

Sports Kinesiology: The Use of Complementary Sports Medicine

by Philip Maffetone, D.C.

Sports kinesiology is also referred to as complementary sports medicine. It has two main features. First, it is a way of evaluating a person's structural, chemical and mental/emotional aspects. This includes any or all means necessary to efficiently assess the person, including muscle testing. Second, it utilizes many approaches to correct the imbalances found, depending on the knowledge and legal scope of the practitioner. These may include various techniques such as acupressure and other reflex methods, diet, nutrition, muscle work, exercise training and other lifestyle issues.

This paper describes the philosophical aspects of complementary sports medicine, some of its definitions, and gives one example of a common imbalance - excess body fat - and how it is addressed in this field.

PHILOSOPHY

Complementary sports medicine is associated with a specific philosophy. It is the ethics, theory and conviction of the individuals who make up a profession whose roots go back thousands of years. This is very clear from the early Hindu writings, and especially in the Chinese culture where the *holism* of the body and mind was recorded in the book of Kung Fu. In ancient Greece, sports was an integral part of a person's upbringing. These cultures produced the philosophical foundation of complementary sports medicine; their approach to athletic care was holistic, many conservative therapies were used, the particular care rendered ranged from rest to activity, diet to herbs, and when needed, surgery was performed, usually by specialists. Only with the advent of modern medicine within the past century has a divergence taken place that broke this field into two distinct and competitive arenas. Today, one area of sports therapy is more western and allopathic, and the other often referred to as "alternative." Complementary sports medicine brings the best of both back together.

There are a number of important factors associated with complementary sports medicine, although these are not necessarily exclusively limited just to this field. They include a hands-on approach, not just of the specific therapies but many aspects of the patient, including the assessment process and concerns for lifestyle and exercise training. This makes for a more holistic strategy, much like a general practitioner rather than a specialist. There is an important one-on-one relationship with the patient, rather than a team or group approach, with more time spent assessing, treating and educating each patient. This is not to say that there will not be times when a specialist is needed. When this happens, the complementary practitioner can work simultaneously with the specialist. This ability and need is important for all concerned, and sets complementary sports medicine apart from the segregation of modern traditional medicine, and alternative medicine. Most importantly, the assessment, treatment and lifestyle factors in this field focus as much, if not more, on the *functional* aspect of the patient as on their specific injury or ill health. In addition, the approach is function oriented rather than symptom directed, with the practitioner open to clinical research and investigation to explore areas that can help bring about the desired clinical outcome. The complementary sports medicine professional is a general sports practitioner, treating not only high level professional athletes, but the average local sports enthusiast, the weekend warrior and beginner. By considering all these factors, practitioners can incorporate both art and science in their approach.

The practitioner in this field not only approaches the patient differently than traditional sports medicine, but sees himself or herself as part of the process, rather than someone from the outside feeding the process. For example, the assessment and treatment processes are interactive, the patient is educated about the body and is required to share much of the responsibility for getting and staying healthy.

Practitioners not only play an active role in patient care, ideally they are also athletes on some level. In this way, the practitioner can better relate to the patient. As such, every professional involved in this field can benefit from the experiences of their own knee pain, Achilles tendon problems, fatigue and other ailments; they can help to better understand their patients, appreciate the healing process and the joy of getting better.

ART AND SCIENCE

The complementary sports medicine approach is from both an art and science perspective. The art is the experience, expertise, and outcome while science includes basic physiology and its many models of energy production, neuromuscular actions and biomechanical activity. An individual human may not, however, always fit perfectly into a particular model. Working with an athlete cannot be accomplished effectively by either art or science alone, rather, a blending of both help make the outcome more successful. An individual who exemplifies this approach is like Michelangelo, whose knowledge about human anatomy is paralleled by his ability to portray it in his paintings - his artwork is a demonstration of his intellect. It is hoped that all clinicians practice both the art and science of their field by being aware of the uniqueness and beauty of the human body.

The *art* of complementary sports medicine is the ability to observe, experiment and implement to find the optimal therapeutic outcome, whether through not only diet, nutrition, exercise or other therapy, but the proper combinations that best match the patients needs. It is the ability we need to recognize when the body needs help, beyond what the patient tells us. The art also infers that some of the tools used in clinical practice may not have fulfilled the rigors of scientific endorsement. Many assessment and treatment tools have not been researched, or not researched adequately to determine why they might produce their results. As a result, their scientific acceptance may not exist. Rather, it is the ability of the practitioner to judge a tool by its usefulness to improve a specific clinical picture. In abstract terms, art is the body's dance, with full orchestra.

This dance can be analyzed with numbers; this is the *science*. It's the objective ability to measure our body's activity to determine its needs, and most importantly theorize the

mechanism behind these actions. Science is the knowledge we gain by studying textbooks and journals; and it begins as art. An observation is made and it may be years or centuries before it's scientifically substantiated. A good example of this is dietary fiber. Some 150 years ago, Dr. John Kellogg and Sylvester Graham separately and by observation, proclaimed fiber could reduce the risk of intestinal problems, cancer and heart disease. By 1974, science began to accept these observations when British surgeons, writing in the *Journal of the American Medical Association*, reported fiber could reduce the risk of atherosclerosis and intestinal disease, including cancer. Today, it's a well accepted fact of life that fiber is a crucial part of our diet.

Combining both art and science in the clinical realm makes for a more efficient and holistic approach, and shifts the emphasis to the outcome rather than understanding and accepting the mechanism of a particular therapy. Today more than ever, our approach to sports medicine is very fragmented, with specialties and subspecialties with sometimes more competition among the professionals than athletes.

A HOLISTIC VIEW

Although the word *holistic* has been overused, abused and misunderstood for the past few decades, the fact remains that it is an appropriate word to use when referring to the field of complementary sports medicine. While the art of helping patients is easily seen as holistic, the science is usually thought of as focusing on the fragments of the whole. As Willis W. Harman writes in his *Re-examination of the Metaphysical Foundations of Modern Science*, "There is increasingly widespread agreement that science must somehow develop the ability to look at things more holistically. In a more holistic view, where everything, including physical and mental/emotional, is connected to everything, a change in any part affects the whole. In a holistic science there is no cause and effect - only a whole system evolving. Only when a part of the whole can be sufficiently isolated from the rest that reductionistic causes appear to describe adequately why things behave as they do, do the ordinary concepts of scientific causation apply. In general, causes are limited 'explanations' that depend upon context."

The true holistic approach of complementary sports medicine is one where all aspects of the

patient are considered. The information value of signs and symptoms are important; none are insignificant. In addition, all the signs and symptoms, as subtle as they may be, must be considered. In a runner with chronic low back pain, for example, many factors must be assessed beyond the low back. Whether this symptom is due to muscle imbalance, ligament sprain or strain, or joint dysfunction, in many cases the back pain itself is secondary, an end result symptom of a variety of imbalances sometimes developing over a long period of time. It is not unusual for an asymptomatic foot problem to not only contribute to but cause a low back problem. In some patients, muscle imbalance in the temporomandibular joint (TMJ) may be a primary factor. In others, several causative factors exist, all far from the site of back pain. By assessing the patient in a holistic way, through a complete inventory of the whole body and not just the low back, the practitioner can find and correct these obscure but often primary problems.

