BY DR. BRUCE E. BECKER

THE SCIENCE BEHIND THE SOAK

HEALTH BENEFITS YOU SHOULD BE SHARING WITH YOUR CUSTOMERS

Warm-water immersion has been found to produce a dramatic impact on the human autonomic nervous system (ANS).
Photo courtesy Caldera Spas

People have enjoyed warm-water immersion long before written history. In fact, many of the earliest habitation areas were established around natural hot springs, which allowed residents to take advantage of the benefits they had to offer. However, despite these facts, it is surprising that still today many people make little use of the warm-water environment for health advancement and preservation.

In recent years, a considerable amount of research has gone into assessing the impact of warm-water immersion and aquatic exercise on health. For instance, warm-water immersion has been found to produce a dramatic impact on the human autonomic nervous system (ANS) (*i.e.* involuntary nervous system), the component of the central nervous system that controls cardiovascular and gastrointestinal function, blood flow and distribution, muscle tone and even a great deal of brain activity. The ANS has two components: the sympathetic system and the parasympathetic system.

The sympathetic system

This system creates what is commonly termed the 'flight' or 'fight' mechanism. It is evoked during fear and prepares the body for combat and stress by raising blood pressure and heart rate, increasing muscle tone, and facilitating intense brain focus on the causes of that fear—be it a rattlesnake or an

THE INDUSTRY NEEDS TO WORK AGGRESSIVELY TO IMPROVE PUBLIC AWARENESS OF THE BENEFITS OF AQUATIC THERAPY BY USING SCIENCE, THE MEDIA, AND BEING PROACTIVE.

enemy combatant. It is also part of the central nervous system (CNS) that is in constant overload during post-traumatic stress disorder (PTSD).

The parasympathetic system

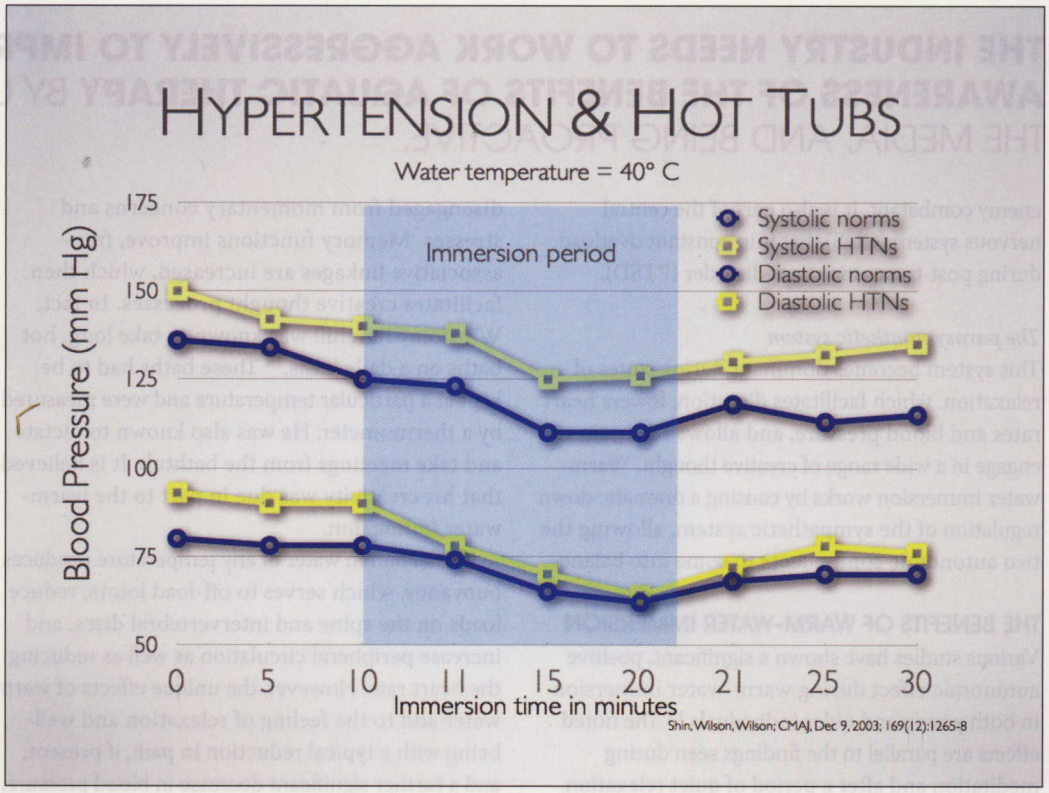
This system becomes dominant during states of relaxation, which facilitates digestion, lowers heart rates and blood pressure, and allows the brain to engage in a wide range of creative thought. Warm-water immersion works by causing a dramatic down regulation of the sympathetic system, allowing the two autonomic components to come into balance.

