

# Neuropak

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**How it works, Research, Medical Reviews, and Product Specs**

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## **PATENT PENDING**

Traditional models of human performance rely heavily on basic strength and conditioning strategies. While these are mildly effective, these models do not translate into real-time athletic skill development.

Our clients are unique in their needs and demand a realistic approach that focuses on athletic performance in ever-changing environments. Essentially the patent-pending device lets you train like you play, assess while you train, and correct in real-time.

**The problem: There is a disconnect between skill development and traditional strength and conditioning.**

**Train Like You Play**

**Unrestricted performance patterns  
specific to the individual athlete and  
directly applicable to the skills needed in  
real-world environment's**

**The benefits of the 1109 Bravo Neuropak  
device include:**

- 1.** Neuro-Cognitive Learning –  
Accelerated Performance-Based  
Learning, Decision-making process.

2. Neuromuscular Conditioning – Quicker reaction and sustainability of any critical skills
3. Neuromuscular Re-education – The **Neuropak** increases power, provides lasting endurance, better coordination, ability to repeat maximum force in the desired direction with less effort and concentration.
4. Training Efficiency – 1109 Bravo **Neuropak** transitions users away from ineffective training methods and bad habits, develops strength and endurance, new ranges of motion, enhances posture, refines and conditions skills.
5. Injury Prevention – 1109 Bravo **Neuropak** self-corrects movement patterns that create injury and reduce performance, directs skill performance

toward the correct methodology that reduces injury and allows for effective and efficient performance

6. Aerobic/anaerobic Conditioning of the cardiovascular system – Due to an intense Co-contraction that the device places on the kinetic chain throughout the body simultaneously, there is an increased demand and conditioning of the cardiovascular system to drive blood and oxygen throughout the body to all the contracting muscles
7. Force Coupling of the muscles by activating “muscle groups” rather than an isolation exercise. This will ultimately increase stability in the joint or region that is engaged, increase proprioception, and decrease the likelihood of injury. **SEE PNF**

## **PRINCIPLES BELOW FOR MORE DETAIL**

The 1109 Bravo **Neuropak** training system bridges the gap between functional skill specific performance training, corrective exercise (injury rehab/prevention) and is a comprehensive assessment platform.

### **How it Works:**

The human body is equipped to adapt/learn and stabilize itself through homeostasis. By nature of training in the skills needed for your specific sport or occupation and not disconnecting cardio, strength training, skill development. You will condition your cardiovascular (fitness), nervous system,

brain, endocrine system (regulates hormones) specific to your critical skills. So, the brain, cardiovascular system, endocrine system (regulates hormones) and nervous system when put in those environments will intuitively know what to do and become much more efficient through skill specific conditioning utilizing the **Neuropak**.

The **Neuropak** is a wearable training system that will support and accelerate the human body's natural ability (homeostasis) to adapt, learn and grow in the dynamic environments that may be required through neuromuscular engagement.

The **Neuropak** doesn't define your potential. The **Neuropak** allows you to

reach true potential by supporting your efforts through user-defined technology.

## **“Sharpen your Brain, Sharpen your Game”**

The two areas of human development that are strategically targeted in the areas of Neuroplasticity and Proprioception.

Neuroplasticity, also called brain plasticity, is the process in which your brain’s neural synapses and pathways are altered as an effect of environmental, behavioral, and neural changes.

This is accomplished by **Neuropak** primarily due to strengthening with resistance in a functional way. The key component is task specific functional testing and training.

Neuroplasticity for lack of better words is reprogramming the hardware “central nervous system” in your body starting in the brain that will send faster conditioned “reflex signals” that are specific to elite critical skill patterns and be sustainable even under fatigue.

Proprioception: The ability for joints and limbs to sense stimuli arising within the body regarding the position, motion, and equilibrium. Even if a person is blindfolded, he or she knows through proprioception if an arm is above the head or hanging by the side of the body

To improve or retrain proprioception, weight bearing through upper extremities during exercise helps train proprioception. In addition outside perturbations from

bands during all exercises improves proprioception as well.

Currently, the method of developing speed and reflex in these movements are done by repetitive drills.

The **Neuropak** is a training system that not only develops neuroplasticity and increased proprioception. It does so in a fraction of the time while taking a much more comprehensive approach to affect the aerobic/anaerobic conditioning "fitness" but, also will allow for assessment of skill competencies and directly improve performance.

The **Neuropak** Training System bridges the gap between functional skill specific performance training, corrective exercise

(injury rehab/prevention) and is a comprehensive assessment platform.

