

AMIT: Advanced Muscle Integration Technique

Understanding how muscles perform, adapt and recover from injury.

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The body is a biological mechanical system that monitors itself in complex yet simple ways. It accomplishes this, in part, through the Central Nervous System. The central control system has a highly complex communication system made up of the brain, brain stem, spinal cord, nerve roots, nerve tracts, dendrites and nerve centers called proprioceptors. Every tissue in the body is saturated with these Proprioceptors. These nerve centers monitor and control every aspect of the body's function.

They not only monitor and control the minute functions of the body; they monitor tension, pressure, movement, stretch, temperature, compression and extremes of motion among other things. Their function is highly specialized in nature. As an example, certain receptors only become active during inflammation as part of the protective mechanism.

Many of these receptors are protective in nature. An example central to the A.M.I.T. ® model is when a system in the body is stressed beyond its ability to handle the demand as in a sprained ankle, certain receptors become active. The lateral ankle stabilizing muscles become inhibited, the ankle joint becomes rotated, ligaments are stretched and an entire volley of proprioceptors become active to protect the tissue and joint from further injury. The tissues react by splinting to restrict motion, pain centers turn on to force unloading of the joint, fluid and blood infiltrate the tissue to cushion the joint and initiate the healing process.

These receptors are in essence communication centers, which communicate there is an injury or "overload" in the system. The communication can be initially subtle such as muscle tension, joint stiffness or it can display as severe pain and swelling. In chronic problems these symptoms tend to come and go. As time passes and the cause of the problem is not corrected, the communication or symptoms worsen. If the symptoms are ignored or suppressed with medication, disease will follow. Eventually, in time the body develops a diagnosable disease state requiring constant drug therapy or surgery.

The human body has an inborn Innate Intelligence, which monitors and controls every aspect of the body's function. It is the same intelligence, which created the human body when the sperm and egg merged to form a single cell. It is the same Innate Intelligence that controls every aspect of the body. Science struggles to understand a small fraction of how this works. The innate intelligence operates in part through the central nervous system. It is this intelligence that displays the "alarm" in the form of symptoms. To suppress the symptoms with medication is in essence telling the body to "shut up".

An analogy could be the Space Shuttle. The Space Shuttle cockpit is filled with complex sensors, gauges, warning lights and control switches. When there is a problem with any part of the Space Shuttle, the pilots are made aware instantly. A pilot would never think of ignoring the warnings or removing the alarm by punching the flashing lights or gauges out with a screw driver to remove the alarm. Or they could just learn to live with it. Maybe they could go take a course that teaches them to control their sense of how they relate to the alarm. Yet, every time we take a

medication or ignore a symptom, we are doing just that. If the pilots continue to knock out the alarm indicators, it would not be long before the Shuttle would no longer work. They would be locked in a vehicle that no longer functioned, doomed to a certain discomfort and death. Isn't this what we are doing to our bodies? When a sensor activates an alarm in the cockpit, the pilot immediately begins to trouble shoot the problem to define the cause. Once the cause is defined, appropriate action can be taken. If the problem has accurately been corrected, the shuttles systems return to normal function.

Trusting the central nervous system and knowing it never creates an alarm unless there is a reason is important for understanding the cause of disease. We know the body always has a reason for creating a symptom or warning. Defining the cause of the symptom should be the aim of all physicians. It is not enough to diagnose "Bursitis" and treat with anti-inflammatants. This is merely treating the symptoms and chronic drug use will lead to a future of kidney problems. You must continue to ask the "why" question after each answer until the core cause is defined. The body is capable of healing most diseases as long as all the essential components for healing are made available.

If the body can develop a way to compensate by shifting the stress to another tissue, the symptoms may dissipate without medication or further treatment. This lulls us into a false sense of well being until the next stress or injury. This process continues throughout our lives as we adapt into more complex adaptive strategies. As we get older, the accumulation of problems reduces the tissue options and our ability to adapt or compensate. This is when we end up with chronic pain and degenerative disease. This explains why we develop pain in a shoulder years after sustaining an injury playing football in high school. As we age, it is more difficult to adapt and so those old injuries begin to resurface. We simply wake up one morning in pain.

