

# sportswave®

Professional Neuromodulation  
Pain Therapy System



# The Future of Pain Relief Has Arrived.

The Sportswave® Neuromodulation Pain Therapy System is a first course therapy for treating chronic, acute or post-surgical musculoskeletal pain.

Clinical studies have shown that Sportswave® can be used to reduce pain and improve function including an increase in range of motion, decrease in stiffness and reduction of muscle spasm for up to 24 hours following a single 30-minute treatment.

Sportswave® can be used to treat numerous locations on the body including the lower back, cervical spine, hip, knee, shoulder, ankle, foot,

elbow, wrist and hand. In addition, Professional Athletic Trainers report excellent results treating pain from ligaments, tendons and sprains.

Professional athletes that use Sportswave® have reported they experience better pain relief and functional improvement than with any other electrical stimulation modality and choose to be treated with Sportswave® everytime they return to the training room.



## SPORTSWAVE® SYSTEM

The Sportswave® System is comprised of Biowave's portable professional physician device called Deepwave® and non-invasive Sportswave® Electrodes. This system is ideal for professional and college sports, athletic training and physical therapy applications.

## How is Sportswave® Superior to TENS?

### Patented Advanced Electrical Signal Technology

All of Biowave's devices deliver a patented proprietary electrical signal technology into the body, which differs from conventional TENS as follows:

First, low frequency signals (1-180Hz in frequency) are required to affect pain fibers in the body. However electrical signals in this frequency range cannot pass through the skin because of the skin's impedance and capacitance. TENS devices try to deliver low frequency signals between 2 or 4 electrodes. The effect is a "busy bees" sensation on the skin in between the electrodes. TENS may act as a distraction to the pain while the device is on (this is known as Gate Control Theory), however there is little residual benefit and no functional improvement following the treatment.

In developing Biowave's technology, we knew that high frequency signals (greater than 1000Hz in frequency) can easily pass through the skin, but individually, such signals do not affect pain fibers.

Biowave discovered and patented that when 2 or more high frequency signals are combined together in our device and then delivered into the body through a single electrode, the signals will pass into deep tissue in the body to a second opposing electrode. As the combined high frequency signals pass through the body, polarized structures like the membrane of the C-fiber and muscle tissue force these signals to further multiply together resulting in a new spectrum of signals in the body. One of the new signals formed in deep tissue inside the body is a low frequency signal that inhibits the transmission of pain signals along pain fibers. Additionally, muscle tissue is held in contraction in the region of the electric field which may relate to the increased functional outcomes reported by patients and in clinical trials.

### Targeting of Electric Field and Different Electrode Placement Rationale

Sportswave® uses 2 different sized electrodes—typically, a smaller round Pain Site electrode and a larger rectangular Feed Electrode. The smaller round Pain Site Electrode is always placed directly over the center of the painful area.



Feed Electrode, Pain Site Electrode, and Leadwire Cable

The larger rectangular Feed Electrode is generally placed over a secondary point of pain or in an opposing location. This is because the mixing of the high frequency signals from the device are concentrated in a 2"–3" volume of tissue beneath both electrodes—not along the surface of the skin between electrodes.

The pairing of different sized electrodes causes the low frequency field to be concentrated under the smaller area electrode and into a specific volume of tissue encompassing the pain site.

With TENS, the signal travels along the surface of the skin between 2 or 4 electrodes and the effect occurs on the surface between the electrodes, not underneath each electrode, so it is difficult to target the pain site.

In Biowave's first dosage study conducted at Weill Medical College of Cornell University/New York Hospital, we determined there are an optimal set of high frequency signals for delivering energy into the body and an optimal low frequency signal that forms in deep tissue for inhibiting pain transmission and improving function. This resulted in the design of a very simple to use device that is purposely not programmable and from which an optimized set of signals are delivered into deep tissue.

### Empirical Results Unique to Sportswave®

Empirical results produced by Sportswave® which are *not* generated by conventional electrical stimulation devices include:

- Long carryover effect following a 30-minute treatment—up to 24 hours;
- Paresthesia at the location of the pain site electrode;
- Muscle in the region of the low frequency electric field is held in contraction during the course of the treatment; there is typically no muscle fasciculation or twitching.

### Accelerated Rehabilitation

As part of a rehabilitation regimen, Sportswave® should be used prior to or during the exercise portion of the physical therapy regimen.

The typical regimen for physical therapy is to begin with heat, continue with the exercise portion of the therapy, and finish with electrical stimulation in conjunction with ice. However, with Sportswave®, the regimen and practice habit must be changed.

By using Sportswave® first, in place of heat, the patient obtains a significant long acting period of pain relief as well as a functional improvement including an increase in range of motion. As a result, during the exercise portion of the regimen, the patient can handle more resistance through a greater range of motion, which is the whole key to getting better faster. Plus, there is a significant reduction in post-exercise pain. At the end of the physical therapy regimen, ice can still be used on its own, or if desired, in conjunction with Sportswave® therapy.

