

Practical

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**Omega-3 Fatty Acids
and Neuropathic Pain**

**Osteopathic Manipulative
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Functional Restoration and Complex Regional Pain Syndrome



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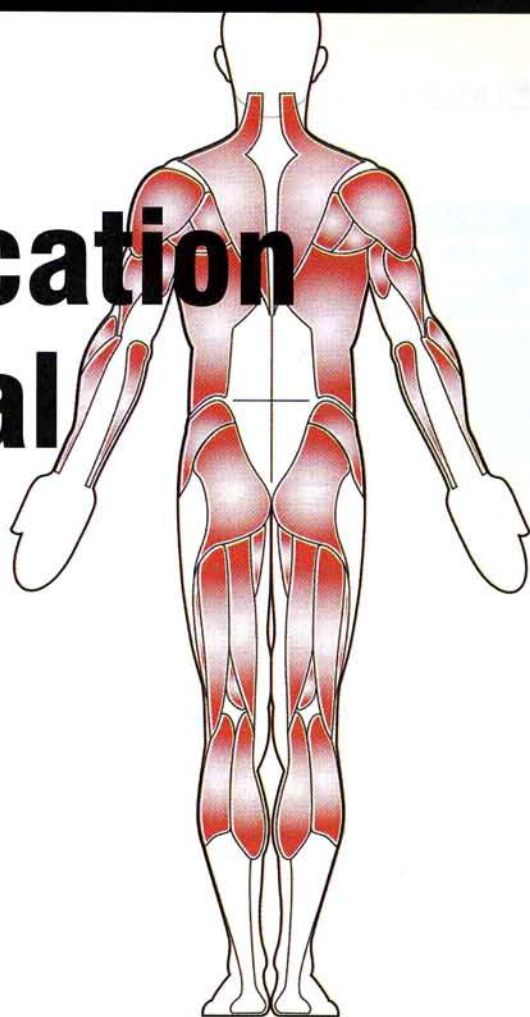
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Practical Application of Neuropostural Evaluations



The P.A.N.E. Process:

Basic Principles and the First Three Tests

By John L. Beck, M.D.

Allopathic medicine has traditionally relied on an algorithm based on subjective complaint—a patho-anatomic search to solve medical and physical problems. The doctor begins his diagnostic search based on the complaint of the patient. We challenge this time-honored chestnut, at least in matters concerning chronic pain. It is true that in acute injuries the pathology is usually where the pain is. But in chronic conditions, the brain and the body have most likely instituted a variety of compensatory mechanisms that may drastically alter the degree and location of symptoms, rendering them useless in identifying the true cause of the problem. In view of the poor record we have in treating chronic pain, I suggest that a new algorithm is in order.

The P.A.N.E. Process: Basic Principles and the First Three Tests

In the July/August issue (Vol. 8, Issue 6), this author introduced a new diagnostic algorithm for evaluating chronic pain based on principles of neurobiology, gait, and motor physiology, combined with current theories from pain medicine. It is called the P.A.N.E. Process and stands for "Practical Application of Neuropostural Evaluations."

The P.A.N.E. Process is unique in a number of ways. Rather than starting with a focus on the presenting pain complaints, it is a systematic exam that more closely resembles how a car mechanic would diagnose a problem. We do the same diagnostic cascade on every patient. This addresses what we believe are a number of shortcomings in the traditional Western Medical approach to chronic pain. We all can probably agree that chronic pain disorders in general are an anathema for conventional medicine using the traditional approach.