Taking this example a step further, we have to ask where the foot problem came from, or how the TMJ imbalance started. Perhaps the patient was wearing the wrong types of shoes, or ones that fit improperly. Unless the patient is asked about their shoes or last visit to the dentist, these hidden problems may go undetected. In this case, applying therapy to the low back will not be truly successful. It is possible to get symptomatic relief, but either a recurrence of the problem or the development of a new symptom will often be the result.

Another important aspect of this holistic approach is the fact that we are all athletes. We tend to categorize the patient population into athletes and non-athletes. But individuals who are "couch potatoes" are just out of shape, inactive athletes who are literally a step away from being more athletic. This patient is perhaps the most important one to help due to the potential benefits that may be derived. Many patients are reluctant to start exercising because of the traditional view of what they perceive of as a "no pain no gain" activity. They see runners along the road who look like they're struggling, aerobic dance classes that look too advanced and weight rooms with sculptured bodies that turn them off. If these patients could understand that gradually working up to a thirty minute easy walk, four or five times a week would dramatically improve their health, many would happily comply. In addition, many patients are

intimidated (and embarrassed) to workout where others with seemingly "ideal" bodies are also working out. Education becomes an important tool for these patients.

Likewise, we often separate an *athletic injury* from all the rest. The patient who complains about shoulder pain from spring cleaning may have develop and imbalance not unlike the baseball pitcher who overworks it in spring training. We should not treat a "sports injury" but rather the person attached to it. Worse is the fact that too often a name is assigned to an injury so a pre-determined therapy can be given. The fact is, every rotator problem in the shoulder is unique, every fasciitis different and no two Achilles tendonitis problems exactly the same. As such, each patient should be treated as a whole, individual person.

THE EQUILATERAL PARADIGM

Another way of looking at the holistic paradigm is by viewing it as an equilateral triangle. Each equal side represents one important aspect of the patient's health, represented as structural, chemical and mental/emotional. If a person has low back pain, fatigue or other symptoms, usually all three aspects are involved to some degree, although at first glance it may appear only as one.

STRUCTURE

One side of the triangle portrays the person's structural aspect. This includes the skeleton, muscles, ligaments and tendons. The foot and TMJ are some regional examples of this aspect. The functions of all our structural parts are very dependent upon each other. For example, the tibialis posterior muscle plays a major role in the bony stability of the foot. And the physical equilibrium of the bony pelvis, itself dependent upon good muscle balance, has an indirect but significant impact on neck motion. Our whole body is a kinematic chain which acts as one complex functional unit, and while we study it in separate and distinct parts, we can not successfully look at it that way clinically.

The structural aspect of the body is often tended to by specific types of practitioners. Chiropractors, osteopaths, physical therapists and massage therapists are among those conservative professionals who focus much or all of their care to the structural aspects of their patients. Surgeons are also clearly structurally oriented.

From a holistic standpoint, caring only for the structural aspect of a patient may be less than adequate, even if the problem appears purely structural. A recurrent painful spinal imbalance, for example, is often associated with inflammation; treating it only with local therapy may not completely resolve the problem. Or, following surgery of a torn meniscus, the patient may greatly benefit by specific nutrition to help the healing process.

CHEMICAL

The chemical side of the triangle incorporates all the biochemical aspects of the individual. Specific foods, nutrients or drugs will have certain effects within the body. Consider the wide ranging effects of caffeine or other drugs, or the effect of diet on eicosanoid production. Like the structure, one facet of body chemistry can influence many others. For example, eating a large highly refined carbohydrate meal before exercise may have an adverse effect on the utilization of fats for energy and endurance. Emphasizing either protein or carbohydrate may favor the specific production of neurotransmitters in the brain (i.e. norepinephrine and serotonin) and may influence concentration, a vital aspect of many sports.

This aspect of the triangle is represented by professionals who attempt to manipulate the body's biochemical systems. This is done with drugs, diet, nutritional supplements and other approaches including homeopathic remedies, herbs and other substances. Traditionally, nutritionists, naturopaths, homeopaths and practitioners of Chinese medicine are the more conservative practitioners in this field, with many medical doctors and osteopaths frequently employing drugs.

Like those who strictly adhere to structural therapy, caring only for the chemical aspects of the body may be less desirable, even when the problem appears to be only chemical. A person's chemistry can effect their structure, easily seen in the hormonal and nutritional relationships with the bones. A person's structure can also affect his biochemistry. For example, an athlete who has difficulty chewing due to TMJ or tooth problems, eating certain healthy foods, or properly digesting them, may be difficult, affecting the nutritional status.

MENTAL/EMOTIONAL

The mental/emotional side of the triangle incorporates the behavioral aspects of the patient. The mental state may be referred to as cognition - sensation, perception, learning, concept formation and decision-making. It is important for the practitioner to understand these aspects of the patient since it can effect their overall health and fitness. The emotional state is the affective aspect of the patient, and may include pain, moods of anxiety or depression, and loss of enthusiasm or motivation.

Traditionally, this part of the triangle is cared for by psychologists, psychiatrists and counselors. Certainly all professionals are trained to be aware of the mental and emotional aspects of the patients. Bed side manner is one such example. In many patients, their mental/emotional stress may come from trying to schedule training with work and family obligations, competitive anxiety or the fact that they are frequently injured.

Sports psychologists can play a key role in helping to re-educate patients of all ages. Our modern society has promoted sports to an unhealthy level. Young kids think playing hurt is good because they see and hear it on TV and radio. Being all bandaged up in a game is a sign of superiority, they think. And pushing oneself beyond the limit is something to strive for, people are told. Ad campaigns of images that are not real are thrown at us and our kids daily. This has contributed to the increase in sports injuries, not just physically, but mentally also.

The equilateral triangle concept is a simple representation and does not represent the complex interrelationships that continually exist throughout the body. For example, within the structure of the muscles are intricate chemical reactions allowing it to function. Our thoughts are also chemical reactions, and without the structural aspect of absorption, the function of the villi, our nutritional status would be severely compromised.

Another important factor with so many specialties and so much diversity within each profession is that many patients are unknowingly choosing their own therapies. If a tennis player develops a chronic shoulder pain, at some point he makes a vital decision and walks into a professional's office. That professional will most often render his or her specialty for that shoulder problem. If the office

is that of an acupuncturist, the patient gets acupuncture. If it is a chiropractor, spinal manipulation, if a medical doctor usually drugs. The best care, however, may be a combination of therapies. With more holistic awareness and cooperation between professions and professionals, patients can receive superior care. More importantly, the complementary sports medicine practitioner may be able to provide a variety of different but appropriate therapies required by the patient.

Today, many professionals are turning more holistic than ever, incorporating other techniques into their approach. Some orthopedists are using nutrition, chiropractors are providing dietary guidelines and many doctors are considering how mental/emotional stress impacts their particular type of therapy.

THE NEED FOR BALANCED CARE

It would be wrong to think that only conservative therapy should be used in caring for all patients. Likewise, many problems seen in athletes do not require surgery or drugs. The fact is, there will be times when the use of more radical care is necessary and times when a conservative approach will be successful. In the case where a specialist is needed, especially in the case of surgery or if one's license does not permit writing a prescription, the referral process is not only a necessary part of complete therapy but contributes to harmony among all branches of health care. Presently, health care providers are as fractionated as ever, even within the same profession. Competition seems to sometimes supersede the need to share and refer to someone who can help in the assessment process or apply a more useful therapy.

