NEW HELP FOR MS PATIENTS

Multiple sclerosis (MS) is a chronic, progressively disabling disease of the central nervous system that strikes men and women in the prime of life. Wasting of the nerves, caused by loss of a body substance known as myelin, can affect thought processes, vision, dexterity, balance and sensation.

Myelin normally forms a coating around the nerves like insulation around a wire. This insulation allows signals to be conducted through the nervous system; conversely, its absence bars proper functioning of the nervous system. More than 30 years ago it was discovered that body cooling can produce a dramatic improvement in MS symptoms. Experimental data shows that conduction can be temporarily restored to "demyelinated" nerves by cooling the body's core temperature only one degree Fahrenheit. Therefore, physicians have long used cold showers, pools and air conditioning to lower the body temperatures of MS patients.

A SPACE-DERIVED PERSONAL COOLING SYSTEM HEADS A SAMPLING OF SPINOFF DEVELOPMENTS IN THE FIELD OF HEALTH AND MEDICINE

Such treatment is sometimes useful but it has drawbacks. It is not practical for severely disabled patients and it can be uncomfortable. Moreover, patient immersion in a pool can sometimes be self-defeating, because body mechanisms — such as shivering and vasoconstriction (constriction of the blood vessels) — go to work to prevent a drop in core temperature.

However, many patients are now benefiting from a body cooling technique that does not require immersion, nor does it induce shivering or vasoconstriction. It involves use of a "cool suit," a device more formally known as the Mark VII MicroClimate® Medical Personal Cooling System. The suit, which consists of a head cap and a torso vest, is a spinoff from space technology developed by Life Support Systems, Inc. (LSSI), Mountain View, California. The Mark VII is being used to treat symptoms of MS and other illnesses where temperature regulation can be beneficial, such as HED (hypohidrotic ectodermal dysplasia), peripheral neuropathy, epidermolysis bullosa, spina bifida and cerebral palsy.

The Mark VII system includes a control console — either fixed or portable versions — with a cooling unit and a pump. The pump circulates a water-based fluid, cooled to about 50 degrees Fahrenheit, through "veins" or tubes in the vest and cap. Due to its efficient heat transfer, it can lower a patient's core temperature one degree Fahrenheit in 30 to 40 minutes, with sometimes dramatic improvement in symptoms that continues for two to four hours after a cooling session.

The cooling system is not a cure, nor does it help every MS patient. It has, however, helped many patients although it is still relatively new, and those for whom it works are lavish with their praise. LSSI has received a number of testimonials like this from author/journalist Charles Fox:

A multiple sclerosis (MS) patient at a Glassboro, New Jersey barrier-free housing facility is using a spinoff "cool suit" to lower her temperature and alleviate MS symptoms. The suit consists of a head cap, a torso vest and the cooling unit shown in the foreground. With the patient is John Hodson, Sr., founder and president of the Multiple Sclerosis Association of America, which has placed cool suits in more than 50 MS care centers in the U.S.

"It improves my speech, breathing and thinking. I have fully integrated the use of the Mark VII into my life. It's part of my life, and has brought me more relief than anything I have tried in the last twenty-three years." And this from registered nurse Sharon Giberson: "My neuropathy, speech and overwhelming fatigue improves. My depression subsides. I am blessed with a better quality of life and wouldn't want to live without it (the Mark VII)."

The Multiple Sclerosis Association of America (MSAA) has sponsored a 12-week, 12-patient detailed study of the effectiveness of the MicroClimate system; the study was conducted by Dr. Wallace Tourtellotte of the UCLA Medical Center. Final results were pending at publication time, but a preliminary report indicated that most subjects experienced reduced fatigue and improved mobility immediately after and up to three hours after cooling; four patients reported long term improvements in life quality over the six weeks in which they received daily cool suit treatments.

More MS patients will have the opportunity to see what the cool suit can do for them, since MSAA is expanding the availability of MicroClimate cooling. The association has bought and placed cool suits in more than 50 MS research care centers in the U.S. and it is estimated that, through these clinics, more than 100,000 MS patients will be able to get MicroClimate treatment. (Continued)

® MicroClimate is a registered trademark of Life Support Systems, Inc.

Life Support Systems, Inc. (LSSI) did not start out with the intention of producing medical systems. The medical application of the company's cooling technology sought the company. It resulted from nationwide publicity when LSSI began providing cool suits for children afflicted with HED (hypohidrotic ectodermal dysplasia), who have no natural cooling system because they were born without sweat glands. The extraordinary success that accompanied use of the LSSI Mark VII MicroClimate System for alleviating HED symptoms prompted a flood of inquiries from people in the U.S. and abroad about the LSSI cooling technology and sparked development of units especially designed for medical applications.

By that time — in the latter 1980s — LSSI was already an established company, a NASA spinoff company, in fact; its entire line of temperature regulation products stemmed from a NASA technology that the company modified and refined to produce a variety of cooling systems for military, recreational and industrial applications.

The MicroClimate technology had its origin in a 1968 NASA development program at Ames Research Center that produced a spacesuit undergarment for cooling astronauts on the surface of the moon or during extravehicular forays outside a spacecraft or space station; the system circulated a fluid, cooled by a heat exchanger and delivered by a battery-powered minipump, through a network of tubes in the garment.

In 1971, Ames awarded a contract to Acurex Corporation for an extension of the technology: a heat stress alleviating liquid-cooled helmet liner for helicopter pilots. In the mid-1970s, NASA, Acurex and the Bureau of Mines carried the technology a step further with development of a self-contained cooling system for mine rescue work.

In 1980, William Elkins, formerly with Acurex and long associated with cooling system research, founded LSSI to pursue commercial uses of the technology. In the years since, LSSI has refined the technology and brought to the commercial marketplace three generations of improvements.

The Life Support Systems, Inc. (LSSI) Mark VII cooling/control unit can be mounted on the rear platform of a patient's wheel chair; the unit feeds fluids to the cool suit through an umbilical tube. In the near photo is an alternative type of vest cooled by a quick-change ice cartridge.

Wearing an LSSI Integrated Cooling System (blue chest pack and cap), a Hazmat team member is helped into a protective vapor suit by a teammate. The chest pack includes a cooling cartridge and controls.

The company has grown into a thriving business that has expanded both horizontally — more and more applications — and vertically — increasing orders for some of the principal applications. MicroClimate cooling systems are in service with U.S. and foreign military services who must perform arduous tasks while wearing hot and bulky protective gear; for airmen flying unpressurized aircraft; for armored vehicle crews; and for shipboard personnel engaged in such heat stressful work as operations in boiler rooms or steam catapult rooms.

The range of civil applications is even broader. It includes protection for public service and industrial firefighters, plus workers in such industries as nuclear power, primary metals reduction, glass manufacturing, chemical processing, petrochemical refining, paper production, steel mills and foundries, and agricultural crop dusting.

LSSI has also moved into the sports and recreational field by providing cooling equipment for professional race car and hydroplane drivers; the list of users reads like a Who's Who of those sports.

For its importance and broad potential, LSSI's cool suit was elected to the U.S. Space Foundation's Space Technology Hall of Fame in 1993.

LSSI recently introduced a MicroClimate unit especially designed for hazardous materials handlers who must wear protective clothing for long periods. This system, along with the medical systems, represents a fourth generation of LSSI development of the original technology. The company expects to sell between 5,000 and 10,000 MicroClimate systems over the next five years — and that doesn't include the hazmat and medical systems, whose sales potential have not yet been evaluated. •

A variation of the MS patient's cool suit is the Mark I Surgical Personal Cooling System for medical personnel who must wear protective clothing in hot operating room environments.