THE BENEFITS OF WARM-WATER IMMERSION

Various studies have shown a significant, positive autonomic effect during warm-water immersion in both young and older individuals.[1,2] The noted effects are parallel to the findings seen during meditation and after a period of quiet relaxation.

Warm-water immersion has also shown to reduce anxiety. During this relaxed state, the brain is disengaged from momentary concerns and stresses. Memory functions improve, free-associative linkages are increased, which then facilitates creative thought processes. In fact, Winston Churchill was known to take long, hot baths on a daily basis.[3,4] These baths had to be kept at a particular temperature and were measured by a thermometer. He was also known to dictate and take meetings from the bathtub. It is believed that his creativity was due in part to the warm-water immersion.

Immersion in water of any temperature produces buoyancy, which serves to off-load joints, reduce loads on the spine and intervertebral discs, and increase peripheral circulation as well as reducing the heart rate. However, the unique effects of warm water add to the feeling of relaxation and well-being with a typical reduction in pain, if present, and a further significant decrease in blood pressure. These effects can be beneficial in healthy people and very valuable to those suffering from health



During warm-water immersion, heart rate and blood pressure typically drop, peripheral circulation increases, and the efficiency of the cardiovascular system improves.
Diagram courtesy Dr. Bruce E. Becker

problems, such as heart disease, arthritis, anxiety disorders and depression.

Improving cardiac function

During warm-water immersion, heart rate and blood pressure typically drop, peripheral circulation increases, and the efficiency of the cardiovascular system improves. These effects have been translated into a number of studies of individuals with heart disease, showing the significant benefits of both simple immersion and aquatic exercise performed in a warm-water environment for these populations.[5,6,7]

Cardiac function improves because the heart does not have to exert as much force to circulate blood throughout the body thanks to reduced vascular resistance and a slower heart rate. In fact, several studies conducted to assess the impact of warm-water exercise—based on a frequency of three times per week—showed a lasting benefit.[8,9] It is unfortunate this is so poorly recognized within the health care industry, because if it were, overall public health would improve and healthcare costs would likely be reduced.

Relieving acute and chronic joint pain

Another common, well-researched public health issue is arthritis. For centuries, warm-water immersion has been used for the management of both acute and chronic joint pain. A number of studies conducted in the last 50 years have shown positive effects on both arthritic pain and function through warm-water aquatic exercise, while the benefits of simple, static warm-water immersion have received less attention.[10,11,12]

Simple immersion produces hydrostatic pressure on the body, which is the driving force to decrease joint swelling—both in acute arthritis as well as in post-operative joints—particularly in the knees, ankles and hips. As a result, this can facilitate pain reduction and increase joint movement.

Immersion also produces buoyancy, which off-loads weight from joints and further reduces pain to enable the performance of strengthening exercises. This, in turn, helps to improve balance, co-ordination, endurance and overall quality of life. In fact, as a result of these combined benefits, many studies of individuals with arthritis have shown sustained improvements in pain levels, gains in functional abilities, and improvements in mood and self-confidence.[13,14,15]

Treating fibromyalgia

While not a joint-specific problem, fibromyalgia is categorized within the same class as arthritic diseases. The actual cause of this disorder remains unknown and, for some, the available drug therapies can be problematic, resulting in significant side effects. As a result, this leaves fibromyalgia patients with limited options for treatment.