Referrals to specialists should also be accompanied by an understanding of all parties that possibly during or after the work of the specialist, more conservative services may be very valuable. For example, in a patient who requires knee surgery, there may be need for specific dietary or nutritional factors in the patient's diet, such as omega-3 or -6 oils that will increase natural anti-inflammation production, helping in the recovery process. Immediately afterwards, improving muscle function through acupressure or muscle work can improve postural balance and speed recovery, sometimes dramatically.

The concept of balance in all that is done in assessment, therapy, and especially lifestyle is

another highlight of complementary sports medicine. Whether the philosophy is borrowed from Chinese medicine (the balance of yin and yang), simple mechanical balance of muscle groups or nutritional balance, the end goal is the same; the optimal balance of the whole person.

Natural balance in sports medicine was also recognized by the early Greeks; too much or too little of any component, referred to as disharmony. Around 1910, Chiropractic borrowed the same "too much or too little nerve energy" philosophy. Modern physiology uses the word homeostasis. Whatever the philosophy, the idea of balance is now universally accepted.

FUNCTION AND DYSFUNCTION

Some people have clear imbalances associated with an injury; a fracture, or a meniscus tear. However, many others do not have distinct classical injuries or diseases, but typically complaints related to vague and less well defined symptoms. The same pattern may be true for chemical and mental or emotional "injuries," such as a reduction in performance. These are referred to as *functional problems*, or a *state of dysfunction*, and are by far the most common problems seen in athletes. Low back pain that has no positive neurological or x-ray findings, fatigue associated with normal values in blood tests, and acute diminishing athletic performance in a patient who, by all standard medical assessments, continues to be in optimal health. In addition, some patients also possess various signs not related to an injury or disease state and not accompanied by any other signs or symptoms of injury or disease; orthostatic or postural hypotension is common in athletes with heavy workout schedules, elevated resting heart rate is observed in some, and others record very low body temperatures. In many cases, these signs and symptoms are manifestations of the pre-injury state - a body language denoting that if these problems are left unchecked, they may progress to the more traditional, more obvious injury or even disease.

In the early functional stages of an injury, there are often no particular names given to these imbalances other than to say it is a functional problem, or a dysfunction. We could use the phrase "functional injury" or, in the case of an illness, functional illness. In this situation, it is better to describe the signs and symptoms, or preferably the clinical findings or neurophysiological dysfunction rather than

applying a name to the condition; *the patient's right latissimus dorsi is inhibited with a concurrent over-facilitation of the right pectoralis major muscle, producing shoulder joint dysfunction*. This athlete complains of an inability to throw the ball, rendering him unable to play effectively. Patients with functional problems do not necessarily fit into classical injury models; typically microtrauma exists without the classic cell atrophy, inflammation or degenerative changes. In most cases, early injury is without pain.

A functional injury is a *dysfunction* in the body's structural, chemical or mental/emotional process. It is between the state of optimal health or excellent function, and some frank injury or disease. It is also an injury that is not necessarily accompanied by any significant tissue damage or inflammation. The signs and symptoms of functional illness may include fatigue, back pain, and even a diminished eye-hand and other coordination important for athletes. In some cases, the symptoms are very minor or vague and traditionally discounted by many doctors. More importantly, subtle states of dysfunction may not produce any signs or symptoms by the patient. In this case, it is up to the practitioner, through a complete assessment, to find and correct these relatively minor but important imbalances. All of these problems can not only affect sports performance, but can interfere in the quality of life.

In some cases, however, the patient's complaints may mimic a clear injury or disease. In this situation, it is important that the practitioner base all therapy on findings rather than postulate that despite the lack of evidence, an injury exists. In other words, treat the person rather than a named condition. In this situation it is important to not assume that an obvious injury is present until there is some proof it is so. Determine what type of therapy to use based on findings not speculations.

How can we evaluate the functional status of a patient? There are several key assessment tools that will help the practitioner accomplish this; observation being the most important. By observing body language, the practitioner will ultimately learn a great deal about the patient, especially in the case of an athlete where posture and gait play such a key role. Obvious examples of body language include antalgia, or an irregular gait. The effects of muscle imbalance, for example, may even appear in a seemingly

healthy athlete by observing static posture with a plumb line. Muscular imbalance results from an inhibited muscle and one that is over-facilitated producing a postural distortion. When the pelvis is tilted, on the side of pelvic elevation, for example, there is often an inhibition of the gluteus maximus muscle, associated with a tight quadriceps femoris.

Other assessment tools include many standard diagnostic tests currently in use, such as blood pressure readings, blood tests and a complete history. Where complementary sports medicine departs from mainstream medicine is in the interpretation of some of these tests. For example, in addition to ruling out hypertension, taking the blood pressure in the lying, sitting and standing positions may help reveal some functional problem. Normally, systolic pressure increases slightly upon standing. If this does not occur, or the pressure decreases slightly, it may indicate adrenal dysfunction. Other assessment tools that are important for the evaluation of functional problems include manual muscle testing and its connection with an approach to patient care called *applied kinesiology*.

Throughout this text, a variety of functional disorders will be discussed in detail; adrenal dysfunction rather than Addison's disease, thyroid dysfunction rather than thyroid disease, and hyperinsulinemia, a dysfunction which is a precursor to diabetes, are some examples. Specific disease states and more serious injuries such as those requiring the care of specialists goes beyond the scope of this book and will not be discussed. Examples of these include dislocations, fracture and the need for surgery. However, a variety of complementary therapies can greatly assist these types of cases and is a key aspect of complementary sports medicine. More importantly, there are times when cases of disease states are reported in athletes, but no known treatment is known so none is rendered. In this situation, the complementary sports medicine practitioner can evaluate for dysfunction and perform an appropriate therapy if indicated. Frequently, this not only improves the function of the patient, but also improves or eliminates the signs and symptoms associated with them. This parallels the Hippocratic philosophy which relies on nature and the improvement of body function.

Case History: Billy was a high school freshman soccer player who presented with right knee pain especially inferior to the

patella. The left knee was asymptomatic. The pain was nearly debilitating with activity, and even walking to class was difficult. A previous visit to his pediatrician resulted in the diagnosis of Osgood-Schlatter's disease. I examined Billy and found a number of functional problems including a significant excess pronation of the right medial arch, and an inhibition of the right psoas major and sartorius muscle. Through a variety of complementary sports medicine therapies over the next 10 days, foot stability improved and the psoas and sartorius muscles normalized. This eliminated the pain by about 95% and Billy could walk comfortably without difficulty. X-ray evaluation revealed almost identical signs of osteochondrosis in both tibial tuberosities.

In this case, like many others, we must question whether the diagnosis of Osgood-Schlatter's is the end of the assessment process, whether other forms of treatment are appropriate and even if functional problems precede the disease state. It should also be noted that the original diagnosis of Osgood-Schlatter's may not have been changed if this patient was seen in his nearly asymptomatic state.