### **Assess While You Train:**

The **Neuropak** allows teams to identify with induced fatigue protocols an individual's proficiencies against their teammates which provides the individual and the entire team an opportunity to be confident that each member is dialed in at the same level.

### **Correct in Real-Time:**

Identify biomechanical deficits such as "right-hand dominance" or "external rotation of the knee" and have the ability to rehabilitate and correct the deficiency by

training with the device during your current training regimen.

## **Neuro-Cognitive Learning/Embodied Cognition for learning:**

A great deal of the scientific research and academic dialogue related to brain-based learning has been focused on *neuroplasticity*—the concept that neural connections in the brain change, remap, and reorganize themselves when people learn new concepts, have new experiences or practice certain skills over time.

Scientists have also determined, for example, that the brain can perform several activities at once; that the same information can be stored in multiple areas of the brain; that learning functions can be affected by diet, exercise, stress, and other conditions;

that “meaning” is more important than “information” when the brain is learning something new.

For example, instructors may design lessons or classroom environments to reflect conditions that facilitate learning—e.g., they may have students engage in physical activity with different environmental stressors.

When the CNS and PNS are properly engaged with the 1109 Bravo **Neuropak**. It will stimulate the nervous system and make it more receptive to receiving and sending chemical signals which will accelerate learning the task or skill in the context of the leadership, problem-solving, and decision making.

One of the key principles in learning and putting the nervous system in the right mode is mindfulness of the task being performed. Basically, focusing and getting into the zone of what you are doing.

## **Non-Stimulate Based Cognitive Enhancement**

With the **Neuropak** we can avoid the stimulate based supplements (Monster drinks, 5-Hour Energy) and drugs (Adderall, Provigil, NuVigil, etc..) by naturally engaging the endocrine system to release dopamine, serotonin, amongst other hormones through activation of the motor neurons and PNS. Stimulates by nature will de-sensitize the nervous system and the individual will "crash" without additional artificial stimulates thus creating dependency.

## **Homeostasis:**

The human body is equipped to adapt/learn and stabilize itself through homeostasis. By nature of training in the athletic skills needed and not disconnecting cardio, strength training, skill development. You will condition your cardiovascular (fitness), nervous system, brain, endocrine system (regulates hormones) specific to your critical skills. So, the brain, cardiovascular system, endocrine system (regulates hormones) and nervous system when put in those environments will intuitively know what to do through skill specific conditioning utilizing the **Neuropak**.

## **Neuropak Specs:**

The **Neuropak** is 2.5 lbs. and created from carbon fiber and titanium. It is fully adjustable on each side for desired

resistance level and each unit is built and adaptable to heights ranging from 5' to 6'5" with no additional modifications. The resistance has a very low level of hysteresis (even tension) and provides the nervous system with smooth loading not to disrupt or overload the skill pattern by sending varied signals to the motor neurons.

### **Additional Videos:**

#### **Football:**

<https://youtu.be/X9oEqnCBgTE>

<https://youtu.be/blg4-AX5ol4>

#### **Golf:**

<https://youtu.be/oP5tARSlqsY>

## **Youth Baseball:**

<https://youtu.be/dncfwUAnMiQ>

<https://youtu.be/4St4cVxY00Q>

## **Special Operations:**

<https://vimeo.com/264006346>

<https://vimeo.com/264001979>

<https://vimeo.com/263999148>

## **Principles that are used with the Neuropak:**

- Tactile input principle <http://neuropedicspt.com/blog/forprofessionals/2015/8/30/proprioceptive-input>

The ability of the **Neuropak** to add tactile input to key muscles and joint DURING a sport or job-specific task is KEY. This allows the user to better train the correct positioning and activation of the muscle groups that are actually used during the activity.

- 2) Proprioception In regards to Tactile input the proprioception of the associated joints and muscles will allow training during the activity that would take hours of training with NON-sport or job-specific tasks.
  
- 3) Co-contraction/Force Coupling

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3257849/>

<https://caloriebee.com/workout-routines/Exercise-for-Stomach-Muscles>

By having multiple points of resistance there is thought to be a natural tendency for stabilizing muscles groups and core muscles to activate. In addition, there is co-contraction that happens between core muscles, lower extremities, and upper extremities. Co-contraction is known to improve the stability of the associated joints and muscles. By activating core and stabilization muscles groups during a sport or job-specific activity you will improve muscle and joint endurance and performance during live sport or job-specific activities.