Similar to the benefits of warm-water immersion for arthritis sufferers, a substantial number of studies performed on patients with fibromyalgia

have shown warm-water exercise as well as simple immersion to be beneficial for muscle pain, strength, endurance, and overall health. It is quite safe to say no other medical intervention currently available for fibromyalgia offers such substantial benefits with so few side effects or such little risk.[16,17,18,19,20,21]

INCREASING THE RECOGNITION OF AQUATIC THERAPY

While the benefits of aquatic therapy have been recognized since prehistoric times, it is surprising there has been so little established within modern-day society, general medical practice, and research funding opportunities.

Unfortunately, for both general public health and the economic value of the industry, it is far easier to find federal funding for complex medical technology than for aquatic health benefits. While knowledge of the value of warm-water immersion is emerging, the level of public recognition remains low. To change this, the industry needs to work aggressively to improve public awareness by using science, the media, and being proactive.

NOTES

[1] See "Biophysiologic Effects of Warm Water Immersion," by B. E. Becker, K. Hildenbrand, R. K. Whitcomb, and J. P. Sanders, published by the *Journal of Aquatic Research & Education* 2009; 3 (1), pp 24-37. For more information, visit http://journals.humankinetics.com/ijare-back-issues/ijarevolume3issue1february/biophysiologiceffectsofwarmwaterimmersion.

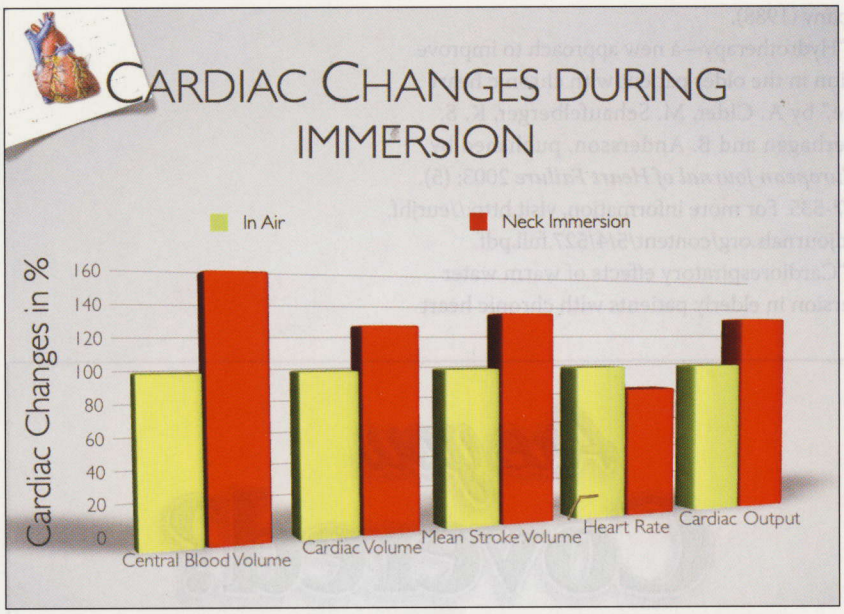
[2] See "Age-Dependent Autonomic Changes Following Immersion in Cool, Neutral, and Warm Water Temperatures," by K. Hildenbrand, B. E. Becker, R. K. Whitcomb, and J. P. Sanders, published by the *Journal of Aquatic Research & Education* 2010; 4 (2), pp 127-146. For more information, visit http://journals.humankinetics.com/ijare-back-issues/IJAREVolume4Issue2May/age-dependent-autonomic-changes-following-immersion-in-cool-neutral-and-warm-water-temperatures.

[3] See "The Last Lion: Winston Spencer Churchill: Visions of Glory, 1874-1932," by William Manchester, published by Little, Brown and Company (1983).

[4] See "The Last Lion: Winston Spencer Churchill: Alone, 1932-1940," by William Manchester, published by Little, Brown and Company (1988).

[5] See "Hydrotherapy—a new approach to improve function in the older patient with chronic heart failure," by A. Cider, M. Schaufelberger, K. S. Sunnerhagen and B. Andersson, published by *The European Journal of Heart Failure* 2003; (5), pp 527-535. For more information, visit http://eurjhf.oxfordjournals.org/content/5/4/527.full.pdf.

