTER Foundation survey of MDT indications — 3 months ago, the Foundation requested therapists to write in with their indications for using maggot therapy. Eleven therapists submitted surveys, describing over 100 treatments. Over 25% of the listed indications were previously unreported or not cleared by the FDA ("off-label"). Several of the therapists were contacted for additional information, and a full report will be published in the coming months. Thanks to all who shared their cases.

Donating used printer cartridges helps the environment and supports the BTER Foundation — The BTER Foundation continues its fundraising program of recycling used printer cartridges. The program raised nearly \$250 last quarter. That's enough to pay for one Patient Assistance Grant—the cost of an average course of maggot therapy for one uninsured patient. Keep sending us your used inkjet or laserjet cartridges. Or use our pre-

paid mailers to send your cartridges directly to the processor (there is a minimum number of cartridges per box) and credit the Foundation with your donation.

Calling All Leech Therapists! Help Draft Policy and Procedures — The BTER Foundation is compiling another guidance document, this time for leech therapy. If you or your facility has provided leech therapy, please contact the Foundation with your current Policy and Procedure. Our committees will assemble a policy document with expert recommendations.

BTER Foundation will soon accept members — The BTER Foundation Board of Directors has voted to amend its Articles of Incorporation and its bylaws so as to accept members. "Members will play an integral role in developing the future programs and services offered by the Foundation," writes the Director Ronald Sherman. "The community has increasingly come to expect educational programs and support from the BTER Foundation. Members will help give direction to our programs, and will have the opportunity to participate in their development."

MDT Workshops — Anyone interested in bringing the MDT Workshops to their city or facility should contact the BTER Foundation office at 36 Urey Court, Irvine, CA 92617; or telephone: 949-509-0989.

Veterinary Maggot Therapy

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ployed anywhere," she commented. "It has the added benefit of being inexpensive and sustainable, making it ideal for developing or remote practices."

Maggots are used less often in pets, but some small animal veterinarians are now using MDT for problematic dog and cat wounds. Dr. Howard Stevens at the Brookside Animal Hospital in Tulsa, OK, describes his experience this way: "Excellent results. What conventional therapy was unable to do, the maggots accomplished within two days. These lesions were literally unapproachable due to depth of abscessed, necrotic pockets."

Further information can be found at: www.BTERFoundation.org.

MDT Workshops - Where to next?

Story continues from page 1

tories, **TriLine**, and two of the Course Sponsors: **Cornerstone Hospital of Southeast Arizona** and the **BTER Foundation**.

Forthcoming courses are being planned for Riverside, CA (April, 2006), and possibly Texas. Contact the BTER Foundation if you would like to see the MDT workshops come to your town.

Equine Hirudotherapy

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toxin reaching the hoof by way of the bloodstream ("toxemia"), our group investigated the effect of using leeches to siphon the local blood supply at the affected hoof during an acute episode of laminitis. Over the past 8 months, we had the opportunity to try this technique on 4 animals afflicted with such. We applied 4 medical leeches to the laminae of each affected foot. Within 12 hours of treatment, the horses resumed their normal pacing behavior completely in all 4 cases.

Our success is very promising. This simple treatment of a very common, serious, and expensive illness deserves further study. If successful, hirudotherapy for acute laminitis could improve the lives of thousands of horses and horse owners. We are currently looking for funding and/or partners to advance our research.

Additional References:

Ben-Yakir, S.: Veterinary Hirudotherapy (VHT) or The Therapy That Sucks. *Journal of the American Holistic Veterinary Medical Association*, 2005; 24 (1): 11-18.



Dr. Sagiv Ben-Yakir is at "ORSHINA" — The Israeli Veterinary Institute for Holistic Medicine. E-mail: benyakir@netvision.net.il

**BIOTherapeutics, Education
& Research Foundation**

36 Urey Court
Irvine, CA 92617

Phone: 949-509-0989 / Fax: 949-509-7040

www.BTERFoundation.org

E-mail: info@BTERFoundation.org



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treasurer@BTERFoundation.org