

THE *Be*TER LeTTER

VOLUME 2, NUMBER 1

• SPRING, 2005

Maggot Therapy Workshop a Success

30 PARTICIPANTS, MANY MORE ON WAITING LIST

The first Maggot Debridement Therapy (MDT) Workshop sponsored by the Foundation was held at the Ayres Hotel & Suites in Costa Mesa, California, on January 29, 2005. By all measures, it was a big success.

Five faculty and several Foundation representatives conducted the all-day training, which included lectures on wound healing, diabetic foot ulcers, venous stasis ulcers, pressure

ulcers, general wound healing treatments, MDT indications and contraindications, and the principles behind successful MDT dressings. After lunch, groups of 5 or 6 attendees toured the UC Irvine Maggot Laboratory or freely rotated through the demonstration tables to see, practice, or discuss MDT dressing techniques.

The program was made possible as a result of private donations and corporate support.

“At first I worried about how we could put on this conference without charging registrants a lot of money,” declared conference organizer, Ronald Sherman. “But then most of the faculty donated their services, we received product donations for the demonstrations, and we received support from corporations like Smith and Nephew.”

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Practice makes better treatment: Faculty like physical therapist Allison Dunbar (seated) assisted workshop attendees as they practiced applying maggot dressings during the January 29 MDT Workshop.

Modern Hirudotherapy — A Review

Olga Glyova, DDS.; Perm, Russia

There is no doubt that hirudotherapy (leech therapy), is one of the oldest practices in medicine. For example, the use of leeches has appeared in ancient China, India, Greece, and pre-Columbian America. Mention of leeches' curative effects can be found in the works of Pliny, Galen, Themison, and Avicenna. Throughout the long history of medicine, interest in hirudotherapy (HT) has periodically risen and fallen. At times, HT was associated with medical

quackery. However, the past 2.5 decades have witnessed a resurgence of interest and respect for hirudotherapy among both physicians and patients.

HT takes advantage of several biological properties of medicinal leeches (*Hirudo medicinalis*). The first and best known is the blood-letting action (phlebotomy). The second property of medicinal leeches is their production of a variety of physiologically active

biochemicals that are injected with the saliva into the host. These bioactive substances have been shown to optimize conditions for tissue regeneration, suppress inflammation, and induce anticoagulation, pain relief (analgesia), neurological stimulation, host defense, and anti-oxidant pathways. The molecules most studied to date include hirudin, Factor Xa inhibitor, destabilase, plasma kallikrein inhibitors, prostanoids,

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Christine Rodriguez, physical therapist at Palm Springs Desert Regional Medical Center, demonstrates MDT dressing for Dr. LoPriore from Tucson (left) and Dr. Richard Russel from Westmead, Australia (right).

MDT Workshop Successful, Travels to Tucson in June

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“Corporate support of such events is good for attendees and good for the companies,” notes Co-chair and Foundation Secretary, Randall Sullivan. “MDT is performed within the context of conventional wound care before and after maggot dressings. Maggots are kept on wounds using standard dressing materials. Attendees need to see the types of dressing ma-

terials available so they will know what to use at their hospital or clinic to contain the maggots or to use after maggot debridement is complete.”

The Foundation has received many requests to repeat the MDT workshop. Another course is tentatively planned for the end of this year. The Foundation also is partnering with hospitals and schools to present the cur-

riculum in other regions of the country. The next workshop will be held in Tucson, Arizona, on June 25, 2005 (register through Tim Poore at Cornerstone Hospital of SE Arizona, 520-901-5542). Anyone interested in hosting, coordinating, or participating on the faculty of a workshop in their area should contact the BTER Foundation.

-- The Editorial Staff

Foundation Announcements

The BTER Foundation announces a survey of MDT indications — In the U.S., medicinal maggots are indicated “for debriding non-healing necrotic skin and soft tissue wounds, including pressure ulcers, venous stasis ulcers, neuropathic foot ulcers, and non-healing traumatic or post surgical wounds.” But occasionally medicinal maggots are used for other reasons. If you use MDT, please complete a survey to let us know when and why you use it. We will publish the results in a future issue of this newsletter. Download survey from: www.BTERFoundation.org/survey.htm.