There are many examples of functional problems leading to serious injury or disease states; quadriceps muscle dysfunction preceding osteoarthritis, poorly functioning abdominal muscles leading to low back pain and disc herniation and the overconsumption of carbohydrates leading to diabetes, heart disease or stroke (Syndrome X) are some illustrations. Not only can the complementary sports professional help an athlete get back to their current activity, but help maintain their desired activity through their full lifespan.

By which means will the complementary practitioner render care? That will depend on three important factors; the need by the patient, knowledge of the subject, and scope of practice. Before giving any type of care, the patient must first be assessed thoroughly to find which type of therapy best matches his or her particular needs. For example, will the stimulation of a particular acupuncture point be the best therapy for a given muscle imbalance? How about other therapeutic reflex areas? Would this problem require nutritional support? Is a combination of therapy best?

There is no therapy which will effectively address all sports problems. As is often the case, a combination of therapeutic tools may be needed in a given patient. Moreover, if a certain therapy works best on a given visit by the patient, that may not necessarily be the case on the next visit, where another therapy might be best. So the assessment process is an ongoing one. Before any treatment is rendered, assess first for the need.

Applying the appropriate therapy also involves a certain degree of proficiency with that therapy. Manipulating the spine or inserting acupuncture needles should not be attempted by any practitioner without a license or appropriate certification. But other more easier and safer techniques can be utilized by many practitioners. They include certain specific muscle therapies, finger stimulation of acupuncture points, and simple non-force osteopathic techniques for the cranium and pelvis. In these types of therapies, knowledge of anatomy and other basic sciences should be enough to allow their safe and effective use.

THERAPEUTIC TRAINING

Early sports medicine practitioners also trained their patients. In Greece, athletes developed their skills under the direct supervision of sports medicine trainers, or gymnastes, who were involved in all aspects of the athlete's program. This practice has been lost in recent times, as training has been given to specialists, including coaches, athletic trainers, and others who may not be aware of the functional status of the patient. Too often, communication between the therapy specialist and training specialist regarding the athlete's function or dysfunction, and specific needs is not concise enough or absent.

Complementary sports medicine incorporates training as one of its remedies. Although in many cases the practitioner does not accompany the athlete during the actual training, there is a clear understanding about each workout, and the goals are precise no matter what the level of sports training. More importantly, techniques such as biofeedback - the use of heart rate monitors - are used during training so both care giver and athlete are more objectively informed about the training quality.

FUNCTIONAL DEFINITIONS

The art and science of complementary sports medicine provides for specific definitions of the

terms used in this field. While many of the terms are similar or identical to the modern traditional definitions, others are interpreted differently.

These definitions are not just philosophical but part of the whole complementary paradigm. And since there is such a strong influence on lifestyle and education of the patient, these definitions should not only be useful and practical for those who are involved in the process, including the practitioner and patient, but uncomplicated.

Alternative definitions more effectively combine the philosophy, assessment and therapeutic aspects of complementary sports medicine. Though the deviation from academic definitions is not so dramatic, the clinical emphasis allows for a more practical, patient-centered practice.

We should first distinguish between the definitions of *clinical* and *academic* as set forth in an older version of *Dorland's Medical Dictionary*: The word *clinical* pertains to the "observation and treatment of patients," and *academic* relates to the "theoretical and basic sciences." With few exceptions, the more clinical definitions are most useful when working with people, with an understanding and respect that there is also an academic component.

As complementary sports medicine is an undivided discipline, so too are many of the words used in this field. As such, many terms are defined in pairs; aerobic and anaerobic, health and fitness, function and dysfunction. Like the Chinese yin and yang, many paired terms relate to the need for balance within the body and mind, and not just that they are opposites or mirror images. In addition, the words within each pair of terms complement each other. For example, in most clinical situations there is a academic element. And for a practitioner to better understand academic information, he or she must be able to relate to it clinically.

Many paired terms also relate to other coupled words. This can be seen in the terms *art* and *science*, which is associated with *clinical* and *academic*. While art is more clinical, it is not without a scientific understanding of many of its parts. These delineations will be more easily seen in our definitions, beginning with the most basic of words, *health* and *fitness*.

HEALTH & FITNESS

As is the case with many terms, *health* and *fitness* are so casually and generally defined both professionally and publicly that many people are not clear on their precise definition. As a result, the two terms are often combined as one and their meaning interchanged.

Health is an ideal state one can strive for but not necessarily be able to obtain. It is more conditional and relative, and not merely the absence of disease or a subjective state of just feeling good. Simply defined, health is *homeodynamic*. Optimal health is the perfect balance and function of all the systems of the body working in harmony, including the nervous, skeletal, muscular, hormonal, intestinal and all other systems.

Fitness is more definitive, and relates to the individual's athleticism. It implies the ability to efficiently perform work. A runner who completes a marathon in under three hours is more fit than the one who finishes in three and a half hours. Fitness does not necessarily infer competition; the walker who exercises five days per week is more fit than the sedentary individual.

The most common misconception about health and fitness is that they occur simultaneously. Many believe that athletes possess more health because of their fitness training. While this may happen, it is unfortunately not always true. Proper sports training can and should provide great health and fitness benefits, but many people do not obtain them due to some disharmony in the process; pre-existing physical imbalances, overtraining, or not meeting the nutritional demands. Millions of people who began to exercise in hopes of getting healthy find out that they got more fit, but their health suffered as a result. Injury, ill health and other signs and symptoms that result from exercise imbalance are indications that their health has suffered. Moreover, during this health reducing process, fitness can improve. The athlete who develops himself to a world class level, only to find he is now fatigued, has allergies and chronic knee pain is the classic patient seen by complementary sports medicine practitioners. These individuals are fit but unhealthy. Ultimately, an unhealthy athlete will ultimately lose fitness, although this may take a long time. Often, a young athlete who sacrifices health for fitness does not show many signs or symptoms until years later. Consider the college

and professional football, basketball and hockey players as an example. But for many people with average fitness potential who take up tennis, running, or cycling, the same process can occur.

It is important, then, that *all the work done in training also be health promoting*. An important long term goal in all training, in addition to improved performance, is to increase the quality of a person's life. Not just for the moment but throughout their lifespan. This is accomplished by correcting and preventing an imbalance between health and fitness.

PREVENTION

Various professions define prevention differently. In many cases, modern medicine sees prevention as the process of *screening for disease*. Annual physicals, mammograms and blood tests check for diseases in their earliest stage. In a middle-aged overweight patient who wants to begin an exercise program, a physical examination is recommended - an important first step in that process. This evaluation screens for heart disease, anemia and other disease states but they don't usually consider the functional aspect of the patient. While this process may uncover a serious cardiac problem, for example, it does nothing for the majority of functional problems that already exist in the patient, many of which may be the precursor to a more serious future injury. These are the problems addressed by complementary sports medicine.

Sometimes prevention is defined as *avoiding* disease. Philosophically, this is the other extreme of the medical definition. Heart disease, cancer and other degenerative processes may actually be a normal wear-and-tear of aging. Avoiding them completely may not be a reality. But *outliving* them is a reality. Many persons are very functional through their eighties and nineties while maintaining relatively good function, and die from non-specific causes while having a history of heart disease, cancer or other conditions.

