

Chapter 1 : Liebenson's Functional Training DVDs and Handbook

Neuromuscular training has also been used to increase core stability and functional stability of the shoulder, elbow, and wrist in rehabilitation and as a preventive measure (). This type of training should include balance exercises at a progressive level of difficulty and should be developed into sport-specific exercises.

Traditionally, for healthy individuals or athletes it focused on strength, flexibility, or cardiovascular training. This book promotes a different approach in that the aim of training is to promote athletic development 1,2. Ironically, as enhanced movement literacy becomes the goal of athletic development, training not only becomes more functional but also begins to overlap with clinical rehabilitation. It becomes more functional because it is focused on stereotypical movement patterns i. A bodybuilder may prefer to isolate a muscle to cause hypertrophy, but isolation is not the primary goal for an athlete. An important exercise science principle that highlights the limitations of the isolated muscle or joint approach is the Specific Adaptation to Imposed Demands SAID principle. The SAID principle shows that training gains are specific to the movement that is trained 4,5. Therefore, an isolated movement that is trained repetitively does not necessarily transfer any benefit to functional tasks, whereas if fundamental movement skills or movement literacy is trained there is high transfer of benefit to enhanced sport performance as well as injury prevention 6â€” Clinical rehabilitation of musculoskeletal disorders also traditionally focused on the prescription of repetitive, isolated exercises. For instance, shoulder rehabilitation would involve exercises for the individual rotator cuff muscles with resisted internal and external rotation of the shoulder at different angles of arm elevation For instance, rehabilitation of a baseball pitcher with rotator cuff tendinosis or labral insufficiency might draw from a menu involving scapulothoracic stability, closed-chain exercise, core stability, and single leg posterior chain training 17â€” There are parallels in both the rehabilitation and training fields with an evolution toward greater emphasis on motor control with a concurrent lessening of the emphasis on isolation of individual muscles and joints 20, An important process underpinning the emphasis on training functional movement patterns instead of mainly isolating individual muscles and joints is called cortical plasticity. Movements which are repeated are learned by the central nervous system as a new engram. Poor postural habits and adaptations to pain or injury result in compromised movement efficiency. If we only train isolated motions as the SAID principle implies, there will not be an improvement in our functional skills Therefore, modern training and rehabilitation both have come to the same conclusion. If the goal is to identify and remediate faulty movement patterns, does this mean that we ignore individual 1 c Wolters Kluwer. No, frequently there will be a specific dysfunction of a joint i. What changes is the way we conceptualize what we are doing. As the famed neurologist from Prague Dr. Segmental treatment alone, without appreciation of the big picture, will result in the patient or athlete being as lost as their myopic trainer or rehabilitation specialist. Such beliefs or practices are considered by some to be exempt from criticism or questioning, despite containing inaccurate dogmas, and this book will attempt to expose some of these myths, while proposing alternative, science-based explanations. Advances in Functional Training. On Target Publications; Balyi I, Hamilton A. Trainability in Childhood and Adolescence. Sale D, MacDougall D. Specificity in strength training: Can J Sport Sci ;6: Neuromechanical Basis of Kinesiology. The effectiveness of a neuromuscular prevention strategy to reduce injuries in youth soccer: Br J Sports Med ; When to initiate integrative neuromuscular training to reduce sports-related injuries and enhance health in youth? Am Coll Sports Med ; Neuromuscular training improves performance and lower-extremity biomechanics in female athletes. J Strength Cond Res ; Prevention of anterior cruciate ligament injuries. Curr Womens Health Rep ;3: Physical fitness, injuries, and team performance in soccer. Med Sci Sports Exerc ;2: Incidence of soccer injuries and their relation to training and team success. Am J Sports Med ; Clin Sports Med ;8: Shoulder rehabilitation strategies, guidelines, and practice. Op Tech Sports Med ;8: Shoulder musculature activation during upper extremity weight-bearing exercise. Wilk KE, Arrigo C. Current concepts in the rehabilitation of the athletic shoulder. J Orthop Sports Phys Ther ; Rehabilitation of scapular muscle balance: Current concepts in the scientific and clinical rationale behind exercises for glenohumeral and scapulothoracic musculature. J Orthop Sports Phys Ther ;2: Functional-Stability Training in Rehabilitation of