Donating used printer cartridges helps the environment and supports the BTER Foundation — The BTER Foundation has teamed up with the UC Irvine Maggot Labo-

ratory and InkBank to benefit the Foundation and the environment by recycling used printer and fax ink cartridges. If you do not already recycle your inkjet or laserjet cartridges, or if you recycle them without any personal benefit, please consider letting us recycle them for you.

Centers for Medicare & Medicaid (CMS) decides not to assign HCPCS code to Medical Maggots — The 2005 Medicare HCPCS codes are out, and medical grade maggots are not included. CMS determined there was “[no] national program operating need to establish a new code.”

For now, we are told that therapists billing Medicare or Medicaid should use code A9270 (“non-covered item or service”) and thoroughly describe the device and its justification. Decisions



Attendees at the January 29 MDT Workshop enjoy snacks and music while reviewing study materials. The next Workshop is scheduled for June 25 in Tucson, AZ (register through Tim Poore, 520-901-5542). If you would like to host, sponsor, or partner with the Foundation to bring the MDT Workshops to your city, contact the BTER Foundation.

will continue to be made at the local, not national, level. Denials should be appealed if the treatment decisions can be defended. Supporting literature is available through the Foundation.

Remember: Do not withhold treatment because of financial concerns. Medicare and Medicaid usu-

ally reimburse reasonable expenses, even though there is no national requirement to reimburse for maggots. If your appeal is denied and your patient has inadequate financial resources for self-pay, simply apply for one of our Patient Assistance Grants. Updates on this topic will appear in future issues of *THE BeTER LeTTER*.

Biotherapy in the News

Maggot Therapy Policy & Procedures — Thanks to a team of experienced clinicians donating their time, a sample Policy and Procedures template is now available for anyone to download from the BTER Foundation internet site, www.BTERFoundation.org. The template can be modified to meet the individual

style and criteria of each institution. Pass it along to your colleagues who need help or guidance establishing MDT in their facility.

Maggot Therapy Begins in Iran— Entomologists and Surgeons teamed up in Iran to begin maggot

therapy. Their first patient was a 17 year old victim of a train accident, treated in January, 2005. The outcome was reportedly so successful that the treatment has since been used for diabetic foot ulcers, post-operative wound infections, and other wounds which failed conventional treatment. Team

members include Dr. Abbas Mirabzadeh, PhD (Senior Entomologist), Shahram Sharifi (biologist), Majid Mashayekhi (entomologist), Dr. Morteza John Nesari, MD (Orthopedic Surgeon), and Dr. Alireza Shafiei (Resident in Orthopedic Surgery).

Modern Hirudotherapy

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bdellins, eglins, hyaluronidase, collagenase, and histamine-like substances.

Leeches are now applied to treat a wide array of medical and surgical problems, with specific applications that vary regionally. For example, U.S. and European practitioners emphasize the value of leeches in microvascular and reconstructive surgery.¹⁻⁶ In microvascular surgery, during reattachment of a limb, arterial vessels can be repaired and reconnected surgically; but small veins cannot. After surgery, if blood successfully reaches the appendage but cannot be drained by venous or lymphatic channels, then the blood will pool in the appendage (a complication known as “venous congestion”). If the pooling blood increases pressure within the appendage—enough to prevent any more nutrient-rich arterial blood from reaching the site—then the reattached appendage will not survive. If the pooled blood hard-

ens to form a blood clot (thrombosis), again the appendage could be lost. Leeches are used effectively to phlebotomize (or suck the pooled blood from) the congested appendage. Leech-produced salivary analgesics make the procedure nearly painless, and salivary anticoagulants decrease the risk of thrombosis and maximize blood drainage by allowing the HT bite wound to continue oozing blood long after the leech is removed.

Currently, in Russia, HT is officially recognized by the Ministry of Public Health as a method of traditional medicine. This recognition is based on a growing body of research in leech biology and biochemistry that has radically changed our understanding about the local and systemic actions of medicinal leeches.