A preferred definition of prevention, the one used in complementary sports medicine, incorporates the functional aspect, and refers to the postponement or slowing of the onset of dysfunction and, in many cases, ultimately disease. Hypothetically, if we delay death from heart disease until we are 110 years of age, but we die of natural causes at 109, we have prevented heart disease from affecting us.

Postponing dysfunction and disease occurs when we maintain a higher quality of life, throughout our lifetime.

TRAINING

One of the important mechanisms used to help the patient secure balance of health and fitness and prevent dysfunction is training. For a more holistic meaning, training should be defined with a concern for both health and fitness, where patients ultimately understand balance, and an appreciation of bodily function. When defining training, we must look at the whole process rather than just the actual workout time, which is usually the main focus. An equally important aspect of training is the rest phase. Training, then, includes the workout, plus the rest necessary for proper recovery. The balance of training can best be seen by defining it as an equation:

$$\text{Training} = \text{Work} + \text{Rest}$$

The work is the actual workout; the specific training routine which builds muscles and improves their efficiency, increases oxygen uptake, improves cardiac function, etc. This part of training is sometimes referred to as the *overload*, and with effective training comes a progressive increase in overload; all within the body's capabilities. In the case of a muscle, it must be worked slightly harder than it is normally used to in order to rebuild and improve its function. The most common cause of excessive training, called overtraining, is due to overloading the body to the point of trauma (abuse) or beyond the point where an effective recovery can take place before the next workout. For many more people, undertraining, or *training deficiency* is the lack of activity. The human body is made for activity and without it we can suffer imbalances and ill health.

The balance of training can also be seen physiologically as an equilibrium between anabolic (building up the body) and catabolic (tearing down) metabolism; training can be seen as a continuum of building up and tearing down. This balance is controlled by many factors, including genetics, type of training and hormonal activity.

In looking at the patient holistically, working out is not always limited to an athletic training overload. For many individuals, housework, working in the yard or office work, also is an activity that may evoke a physical overload, or other stress in the form of a chemical or

mental/emotional overload. This activity works the muscles, stimulates the metabolism and nervous system, and may even increase blood lactate. Although it may not necessarily help in a given athlete's specific training, it must still be considered part of the training program because it is work.

Rest is the other part of the training equation. It is the part of the training equation that balances the workout. During the rest phase the body recovers from training overload and prepares for the next session. During rest, there should be no real training, even from other lifestyle activities that induce overload. Included in this phase is the need for sufficient sleep. If this patient is unable to successfully rest and recover from their workout, the alternative is to reduce their workout time and/or intensity to maintain a balanced training equation. (The idea that anabolic steroids may significantly speed recovery has probably contributed heavily to their use.)

OVERTRAINING

An imbalanced training equation is the simple definition of overtraining. This may come from too much or too little working out, too little rest, or a combination of both as is most often the case. Unfortunately, many believe the only way to reach their potential is to train more, an attitude and obsession of "no pain no gain." And clinically, we know this attitude can lead to structural, chemical or mental/emotional injuries. It is the author's opinion that overtraining, including its mildest form, is found in 60-75% of the athlete population. It not only is a common precursor for injury, but the most common cause of diminished performance.

Overtraining must be distinguished from over-reaching. While overtraining produces imbalance, over-reaching is defined as a short term period of increased training volume and/or intensity. If the period of over-reaching causes a physical, chemical or mental/emotional imbalance in the individual, it has turned to a *overtraining*.

AEROBIC & ANAEROBIC

Two key words used in the sports world are aerobic and anaerobic. Their definitions form the basis of being both healthy and fit. Balance of both physiological states is a key goal of the complementary sports medicine practitioner.

These terms are frequently defined academically in relation to their oxygen relationships, with aerobic described as oxygen utilization and anaerobic as the absence of oxygen. However, these terms are clinically defined from a standpoint of the origin of their chief source of energy for ATP production; fats (fatty acids) being the potentially predominant source of aerobic energy and sugar (glucose) the primary anaerobic energy source. Aerobic is defined as the *increased* burning of fats, and anaerobic as the *increased* utilization of glucose by the body.

Even in those who utilize a high percentage of fat for energy, there is still a significant contribution from glucose, especially to maintain beta oxidation - the metabolic mechanism which maintains fat burning. This contribution from glucose may be relatively low if activity is minimal, or large during times of higher intensity workouts. (In very short term sprint and power sports, those lasting just a few seconds, glucose and creatine phosphate are the exclusive fuels.) As workout intensity increases, so does the demand for more glucose as the dominant fuel with less reliance on fats. In this instance our definitions are still useful; as exercise intensity increases, the individual becomes more anaerobic and less aerobic; low intensity workouts are generally more aerobic.

What makes these definitions more functional is the fact that many lifestyle factors can significantly influence our ability to burn fat for energy. Some of these include the macronutrient make-up of the diet, training intensities and stress. When this happens, body fat stores usually increase.

The usefulness of these definitions of aerobic and anaerobic, as opposed to the more traditional and academic ones, are important to both clinician and patient. For the average athlete, defining anaerobic as being without oxygen is not precise when relating to performance; during any activity, including rest, the body can not survive without oxygen for more than a couple of minutes. In the case of microorganisms, however, the definition of "without oxygen" would be most appropriate.

Individuals who are more aerobically developed are generally healthier and more fit. As aerobic function improves the patient's overall health improves.

Most of the well known benefits of exercise are attributed to the improvements in the entire aerobic system. This system includes the heart and lungs, blood vessels, aerobic muscle fibers and their internal functions, especially the ability of the mitochondria to convert fat to energy.

In addition, an increase in aerobic function can improve long term athletic performance, endurance and aerobic speed (these last two terms are defined below), and also prevents injuries; this is acquired by regularly building the aerobic system with relatively slower training and temporarily avoiding all anaerobic training. This training period is called the aerobic base. Improving aerobic function can also serve as a therapy for many injured athletes, and is an excellent weight control strategy.

ENDURANCE

If we define endurance as the time a given exercise intensity can be sustained, it still does not reflect the important aspect of endurance; fuel utilization. Clinically, endurance is also an expression of aerobic function, including the quality and quantity of that aerobic function, in an individual. Most importantly, with improved aerobic function and endurance is the ability to utilize more fats for energy. For the athlete, endurance is the ability to perform more work (such as a more rapid pace) while remaining at the same or relatively low level of intensity (i.e. heart rate). This is accompanied by increasing the percent fat utilization for energy and a reducing dependence on carbohydrate utilization.

Developing endurance is especially important for the person beginning an exercise program. In addition, it is vital during any rehabilitation, whether following hip surgery, a heart attack, part of a program for an obese patient or any other reconditioning. The need for increased endurance not only applies to so called endurance athletes - distance runners, cyclists, and swimmers for example - but those in all sports. Even the sprinter and power lifter will benefit from improved endurance. In addition, an individual's endurance should not only persist for many years, but continually improve well into the fourth decade of life and potentially beyond. Stu Mittleman, one of the author's patients, won the *World Champion Six-Day Running Race* in La Rochelle, France in 1994 at age 43 by running almost 100 miles per day for six consecutive days!