the Spine: Markham J, Greenough WT. *Neuron Glia Biol* ;4: Muscular coordination and strength training, implications for injury rehabilitation. Excessive scapular motion in individuals recovering from painful and stiff shoulders: Relative balance of serratus anterior and upper trapezius muscle activity during push-up exercises. *Am J Sports Med* ;2: Upper and lower trapezius muscle activity in subjects with subacromial impingement symptoms: *Phys Ther Sport* ;2: Plyometric training in female athletes. Decreased impact forces and increased hamstring torques. Evaluation of muscle imbalance. Rehabilitation of the Spine: Comparison of different strongman events: *J Strength Cond Res* ;4: Exercises for the torso performed in a standing posture: *J Strength Cond m Res* ;2: Deficits in neuro muscular control of the trunk predict knee injury risk: The effects of core proprioception on knee injury: High-quality training and injury prevention are closely related and both should be sport-specific. Injuries usually occur if the biomechanical load becomes higher than the tolerance of the potential structure. This can occur either if the biomechanical load is too high or if the tolerance against a certain biomechanical load is reduced 1. A too high biomechanical load usually occurs either when a single bout of load is too high for the involved structure to absorb leading to an acute injury or if the load is excessive over a period of time leading to an overuse injury. An example of an excessive biomechanical load is a typical injury mechanism of a lateral ankle sprain in soccer when the involved player is running with the ball. At the moment of injury all of his body weight is on one leg and he receives a laterally directed tackle from an opponent onto the medial side of the ankle or lower leg. No gliding is possible between the shoe and the surface because the cleats fix the shoe to the field and the whole body weight is on the involved leg. This causes a supination or inversion movement of his foot and forces the player to put weight on his supinated or inverted foot. This often results in an injury on the lateral aspect of the ankle, commonly a ligament sprain or even a fracture 2. Another example of an excessive biomechanical load is a well-known injury mechanism of hamstring strains during water skiing. This mechanism usually takes place if the tips of the skies go below the surface of water during a submerged take-off or the skies stick into a wave during towing. This causes a sudden deceleration of the skies. This results in a forced hip flexion, followed by an excessive load on the hamstring muscles with a subsequent strain or rupture 3. Reduced tolerance against a biomechanical load can be caused by many factors. Examples of factors that possibly can lower the tolerance against biomechanical load are if the training status of athletes does not meet the demand of their particular type of sport. That emphasizes that the training methods, as well as the training load, intensity, and progression, are important and need to be sport-specific. The quality of training in junior sports is particularly important when building up different training effects such as strength, flexibility, power, and muscle endurance in a sport-specific manner. Another well-known injury situation is if athletes start high-intensity training or competition too early after a previous injury and the injured structure is not able to tolerate the biomechanical load required. This often results in a recurrent injury. In overuse injuries where the injuries slowly evolve without a clear onset, the injury mechanisms are not always as obvious as in acute injuries. It is well known that risk factors often interact with each other, which can influence their appearance and strength. Increased age is, for example, a well-documented risk factor for injuries in many types of sport. Older players have usually participated in sport longer than younger players, and often sustained more previous injuries. In addition, they most likely have some age-related degenerative changes, and their training volume and intensity may even be reduced compared with younger players, leading to a reduced physical performance and increased risk of fatigue late in training or competition. All of these factors may be related to the amount of risk due to increased age. Classification into modifiable and nonmodifiable risk factors is also known and is based on the fact that some risk factors are modifiable such as strength imbalance or functional instability, while others are not modifiable such as increased age or race 6. Another method to categorize risk factors is to use a classification based on participation in sport, physical fitness, psychological factors, environmental factors, and unchangeable factors Table 2.

Chapter 2 : Core Stability Training for Injury Prevention

Craig Liebenson's New DVDs I am eagerly awaiting for my copies of Craig Liebenson's DVDs, Core Stability Training and Functional Performance Training. Craig always does a great job.

Dynamic Chiropractic " August 13, , Vol. Traditional approaches have focused on sit-ups, while today, abdominal hollowing is the new trend. Core training should be as functional as possible and involve all the muscles of the core. The diaphragm, pelvic floor, oblique abdominals, transverse abdominus, rectus abdominus, as well as the lumbar spine musculature, should all participate in a well-coordinated manner. However, the sit-up places a high compressive load on the disc. Researchers at Yale University have shown that a specific motor-control signature of delayed agonist-antagonistic muscle activation predicts which asymptomatic people will later develop low back pain LBP. Inappropriate muscle activation patterns during seemingly trivial tasks only 60 Newtons of force , such as bending over to pick up a pencil, can compromise spine stability and potentiate buckling of the passive ligamentous restraints. A common practice in gyms is to exhale with exertion. Unfortunately, many strenuous tasks occur when fatigue is setting in. If spine stability is compromised when one is gasping for air, the natural result will be low back injury e. McGill demonstrated a loss of control of the "neutral spine posture" during weight-lifting under challenging aerobic circumstances. A novel approach to achieving stronger co-activation of all abdominal wall muscles is to observe the position of the anterior chest wall. Ideally, a depressed e. The "exhalation" position is believed to be facilitory of the abdominal wall, since active exhalation is produced by the abdominal muscles. Ask your patient to breathe in and feel how their chest naturally raises up. Then manually guide the chest down during exhalation and hold it there while the patient breathes in and out. Finally, ask your patient to actively hold their chest in this depressed exhalation position while continuing to breathe in and out. Co-contractions have been shown to occur automatically in response to unexpected or sudden loading and to have a stabilizing effect. One is a voluntary pre-contraction to stiffen the spinal column when faced with unexpected perturbations. The second is an involuntary, reflex contraction of the muscles quick enough to prevent instability following either expected or unexpected perturbations. The patient should pretend they are about to be pushed or hit and they will "automatically" brace. Then the patient can be asked to hold the AB while breathing in and out. Finally, in recumbent, sitting, standing or various exercise positions e. All the while, the patient is verbally cued to "breath and brace. The fourth pillar for spine stability is maintenance of a "neutral spine" or normal lumbar lordosis. Many patients perform a posterior pelvic tilt, which actually places the lumbo-sacral spine in flexion and thus can potentially harm the disc via end-range loading in flexion. The mobilization should occur at the thoracolumbar junction while maintaining the lumbosacral junction in slight lordosis. Training the Core The dying-bug position is ideal for core training. Begin in the recumbent squat position. This is the same position an infant can control at some time between 3 and 4 months old. The instruction is to tap a knee with the opposite hand and then partially separate the arm and leg, performing eight to 10 slow repetitions. This can be progressed by adding a weighted medicine ball in the hand. Another excellent recumbent core exercise is the overhead arm reach on a foam roll. The same cueing is utilized to incorporate the four basic pillars of core training. Then have the patient slowly bring a medicine ball overhead without losing the exhalation position of the anterior chest. Move the ball back to the starting position and perform slow repetitions. Since most functional activities require transverse plane motion e. The key is to perform a small counter-rotation of only 1 or 2 inches. The arms and legs roll, but the spine should stay solidly in place on the mat. Abdominal exercises are utilized for cosmetic and therapeutic purposes. There are a number of myths which should be unmasked about this subject regarding sit-ups, morning exercise, the posterior pelvic tilt, the transverse abdominus, exhaling with exertion, etc. The four pillars of core training described in this article should be incorporated into all abdominal training. The dying bug is an excellent starting point to "groove" healthy motor patterns. This should be seen as a first step, but not an end in itself. Progressions to side support, quadruped, and most importantly, upright e. Recent advances in lumbar spine mechanics and their clinical significance. Role of muscle in postural tasks: Delayed trunk muscle reflex responses increase the risk of low back injuries.