This adaptive process has only recently been understood. We now know that if an injury is not corrected within six weeks, the central nervous system is forced to adapt. In the adaptive process, other tissues or system are forced to take on more of the load. As explained above, the tissues in the body are richly endowed with receptors. These receptors are called proprioceptors and are varied in function and very specialized. Under normal muscle contraction, receptors monitor tension (spindle cells, Sharpey's fibres), compression (Ruffini corpuscle, Pacinian corpuscles) and stretch (Golgi tendon apparatus). These proprioceptors allow for constant surveillance of motion, tension and load levels throughout the body. Thus, receptors are able to produce a discriminating afferent (sensory) inflow to the central nervous system (CNS), thereby contributing to the protection and function of the joints through the musculature. This is the key to control and protection of the bodies muscle and joint systems.

The central nervous system controls muscle function and the muscles control joints. Whenever any one of these systems are faulty, dysfunction, injury or disease will follow. The A.M.I.T. ® model has a unique way of looking at the body. Under normal conditions, when a muscle contracts it sends reciprocal nerve impulses to antagonist muscles, which allow the antagonist muscle to relax as the prime mover contracts under load. This is based on Sherrington's Law of Reciprocal Innervation. Sherrington's Law states that when a muscle contracts it sends inhibitory impulses to its antagonist muscle which relax the antagonist muscle to allow for smooth motion. This process takes place though every plane of motion as we move through time and space. If this process does not work properly, muscle tightness, dysfunction, pain and disease follow.

In the A.M.I.T. ® model, tight muscles are not the focus as with most therapies. The symptom of muscle tightness is created by the following mechanism. When a muscle or tissue is over loaded beyond its ability to handle the load though an injury or overuse, one or two things happen. Either the tissue tears and / or the proprioceptors neurologically inhibit the contracting muscle to cause it to "give way" when loaded. We call this process **neuroproprioceptive inhibition (NPI)**. This is protective in nature and

occurs in order to reduce the amount of damage to the tissue. This process is similar to a circuit breaker in an electrical circuit blowing.

Once this occurs, the injured muscle stays inhibited and other tissues attempt to take on the added load in an adaptive process. If the adaptation/compensation is successful, the symptoms may disappear. If not, pain occurs each time the muscle is used. This imbalance remains permanently until such time as the problem is defined and corrected. This situation is commonly diagnosed as tendonitis, bursitis or myofascitis.

The effect of this is that when a muscle is neurologically or proprioceptively inhibited, it loses its ability to reciprocally inhibit the antagonist muscle. As a result, the antagonist remains contracted throughout the entire range of motion. For example, this is the major cause of chronically tight muscles such as hamstrings. Chronically tight hamstrings can occur because one or more of the quadriceps are inhibited. Therapy applied to alleviate the tight hamstrings is usually only temporary and returns the next day. Eventually, the chronically tight hamstring will lead to an injury to one or more of the six heads of the hamstrings. By correcting the inhibition of the quadriceps, the hamstring tension disappears without any therapy to the hamstrings. Range of motion is increased as well. In this case, the hamstrings were merely the symptom tissue and an example of why symptoms should never be the focus of treatment. If the hamstrings do eventually become injured, the hamstring will need to be reactivated using A.M.I.T. ® therapy after the quadriceps have been treated.

Therefore, the loss of reciprocal inhibition creates restricted range of motion due to tight muscles. The body will not allow motion into a position of instability. The body is moving to protect itself and the next adaptive cycle begins. If therapy is applied to increase flexibility and range of motion without creating stability, more injuries will occur unless the body successfully compensates into another tissue. The foundation of the A.M.I.T. ® system is to define and reverse these adaptive cycles.

Compensatory tissues eventually become over loaded and lead to overuse syndromes, and increased susceptibility to further injury. At the very least, this over use will lead to pain in the adapted tissue even though there is no history of injury to that site. This is why a person can wake up one morning with severe pain in a shoulder or knee for no reason. When the compensatory tissue is eventually injured, the system can no longer adapt at the local site and must move away to the next joint in the body. If the inhibited muscles are continually stressed they will inflame at their attachments. This leads to chronic pain, which is part of nature's communication and protective system.