First, the pain symptoms in chronic pain are the result of neurological dysfunctions and not the main focus. The dysfunctions

have to be identified and addressed to resolve the pain complaint. Secondly, we have overlooked the enormous compensatory capacity of the human nervous system driven by biological survival priorities. Chronic pain symptoms are often trade-offs the brain is willing to make to protect a higher priority Life Process. Simply stated, pain is not a survival priority in nature. This is where neurobiology as a science enters the Pain Management arena. We orthopedists, in particular, spend a lot of time (and health-care dollars) doing expensive tests looking for the elusive pathological anatomy causing a chronic pain condition when, in fact, chronic pain is a functional, not an anatomical problem. I believe the P.A.N.E. Process is a start in resolving these issues. The P.A.N.E. Process, in order of priority, helps to:

1. Confirm there is a stable central Neurological hierarchy and therefore ensures stable homeostasis. This is accomplished using "Primitive Motor Reflex Screening." This first step confirms stable and reliable pain mechanisms as part of normal homeostasis.
2. Establish that the neurospinal complex is intact and that a stable segmental physiology is present by cutaneous provocative dermatomal stimulation.
3. Confirm that the peripheral nervous system is intact and without neuritis/neuropathy; that inhibitory phenomena is absent; that compensatory weakness is absent; and that extremity neural function is stable.
4. Confirm that there is a normal supraspinal (cerebellar) strategy, without postural compensation.
5. Confirm that there is intact neurospinal myology with stable core kinetic chains.
6. Confirm that normal joints-specific myology is present.
7. Establish that there is normal, osteoarticular function based on orthopedic examination.

Neuropostural Evaluation

The primary physiological instrument in the P.A.N.E. Process is *Postural Motor Testing*. Posture is the perfect function for testing because it is our human relationship with gravity—the only consistent reference point in our environment as demonstrated by a plumb bob (see Figure 1). It brings with it definite 'yes' or 'no,' 'on it' or 'off it,' answers. Our name for posture as we are using it in this article is "Neuroposture" because postural function is based primarily on neurological processes, like proprioception, and we wish to differentiate it from simply "standing straight."

Neuropostural assessment has significant advantages:

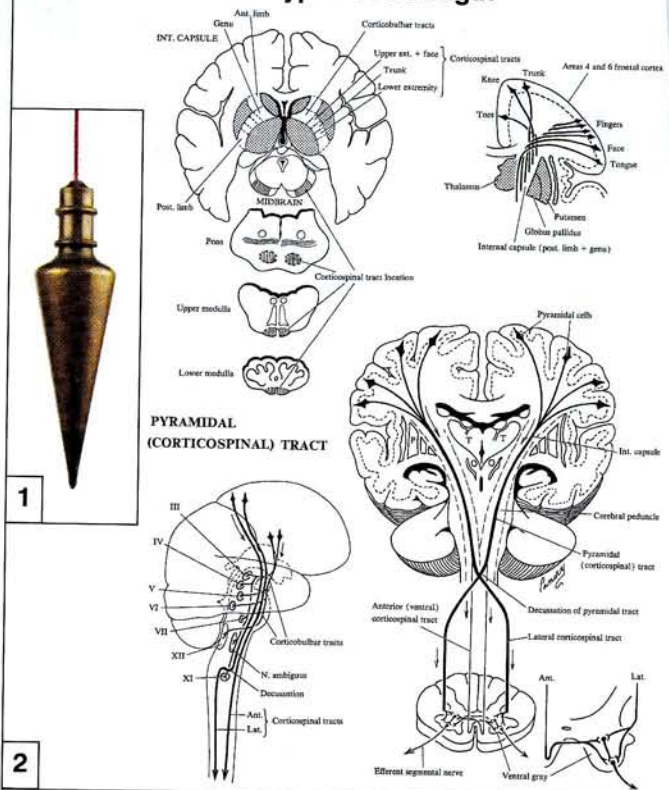
1. Neuroposture, by its nature, is systemic in scope; it reflects relationships within the entire body. Too often, we tend to focus on our own area of specialty interest and miss wider relationships.
2. Neuroposture is fundamentally a neurological process. *All human movement originates from within the nervous system.* No muscle acts without neural input, but with our focus on muscles, bones, and joints, we frequently miss underlying neural pathology. Because Neuropostural action is reflexive and not voluntary, posture is the window to observe the nervous system in all its mysterious workings.
3. Neuropostural function involves all levels of the nervous system: voluntary (conscious) and involuntary, sensory and motor, central and peripheral. Involuntary (autonomic, reflexive) neurological functions are typically ignored in Western Medicine, leading to many of our frustrations concerning chronic pain issues.
4. Neuropostural assessment lends itself to a systematic examination, much like a car mechanic examining an automobile. We do the same exam every time. In this way, we avoid missing important pathology, and simultaneously establish the priorities in treatment.
5. Neuroposture is an involuntary, reflexive process that is evaluated by testing the reflexes that drive it. Although human motor behavior is infinitely complex and variable, reflexive motor behavior tends to be stimulus-specific and, therefore, predictable and reliable.
6. Neuropostural testing is a process of measuring weaknesses and strengths through manual muscle testing. Although not entirely objective, and somewhat dependent on examiner skill, it is much more objective than the usual subjective assessment of pain.
7. Posture and inherited survival instincts are intimately intertwined, giving posture a strong survival bias which drives its compensatory actions. The Brain will always organize somatic pathology in a predictable order of survival priorities. *This can help the clinician to separate compensatory from primary conditions, and establish the order of treatments needed.*