Stabilizing function of the trunk flexor-extensor muscles around a neutral spine posture. Mechanical stability of the in vivo lumbar spine: Implications for injury and chronic low back pain. Clin Biomech, ;11 1: The influence of sudden perturbations on trunk muscle activity and intra-abdominal pressure while standing. Exp Brain Res, ; Cost-benefit of muscle cocontraction in protecting against spinal instability. Relation between the structure of the annulus fibrosis and the function and failure of the intervertebral disc. Delayed postural contraction of the transverse abdominus associated with movement of the lower limb in people with low back pain. J Spinal Disord, ; Altered trunk muscle recruitment in people with low back pain with upper limb movements at different speeds. Arch Phys Med Rehabil, ; Determining the stabilizing role of individual torso muscles during rehabilitation exercises. Rehabilitation of the Spine: The effects of preview and task symmetry on trunk muscle response to sudden loading. Muscle activities during asymmetric trunk angular accelerations. J Orthop Res, ;8: Trunk loading and expectation. Mechanism of Injury and Restabilization. Ultimate Back Fitness and Performance, 2nd ed. Loads on the spinal tissues during simultaneous lifting and ventilatory challenge. The stabilizing system of the spine. Function, dysfunction, adaptation, and enhancement. J Spinal Disorders, ;5: Decrease in trunk muscular response to perturbation with preactivation of lumbar spinal musculature. Muscular response to sudden load. [Click here for previous articles by Craig Liebenson, DC.](#)

Chapter 3 : Library Resource Finder: Table of Contents for: Rehabilitation of the spine : a practiti

permission from Liebenson C. Functional Stability Train-ing in Liebenson C (ed) Rehabilitation of the Spine: A C. Liebenson Functional training for.

Improve your mobility by 30 degrees, injury proof your workouts, and avoid self-sabotage. Here is our interview with functional training expert, Dr. So lets set the record straight right off the bat. What is the real definition of functional training? First off functional must be purposeful. This is what athlete-centered programming is all about. It must be training that is targeted to creating transfer to sport skill or residency. Functional training is related to your goal, plain and simple. If you play soccer there will be a large energy systems component. If you are female athlete in basketball, volleyball or soccer it would involve ACL injury prevention. What functional training is not is standing on one leg on a Bosu ball. Click To Tweet Rusin: That basic definition makes perfect sense. But why does functional training continue to be such a polarizing topic in athletic performance and fitness, and a confused on at that? I suppose because the reaction to training isolated movements such as knee or elbow flexion or extension was to train whole body control on unstable surfaces. Of course we already had functional training. It was called general physical preparedness GPP which consisted of squats, deadlifts and bench presses. These complex movements were automatically functional and had great transfer to sports or other activities. At the end of the day functional is about transfer and skill acquisition. I get that nearly everything can be considered functional to the right person with specific goals, but what capacities do human beings need to magnify in their training to stay healthy and resilient against injuries? So we all need more movement. Would you consider any of them functional training gurus? And is that designation actually a bad thing? What is the person in front of us after? Weight loss, reduced cardiac risk, more energy, more tone? Or, less shoulder pain when they throw, knee pain when they run? Or, to stay healthier as they age? Even in his work: What is the demand or expected capacity that the individual needs. Like Jill Cook PT, PhD we have to bridge the gap between current and required capacity or else a tendinopathy will result. This is where my friend Professor McGill really shines. Assessing current capacity and asking the question what is their goal or demand. We not only need to bridge the gap but ensure there is a margin of error or stability surplus. In an way all of this goes back to Professor Janda who highlighted that modern life involves an excess of sitting and sedentarism. A lack of minimum quantity and varieties of motion. This was termed functional pathology by he and his colleague Dr Karel Lewit. I prefer to think that we evolved over 6 million years ago to be perfectly suited for nearly any challenge that can be thrown at us â€” except prolonged sedentarism. Since the agricultural revolution we have been in a decline which has accelerated in the last 2 generations because of the chair, desk, computer, cell phone, etc. You mentioned it already, but lets cut right to the chase on the topic of balance and unstable surface training. Would this be considered functional? They used the Bosu quite frequently during 1 leg squats. Similar to how Juan Carlos Santana made it popular. One of their best players did this a lot. I noticed poor motor control at the ankle, but he was doing loaded exercises repetitively on the Bosu. Do I use the Bosu? Yes, I will occasionally use it. But, we become slaves of our methods. If you have a purpose then go for it. The problem with unstable surface training is highlighted by my example. I think most people know these limitations now. The ship of unstable training has sailed. Rather than train on an unstable surface. Then, of course on one leg balance reaches are also a wonderful way to challenge stability. The ACL problem underscores how important balanced posture is. The poor ACL is a tiny structure which fails at 2x bodyweight load non-traumatically in this situation. Is there any merit to keeping an athlete or client on rehab based programming for the long term? Gray Cook, PT has I think steered us towards the solution on this. There are acceptable compensations. Find a 1 with unacceptable compensation and improve that. Our program should always be individualized and never be about our allegiance of a system. I love when Mike Robertson says he used to program for 4 week blocks but now even though it is much more work he programs only for 1 week blocks. Because the rate at which people adapt or achieve skill acquisition varies! So back to your precise question. Policing perfection as Charlie Weingroff says is rarely good. This is the mud that Greg Glassman refers to. Their must be some struggle. Then, and