Traditionally, endurance athletes include runners and cyclists, mountain bikers, swimmers, skaters and cross country skiers, triathletes and duathletes. But others not usually thought of as endurance athletes also require high levels of aerobic function. These include basketball, hockey, football, soccer and baseball players, and even race car drivers. More importantly, those millions of people who are trying to lose weight and get more fit, and executives wanting to be more productive are endurance athletes; they attempt this through walking, aerobic dance, home exercises and other approaches. Many, however, perform activities which do not adequately build endurance or the aerobic system effectively and for a long period. These include weight lifting, abdominal exercises, irregular tennis or golf, and calisthenics.

AEROBIC SPEED

Through proper aerobic training comes more endurance, which was defined above as the ability to perform more work with the same or less effort. In the case of a runner, for example, this increased work capacity comes in the form of more *aerobic speed*. Using the heart rate as a measure of effort, let's assume this athlete can run 5,000 meters (3.1 miles) in 18 minutes. After four months of improving endurance he or she can now run that same distance in 17 minutes. This is also applicable to other sports. During the course of a game, the basketball player maintains the ability to run up and down the court faster with less effort (i.e. utilizing less energy) and fatigue. The distance cyclist, swimmer or cross country skier can go faster with the same or less energy and for longer periods. This aerobic speed is accomplished by increasing the utilization of fats for energy. This is distinguished from anaerobic speed, which is called sprinting - a short burst of energy is provided through glycolysis (and creatine phosphate) and is limited to two to four minutes.

BURNING BODY FAT TO LOSE WEIGHT

One of the most common problems facing people today is increased body fat. This can occur in active athletes, sedentary people, the young and old, male and female. We now have, in the industrialized world, an epidemic of overfatness. Complementary sports medicine addresses this problem with great success, using the same philosophy as discussed above.

Patients usually consider excess body "weight" and body "fat" as synonymous. The issue, however, is body fat as the patient's weight is influenced more by the body's water content. In addition, the obsession of "less is best" regarding body fat is often held by many people.

EXCESS FAT

Clearly, above normal levels of body fat are harmful to health, especially when it occurs in later adult life. Unfortunately, over a quarter of the US adult population is overfat, with that number increasing. This rate is higher only in Italy. Body fat levels above 25% in men and 35% in women may be considered obesity, although other estimates are used. Childhood obesity has also increased 20% during the last decade and is now prevalent in about 25% of US children. No "normal" body fat levels should be established due to individual variations (i.e. physical and chemical body make-up); rather, a "desirable" level should be considered. These optimal levels of body fat are approximately 15% for men and 25% for women.

Complementary sports medicine practitioners are as capable, if not more, than any other professional to treat most patients with imbalances causing excess fat. In many ways, these patients are metabolically similar to athletes with aerobic deficiency, and almost always have nutritional imbalances and adrenal dysfunction. As such, the recommendations for a patient whose goal is to lose fat is no different than any one else; the patient is treated and not the condition. A proper and extensive assessment is made, followed by the appropriate treatment, with the necessary lifestyle recommendations regarding eating and exercise.

It is important to avoid using the word "diet" with patients who may have been following many weight-loss diets which resulted in failure. True success in body fat balance occurs when there a reduction in stored fat to healthier levels without lowering lean body mass or inducing dehydration, *and this balance is maintained year after year*. The majority of weight-loss programs may succeed in reducing the number of kilograms or pounds, but this does not always reflect a relative body fat loss. More importantly, there is often a return of the lost weight, frequently with additional body fat gains. This is an example of the unhealthy aspects of "dieting."

ASSESSMENT OF BODY FAT

It is best to use body fat content as a primary assessment tool, with scale weight as a secondary measurement, if used at all. The waist-to-hip ratio may be the best single measurement which reflects *metabolic function*, and is described below. It is important to emphasize to the patient that measurements of body fat should not be taken daily or even weekly since fat loss takes place over a longer period of time. Frequent measurements may produce or maintain preoccupation as is often the case with patients who are on a diet and weigh themselves on the scale once or twice a day.

WAIST-TO-HIP RATIO

Measurement of the body can provide more information for the complementary sports medicine practitioner than only scale weight. While a patient's weight has some significance, it is mostly a measure of water content, not percentage body fat or fat distribution. The waist-to-hip ratio is a measure of body fat *distribution*, and may reflect body function and potential future health and disease status.

Two separate tape measures are required to obtain the waist-to-hip ratio: a) the first is a measure of the circumference of the patient's waist at the umbilicus; b) the second is a measure of the hip circumference. The ratio of a to b is noted (a divided by b). In men, a ratio greater than 0.9 and in women a ratio of 0.8 indicates *android body type*. The android body is larger above the waist compared to below, and sometimes referred to as "apple shaped" as opposed to a lower waist-to-hip ratio which constitutes the gynecoid body type or "pear shaped." In addition to inactive patients, many active trained athletes have elevated waist-to-hip ratios.

PERCENT MEASUREMENTS

The common devices and formulas used to measure body fat are very general, and neither precise nor comparable. For example, one study of bioelectrical impedance using 12 common formulas showed the formulas that performed well in one group gave poor results in another, and vice versa. Skinfold thickness, measured by calipers and using various formulas, may also vary in its fat content results. For example, two identical skinfold thickness may have significantly different concentrations of fat cells, and these external measurements of

subcutaneous fat do not consider internal adipose tissue content. When calipers are compared to underwater weighing for body density, one study found an error of 4.9% body fat - too large for accurate estimates. Even the use of more complex assessments, such as dual-energy X-ray absorptiometry, do not reveal *precise* measurements of body fat. Although more accurate, computerized analysis of magnetic resonance images also results in some variability, however, these tests are much less practical.

In all, most methods *underestimate* body fat content. The use of any device to obtain body fat content should be considered only a general measure, and the patient must understand that small changes are not relevant and may be due to error. In an office setting, a slight improvement in accuracy may be obtained if the same device is used in all evaluations, and by the same person (i.e. staff member, practitioner, etc.).

It should be noted here that in competitive athletes, restricting kilocalories as a means of losing body weight can result in diminished athletic performance. Athletes who restrict energy intake to promote weight loss can also decrease bone density. The problem in some sports, especially in wrestling and ballet, is the increased mental/emotional pressure to attain low body weights. As a result, many unhealthy habits are implemented by these athletes and at all ages, including food restriction, dehydration (fluid restriction), bulimic behaviors and others. Some programs, such as the *Wisconsin minimum weight program* restricts weight loss in wrestlers by including a minimal weight limit determined from percent body fat along with a nutrition education program. This type of program may serve as a healthy guide for those in sports.

Clearly, many athletes are more preoccupied with thoughts of eating and body weight, feel difficulty controlling their body weight, abuse laxatives for weight control, and report disordered eating more than non-athletes. For example, two-thirds of ballet dancers currently use at least one method of weight control.

DIET & NUTRITION

In addition to building the aerobic system through effective exercise, dietary and nutritional factors are clearly important to increase body fat loss. Although there are no

special formula's for patients with excess body fat, some key points are noted here.

Dietary assessment should be made initially, to view the patient's style of eating along with their levels of nutrients. Note especially meal frequency, water intake and if there is an obsession about low-fat food items. A healthy eating plan can usually be structured for any patient around their likes and dislikes. Often, patients need encouragement to try foods and combinations they never tasted; spaghetti squash, Brussels sprouts, vegetables with breakfast, fresh ginger in salad dressing, etc.