Introduction to Neuropostural Motor Testing

From the preceding discourse on Neuroposture, you should now have a vastly different perspective of this marvel of human motor behavior. This section will present a unique version of practical Neuropostural testing as it applies to clinical diagnosis. Because Neuroposture encompasses so many different aspects of physiology, Neuropostural testing can be done in many different ways.

The following is the author's system derived from experience

Two Central Origins of Motor Action Two Types of Strength



FIGURES 1 AND 2. Plumb bob; Pyramidal Tract (Voluntary NS) (Source: Pansky B and Allen DJ. *Review of Neuroscience*. Macmillan Publishing. NY. 1980)

in neurorehabilitation, orthopedics, kinesiology, pain medicine, physical therapy and, yes, biology. The central purpose of this examination process is to identify areas of 'postural injury,' namely, those conditions which induce a state of Neuropostural compensation. This system will assess postural balance integrity and the presence of protective inhibitory reflexes which affect motor efficiency. Also addressed is the issue of homeostatic stability—critical in evaluating any pain condition—by muscle testing in patterns of primitive posture. Later in the diagnostic cascade, we may evaluate neuromuscular coordination with other types of manual testing, but these issues are further down the priority list.

Most of the tests are based on manual muscle testing. This type of testing is only as good as the skill of the tester, so we will spend some time here just on technique. It is not good enough to look at a picture and then try to replicate these tests—you have to know what *kind* of muscle response you are testing. Recall that Neuropostural strength is the *mirror image* of the way we are used to thinking about muscle strength. Corticospinal (voluntary) strength is the strength we use to pick up a weight. It originates from the motor cortex (see Figure 2). Neuropostural strength, on the other hand, is the *automatic response* of the rest of the body to hold still and not move in response to the voluntary effort (see Figure 3). Thus, to every voluntary motor action there has to be an equal and opposite involuntary Neuropostural reaction to the conscious movement in order to maintain equilibrium. This is