With the reduction in the muscles ability to contract under load, the connective tissue, i.e. ligaments, cartilage, bursa, bone are forced to take on more of the burden of support. These tissues are not designed for this and so the proprioceptive centers create pain. This situation forces the person to reduce the amount of stress placed on the tissues or restrict movement in the joint. Repeated stress creates inflammation and swelling as the body tries to restrict movement and cushion the joint with fluid. This is the point at which a diagnosis of bursitis, tendonitis, capsulitis, myofascitis, arthritis or stress fracture is made. The common therapy is anti-inflammatories, pain pills and therapy modalities like ultrasound, Russian Stim or Interferential. These therapies help to reduce the symptoms, even completely remove them. The problem is that the dysfunction of the muscle system is still present. These forms of therapy assist the body in the adaptive process, but do little to correct the problem. The muscles are still not capable of supporting the joint under a workload. Eventually the system becomes so inflamed that any movement of the joint is painful, thus the need for chronic anti-inflammatory medication use.

The problem with this is when the protective mechanism is removed through the use of medication; the body can no longer monitor the tissue or feel the pain. This allows more stress to occur in a joint. With the loss of the protective mechanisms; ligaments become over stretched, stress fractures can occur and degeneration of the joint is accelerated leading to degenerative joint disease. This is the point at which surgery is suggested.

To suppress the symptoms is to set the body up for more serious problems in the future. This is where the A.M.I.T. ® system offers a highly effective alternative. The A.M.I.T. ® system has been used extensively on Olympic and professional athletes over the past thirty four years. It has proven to be what athletes like John Stockton, Picabo Street, Emily Cook, Bill Romanowski, Charles Barkley, Chad Hendricks, Torah Bright and many others have claimed bordered on the "miraculous". Not only has it corrected acute and chronic problems, it has allowed athletes to perform at levels they had not considered possible. Young athletes struggling with chronic pain during training not only find relief, but experience a higher level of function. Athletes who were ready to give up their dreams now discover a new level of performance, make an Olympic team and win medals. It is a system that maximizes the function of the body so that training and mental focus can express through the body with dramatic results.

The A.M.I.T. ® system defines why the symptoms are present and offers a therapeutic model that produces consistent and miraculous results. In addition, it defines body and joint movement patterns that are not stable that lead to injury and reduced performance. To understand how this is done, it is helpful to explain how we approach a patient. The first step is defining the history of the injury and past health issues. This leads the examiner to the areas in need of evaluation. If the problem is acute, or occurred within the past six weeks, the body should be evaluated at the local injury or symptom site. If the symptoms have no known cause or have been experienced for longer than six weeks the evaluation becomes more complicated. The complexity is associated with the fact that if a problem is not corrected within the first six weeks from injury, the central nervous system is forced to adapt into other areas of the body. Other tissues are forced to take up the load. Thus, the symptom site may only be the site of adaptation from an old injury. This being the case, a more extensive examination of the body is required.

The examination procedure involves evaluating the range of motion and muscle function of the joints of the body. We can test 740 muscles for function which makes for the most precise functional analysis available. If a muscle is not firing due to NPI it cannot stabilize the joint through that plane of motion. The body will not allow a movement pattern to occur that it cannot stabilize. This is the reason for restricted range of motion and is why many patients find it difficult to rehabilitate a muscle. Next, the muscles that support the symptomatic joint must be tested using a muscle test procedure developed by Kendall and Kendall, Goodheart and expanded by Beardall and Buhler. (Graph 1 & 2) The A.M.I.T. ® procedure utilizes a precision form of muscle testing (force/time) which helps in more clearly defining the instabilities. If the position of the muscle test is 2 degrees off, the dysfunctional muscle will be missed. Displacement of joint, speed, duration and angle of test are held to a ridged standard. If only one muscle associated with a joint is dysfunctional, the entire mechanics of the joint will be changed. Once all the parameters have been defined, we now have a blue print of the past and present errors. Most patients forget many of their past injuries but the A.M.I.T. ® examination reveals them. As the patient can recollect the old injuries, it aids in defining the sequence of biomechanical break down over time. This reaffirms the concept of cellular memory and the muscles are the display units of the body.

The next question that needs to be addressed is "Are the imbalances that have been defined the cause of the problem or merely the site of adaptation"? Accurately answering this question is the key to maximizing the effectiveness of therapy. This is when therapy can begin with maximum results. **From this point, A.M.I.T. ® therapy can begin to correct the problem and normalize function. Therapy consists of stimulating 12 different reflex and tissue systems for each muscle being treated. They include: The origin and insertion of the muscle, re-setting the spindle cells of the muscle, stimulating vascular, lymphatic, visceral organ reflex points, acupuncture points, cranial bone and three specific vertebra in the spine. All of these must be stimulated in a particular**

way to reactivate the muscle. Once all of these are normalized, the muscle becomes capable of maximum contraction under load. If any of these reflexes are missed, the muscle will not maintain its optimum function when stressed and will require repeat treatment. This therapy was born out of the frustrations of having to treat the same muscle over and over again every time an athlete stressed it. You should never have to treat the same thing twice. If you do, you have missed something.