Among the most common problems associated with increased body fat is the consumption of excess carbohydrates, especially refined ones including sugar. It is important to understand that about half of all carbohydrates consumed turn to fat and are stored. Patients eating a high-carbohydrate, low-fat diet usually burn less fat for energy (and store it) and rely more on sugar. In addition, high-carbohydrate, low-fat diets may lead to carbohydrate intolerance and insulin resistance. Lowering carbohydrate intake can substantially increase fat-burning. This may be due to the insulin lowering benefits of lower carbohydrate diets compared to other weight-loss diets. Despite these and other clear indications which contradict low-fat, high-carbohydrate diets, they are still used for weight control. Unfortunately, the low-fat philosophy leads many patients to consume larger amounts of prepared low-fat foods, which are often made from high amounts of sugars elevating glycemic index.

It may, therefore, be important for many patients to begin the process of reducing body fat with a Two-Week test as described below. In addition, controlling the postprandial insulin peak and potential extreme glucose fluctuations are very important for two reasons; 1) this will help control any regression in carbohydrate intolerance, and prevent additional storage of fat (from dietary carbohydrate), and 2) it can control hunger, cravings and binge eating. Food frequency is also an important element in the dietary habits of patients seeking to increase fat burning. Spreading out the full day's food into many smaller meals rather than one, two or three large ones can significantly help produce a flatter postprandial curve and control insulin and glucose peaks, which can also have a positive effect on body weight control. Many diet programs restrict meals and substitute high

carbohydrate drinks or other snacks, which are often a major metabolic stress. It is important to emphasize that patients eat real food and real food products throughout the day rather than rely on convenience items which are usually unhealthy, especially in relation to the content of fats.

It should also be noted that the pungent principle of hot red peppers, *capsaicin*, may have a positive effect in those patients with excess body fat since it increases energy expenditure. This may be associated with increased sympathetic nervous system function, which is diminished in some patients with excess body fat.

THE TWO-WEEK TEST

(Excerpted with permission from *In Fitness and In Health* by Dr. Philip Maffetone.)

This test will provide you with two vital pieces of information: it will help you decide if you really have a carbohydrate intolerance. And if you do, it will start you on the right path to finding your optimal level of carbohydrate intake.

The Two-Week Test is a period of time in which your insulin levels remain relatively low because your carbohydrate intake is decreased. Here are the rules:

1. Before you start the test, *Ask Yourself* about the signs and symptoms of carbohydrate intolerance listed below. Write down the problems that you have from this list, along with any other complaints you have. After the test, you will ask yourself again how you feel regarding these complaints. In addition, weigh yourself if you are concerned about your weight. (This is the only instance I recommend using the scale.)

Questions regarding excess carbohydrate intake. If 'yes' is a frequent answer, you may be carbohydrate intolerant:

- are you sleepy after meals?
- do you get bloating after meals?
- do you have general mental or physical fatigue?
- do you have cravings for sweets or caffeine?
 - are you always hungry?
 - do you have too much body fat?
 - do you have blood sugar problems?

- are you depressed?
- are you aerobically deficient?
- do you have excess adrenal stress?

If your carbohydrate intolerance has progressed to insulin resistance, you may have some of these problems:

- high blood pressure
- high cholesterol
- high blood triglycerides
- diabetes
- heart disease
- breast cancer
- polycystic ovaries

2. For a period of two weeks, do not eat any of the following foods, except for breakfast where one slice of 100% whole grain bread or toast is allowed with your meal (but not as your meal).

Foods to avoid...

- ÿ bread, rolls, pasta, pancakes, cereal, muffins, rice cakes.
- ÿ sweets, including products that contain sugar such as ketchup, honey,
- ÿ and many other prepared foods (read the labels).
- ÿ fruits and fruit juice.
- ÿ potatoes (all types), corn, rice, beans.
- ÿ milk, half and half, yogurt.
- ÿ so-called healthy snacks, such as 40-30-30 bars and drinks.

You may eat as much of the following foods as you like:

Foods to eat...

- ÿ whole eggs, all real cheeses, cream.
- ÿ all meats (beef, turkey, chicken, lamb, etc.), but beware: many cold cuts are cured in sugar and should be avoided.
- ÿ all fish and shellfish.
- ÿ tomato, V-8 or other vegetable juice (such as carrot).
- ÿ all vegetables (except potatoes and corn), cooked or raw, and tofu.
- ÿ nuts, seeds, nut butters.

- ÿ oils, vinegar, mayonnaise, mustard, (no hydrogenated oils).
- ÿ sea salt is highly recommended, unless you are sodium sensitive.

Go Shopping. Before you start the test, make sure you have enough of the foods you'll be eating during the test. And, get rid of the sweets in your house, or you'll be tempted.

Do Not Go Hungry! There is a variety of food to select from so you don't ever go hungry. Eat as many eggs as you want, as much cheese or meat and as many vegetables as you need to feel full. Remember, this is only a test which will last two weeks. You will not be eating like this forever. Don't worry about cholesterol, fat or calories. Or the amount of food you're eating. This is balanced in the next steps.

The test should not be difficult, although it is probably a big change from the way you were eating previous. Many CI individuals have been on a high carbohydrate, low fat and low protein diet. If you've been eating lots of sweets or other carbohydrates, you may experience cravings for sugar for a few days during the test. (Some have referred to this as a carbohydrate addiction). Eat something on the acceptable list instead and stick it out.

Following the diet for less than two weeks probably will not give you a valid result. So, if after 5 days, for example, you eat a bowl of pasta, you will need to start the test over.

3. After the Two-Week Test, re-evaluate your list of complaints; do you feel better now than you did two weeks previous? Did you lose weight? If nothing improved, then you may not be carbohydrate intolerant. If you do feel better – some say they feel like a new person – especially if you've lost weight (which would be water weight), the test most likely indicates you have some degree of CI.

If the Two-Week Test improved your symptoms, the next step is to determine how much carbohydrate you can tolerate, without getting any of those symptoms. This is done the following way:

1. Begin adding *small* amounts of carbohydrates to your diet. This may be a slice of bread at lunch, or a half of potato with dinner. Whatever you add, make sure it's not a refined carbohydrate: no sugar containing foods,

no refined flour products (like white bread, rolls or pasta), brown rice instead of white, etc.

2. Don't add a carbohydrate with back-to-back meals. Because the amount of insulin production is partly based on your previous meal, add a carbohydrate every other time you eat a meal or snack.

3. With each addition of carbohydrate, observe for any of the symptoms you had before you started the test which were eliminated by it. Look especially for symptoms that develop immediately after eating, such as intestinal bloating, sleepiness after meals, or depression. If your hunger or craving disappeared during the two weeks and now have returned, you've probably eaten too many carbohydrates. If you lost 8 pounds during the test, and gained back 5 after adding some carbohydrates for a week or two, you've probably eaten too many carbohydrates.

During the Two-Week Test and forever after, be sure to drink lot of water. Most people need at least 6-10 glasses (8 oz ones) per day. Generally, the more protein you consume the more water you will need between meals.

Below are some other suggestions for eating , food preparation and dining out which may be helpful during and after the Two-Week Test.