[6] See "Cardiorespiratory effects of warm water immersion in elderly patients with chronic heart



During warm-water immersion cardiac function improves because the heart does not have to exert as much force to circulate blood throughout the body.
Diagram courtesy Dr. Buce E. Becker

failure," by A. Cider, K. S. Sunnerhagen, M. Schaufelberger and B. Andersson, published by *Clinical Physiology and Functional Imaging* 2005; 25 (6), pp 313-317. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/16268981.

[7] See "Thermal vasodilation as a treatment of congestive heart failure: a novel approach," by C. Tei and N. Tanaka, published by *The American Journal of Cardiology* (1996); 27 (1), pp29-30. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/8683432.

[8] See note 6.

[9] See "Immersion in warm water induces improvement in cardiac function in patients with chronic heart failure," by A. Cider, B. G. Svealv, M. S. Tang, M. Schaufelberger and B. Andersson, published by *The European Journal of Heart Failure* 2006; (8), pp 308-313. For more information, visit http://eurjhf.oxfordjournals.org/content/8/3/308.full.pdf

[10] See "Hydrotherapy versus conventional land-based exercise for the management of patients with osteoarthritis of the knee: a randomized clinical trial," by L. E. Silva, V. Valim, A. P. Pessanha, L. M. Oliveira, S. Myamoto, A. Jones and J. Natour, published by *The Journal of the American Physical Therapy Association* 2008; 88 (1), pp 12-21. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/17986497.

For more information on the 'Science behind the soak,' visit the National Swimming Pool Foundation's (NSPF's) YouTube channel, http://www.youtube.com/user/NSPFSwimPoolFnd to view a six-part series of Dr. Bruce E. Becker's 2011 World Aquatic Health Conference presentation.

[11] See "Intensive dynamic training in water for rheumatoid arthritis functional class II—a long-term study of effects," by C. H. Stenstrom, B. Lindell, E. Swanberg, P. Swanberg, K. Harms-Ringdahl and R. Nordemar, published by the *Scandinavian Journal of Rheumatology* 1991; 20 (5), pp 358-365. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/1947899.

[12] See "Effectiveness of Arthritis Foundation Aquatic Program on Strength and Range of Motion in Women with Arthritis," by R. Suomi and S. Lindauer, published by the *Journal of Aging and Physical Activity* 1997; 5 (4), pp 341-351. For more information, visit http://journals.humankinetics.com/japa-back-issues/japavolume5issue4october/effectivenessofarthritisfoundationaquaticprogramonstrengthandrangeofmotioninwomenwitharthritis.

[13] See "The Effect of Aquatic Exercise and Education on Lowering Fall Risk in Older Adults With Hip Osteoarthritis," by C. M. Arnold and R. A. Faulkner, published by the *Journal of Aging and Physical Activity* 2010; 18 (3), pp 245-260. For more information, visit http://journals.humankinetics.com/japa-back-issues/JAPAVolume18Issue3July/TheEffectofAquaticExerciseandEducationonLoweringFallRiskinOlderAdultsWithHipOsteoarthritis-5588194.

[14] See "Does hydrotherapy improve strength and physical function in patients with osteoarthritis—a randomised controlled trial comparing a gym based and a hydrotherapy based strengthening programme," by A. Foley, J. Halbert, T. Hewitt and M. Crotty, published by the *Annals of the Rheumatic Diseases* 2003; 62 (12), pp 1162-1167. For more information, visit http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1754378/.

[15] See note 10.

[16] See "A randomized controlled trial of deep water running: clinical effectiveness of aquatic exercise to treat fibromyalgia," by M. R. Assis, L. E. Silva, A. M. Alves, A. P. Pessanha, V. Valim, D. Feldman, T. L. Neto and J. Natour, published by *Arthritis & Rheumatism* 2006; 55 (1), pp 57-65. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/16463414.

[17] See "Effectiveness of aquatic therapy in the treatment of fibromyalgia syndrome: a randomized controlled open study," by D. Evcik, I. Yigit, H. Pusak and V. Kavuncu, published by *Rheumatology International* 2008; 28 (9), pp 885-890. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/18278501.