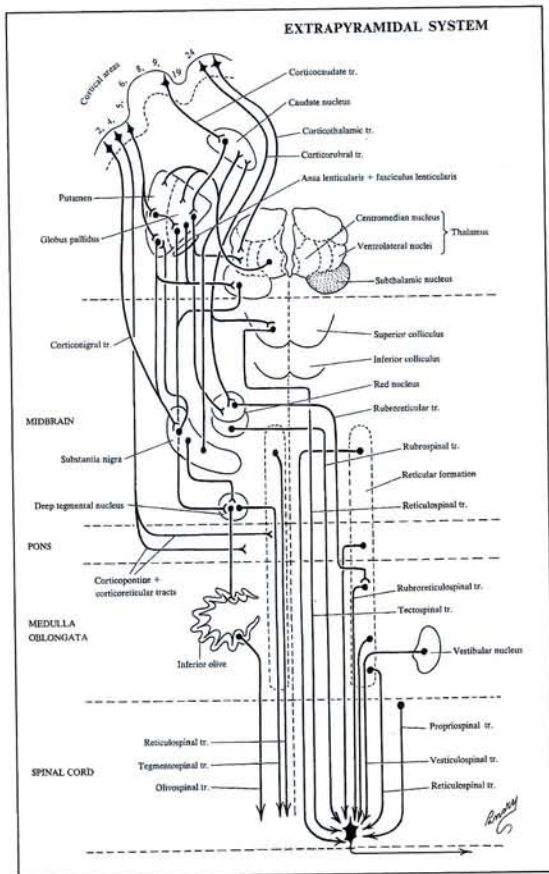


FIGURE 3. *Extrapyramidal NS (Involuntary)* (Source: Pansky B and Allen DJ. *Review of Neuroscience*. Macmillan Publishing, NY, 1980)

the dynamic definition of Neuroposture.

Conceptualize this example: you are standing stationary on the sidewalk and the wind starts to blow. If you are to remain stationary, you have to stand 'harder' with muscle reaction to prevent being displaced. That is your Neuropostural response to the wind. Neuropostural strength does not create movement, it prevents movement. You need to have this picture in your mind when you perform these tests since you can't measure Neuropostural reaction directly. Patients frequently want to win an arm wrestling contest, which instantly switches them into the voluntary mode and you are no longer getting their Neuropostural response. The instruction should be: "Hold this position while I push on you—the statue does not chase the pigeon." In balance work, we refer to an external force that moves a person as a *perturbation*. In Neuropostural testing, the examiner provides the perturbation and the patient holds still. Inability to keep up with the examiner is a sign of Neuropostural weakness.

Getting the feel of the difference between Neuropostural and voluntary strengths is critical to reliable testing; you must know which response you are seeking.

There are some little tricks to facilitate this process. Be relaxed and stable yourself so the patient will relax and 'settle in.' Position the patient for the desired test and instruct her to "hold still, don't let me push your hands together." You then initiate a gentle push to establish a gentle steady state of mutual effort. Hold the slight pressure for a moment so the patient establishes a steady state postural mode. Then, you accelerate your pressure in a smooth crescendo and notice if she keeps up or caves in/weakens. This testing has a definite "feel" and it is important to help you to understand this. Always be consistent in your hand placement and the way you perform the tests. Consistency is the key to consistent results (see Figure 4).

Equipment and Materials

The good news about the P.A.N.E. Process system of testing is that it does not require expensive equipment or even much time. The room should be bright, preferably with sunlight, and free of distractions. A sturdy table is a must and, of course, the floor should be level. Another useful item is something black and non-reflective for the subject to gaze at during the Light Test and the Dark Test (Light/Dark Test). The only other special items needed are tongue blades for the TMD tests; 4% topical Xylocaine for allergy tests; and 0.5% or 1% injectable Xylocaine (or Nesacaine) and small-bore syringes and needles with which to perform diagnostic nerve blocks. Clothing should be light in weight and have the arms exposed.