**The Neuropak Training System bridges the gap between functional skill specific performance training, corrective exercise (injury rehab/prevention) and is a comprehensive assessment platform.**

## **Product Testing**

On Friday 7/14/17 at the Warrior Expo in Virginia Beach, Joel Huntgate, the VP of Orthopedic Programs at DARI tested the **Neuropak** and submitted reports on the Function Motion Analysis. The results were as follows:

DARI **without Neuropak** scored a HIGH of 55 on the dysfunction scale

DARI **with Neuropak** scored immediate correction to a LOW of 37 on the dysfunction scale

### **Key Takeaways from DARI Analysis:**

1. Significant effects noted on balance, stability, control, and sway in center of mass with the **Neuropak**.
2. Immediate increase in quality of upper body movement (less multiplanar deviation), increase in global thoracic mobility 17 degrees of asymmetry to and immediate correction to 3.5 degrees, and improvement in torque production and symmetry as a whole.
3. Overall, the **Neuropak** lessened joint "vulnerability" to soft tissue and mechanical injury.

## **4. Immediate increase in vertical jump performance by 3 1/2"**

**Joel Huntgate**

**Vice President, Orthopedic Programs**

**DARImotion.com**

**DARI Analysis Video:**

<https://youtu.be/p0IMrNzNp2Q>

<https://youtu.be/LZWGufbCe0g>

Additional Testing Reports:

(Please Download Reports to View)

**Baseline**

[DARI Certified Functional Assessment – Baseline](#)

## **Testing with Neuropak**

[DARI Certified Functional Assessment – Neuropak](#)