most critically letting people explore movement challenges “ so long as safety is assured ” is the best way to learn. Being told what to do is interestingly target cues, reactive training, etc is an ideal way to challenge people so they get into a flow state. But, rehab purgatory is the opposite of that. It seems as though a lot of performance coaches and rehab specialists devalue the power of progressive resistance training and loading in general. Once we have muted pain triggers and established baseline movement competencies it is time to grow some balls. The problem is not so much overuse as under training. Of course we need recovery, proper sleep, better fuel, great mechanics, etc.. But, the biggest modifiable risk factor in sport is a high ratio of acute 1 week to chronic 6 week activity. In other words if we sit all week then play golf on the weekend our back will hurt. Also, how to modify based on injuries, colds, etc. As Joyce says rehab must be periodized and I believe this is the key to avoiding rehab purgatory. I of course agree, as strength is the foundation of our pain-free performance programming model. Going a step further, what role does developing strength and muscular hypertrophy play in the overall function of a human being? Strength is the key to GPP and thus athletic performance. It is necessary to prevention of sarcopenia and frailty. If we look at squat strength it enhances speed in an athlete. Hypertrophy is an armor to an athlete. Click To Tweet Young athletes need to find their ideal combination of strength and speed as they develop. This requires training for hypertrophy with higher volume training until they have competed at the professional level for years. After which volume may decrease but their PRs continue to rise. This will allow them greater recovery potential. Lets have a little fun, and actually bring these concepts around full circle for our coaches and clinicians reading to take action. Another great follow-up question John. Yes, trivial exercise without being likely to transfer is highly wasteful of time. This is a limited commodity. Think of the NFL. The collective bargaining agreement CBA is a disaster for player health. Only the superstars can afford top off-season training programs. Now due to the CBA training camp is shorter. No wonder ACL injuries are taking off. This in a league with average career span of 3. What were they thinking?

Chapter 4 : Craig Liebenson & Gray Cook Talk on Function - On Target Publications

Functional Stability Training is the integration of physical therapy and performance enhancement training, the integration of exercises and manual techniques, and the.

Dynamic Chiropractic â€” February 26, , Vol. Yet scientific research shows that programs which address functional deficits through reactivation and rehabilitation enhance the coping ability of patients far more than any passive intervention such as medication, manipulation, manual or physical therapy, injections or surgery. This new consumer awareness represents a great opportunity for health care professionals who want to benchmark themselves as MP experts. However, these passive treatments should be seen as a means to recovery rather than an end. A new organization, the International Society of Clinical Rehabilitation Specialists, is an example of how multidisciplinary health care providers can demonstrate their unique practice philosophy as MP experts who focus on functional fitness www. Such experts benchmark themselves by adhering to the overarching goals of modern care for neuromusculoskeletal problems, as described by the recent clinical framework document from the Victorian WorkCover Authority in Australia. Treatment must be based on the best evidence available. Treatment effectiveness must be demonstrated with outcome measurements. A biopsychosocial approach is essential. Treatment must focus on self-care or management skills. Treatment must be functional and focused on return to work or activities. Functional fitness is a perfect way for any health care provider to help patients with disabling or activity- limiting MP syndromes resume normal activities. The focus should be on identifying what tissues require stabilization and which require mobilization, rather than routinely giving one or the other generically. In this way, an individualized, patient-centered approach can be prescribed. Excellent resources for performing a functional assessment and giving direction-specific e. McKenzie, yoga or stabilization exercises e. Pilates, core training are available. *Functional Stability Training in Rehabilitation of the Spine: Ultimate Back Fitness and Performance*, 2nd ed. [Click here for previous articles by Craig Liebenson, DC.](#)

Chapter 5 : A Modern Approach to Abdominal Training - Mike Reinold

Save over \$40 when you order the complete package of Dr. Liebenson's outstanding resources! Improve sports performance, treat and prevent injury, re-train patterns, and much more with this comprehensive, multimedia package! The Functional Training Handbook helps you reach a whole new level of physical training while fo.