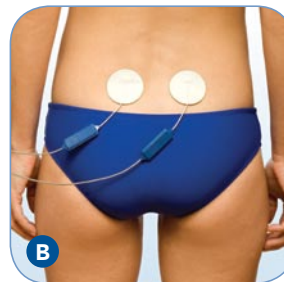
## SAMPLE ELECTRODE PLACEMENTS

Sportswave® Electrode placements are different from conventional electrical stimulation. The mixing of the proprietary therapeutic signals occurs in a 2"–3" volume of tissue beneath each electrode, not along the surface of the skin between the electrodes. As a result, the small round electrode

is placed directly over the pain site. The larger rectangular electrode is placed over a secondary point of pain or in an opposing location. In some cases, 2 same sized electrodes may be used for bilateral pain where each electrode is placed directly over a painful area.



Low Back Pain in One Location



Bilateral Low Back Pain



Lateral or Medial Knee Pain



Patellar Tendinitis



Front or Top of Shoulder Pain



Cervical Pain in One Location or Back of Shoulder Pain



Wrist, Hand or Finger Pain




Lateral or Medial Epicondylitis



Foot or Ankle Pain

**B** Bilateral **E** Extremities **U** Unilateral

See back cover for electrode descriptions.

PRODUCT SPECIFICATIONS	ORDERING INFORMATION																				
<p><b>Physical Dimensions</b></p> <p><b>Size (H x W x D):</b> 8.80" x 6.31" x 3.07" / 22.35 cm x 16.02 cm x 7.79 cm</p> <p><b>Weight:</b> 2.9 lbs / 1.3 kg</p> <p><b>Environmental Conditions</b></p> <p><b>Operating Temperature:</b> 0 – 40 °C / 32 – 104 °F</p> <p><b>Humidity:</b> 30 – 85% relative humidity, non-condensing</p> <p><b>Signal Output</b></p> <p><b>Feed Frequency 1:</b> 3858 Hz</p> <p><b>Feed Frequency 2:</b> 3980 Hz</p> <p><b>Output Voltage Range:</b> 0 – 27.5 V rms</p> <p><b>Waveform:</b> Sum of 2 sine waves</p> <p><b>Power Source</b></p> <p>12 V DC, 3850 mAh rechargeable NiMH battery</p> <p>Provides 8 hours of power at 80% output into 500 Ohms</p> <p><b>Leadwire</b></p> <p>Rating complies with 21 CFR Part 898 (performance standards for electrode leadwires)</p> <p><b>Electrodes</b></p> <p>Sportswave® Electrodes are of a silver/carbon construction with a pre-applied hydrogel and are cleared for marketing under 510(k) numbers K962332, K900519 and K915333.</p>	<table border="0"> <thead> <tr> <th>Item</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>SWD001</td> <td>Sportswave® Device</td> </tr> <tr> <td>SWE001 ⓑ</td> <td>2 Sportswave® Large Pain Site Electrodes (2" diameter) for ⓑ bilateral low back, bilateral cervical and knee electrode placements.</td> </tr> <tr> <td>SWE002 ⓔ</td> <td>1 Sportswave® Small Pain Site Electrode (1.375" diameter), with 1 Sportswave® Small Feed Electrode (2" x 4") for use on ⓔ extremities such as the knee, ankle, foot, shoulder, elbow, wrist and hand.</td> </tr> <tr> <td>SWE003 Ⓤ</td> <td>1 Sportswave® Large Pain Site Electrode (2" diameter) with 1 Sportswave® Large Feed Electrode (5" x 8") for Ⓤ unilateral low back, buttock, hip, quadricep and hamstring electrode placements.</td> </tr> <tr> <td>SWL001</td> <td>Sportswave® Leadwire Cable</td> </tr> <tr> <td>DWB001</td> <td>Battery</td> </tr> <tr> <td>DWA001</td> <td>AC Adapter and Power Cord - US</td> </tr> <tr> <td>SWU001</td> <td>Sportswave® User's Manual (English)</td> </tr> <tr> <td>SWQ001</td> <td>Sportswave® Quick Reference Card</td> </tr> </tbody> </table> <p><b>biowave</b> </p> <p>Manufactured by Biowave Corporation 16 Knight Street Norwalk, CT 06851</p> <p>T: 1-877-BIOWAVE E: info@biowave.com W: www.biowave.com ©2008 Biowave Corporation</p>	Item	Description	SWD001	Sportswave® Device	SWE001 ⓑ	2 Sportswave® Large Pain Site Electrodes (2" diameter) for ⓑ bilateral low back, bilateral cervical and knee electrode placements.	SWE002 ⓔ	1 Sportswave® Small Pain Site Electrode (1.375" diameter), with 1 Sportswave® Small Feed Electrode (2" x 4") for use on ⓔ extremities such as the knee, ankle, foot, shoulder, elbow, wrist and hand.	SWE003 Ⓤ	1 Sportswave® Large Pain Site Electrode (2" diameter) with 1 Sportswave® Large Feed Electrode (5" x 8") for Ⓤ unilateral low back, buttock, hip, quadricep and hamstring electrode placements.	SWL001	Sportswave® Leadwire Cable	DWB001	Battery	DWA001	AC Adapter and Power Cord - US	SWU001	Sportswave® User's Manual (English)	SWQ001	Sportswave® Quick Reference Card
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