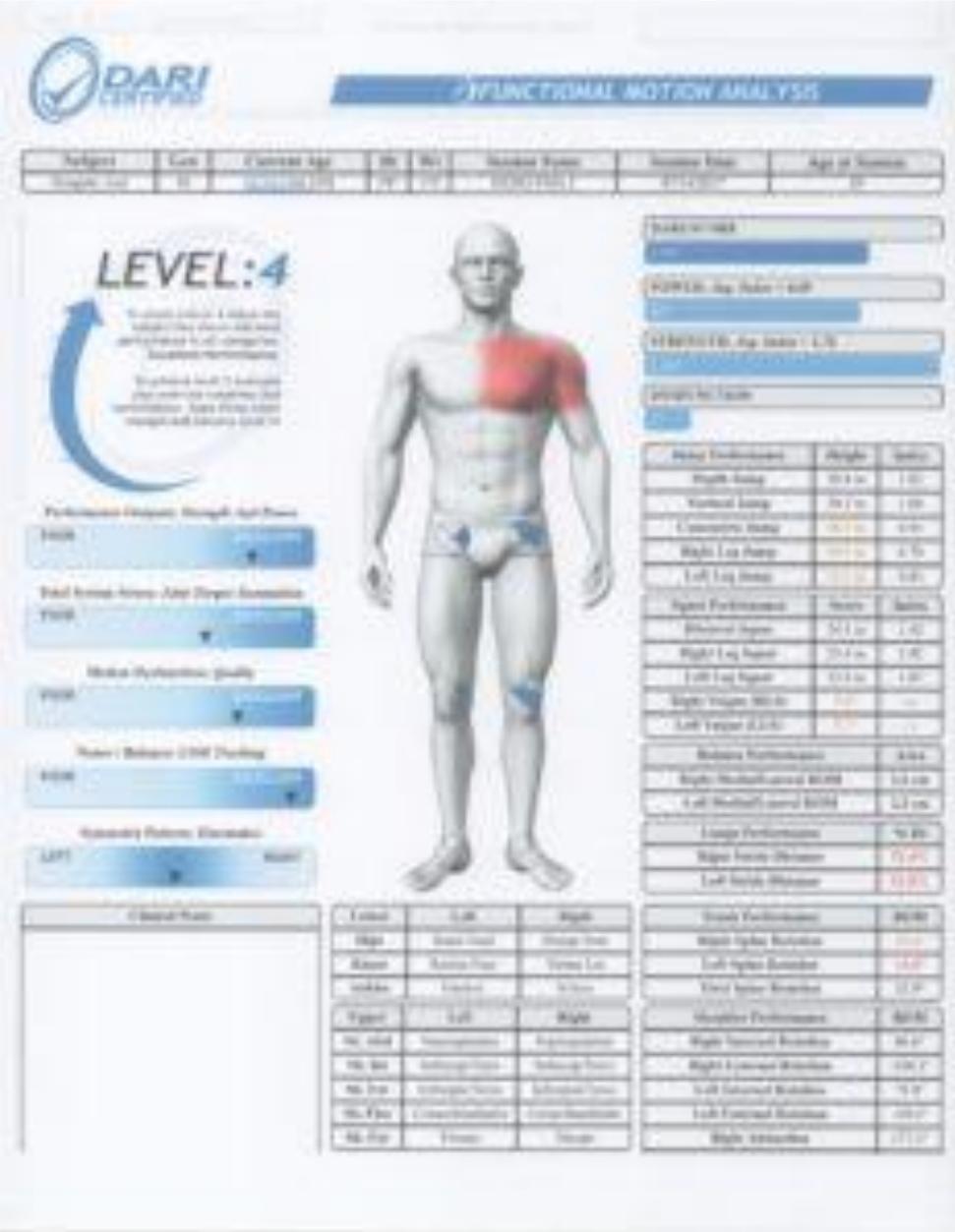
## **Post Neuropak Testing**

[Vertical Jump Overview](#)

[Vertical Jump Neuropak](#)

[De-loaded Vertical Jumps](#)

# DARI Instant Motion Reports



“Comparing both reports will allow your team to see the biomechanical effect the

**Neuropak** had immediately on some core, functional movements that I performed in the system. Some impressive, immediate findings I noted:

Your **Neuropak** incurred a significant increase in my core stability during unilateral balance testing (especially considering I exhibited solid balance before donning the **Neuropak!**), and improved my stabilization during control of my center of mass, hips, knees, and ankles on both lateralities, in both the M/L plane and A/P plane.

Your **Neuropak** also immediately eliminated some asymmetries I exhibited in the unencumbered scan—namely at my knee and spine.

Likewise, looking at the smoothness of my motion data curves, your device did not have a significant effect on my ability to

perform any planar ROM (save for some spinal rotation limitation due to impingement), nor did it have any effect on my ability to achieve comparable squat depths. The smoothness of the motion was a surprise to me and is a testament to your design not incurring “jerky” patterns while in use by an operator.

Also of note, the device obviously had an effect on my jumping ability (due to the extra tension and weight) but that is the point of having it on in the first place. Also of note, my unilateral kinetic chaining was not encumbered with the device, though I would have to repattern my kinetic chaining to accommodate the device during my bilateral vertical jump—but once again I

think that is point



behind training with a new layer of neuromuscular stimulation. All in all, I was thoroughly impressed with

the freedom of movement throughout the functional motion analysis, and the “opening up” that the **Neuropak** incurs in spinal and core stability, which made an immediate difference. Likewise, I was impressed with my ability to perform even while fatigued from the unencumbered scan and still maintain smoothness and ROM.

Regarding my right hip being flagged on the “instant motion report” – Any biomechanical “flags” that you see on the “instant motion report” represent my body’s source of compensation for the device (i.e. right hip being red) and would improve with training. Really, I’m impressed it didn’t cause more up-or-down chain compensations.”

Best,

Joel Hungate

VP of Orthopedic Programs- DARI

# Medical Reviews:

"If you can identify a biomechanical asymmetry and correct it in a truly functional way then you will dramatically reduce the potential for INJURY and exponentially increase your PERFORMANCE in any specific pattern. Furthermore, you can rehabilitate an injury in a truly functional way which will ALWAYS have better outcomes.

The **Neuropak** has bridged the gap from traditional physical therapy protocols to a comprehensive way to rehabilitate in a truly functional way which leads to quicker

outcomes and reduces the likelihood of re-injury.”

**Dr. Brad Conder**

**Owner, Focus Physical Therapy**

**Board Certified Orthopedic Specialist**

“For the first time I can actively engage my lower trapezius and supporting muscles that stabilize the shoulder and spine and avoid over compensating with other muscle groups.

The biggest impact is the immediate global impact and constant feedback of neuromuscular engagement throughout the entire body.

After one session with the **Neuropak** I felt a residual benefit that I was able to actively

engage the smaller supporting muscles well after the **Neuropak** session, which is a testament to the ability that the **Neuropak** has to intuitively engage the entire kinetic chain.”

**Dr. Kara Esterle**

**Focus Physical Therapy-Patient**

**Rehab Video:**

<https://youtu.be/eP30mrrrxo>

**Research:**

**Fryette laws of spinal motion. Research based knowledge of how the spinal is**

**dysfunction as it related to muscle activation and how to correct it.**

[https://www.physio-pedia.com/Fryette%27s Laws of Spinal Motion](https://www.physio-pedia.com/Fryette%27s_Laws_of_Spinal_Motion)

**More research for the anatomy of how the lumbar spine stabilization with force coupling with contralateral muscles groups.**

<https://www.ncbi.nlm.nih.gov/pubmed/7701385>

<https://www.aaronswansonpt.com/force-coupling-for-the-lumbo-pelvic-hip-complex/>