MEAL IDEAS

Eggs:

- ÿ Omelets, with any combination of vegetables, meats and cheeses.
- ÿ Scrambled with guacamole, sour cream and salsa.
- ÿ Scrambled with a scoop of ricotta or cottage cheese and tomato sauce.
- ÿ Boiled or poached with spinach or asparagus and hollandaise or cheese sauce.
- ÿ Add turkey or chicken slices if appealing.
- ÿ Soufflés.

Salads

- ÿ Chef – leaf lettuce, meats, cheeses, eggs.
- ÿ Spinach – with bacon, eggs, anchovies.
- ÿ Caesar – Romaine lettuce, eggs, Parmesan cheese, anchovies.
- ÿ Any salad with chicken, tuna or shrimp or other meat or cheese.

- ÿ Salad Dressings:
- ÿ Extra virgin olive oil and vinegar (balsamic, wine, apple cider). Plain or with
- ÿ sea salt and spices to taste.
- ÿ Creamy – made with heavy cream, mayonnaise, garlic and spices.

Fish & Meats

- ÿ Pot roast cooked with onions, carrots and celery.
- ÿ Roasted chicken stuffed with a bulb of anise, celery and carrots.
- ÿ Chili made with fresh chopped meat and a variety of vegetables such as diced
- ÿ eggplant, onions, celery, peppers, zucchini, tomatoes and spices.
- ÿ Steak and eggs.
- ÿ Any meat with a vegetable and a mixed salad.
- ÿ Chicken Parmesan with a mixed salad.
- ÿ Fish (not breaded or fried) with any variety of sauces and vegetables
- ÿ Tuna melt on bed of broccoli or asparagus

Sauces

- ÿ A quick cream sauce can be make by simmering heavy cream with mustard or curry powder and cayenne pepper, or any flavor of choice. Delicious over eggs, poultry and vegetables.
- ÿ Italian style tomato sauce helps makes a quick Parmesan out of any fish, meat or vegetables. Put this over spaghetti squash for a vegetarian pasta-like dish. Or make a "lasagna" out of slices of eggplant or zucchini instead of pasta.

Snacks

- ÿ Celery stuffed with nut butter or cream cheese.
- ÿ Guacamole with vegetable sticks for dipping.
- ÿ Hard boiled eggs.
- ÿ Rolled slices of fresh meat and cheese.
- ÿ Vegetable juices.
- ÿ Almonds, cashews, pecans, sunflower seeds.

When Dining Out

- ÿ Let the waiter know you do not want any bread, to avoid temptation.
- ÿ Don't hesitate to ask for an extra vegetable instead of rice or potato.

- ÿ Avoid fried food (it's usually laden with bread crumbs and bad fat).
- ÿ Avoid iceberg lettuce. Choose a Caesar or spinach salad instead.

Dining Menu Options

- ÿ Chinese; Steamed dishes, or Moo Shu (No rice, pancakes or sweet sauce).
- ÿ Continental; Filet mignon or other Steak, Duck, Fish or Seafood.
- ÿ French; Coquille Saint-Jacques, Boeuf A La Bourguignonne.
- ÿ Italian; Eggplant Parmesan, Veal Marsala, Mussels marinara.
- ÿ Vegetarian; Tofu or cheese and vegetables, egg dishes.

Many people find the loss of grains in the diet leaves the digestive tract sluggish, which may make you a little constipated. Adding plain unsweetened psyllium (available in health food stores) to a glass of water or tomato juice will keep your system running smoothly. Another way to add psyllium to your diet is to use it in place of flour for thickening sauces or in place of bread crumbs to coat meats and vegetables.

REALITY CHECK

Once you've found your body's ideal level of carbohydrate intake, it will be relatively easy to maintain your intake. You'll be able to eat almost anything you want once you know your limit. And you probably won't want to eat more than your limit because you'll become acutely aware of how bad your body feels when you eat too many carbohydrates. From time to time, you may feel the need to go through a Two-Week Test period to check yourself and make sure your tolerance has not changed.

Some people may become constipated during the Two-Week Test, or afterwards when a lower amount of carbohydrate in the diet is maintained. This may happen for three reasons. First, you may not be eating enough fiber. Bread, pasta, and cereals are significant sources of fiber for many people. But so are vegetables. And sometimes it's the cooked vegetables that are better for the intestines since they're partly broken down in the cooking process. So if you become constipated, it may simply be that you need to eat more vegetables. And once you learn how much carbohydrate you can tolerate in your diet, adding that will also help. Especially if you

can tolerate some fruit. If you require a fiber supplement, be sure to use the ones that do not contain sugar. Most fiber products contain sugar, so read the labels. Konsyl®, available in drug stores, is among the many sugar-free psyllium products on the market. One teaspoon per day is usually enough to maintain regularity.

Another reason for constipation at this time may be dehydration. If you don't drink enough water, you could be predisposed to constipation. During the Two-Week Test, you'll need more water; up to three quarts or more per day.

For some people, drinking gallons of water won't prevent the intestine from absorbing too much water, making you constipated. This is partly controlled by the prostaglandins, which come from our dietary fats. This is discussed in detail in the next chapters. For now, remember that in many people who are constipated, there is not enough oil in the diet.

Occasionally, some people will get very tired during the Two-Week Test. This can be a number of problems; *Ask Yourself*:

- ÿ Am I drinking enough water?
- ÿ Am I eating enough food?
- ÿ Am I eating as often as necessary (i.e. every two or three hours)?
- ÿ Am I eating carbohydrates without realizing it?
- ÿ If I am not sodium sensitive, am I getting enough salt (from sea salt)?
- ÿ Am I eating enough vegetables?

All vegetables contain some carbohydrates. Except for potatoes and corn, the amount are relatively small. Occasionally, a person is so sensitive that high starch vegetables like carrots or squash cause symptoms.

MAINTAINING YOUR BALANCE

Once you successfully finish the Two-Week Test, and add back the right amount of

carbohydrates to your diet, you should have a very good idea of your limits. This is best accomplished by *Asking Yourself* about your signs and symptoms on a regular basis; energy, weight, sleepiness and bloating after meals, etc. You may want to keep a diary so you can be more objective in your self-assessment. In time, you won't need to focus as much on this issue as your intuition will take over and you'll automatically know your limits.

CONCLUSION

Complementary sports medicine, or sports kinesiology, is not a technique, but an approach to patient care. It encompasses many facets, addressing the needs of the whole person, not just those related to sports. The use of muscle testing is a foundation of the assessment process, a method of determining functional imbalances and a way to assure that effective corrections have been made.

Dr. Philip Maffetone practiced applied kinesiology for over 20 years. During this time he treated and trained many world class and professional athletes, and helped many others begin an exercise program. Some of the athletes he worked with include triathletes Mark Allen, Mike Pigg and Wendy Ingraham, race car drivers Mario and Michael Andretti, baseball player Tom Seaver and others.

Dr. Maffetone was named *Coach of the Year* in 1996. He served as chairman of the *International College of Applied Kinesiology* from 1990-94. His two general audience books include *In Fitness and In Health*, and *Training for Endurance* (Barmore Productions: 607-652-7610; BarmorePro@aol.com), with a professional book, *Complementary Sports Medicine* (Human Kinetics: 800-747-4457) due out in early 1999. Dr. Maffetone writes and lectures extensively on sports, exercise, diet & nutrition and complementary medicine. He is currently President of the *MAF Group*.