It was funny reading my old review because much of my thoughts on the course and its content have not changed except for a few key details. When I first took his seminar I was less than 2 years in practice and was still very new to a lot of the concepts being taught. Unlike 4 years ago, this time I was actively thinking about patients in my practice that would benefit from the concepts taught without overwhelming myself with minutia. I felt better able to appraise what was being taught, both the good and the not so good. This course was a mishmash of content derived from many other schools of thought. This makes going back to review the material challenging as there is minimal framework as to why certain slides are put into the manual. In short, the manual is hard to follow. I will share a few pros and cons as I saw them. Craig is fantastic at getting his audience to change their gestalt on patient care. He challenges course participant to incorporate more active care into the assessment and treatment of each patient. He is very good at giving tips and "tricks" to help patients see the value of active care over a passive care. Many times on the course he would use a demo who had pain doing a task such as a squat and would do an exercise drill with them, often targeting the core or another area of the body far removed from site of symptoms and then re-assess their pain in front of a crowd of at least 75 people. Each time the participant would say they felt better and was better able to do the functional test they had issues with before the exercise intervention took place. Basically, you can temporarily trick the CNS into "better" movement but the results are often very short lived. One other point that needs mentioning is that when he was instructing participants on how to do the exercises, he made it look easy. We are treating chronic pain patients with huge gaps in motor control and exercise capacity. This fact alone makes applying the concepts much more challenging then was let on in the course. I liked how Craig was able to introduce the audience to many other approaches such as SFMA, DNS, McKenzie etc without bashing any one approach, stating many times that they each have value and are all tools that can be used depending on the patient in front of them. This manufactured controversy might appeal to contrarians like me , but it also looks unprofessional. I like Craig for his non-guru approach to functional medicine and does a fantastic job of letting people know their are "many roads to Rome" as he liked to say. This next point is just a personal opinion, but I found the lecture components to be quite preachy at times. At one point I counted over 25 quotes, one after the other, in his power point slides. He literally read quote after quote, which I think only served to dissuade the audience from paying attention because it started to feel more like a church sermon then a rehab course. I personally could have done without the excessive number of quotes used to drive home points. Simply put, I got some pretty awesome corrective exercise ideas that help with "buy in. I had him do it reps, each time being sore. I then had him to the side plank hip thrusts with the painful leg on the downside and after about 10 reps we re-tested his single leg squat and he literally said "holy shit, how did you do that!?" I am also sure a number of other drills would have worked, but hey.. The course just gave me more ideas that really help the patient see the need to do exercise to help with their pain complaint. For this reason alone the course was well worth the time. In all honesty I took this course again to help motivate me to keep pushing active care in both my assessment and treatment. I found myself "succumbing" to patient preferences for passive care and as a manual therapist it was easy to do that. I always give exercises based on what I see as being issues, but I found myself being more lax with patient compliance. And I know I get so much more job satisfaction if patients get better quickly and their goals are met. This course was great at giving that push I knew I needed. You can find out when Dr. Interested in live cases where I apply this approach and integrate it with pain science, manual therapy, repeated motions, IASTM, with emphasis on patient education? Check out Modern Manual Therapy!

Chapter 6 : Core Training: The Importance of the Diaphragm

Functional Stability Training is a new program by Mike Reinold and Eric Cressey overviewing their approach to an integrated rehabilitation and performance training system. In order to function properly, our body needs to be strong and mobile, but control and stabilization of this mobility is often less than optimal.

What we need is to become more active. We post workouts and start discussions about how to be strategic around finding a healthier you. The Power of Functional Movement with Dr. Craig Liebenson joined us to discuss how we can stabilize and strengthen our bodies. But before Rob got into the interview with Dr. Liebenson, Devon and him wanted to talk about an awesome app that one of our OSF Facebook group members mentioned called Meetup. Look up people who are interested in doing similar activities as you such as hiking, biking, yoga, CrossFit etc so you can all workout together. When you find a group of people who have similar interests as you, it can really boost your motivation. You can also use it to talk to people about topics in your field, about family, or education, etc. However, what we should be focusing on to help us avoid injuries and physical limitations are functional movement exercises. Why are functional movement exercises so important for our health? Therefore, you may have to focus on healing one part of the body to be rid of the pain in a totally different area. Functional movement is about keeping our muscles strong as we go through life. There are different things that a tennis player needs to focus on compared to a runner. Craig Liebenson Just as our bodies are unique, so are our pains and injuries. To discover the root of your pain or ache, you have to look for hidden skeletons. The better you know your body, the more dependent you will be on yourself to find, treat, and heal any pain or soreness. We can turn our bodies around at any age. To begin feeling more active, just focus on simple movements and getting up during the day. I want everyone to develop a sustainable relationship with their body. Craig Liebenson To begin to heal his patients with functional movement, Dr. Craig Liebenson starts from the very beginning by looking at their chronological pasts. By learning what people have done in the past or their genetic history, he can understand what their body is capable of and what needs to be improved to boost their functional capacity. With that knowledge, Dr. Liebenson teaches his patients how they should be moving and how to improve their mobility by simply modifying their movements when performing physical activities. After reviewing your history including pains, injuries, and stresses, focus on where your current pain is located. What have you done before to treat that area and what are your triggers? Triggers can be anything that irritates the body such as a movement or stretch. Instead, you want to retrain the body with functional movement patterns. Examples of functional movements for the knee when you need to stabilize and strengthen it include: Lateral squats Single dead lifts Basic exercises that can help begin the process of including more functional movement in your workouts include: The simplest way for us to get started is to stop staying in a sedentary position for so long and just walk around. Try to find a way by adding movement to your day by either getting a Fitbit to motivate you, buy a standing desk, or take microbreaks during the day just to get up and walk around for awhile. The first ever chiropractic member of the McKenzie Institute U. He is actively engaged in ongoing research on the spinal stabilization system as a Visiting Scholar at Pr. He began studying with both Dr. Published works by Dr. He worked as team chiropractor for the N. Los Angeles Clippers from , consulted with the M. He serves on the Advisory Council for Equinox worldwide luxury fitness gyms.