Following therapy, we consistently find that the pain associated with the movement pattern of the muscle treated is no longer present. Function is now normalized through that plane of motion. As each muscle is cleared, function gradually improves giving the patient 100% access to all muscles supporting the joint. This leads to pain free joint range of motion. Healing and strengthening can now take place rapidly. There is no longer a need to take medication or have surgery.

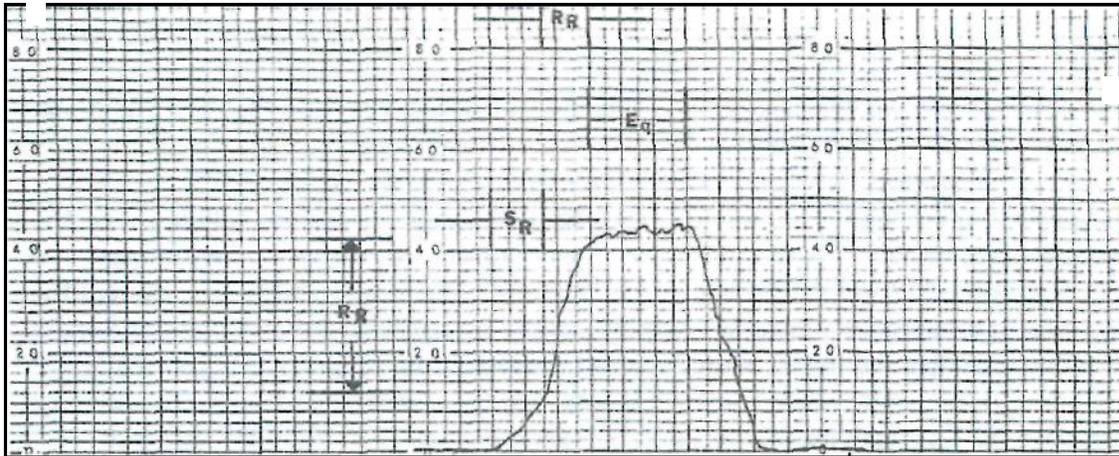
The change in function as **Tim Ferriss states in his book "The 4-Hour Body"** is "incredible". "Before you aim to improve a muscle's output (weight or repetitions lifted) by increasing size, it's important to ensure that the input (neural system) is functioning properly. Do you really need "stronger muscles," or is the wiring just not conducting the signal properly? In the end, I tested his treatment with the only jury that really mattered: objective weights. These changes were not subtle. Take the pectoral, for instance. Since fracturing both collarbones in my teens, I have had disproportionate trouble recruiting the chest, making the bench press and similar movements my weakest exercises. Twenty-four hours before my second session with Buhler, I performed decline flies with 40-pound dumbbells for a maximal five repetitions. Twenty-four hours after the session, I performed slow decline flies with 50-pound dumbbells (20% increase) for 14 repetitions (180% increase). Incredible."

It is not just about the treatment of injuries or maximizing human performance. It is about preventing injuries and more importantly, predicting where injuries may occur. The A.M.I.T. ® system is a precise and predictable Chiropractic approach to athletic injuries and human performance. It is a set of procedures developed from seventeen different disciplines that teach the skills necessary to evaluate and treat chronic and repetitive stress injuries through a different set of eyes and a different pair of hands. These principles accelerate the resolution of severe injuries in a matter of hours, which reaffirms the principle that the body is capable of incredible things if all the essential components are addressed. Your paradigm will never be the same once you are exposed to the benefits of the A.M.I.T. ® world.

Dr. Michael Cerami is currently getting certified with Dr. Buhler's AMIT program.

Currently there are 32 doctors trained in this technique.