Basic Overview of the P.A.N.E. Process

The elements of the P.A.N.E. testing protocol are presented below in the order in which they should be performed. It is critical to perform the tests in this order because the P.A.N.E. Process is organized around Biological and Neurological Priorities. The elements are:

1. Standard postural observation (optional)



FIGURE 4. *Hand position for all postural tests (examiner on right).*

2. Gait observation (optional)
3. The Wall Test: if (+), continue neurological tests, if (-), skip to orthopedic exam (step 11)
4. The Light/Dark Test: if (+), continue with PCSD Tests, if (-), skip to spine tests (step 6)
5. The PCSD Tests (primitive reflexes)
6. The Spinal Scratch Tests (cervical and lumbar dermatomes; rarely, thoracic)
7. The Dynamic Neural Tension Tests (median, radial, and ulnar nerves in the arms, and abduction-scratch in legs)
8. Priority Postural Compensation Areas using kinesiological tests (shoulders, allergy, GI, hands, feet; these are areas likely to cause Neuropostural compensation)
9. Tests for Kinetic Chain (Core) Stability (regional weakness, lumbar & cervical)
10. Kinesiological Joint-Specific Exam
11. Orthopedic Joint Exam

The first three steps in this algorithm are related to purely Neurological functions, since these are at the heart and soul of biological life. Evolution has created both anatomic and functional hierarchies within the central nervous system. The various functions of the brain, in turn, are distributed through these developmental layers in specific ways best described as "stratification of functions." *The layers are not independent of each other, but work together like the members of a symphony orchestra to give us the incredibly diverse capabilities of our human brain.* This functional hierarchy has to be intact for us to operate at our biological and mental best. It is the first priority to check in matters of chronic illness. *Disorganization of the central hierarchy, in this author's experience, is highly associated with Chronic Regional Pain Syndrome (CRPS) and other chronic pain disorders.* We refer to this central hierarchy disorganization as

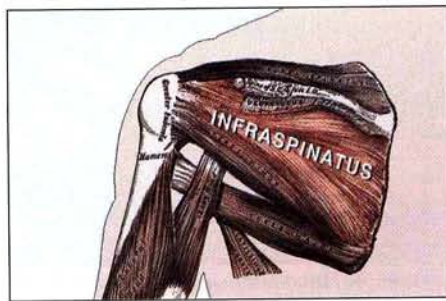


FIGURE 5. The Wall Test position isolates the external rotator of the arm; the infraspinatus. (adapted from Grey's Anatomy)

"dissociative posture." It is important to remember that Dissociative Posture may occur before there are ever any overt pain symptoms. This underlines the usefulness of Neuropostural testing.

First Three Tests of the P.A.N.E. Process

The first three (non-optional) tests in the P.A.N.E. Process (listed as steps 3 and 4, above) are the Wall Test and the Light/Dark test. Following are detailed descriptions of these tests.

The Wall Test

This is the first important screening test that you will use on a regular basis. It tells you the status of the patient's balance. There are many causes of balance dysfunction, so the Wall Test is not specific but, as a screening test, it is simple, reliable, and quick. If the test is *positive*, you will need to proceed to the Light/Dark test and the

remainder of the neurological screening. If the test is *negative*, you can skip over the first level of neurological testing and go to the spinal testing (step 6).

Both the examiner and patient stand facing each other. The patient flexes both elbows to 90 degrees, with the forearms extended forward, and parallel with each other and the floor. The wrists are straight, the fingers extended and adducted, and the palms are facing each other. The feet are positioned comfortably at shoulder width. This position isolates the Infraspinatus muscle, the external rotator of the arm (see Figure 5). It is important to keep the patient's elbows to her sides and not let her abduct her shoulders (flying like a bird) to gain leverage (see Figure 6). This position is reproducible and the test should always be done the same way. Further, it won't let a big person strain you. Your hands should have the thenar eminences of your thumbs cradled against the back of her wrists where the skin creases with wrist extension (see Figure 4).

Details and consistency are important. You apply the test by pushing her hands towards each other and telling her to resist your push. Remember the previous instructions on how to push, and take your time, this is not the time to try and 'trick' the patient with a quick thrust. People are used to testing the *quantity* of their strength, but these tests concern *quality* of response instead. Don't get involved in an

arm wrestling match with the patient. When you exert force, accelerate smoothly and evenly with both hands (it takes concentration and practice). At this point in the screening process, it doesn't matter which side caves in, and we attach no significance to right or left for diagnostic purposes. That comes later. All we are looking for here is a 'yes' or 'no' response—caving, or no caving.

