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The Java Jolt:
Fitness Friend or Foe?

Shake it up...

Or not?

the post-workout puzzle

MEDICAL FITNESS
NEWSFLASH

...AND MORE

CEC Self Test Packet: December 2016





NFPT SELF- TEST DECEMBER 2016 EDITION

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This packet includes continuing education articles that come from NFPT's Blog. Articles for this December 2016 self-test edition are from the months July 2016 to November 2016. All articles are enclosed here to assist you with answering the questions in the back of this packet. Please complete the bubble sheet provided (include your name and contact information) and return to:

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NOTE: there are articles in this packet which contain links and/or references to resources and information that is only available online. Go to: www.nfpt.com/blog/cec for these additional resources.

We thank you for your commitment to the fitness industry and to the NFPT organization of trainers. Please contact us at 800-729-6378 or at info@nfpt.com with any questions, or to just be in touch - we'd love to hear from you! *We wish you continued success in your endeavors!*

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Gluteus Maximus: one of three glutes

BY: Beverly Hosford

Everybody knows the “glutes” are the largest muscle in the body. BUTT...they’re not just one muscle. In total, your glutes are made up of three muscles that each have 2-3 sections. In total, you have eight glutes (nickname for gluteals).

The three glutes

Gluteus Maximus - 3

Gluteus Medius - 3

Gluteus Minimus - 2

In this article you’ll learn about gluteus maximus and how to maximize its role as a muscle, literally!

Gluteus Maximus Attachments



All three parts of your gluteus maximus attach into the gluteal tuberosity and Iliotibial (IT) Band, which is on the lateral (outside) part of your femur bone at the superior (top) part. The gluteus maximus diverts to three different bones on the hip.

The first section travels to the iliac crest near the PSIS.

The second section goes to the sacrum.

The third section attaches to the coccyx.

These three different destinations give the gluteus maximus many options for movement.

In this photo of Andy the Skeleton, the green play-doh represents the attachment sites for the gluteus maximus (all destinations). Imagine the muscle fibers running from one side to the other, creating a bridge.

Gluteus Maximus Function

You can memorize the actions of a muscle, but what’s even better is to understand muscle function. Know the attachments and the actions are revealed!

Remember...

- Muscles contract (shorten) when lengthened to keep the bones together.
- Muscles also contract (shorten) to move bones when signaled by the brain.

Find the attachments on your own body using your fingers to locate the bony landmarks you see in the photo. Enhance your body awareness by getting familiar with the location of the muscle on yourself. Move your hip into abduction (to the side) or extension (backward) to feel the attachments contract into your fingers.

What motions would cause the muscle to shorten OR lengthen?

Gluteus Maximus Movements

- 1. Extension.** When you flex your hip while walking, biking or squatting, the glute max creates hip extension to bring the bones back together.
- 2. Abduction.** As your hip extends it naturally abducts (moves away from midline) slightly. You can choose to abduct it further from a standing or side-lying position. Remember to slightly extend (bring the leg back) to call the full attention of this muscle.
- 3. External rotation.** This is another natural component of hip extension. Humans usually have more external rotation than internal rotation at the hip, which makes sense that there's this large muscle to help with it.

Gluteus Maximus Exercises

You might be familiar with some of these, but now you can make the most of them by focusing on the attachments of gluteus maximus as you perform the motions.

- 1. Squats.** Glute max isn't the only muscle involved with this motion, but it's a major player. The hip has to extend, abduct and externally rotate to do stand up from a squat. *Think about the attachments as you move slowly.
- 2. Stair Climbing.** Every time you flex your hip to step up, the glute max gets stretched (lengthened) and wants to shorten, meaning it's working/contracting. It's similar to a squat motion, but with one leg at a time and looks different. *Place your hand on the greater trochanter and feel the muscle contracting under your fingers.
- 3. Swimming.** As you flutter kick your legs the hip is extending, abducting and externally rotating. *Focusing on the glute max during this movement can give you more power since the glute max fibers are short and dense as compared to other hip extensors like the hamstrings.
- 4. Donkey Kicks.** On all fours, extend your hip up toward the ceiling. Be careful not to arch your back too much. Go slow so you can monitor and isolate glute max. *This is a great muscle mass building exercise when done slow and controlled.

Connect to the Gluteus Maximus

When you exercise, think about the attachments of the muscle. Visualize it shortening and lengthening. Do this by going more slowly through the motions. When you exercise mindlessly and quick, your body diverts to using the muscles it's used to recruiting. Everybody has different motor patterns based upon their structure and the movement habits they have.

Being more mindful about movement is a win-win. It builds stronger muscles and reduces the risk of injury.

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Gluteus medius: two of three glutes

BY: Beverly Hosford

Everybody knows the “glutes” are the largest muscle in the body. BUTT...they’re not just one muscle. In total, your glutes include three muscles that each have 2-3 sections. In total, you have eight glutes (nickname for gluteals).