[18] See "Cost-utility of an 8-month aquatic training for women with fibromyalgia: a randomized controlled trial," by N. Gusi and P. Tomas-Carus,

IN RECENT YEARS, A CONSIDERABLE AMOUNT OF **RESEARCH HAS GONE INTO ASSESSING THE IMPACT OF WARM-WATER IMMERSION AND AQUATIC EXERCISE ON HEALTH.**

published by *Arthritis Research & Therapy* 2008; 10 (1), R24. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/18294367.

[19] See "Pool exercise combined with an education program for patients with fibromyalgia syndrome. A prospective, randomized study," by K. Mannerkorpi, B. Nyberg, M. Ahlmen and C. Ekdahl, published by *The Journal of Rheumatology* 2000; 27 (10), pp 2473-2481. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/11036846.

[20] See "Exercise in warm water decreases pain and improves cognitive function in middle-aged women with fibromyalgia," by D. Munguia-Izquierdo and A. Legaz-Arrese, published by *Clinical and Experimental Rheumatology* 2007; 25 (6), pp 823-830. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/18173915.

[21] See "Aquatic training and detraining on fitness and quality of life in fibromyalgia," by P. Tomas-Carus, A. Hakkinen, N. Gusi, A. Leal, K. Hakkinen and A. Ortega-Alonso, published by *Medicine & Science in Sports & Exercise* 2007; 39 (7), pp 1044-1050. For more information, visit http://www.ncbi.nlm.nih.gov/pubmed/17596770.

Dr. Bruce E. Becker, MS, an internationally recognized expert in the field of aquatic therapy, is a clinical professor in the Department of Rehabilitation Medicine at the University of Washington, and an adjunct research professor at Washington State University where he directs the National Aquatics & Sports Medicine Institute. He is the editor and co-author of *Comprehensive Aquatic Therapy*, and has written, researched and lectured extensively in the field of aquatic therapy for more than 30 years. Becker also serves as the director of aquatic health benefit research at the National Swimming Pool Foundation (NSPF) and is a frequent presenter at the World Aquatic Health Conference (WAHC). To view his seminars online, visit www.nspf.org. Becker can be reached via e-mail at aquaticdoc@msn.com.

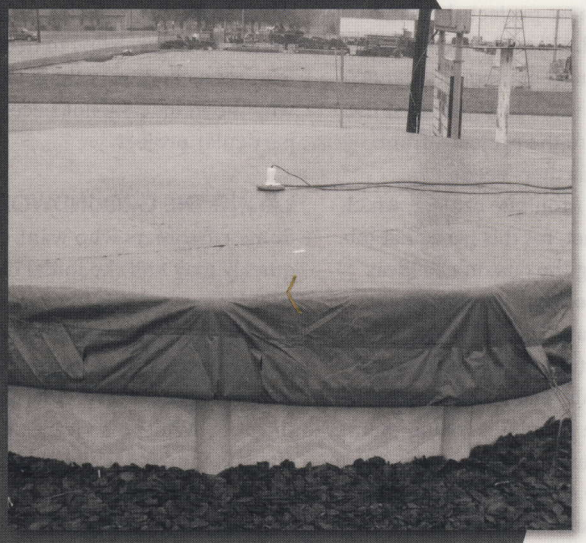
Hurricane POOL
Above Ground Covers

The *ONLY* cover guaranteed not to blow off!


sewn on pockets hold sand or water tubes


customers have the choice....water tube


or sand tube



DISTRIBUTION OR DEALERS WANTED
40% to 50% margins

- Hurricane Pool Covers will replace all existing covers being offered today.
- Twice as thick as regular covers
- Our revolutionary patented design is the greatest improvement to above ground covers in the past 50 years
- Comes with everything needed to install
- 24' round retails for 219.95
- Never touches the water unless there is a heavy snow load.
- Works great with full or partial decks

The Cover Company
270-454-0343
www.hurricaneabovegroundpoolcovers.com
hurricanepoolcovers@gmail.com