In all testing, this author relies on some technique to 'reverse' the observed response both to validate and confirm the finding to the patient. All Neuropostural tests are reflexes coming from the Central Nervous System (CNS) and the Brain can 'switch' them on and off at will, depending on the sensory input. The reverse maneuver for the Wall Test—you guessed it—we repeat the exam this time with the patient leaning back against the wall (see Figure 7 to Figure 8). By leaning against the wall, you re-establish normal balance and the weakness should dramatically disappear. This test is not subtle, and it is always fun to watch the look of surprise on the patient's face when the "lights come on" and she realizes how much of her own strength she is not capable of using, because she is out of balance! The physiological principle here is that, in the presence of less than normal balance, the brain will inhibit voluntary effort (in this case, shoulder external rotation) to stay within the limits of the postural base. The effect is quite dramatic and any skepticism the patient

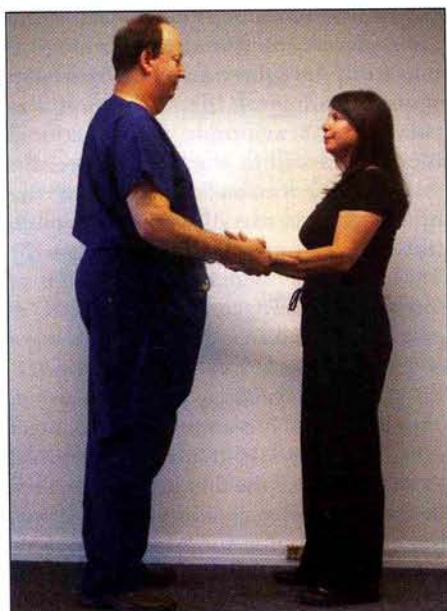


FIGURE 6. The Wall Test. Freestanding, Beginning Position.