The three glutes

Gluteus Maximus - 3

Gluteus Medius - 3

Gluteus Minimus - 2

In this article you’ll learn about gluteus medius and how it’s an antagonist to itself. Just like the name says, it’s in the middle of the other two glutes if you think about them as layers. Gluteus Maximus is most superficial (closest to surface) and gluteus minimus is most deep (closest to bones).

Gluteus Medius Attachments

All three parts of your gluteus medius attach to the superior (top) of the greater trochanter on your femur. This chunk of bone is fairly easy to feel because it’s close to the skin. You can locate it on yourself by standing, placing your hand on the top of your outer thigh and rotating your femur to feel it moving back and forth.

The three parts of gluteus medius divert from the greater trochanter to different places on the iliac crest, which is the ridge of your hip bone. They create a fanned appearance.

The first section travels to the anterior (front) of this ridge.

The second section attaches to the middle of this ridge.

The third section goes to the posterior (back) of this ridge.

In the photo of [Andy the Skeleton](#), the red play-doh marks the attachment sites for both sides of the gluteus medius. Imagine the muscle fibers running from one side to the other, creating a fanned shape.



Gluteus Medius Function

“Think like a muscle” is what I tell anatomy students when they’re trying to remember muscle actions. Look at the attachments, they reveal the role of the muscle and remove the need to memorize the many actions.

Remember...

- Muscles contract (shorten) when lengthened to keep the bones together.
- Muscles contract (shorten) to move bones when signaled by the brain.

Find the attachments on your body using your fingers to locate the bony landmarks you see in the photo. Enhance your body awareness by getting familiar with where the muscle “lives”. Move your hip into abduction (to the side) to feel the attachments contract into your fingers.

What motions would cause the gluteus medius muscle to shorten OR lengthen?

Gluteus Medius Movements

1. Abduction. Most people are familiar with this action for gluteus medius. As humans we don't directly do this action during normal walking. It would look funny and cause us to move like a crab, walking sideways. As we walk, gluteus medius monitors hip movement as it goes into flexion and extension. It helps keep the hip on track.

2. Flexion AND Extension. Say WHAT!?!? How can a muscle do opposing motions? This is because gluteus medius is three different muscles in one. The anterior (front) portion can influence hip flexion while the posterior (rear) portion can create hip extension.

3. Internal AND External rotation. There it is again, opposing actions. Anterior glute med causing internal and posterior glute med causing external rotation. You'll see why this matters in the next section...

Gluteus Medius Exercises

You may be familiar with these exercises, but now you can do them more effectively and avoid compensating with the surrounding muscles like obliques. Many people over-use their spine, but now that you know the attachments better you can monitor the movement more effectively on yourself and clients.

1. Leg lifts.

Lying on your side

and abducting (lifting) your leg is one of the most popular ways to strengthen this muscle. Stop when you feel your spine moving a lot, probably at about 30 degrees.

2. Band walks. A stretchy band around the ankles or thighs provides resistance while you move sideways like a crab. Keep your torso stable and relax your shoulders.

3. Mix it up. Slightly flexing or extending and slightly internally or externally rotating your femur will change which section of the gluteus medius is contracting. Give it a try and tune in to the different sensations as you change positions.

Connect to the Gluteus Medius

When you exercise, think about the attachments of the muscle. Visualize it shortening and lengthening. Do this by going more slowly through the motions. You'll get more out of the time you spend strength training.

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Gluteus minimus: three of three glutes

BY: Beverly Hosford

Everybody knows the “glutes” are the largest muscle in the body. BUTT...they’re not just one muscle. It’s time to meet the smallest glute! It seems like an oxymoron doesn’t it? small GLUTE.

The three glutes in review

[Gluteus Maximus](#) - 3

[Gluteus Medius](#) - 3

Gluteus Minimus - 2

In this article you’ll learn about the under-estimated gluteus minimus and how it “keeps the peace”. It’s the deepest and smallest of the three glutes, making it the most precise mover. Since the muscle fibers are shorter and fewer than it’s sibling, glute max and glute med, it can create more specific movement.

Gluteus Minimus Attachments

Both parts of your gluteus minimus attach to the anterior (front), superior (top) of the greater trochanter on your femur. This chunk of bone can be felt near the hip socket using your hand. The two parts divert to the lateral (side) surface of the ilium making what looks like a triangle.

The first section attaches to the anterior (front) facing part of the surface.

The second section travels to the medial (side) facing part of the surface.

In this photo of [Andy the Skeleton](#), the pink play-doh represents the attachment sites for both sides of the gluteus minimus. Imagine the muscle fibers running from the top location to the bottom, they make what looks like a peace sign when you hold up two fingers. You could think of this muscle keeping the peace while the larger glutes create large movements...

Gluteus Minimus Function

This is small and simple muscle to explore when it comes to actions, just look at the attachments and remember...

- Muscles contract (shorten) when lengthened to keep the bones together.
- Muscles contract (shorten) to move bones when signaled by the brain.