Chapter 7 : Single Leg Exercises, Core Stability, and Functional Training - Mike Reinold

Functional training with the kettlebell in training stability is usually ignored even though it is the more C. Liebenson.

More ease with everyday activities
Decreased chance of injury in athletics and in daily life
Functional Training versus Traditional Strength Training
Functional training works the body in a much more holistic and integrated way than traditional strength training alone. In daily life as well as athletic performance, the nervous system thinks in terms of whole movements, not in terms of moving an individual muscle. While traditional strength training isolates individual muscles or muscle groups, functional training teaches the whole neuromuscular system to work in unison. Through functional training exercises, you become more coordinated as your whole body works together to produce optimal movements. While a bodybuilder doing nothing but traditional strength training may look great aesthetically, we have to admit there is nothing functional about the type of strength built by most bodybuilders. The bodybuilder may be able to bench a large amount of weight while laying supine on a stationary bench, but that skill may not transfer well to everyday life or to athletic performance. That being said, functional training and traditional strength training complement each other and should be used together for the best results. There is a lot of value in isolating individual muscles or muscle groups to address weak links in the movement system. If you are an athlete or even somebody into fitness, you take the fundamental everyday movements of squatting, lunging, pushing, pulling, and twisting to the next level in terms of speed and force. Advanced functional training exercises exist for athletes and advanced exercisers looking to increase their performance. You may also be interested in plyometric exercise, as plyometrics increases the rate at which muscles can produce force, a key dimension of functional fitness. Plyometric exercises also exist on a continuum from beginning to advanced. Read our plyometric training exercise article to learn more. This article focuses on introducing functional training exercises for beginners. As stated above, the number one rule of functional training exercise progression is to master the bodyweight move before adding resistance. You will likely find that the weight of your body is plenty of resistance to achieve noticeable benefits from these exercises, however, once the body weight versions become unchallenging, add resistance or decrease the stability to push yourself further.

Squats
The bodyweight squat is one of the very best exercises you can do for the lower body, working the glutes, hamstrings, quads, and calves. A bodyweight squat simply mimics the motion to sit back on a low stool. Focus on proper form to prevent injury, as this move is tough on the knees and back if performed incorrectly. The hips guide the movement, not the knees. Keep your knees stacked above your ankles and your toes pointing straight ahead as you sink back into the squat. Do not let the knees go beyond the toes. Ground all four corners of the foot and drive back through the heels to keep the primary action in the glutes instead of the quadriceps and hip flexors. Actively contract the glutes and engage the core muscles. The upper body should be stacked and stable with a slight natural curve to the spine, with the shoulders back and down. If you struggle to keep your heels from rising as you squat down, your calf muscles are tight. For the time being, you can place something low such as a weight plate below the heels to give yourself something to ground against.

Lunges
Lunges are also one of the best exercises for the lower body, working all the major leg and butt muscles. A lunge is basically an exaggeration of a walking gait. From a standing position, one foot comes forward, the knees are bent deeply to lower and then raise the weight of the body, then the feet are brought back together before switching legs. You can stride forward or backward with your lunge, or even remain in one place if your space is limited. Perfect your lunge form by keeping an upright upper body with shoulders back and down. Keep your feet parallel, and never let the knee go beyond the toe on the forward foot, keeping the bones stacked to properly distribute force. Keep your hips squared forward as if they are the headlights on your car and you want to drive straight down the road.

Push Ups
Pushing is another fundamental functional movement, and the best way to train pushing strength is through the classic push up. Push ups train the chest as well as the arms and core. Always start your push up sequence with your belly and chest flat on the floor to better address functional strength. Keeping the elbows tight to the body, push yourself up without locking the elbows at the top. Keep your body straight as a plank from head to toe; if observed from the side, your ear, shoulder, hip,

knee, and ankle should form a straight line. Engage your core muscles to keep the midsection from sagging toward the ground. If straight push ups are too difficult for you at your current fitness level, the movement can easily be regressed by raising the incline of your upper body. The push up can be progressed in difficulty by increasing the incline of the feet. Place your feet on a stable raised surface, or a stability ball if you want to further challenge your stabilization. You can raise one leg to further increase the resistance experienced by the upper body, or even raise one leg and the opposite arm. One-legged push ups can be done with the leg on the floor or with the leg placed on a raised surface to progress the movement.