## **RESEARCH AND CASE STUDIES:**

[Reliability of military tests to assess readiness for combat related duties \(1\)](#)

[Brown, E 2003 thesis \(1\)](#)

Prediction of simulated battlefield physical performance from field expedient tests

Postural Control in Dual-Task Situations  
Does Whole-Body Fatigue Matter

Functional training bridge to return to duty  
(1)

Factors That effect movement

***WHAT IS PNF and WHY IS IT IMPORTANT?***

- PNF = PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION. PROPRIOCEPTIVE REFERENCES ANY OF THE SENSORY RECEPTORS THAT PROVIDE INFORMATION CONCERNING MOVEMENT AND POSITION OF THE BODY. NEUROMUSCULAR REFERENCES THE NERVES AND MUSCLES.
- THE PURPOSE OF THE 1109 BRAVO DEVICE IS TO STIMULATE A CHANGE IN PNF OR IN A NEUROMUSCULAR RESPONSE TOWARD NORMAL FUNCTION

## ***PNF PRINCIPLES***

- OVERFLOW – STRONG HELPING THE WEAK. STRONGER MUSCLE GROUPS

WITHIN A PATTERN PLUS STRONGER PATTERNS ARE UTILIZED TO INCREASE THE RESPONSE OF THE WEAKER MUSCLE GROUPS.

- DIAGONALS – REPRESENTATIVE OF THE MASS MOVEMENT PATTERN CHARACTERISTIC OF NORMAL MOTOR ACTIVITY. EACH DIAGONAL CONTAINS THREE COMPONENTS OF MOTION: EXTENSION/FLEXION, ABDUCTION/ADDUCTION, AND ROTATION – THE MOST IMPORTANT FOR TREATMENT.
- DEVELOPMENTAL SEQUENCE – REPRESENTATIVE OF HOW WE DEVELOPED FROM INFANCY TO ADULTHOOD – ACHIEVING SOME MOVEMENT, TRUNK CONTROL, THEN MOVEMENT OF THE EXTREMITIES ON A

STABLE TRUNK, AND LASTLY SKILLED ACTIVITIES.

## ***NEUROMUSCULAR REEDUCATION***

- INCREASED POWER
- LASTING ENDURANCE AND RESILENCY
- BETTER COORDINATION AND KINETHSTETIC AWARENESS
- ABILITY TO REPEAT MOTION WITH LESS EFFORT AND CONCENTRATION FOR EXTENDED PERIODS
- ALLOWS USER TO ACHIEVE MAXIMUM FORCE IN A DESIRED DIRECTION SINCE ANTAGONIST MUSCLES ARE RELAXING.

## ***PHYSICAL TRANSFORMATION:***

- TRANSITIONS USER AWAY FROM INEFFECTIVE TRAINING METHODS AND BAD HABITS
- DEVELOPS STRENGTH AND ENDURANCE AND RESILENCY
- IMPROVES ALL RANGES OF MOTION
- ENHANCES POSTURE BY INTRINSIC STABILIZATION OF THE CORE AND SPINE

### ***INJURY PREVENTION:***

- SELF-CORRECTS MOVEMENT PATTERNS THAT CREATE INJURY AND REDUCE PERFORMANCE

- DIRECTS SKILL PERFORMANCE TOWARD CORRECT METHODOLOGY THAT REDUCES INJURY AND ALLOWS FOR EFFECTIVE AND EFFICIENT PERFORMANCE.
- 2-WEEK ADAPTATION TIME FOR INCREASE IN PERFORMANCE
- REDUCED TRAINING TIME AND LOADS

## ***REHABILITATION:***

- REHABILITATES IN FUNCTIONAL WAY SPECIFIC TO HOW AND WHERE YOU ARE INJURED
- DUE TO REHABILITATION CONSISTENT WITH MOVEMENT PATTERN THE NERVOUS SYSTEM WILL BE CONDITIONED TO "TRUST THAT

PATTERN AGAIN" ULTIMATELY,  
AVOIDING RE-INJURY.

- ELIMATES INEFFECTIVE REHAB METHODS
- REDUCES PAIN
- TREATMENT APPROACH IS ALWAYS POSITIVE IF DONE IN A FUNCTIONAL WAY
- USES THAT WHICH PATIENT CAN DO, ON A PHYSICAL AND PSYCHOLOGICAL LEVEL
- IMPROVES PATIENT'S PERFORMANCE OF FUNCTIONAL ACTIVITIES.
- **1109 Bravo Neuropak Wearable Performance Training System PATENT PENDING**