HT is used in the treatment of various cardiovascular diseases. HT provides relief of symptoms and improved cardiovascular function in mild hypertension and postinfarction

cardiosclerosis (induration of the heart, caused by fibrosis of the myocardium or cardiac muscle). HT is used to improve blood clotting function and treat venous disease such as thrombophlebitis and varicose varicose venous disease.⁷⁻¹¹

¹¹ In our team’s controlled clinical study of 137 patients with venous disease, significantly more of the leech-treated patients (67% vs 45% of the control patients, $p < 0.01$) obtained relief from symptoms (pain and heaviness), decreases in swelling and induration, and healing of their leg ulcers.^{12,13}

HT is used to control pain and swelling, and improve mobility in patients with osteoarthritis. In our non-randomized pilot study of 27 patients with osteoarthritis of the knee, we documented long-lasting improvements in mobility and symptomatic control in patients who received HT in combination with bromide-iodine baths. The same has been shown for systemic osteoarthritis.¹⁴⁻¹⁶

Russian medical literature documents the use of HT in the treatment of various eye diseases, including cataracts, glaucoma, traumatic injuries, and inflammatory conditions such as iridocyclitis and uveitis, chorioretinitis, and keratitis.¹⁹⁻²¹

In gynecology, HT is used to treat various conditions characterized by inflammation, pain, or abnormal bleeding.²²⁻²⁴ These include: endometriosis, parametritis, and mastitis. HT has been particularly useful in localized retrocervical and retrovaginal endometriosis, which often are not amenable to conservative or surgical therapy.²⁵⁻²⁷

HT is used in dermatology for treating diseases of the epidermis, such as psoriasis, lichen planus, and scleroderma. Plaques were cleared and local oxygenation was increased in patients receiving leech therapy for these disorders. In patients with lichen planus derma, HT is associated with decreased

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*Research Review -****Trichuris suis*** in the treatment of inflammatory bowel diseaseReviewed By **Catalina Wang**, Staff Writer

Inflammatory bowel disease (IBD), such as Crohn's Disease (CD) and ulcerative colitis (UC), is a class of gastrointestinal diseases caused by a deregulated response of the body's immune system to intestinal contents. As a result, patients suffer chronic inflammation of the intestinal lining and ultimately ulcerations and other bowel destruction. This manifests in painful and debilitating symptoms, including severe bouts of diarrhea, abdominal pain and cramping, blood in the stool, reduced appetite, weight loss, and fever.

The human immune response consists of two counter-regulatory patterns of T-helper (Th) lymphocyte secretion: Th1 and Th2. It is thought that IBD results from a failure of the body to downregulate a chronically overactive Th1 inflammatory process. However, it has been shown that, under experimental conditions, intestinal helminths can induce Th2 type inflammation

and can also non-specifically downregulate Th1 responsiveness. It is noteworthy that the prevalence of IBD is inversely proportional to the prevalence of helminthic parasites in the population. Therefore, colonization with intestinal helminths might be beneficial in reducing inflammation in patients with IBD.

Summers and colleagues at the University of Iowa Health Care tested this hypothesis. Their findings were published in 2003 in *The American Journal of Gastroenterology*. The purpose of their study was to evaluate the safety and efficacy of helminth ova in the treatment of active CD and UC. The results demonstrated that helminth therapy was both safe and effective in decreasing symptomatic disease.

The study subjects included seven patients with refractory IBD (four with CD and three with UC). All patients had chronic active symptoms, unresponsive to conven-

tional therapy. Patients were treated with a single dose of 2,500 live, pathogen-free *Trichuris suis* ova orally with 30 mL of Gatorade. This strain of helminth is a porcine parasite that will colonize human intestine but does not invade the host nor cause illness. The helminths are spontaneously eliminated from the body after several weeks.

After a single dose, patients were assessed biweekly for at least twelve weeks. Safety studies included blood chemistries and stool analyses. To assess efficacy, patients completed standardized surveys about their symptoms and their quality of life.

Study subjects suffered no adverse events due to the treatment, and they all improved clinically. Three of the four patients with CD entered remission; the fourth improved but did not achieve remission. All patients with UC achieved remission, one of whom later relapsed.