Pull Ups Pulling movements oppose and balance pushing movements, and are just as important in functional training exercise. A great way to train pulling is through the well-known pull up exercise. Pull ups target the back muscles, arms, and core. You can do pull ups in the gym, at home with a pull up bar that fits in a doorway, or out and about in the world on monkey bars, etc. When performing pull ups, always engage your shoulders by keeping them contracted back and down. This will prevent injury and make your pull ups easier and more effective by linking up your body. Use a full range of motion, but avoid overextending at the top; just bring the elbows in line with the body. Avoid the pull up machine commonly found in gyms that supports your knees. From the position at the top, lower yourself very slowly. This is less difficult than pulling yourself up again and again, but it is still demanding on the muscles and will help build strength so you can do the whole movement more easily with time. If you want more involvement of the biceps, turn your hands around so the backs of your hands are facing outward and your fingers are facing you.

Rotations Rotational movement should be a priority in functional training since many people injure their backs during twisting movements. Attach your resistance band to a stable object at waist height such as a doorknob. Standing with one side of your body toward the doorknob, grip the handle with both hands and rotate in a slow and controlled manner away from the doorknob, keeping the core contracted at all times to support your spine. Maintain an upright posture. Switch sides and repeat.

Functional Training Exercises for Beginners: What is functional training? Functional Training for Sports. Craig Liebenson, DC, <http://MaeBarracough.com>. Mae Barracough, B. With her passion for health, fitness, and dance, Mae loves learning all she can and sharing her knowledge with others. The views of the author are his or her own, and do not necessarily reflect the opinions of Ask The Trainer. Did you enjoy reading my article? Please rate it below!

Chapter 8 : The Importance of Functional Fitness

Sensory Motor Training - Craig Liebenson - Download as PDF File .pdf), Text File .txt) or read online. Scribd is the world's largest social reading and publishing site. Search Search.

This article has been cited by other articles in PMC. Enhancing core stability through exercise is common to musculoskeletal injury prevention programs. Definitive evidence demonstrating an association between core instability and injury is lacking; however, multifaceted prevention programs including core stabilization exercises appear to be effective at reducing lower extremity injury rates. PubMed was searched for epidemiologic, biomechanic, and clinical studies of core stability for injury prevention keywords: Articles with relevance to core stability risk factors, assessment, and training were reviewed. Relevant sources from articles were also retrieved and reviewed. Stabilizer, mobilizer, and load transfer core muscles assist in understanding injury risk, assessing core muscle function, and developing injury prevention programs. Moderate evidence of alterations in core muscle recruitment and injury risk exists. Assessment tools to identify deficits in volitional muscle contraction, isometric muscle endurance, stabilization, and movement patterns are available. Exercise programs to improve core stability should focus on muscle activation, neuromuscular control, static stabilization, and dynamic stability. Core stabilization relies on instantaneous integration among passive, active, and neural control subsystems. Core muscles are often categorized functionally on the basis of stabilizing or mobilizing roles. Neuromuscular control is critical in coordinating this complex system for dynamic stabilization. Comprehensive assessment and training require a multifaceted approach to address core muscle strength, endurance, and recruitment requirements for functional demands associated with daily activities, exercise, and sport. Even though limited evidence exists, the integration of core stabilization exercises into injury prevention programs, particularly for lower extremity, is demonstrating decreased injury rates. A universally accepted definition of core stability is lacking. Generally, core stability comprises the lumbopelvic-hip complex and is the capacity to maintain equilibrium of the vertebral column within its physiologic limits by reducing displacement from perturbations and maintaining structural integrity. Several authors have proposed a more functional perspective to describe the core as the foundation of the kinetic chain responsible for facilitating the transfer of torque and momentum between the lower and upper extremities for gross motor tasks of daily living, exercise, and sport. Movement beyond the neutral zone—a region of high flexibility and little resistance around the neutral spine position—requires muscular constraints for stabilization. The primary function of these static tissues is to stabilize in the end range of motion as tensile forces increase and mechanical resistance to movement is produced, as well as to transmit position and load information to the neural control subsystem via mechanoreceptors. The neural control subsystem is the center for incoming and outgoing signals that ultimately produce and maintain core stability. The increased popularity of core stability has also led to the development of several classification systems to describe core muscle function for dynamic stabilization. The function of muscles is determined by their unique morphology, including architectural aspects of fiber length and arrangement. However, Gibbons and Comerford²⁴ and Behm et al⁷ believe that the function of relevant muscles is more complex and that no single category is more important than another. Stabilizers generate force eccentrically to control movement throughout range of motion, while mobilizers concentrically accelerate through range of motion and act as shock absorbers, especially in the sagittal plane. Behm et al⁷ also maintained the local stabilizer category and divided the global muscles into mobilizers and transfer load categories. Injury Risk Core stability exercises are implemented according to the theoretical framework that dysfunction in core musculature is related to musculoskeletal injury; therefore, exercises that restore and enhance core stability are related to injury prevention and rehabilitation. To date, there is no clear evidence that supports the relationship between poor core stability and musculoskeletal injury. Substantial evidence exists demonstrating core muscle recruitment alterations in low back pain LBP patients compared with healthy controls. Hodges et al examined core muscle recruitment patterns during upper²⁹ and lower²⁸ extremity movements in LBP patients compared with healthy controls. Consistently, the transversus abdominus was the first muscle recruited, followed by the