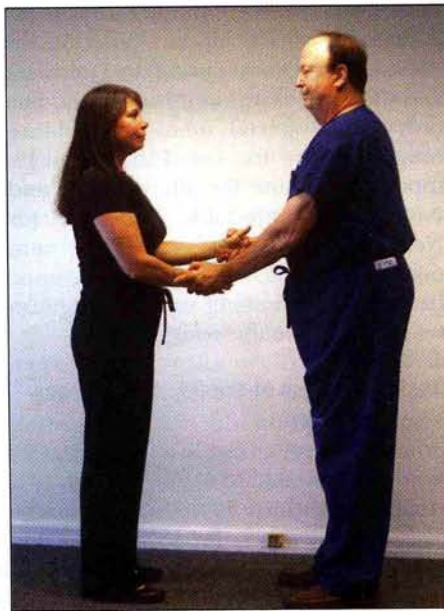


FIGURE 7. Wall Test Without Wall Support—Positive Weakness

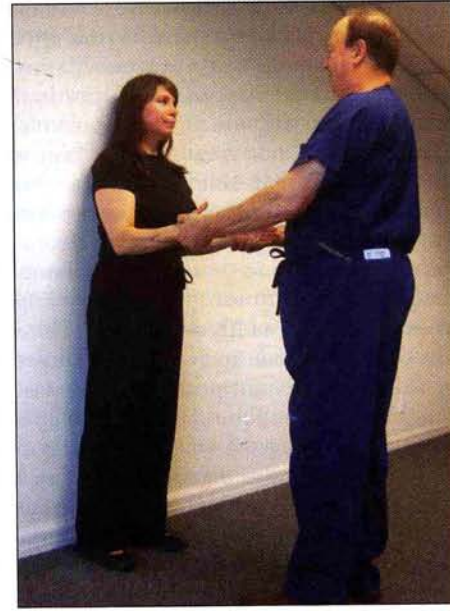


FIGURE 8. Wall Test With Wall Support—Negative Weakness, weakness disappears

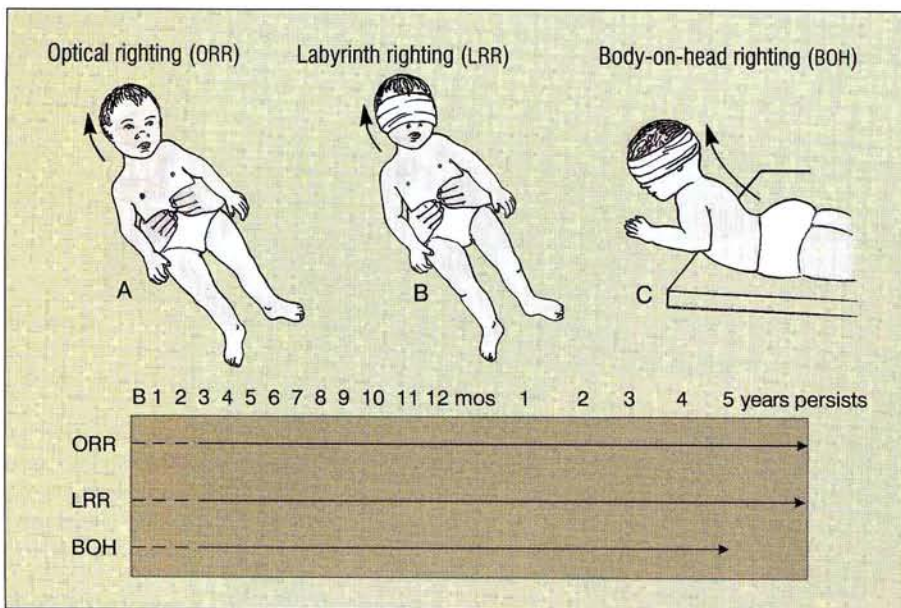


FIGURE 9. Light and Dark Sensitivity of the Immature Human Nervous System (after Baby's Light and Dark Test illustration of Head righting reactions in Shumway-Cook A and Woollacott MH. *Motor Control: Theory and Applications*, 2nd Ed. Lippincott Williams & Wilkins. Baltimore. 2001. p 198, figure 8-5)

had will now disappear.

The Wall Test is a nice illustration of the concept of "percent utilization of resources" which we think is so important in physical fitness. Most people understand the expression 'out of shape' and assume that all they need do is exercise to get back in shape. They do not understand weakness due to the Brain withholding strength for protective reasons. Central withholding is the primary mechanism of postural adaptation and is called *inhibition* in physiological terms. Inhibition is why we display hand weakness when trying to squeeze a hot potato. Exercise won't help the person with altered postural weakness because of this inhibition. In fact, the altered postural mechanics will lead to injury. It is the author's contention that the Wall Test should be done routinely on anyone taking up a fitness program to certify that they can exercise safely!

The Light/Dark Test for Dystrophy

This is an amazing clinical test both for its simplicity, and the information it yields. Earlier, we presented theories concerning hierarchical organization and its relationship to autonomic dystrophy. The Light/Dark Test is a simple screening test to see if central hierarchical control is, in fact, intact. It is only in the perinatal period of infancy that one can witness

the primitive levels of motor control in normal humans (see Figure 9). At this time, the baby is very basic in his approach to his environment. His life is about wet or dry, fed or hungry, warm or cold, and so on. With normal development, these primitive behaviors disappear and are replaced by motor reflexes characteristic of the more developed, complex, higher levels of control. Testing any of the primitive environmental responses could serve to determine if hierarchical control is intact.