The mean duration of the treatment's effects was about eight weeks. After the twelve-week observation period, two CD and two UC patients received repeated doses of *T. suis* ova every three weeks for at least twenty-eight weeks. This trial of maintenance therapy demonstrated sustained benefits in three of the four subjects, without adverse effects in any of the patients. Thus, repeated doses of *T. suis* ova therapy appear to be safe and effective in achieving long term control of IBD.

Catalina Wang is a Staff Writer for *THE BeTER LeTTER*. She reviewed:

Summers RW, Elliott DE, Qadir K, Urban JF, Thompson R, and Weinstein JV: *Trichuris suis* seems to be safe and possibly effective in the treatment of inflammatory bowel disease. *American Journal of Gastroenterology* 2003; **98**, 2034-2041. The authors of this paper were given a copy of the manuscript for review and comment.

Publishing Credits

THE BeTER LeTTER is published by the **BioTherapeutics, Education & Research Foundation**
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Community Announcements

University of California Maggot Therapy Laboratory announces a labeling change to its **Medical Maggots**: "*Pseudomonas aeruginosa* wound infections may not be controlled by maggot therapy alone. Specific anti-pseudomonal therapy may be needed during, or be-

fore, treatment with Medical Maggots." Reminder: **Medical Maggots** are packaged for single use only; they are not approved for multi-dosing because opening the lid can lead to contamination of the maggots as they crawl along the rim, in and out of the vial.

Editorial -

Phaenicia sericata vs. *Pseudomonas aeruginosa*

In this issue of *THE BeTER LeTTER*, the UC Irvine Maggot Therapy Laboratory has posted a notice of their labeling change: Medical Maggots will now include a warning that *Pseudomonas* infections might not be eradicated by maggots. Additionally, there will be stronger language to discourage multi-dosing from maggot containers.

These changes were precipitated by a report from Florida that a patient with recurrent *Pseudomonas* wound infections, treated with maggot debridement therapy (MDT) over the weekend, returned Monday morning with a wound infection that was serious enough to prompt admission for possible sepsis. Fortunately, she was not septic; she was released home the following day. But *Pseudomonas aeruginosa* was cultured from her wound that Monday, and from the vial of maggots that had been saved over the weekend to be used for another treatment. This led to speculation that the maggots may have been

the cause of the wound infection. Further investigation revealed that the unusual susceptibility pattern ("antibiogram") was essentially identical to that of earlier cultures of *Pseudomonas* taken from the same patient over the previous month. Thus, it appears that the wound was already colonized or infected with this organism, which progressed over the weekend despite MDT. The vial of maggots, opened and closed at the bedside, was contaminated during the procedure.

Two important lessons can be learned. First, medicinal maggots may not eradicate all infections. Certainly they may not eradicate some *Pseudomonas* infections. The reasons for this remain obscure, as there is laboratory evidence of pseudomonal killing by the maggots (K. Mumcuoglu, personal communication). In questioning maggot therapists from around the world, it appears that *Pseudomonas* infections are now being recognized as an occasional problem for maggots. How thera-

Modern Hirudotherapy

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inflammation and lesion number, and with prolonged remission.²⁸⁻³⁰

In dentistry, HT complements conventional treatment for gingivitis and paradontitis by decreasing inflammation,

gingival edema and stomatorrhagia, and improving functional and hygienic indices. In patients with hypotrophic gingivitis and abscesses, HT can be used as monotherapy, avoiding surgical intervention. HT in dental practice needs special knowledge, techniques and appliances in order to provide psychological and physical comfort for patients, and to access hard-to-reach mucosal sites.³¹⁻³³

HT even has a place in neurology, being used to treat some forms of neuritis, neuralgia, infantile cerebral paralysis, fibromialgia and ischemic injuries.³⁴⁻³⁷

It is apparent that the spectrum of HT is very broad. The wide array of bioactive products, combined with its minimal side effects, has led many clinicians and researchers to apply leeches to a variety of illnesses. Modern techniques in biochemistry and molecular biology are finally helping to explain how they exert their beneficial actions.

REFERENCES are posted on our website

Dr. Olga Gilyova is Professor of Medicine at Perm State Academy of Medicine, Russia. She is also head of the Hirudotherapy Department of UST Health Resort in Russia, and a member of the Executive Committee of the International Biotherapy Society.

~ RA Sherman

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