NPR STANDARDIZATION GRAPH



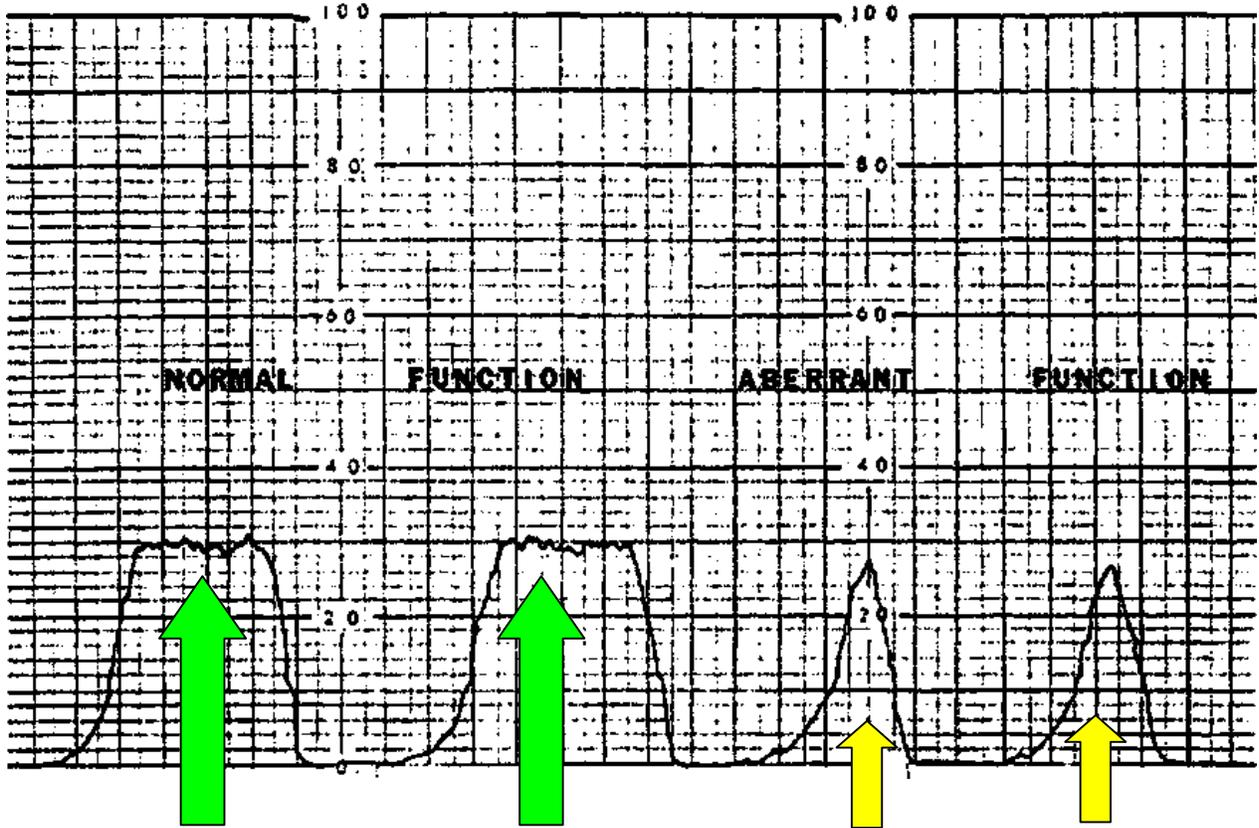
STRETCH RESPONSE (SR): .5 second time interval in which muscle fibers stretch prior to engaging.

Rapid Rise of Force (RR): .5 second time interval in which the muscle contraction of the subject responds to the increasing applied forces of the examiner.

Equalization (Eq): 2 to 3 second time interval in which the patient and examiner forces match as the system continues to respond without displacement (isometric).

Graph 1 represents the response of a functional muscle being tested. The force is applied against the muscle being test in its most shortened position. The initial level of force applied engages the stretch response (SR) of the muscle fibers and should occur within rate of .5 seconds. Once the stretch is taken out of the muscle, force increases until the muscle locks in an isometric contraction. This ramping of force occurs within a rate of .5 seconds. Once the muscle engages in an isometric contraction, the force applied should not be ramped but should be maintained at that force level for at least 2 to 3 seconds before the force application is terminated. This creates a standardized muscle test that compares force and vector against magnitude and time. Each subsequent muscle test should be identical ± 2 lbs. with timing being exact. Any deviation from this standard represents an inaccurate test and should be discarded.

Graph 2



Functional muscle test results (left).

Aberrant muscle test (right).

Note the stretch responses and rate of rise are identical on both the functional and aberrant muscle being tested. The only difference in force is 2 lbs. between the two muscles which is not significant. The significant difference in the aberrant muscle function is the time the muscle can sustain the force before failing.