multifidus, obliques, and rectus abdominus. All local stabilizer and global mobilizer core muscles were recruited before any extremity movement, indicating that core muscles provide proximal stability for distal mobility. In the LBP patients, transversus abdominus recruitment was delayed in upper and lower extremity movements in all directions flexion, extension, abduction. Multifidus and internal oblique recruitment in patients with sacroiliac joint pain during an active straight-leg raise maneuver was delayed until after the leg raise was initiated, indicating a lack of preparatory activation for proximal stability. The gluteus maximus activation was also delayed, suggesting an inability to compress and stabilize the sacroiliac joint and pelvis with associated lower extremity movement. Overall, these studies 28 , 29 , 32 illustrate alterations in muscle recruitment, suggesting that deficiencies in core stabilization and load transfer muscles may be related to lower extremity function and injury. Few studies demonstrate muscle weakness associated with injury status. Leetun et al 40 studied core stability and lower extremity strength test differences between men and women in relation to athletic injury during the season. They conducted preseason core stability tests and isometric strength testing of hip abduction and external rotation on athletes who were tracked for injuries through one competitive season. Men had higher overall core and hip strength values than women, with significant differences in hip abduction, hip external rotation, and the side-bridge test. Athletes who suffered an injury during the season generally had lower values for hip and core strength; however, only hip strength tests were found to be significantly different. They concluded that hip external rotation strength was the strongest predictor of injury. Interestingly, the majority of studies report alterations in muscle recruitment ie, timing, amplitude, and endurance , not decreased strength, indicating that core dysfunction may be more of a neuromuscular control problem than a strength problem. The neuromuscular mechanisms of noncontact anterior cruciate ligament risk factors 40 , 64 , 65 and prevention programs 31 , 33 , 37 , 52 , 53 , 60 , 61 have begun to explain an association between core stability and lower extremity musculoskeletal injury. The premise for the association is based on muscle attachments. The muscles of the hip, or the load transfer muscles, have pelvic and lumbar attachments. Compromised core stability creates an unstable proximal base, thus limiting control and positioning of the lower extremity for functional movements and loads and increasing injury risk. Zazulak et al prospectively measured core neuromuscular control properties of active proprioceptive repositioning 65 and trunk displacement 64 in collegiate athletes, followed by injury tracking over 3 years. Core stability is a primary component of functional movement, essential in daily living and athletic activities. The evidence supporting the association between poor core stability and injury risk continues to lag behind popular beliefs and practices. As a result, clinicians are continually challenged with best practices for assessing and training core stability. Assessing Core Stability Prevention programs that target core stability focus on enhancing the recruitment of the local and global stabilizer, global mobilizer, and load transfer muscles, restoring muscle strength and endurance and regaining posture and balance through regulation of the neuromuscular control system for overall improvements in function Figure 1. Core stability is a complex interaction among local, global, and load transfer muscles, neuromuscular control, and the specific demands of the task being performed. No less complex is the challenge of accurately assessing core stability. A plethora of tests measure core stability, many of which are reliable and valid. The sheer quantity of tests that assess different dimensions highlight the complex and multidimensional role of the core along the kinetic chain for functional movements.

Chapter 9 : Best Functional Training Exercises for Beginners Fitness: Men / Women

This is the first of a three part series on Dr. Liebenson's Modern Approach to Abdominal Training. In this first article, Dr. Liebenson discusses a few fundamental concepts necessary to optimize motor control during abdominal stabilization training.

This manual achieves the highest rating of 10 out of 10 for current textbooksâ€¦ J Amer Chiropr Assoc Apr;43 3: There is no way but giving it 5 spines out of possible 5. It witnesses a galaxy of academic stars whose contributions make the cost of the book seem very good value indeedâ€¦. The Management section is vast, comprising some pages. Many of these pages are taken up with excellent illustrations. No stone seems left unturnedâ€¦. Definitely a five star must-buy book! The first edition â€¦. The new editionâ€¦is wonderfully comprehensive and practical and will build further on that reputation. Reviewed by David Chapman-Smith. California Chiropractic Association Journal, Summer Journal of the Australian Chiropractic Association, June Journal of Complementary and Alternative Medicine, Journal of Manipulative and Physiologic Therapeutics, p, J Occupational Rehabilitation, This text and DVD, are valuable resources that are not likely to gather dust on the shelf. American Pain Society Bulletin 17;2: Similarly, few will dispute the importance of evidence-based practice. However, most of us have likely struggled with how to implement these paradigms into clinical practice. I would strongly recommend this text for every spinal rehabilitation practitioner. He has brought together an illustrious assembly of contributors from around the world and provided a comprehensive coverage of the management of patients with spinal pain.