The author has chosen the conditions 'light and dark' because both are usually easily available in the office. The idea is simple: turn on the lights and baby wakes up, turn off the lights, and hopefully the baby goes to sleep. With maturation of the brain in the first seven years of life, we normally lose this sensitivity to darkness, replacing it with higher levels of control—as anyone with teenagers knows. Wouldn't it be great if they all just went to sleep when it became dark outside! The last piece of this Light/Dark reflex that we retain as adults is the autonomic pupillary response to darkness. Other than that, whether it is light or dark out should have no effect on our physical performance.

Twenty-five years ago, this author made the observation that when Reflex Sympathetic Dystrophy (RSD) patients looked at dark colors, they became weaker as

measured by the Neuropostural Motor Tests. Further experience has shown that "dark sensitivity" is an easy screening test to pick up hierarchical regression even before the symptoms of dystrophy appear.

After you locate the cause in a given patient, neutralize it with a Xylocaine nerve block, and the Light/Dark reflex should go away if you have the right diagnosis. This is a simple and effective screening test to identify those patients in whom neurological disasters are waiting to happen.

The Light/Dark Test is performed with the patient sitting on the side of a sturdy table with the doctor standing facing her. Arm and hand positions are the same as in the Wall Test. Ask the patient to look at a source of light, preferably daylight, and test her posture (see Figure 10). Next, have her look at a dark, preferably black, non-reflective surface and repeat the posture test. If black is not available, ask the patient to close her eyes (see Figure 11). If the patient collapses/ becomes weaker with eyes closed but not with the light, the test is positive. Proceed to the PCSD Tests (step 5) to try and find the source of the dystrophy. If negative, move on to the Spinal Scratch Tests (step 6). A positive Light/Dark Test indicates that this patient has regression of her central hierarchy and is in a state of 'Neurological Dystrophy.' This author refers to this condition as "Dissociative Posture" with or without pain.

Conclusion

In chronic pain patients where the neurobiological cause may be discerned utilizing Neuropostural evaluations, Pain Management can become Pain Treatment. I hope you will practice our first three tests: *The Wall Test*, *The Light Test*, and *The Dark Test*.

In the next article of this series, we will share insights and theories concerning Regional Pain Syndromes based on experience with Motor Reflex Testing. More importantly, eight (8) specific tests based on Pediatric Developmental theory will be presented that this author believes may help us to discover the true cause of a Regional Pain Syndrome. ■

John L. Beck, MD received his medical degree from the University of Pittsburgh Medical School in 1970 and practiced Pediatric Surgery at the University of Cincinnati for two years before spending the next two



FIGURE 10. The Light Test—(Eyes Open)
No Weakness



FIGURE 11. The Dark Test—(Eyes Closed)
Positive Weakness

years as a Major in the Army Medical Corps. Over the ensuing years, Dr. Beck trained with world-renowned experts in the fields of knee surgery, sports medicine, orthopaedics, hand surgery, and joints. In 2004, Dr. Beck started his own Sports Medicine practice in San Diego, California, where he became closely associated with Physical Therapists specialized in Neuromuscular Manual Rehabilitation techniques. He subsequently explored why a normal sympathetic nervous system goes into dystrophy. Dr. Beck gradually transitioned his practice from orthopaedic sports medicine with a specialty in pain and neuro-rehabilitation to one with a strong neurological emphasis. He now works with orthopaedic chronic pain, injury prevention, physical fitness, and orthopaedic rehabilitation. The combination of these broad backgrounds, along with his Masters Degree in Developmental Biology and professional interests in Neurobiology and professional interests in Theory, led Dr. Beck to new insights into the etiology of severe pain syndromes such as Reflex Sympathetic Dystrophy (RSD) or Chronic Pain Syndrome. Over the years, he developed a great interest in peripheral nerve surgery when he and his late partner, Jeffrey Bronson, MD, determined that any persistent musculoskeletal pain almost always has a neurological basis and that neuritis or the involuntary nervous system is almost always the cause of Chronic Pain Syndrome. Dr. Beck may be contacted by email at jbvoodoodoc@sbeglobal.net or by telephone at 714-234-8613.

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