Find the attachments on your own body using your fingers to locate the bony landmarks you see in the photo. Get familiar with the location of the muscle to enhance body awareness. Move your hip into abduction (to the side) and slight flexion (forward) to feel the attachments contract into your fingers. You might have to press a little deeper to feel the ilium attachment since it’s beneath gluteus medius.

What motions would cause gluteus minimus to shorten OR lengthen?

Gluteus Minimus Movements

1. Abduction. Just like gluteus medius, this muscle aids in bringing the hip out to the side with



less motion and more precision.

2. Flexion. Because of the anterior attachment on the greater trochanter gluteus medius aids in hip flexion when walking, biking and climbing stairs.

3. Internal rotation. This is also due to the anterior attachment on the greater trochanter.

Gluteus Minimus Exercises

These exercise all utilize many other muscles than the gluteus minimus. But, when performed slowly with attention on this smaller muscle, you might be able to feel it contract, especially if you stop and hold the position for a moment.

1. Side kicks. Standing tall, bring your leg into abduction and add slight internal rotation or flexion to call upon the gluteus minimus.

2. Marching. Hip flexion (lifting the thigh up) will engage gluteus minimus in the early phase of lifting your leg. Go slowly and pause at every inch to see if you can connect to it.

3. Band walks. With a band around your ankles or thighs walk like a crab sideways slowly. Getting into a partial squat causes hip flexion which will utilize the gluteus minimus more specifically.

4. Side lying leg lifts. Doing these with slight hip flexion or internal rotation like the kicks is also an effective way to work gluteus minimus.

Connect to the Gluteus Minimus

When you exercise, think about the attachments of the muscle. Visualize it shortening and lengthening. Do this by going more slowly through the motions. Remember, this muscle works with precision and when overridden by larger muscles it might not do much work at all. This is why doing smaller, isolated exercises as a part of your workout routine is smart to create more stability and balance in your body.

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The Importance of Juxtaposing Mindfulness and Fitness Pt. 1

BY: Cathleen Kronemer

What's on *your* mind when you exercise?

We all exercise for different reasons. Sometimes our reasons vary with the workout itself: perhaps we prefer training biceps and triceps instead of quads, simply because we can see progress developing more easily. Clients often report that nothing kicks their endorphins into high gear like a good 3-mile outdoor run on a perfect spring morning.

Whatever the motivation, we can all recognize that our bodies need the physical release that exercise provides, the uniquely powerful sensation that we have pushed our muscles beyond their limits and conquered the next level of strength or endurance.

What about working out our minds? How do we match this physical challenge in the cerebral realm? Contrary to popular belief, the answer is much more complex than simply doing crossword puzzles on a daily basis.

"Mindfulness" is a popular term typically tossed around in association with meditation, yoga and practices of spirituality. Its pure definition often remains elusive. However, in the world of Experimental Psychology, the idea of mindfulness can be described as controlled attentiveness, a deliberate awareness of what is happening when we are present in the moment. In recent years, scientists have found many associations between mindfulness and physical health.

The irrefutable connection between mind and body can be traced all the way back to Hippocrates in Western science. As medicine moved forward this notion of the coupling of mind and body was brought to light even further by Dr. Herbert Benson. In his formal documentation known as *The Relaxation Response*, Dr. Benson expounds upon the physical effects of meditation: slower breathing, reduced heart rate, and a quieting of brain activity. Today, meditation is often thought of as simply sitting still; but if we recognize its role in the practice of Chinese martial arts and yoga, we come to observe that mindfulness is anything but static in nature.

Just like during meditation, your mind can wander in the midst of your workout. This happens more often than we may realize. Maybe we find ourselves inaudibly singing the words to a song playing through the fitness center's speakers. Perhaps a particularly buff individual has caught our eye from across the weight room floor. Even a cute puppy encountered on an intense run through the park may cause us to momentarily lose focus on the task at hand. But again, similar to when meditating, sometimes the most important thing to do at the gym is to bring your attention back to the workout and simply let go. Soon you discover that the more you corral and focus your attention on the present moment, getting in touch with the rhythm of your body as it moves the demanding weight loads, it becomes possible to emerge yourself deeper. Without realizing it, the inner space in your soul opens up. There comes over you a quality of calmness and clarity when you consciously focus attention solely upon one thing. You may soon feel more integrated and less scattered, and this seems to enable you to harness even more energy for the physical task at hand.

Spiritual guidance experts often speak of harnessing one's breath as one attempts to discover inner quiet. Breathing practices help to expand the capacity of the lungs, thereby allowing the breath to become more adaptable. This same principle can apply to physical manifestations as well. Visual

imagery can help to create a positive association with movement, which can over time improve the outcome of exercise. Consider for a moment what truly separates the highest level of athletes from the average elite competitive warrior. At the upper echelon of peak performance, it might be hard to tell the differences between each athlete in terms of their physical abilities. The difference appears through the refinement of their own ability to concentrate and stay calm under pressure. Many experts in sports psychology agree that professional athletes and Olympians are experts at mindfulness, since they are consistently being required to harness mind and body at levels of balance and integration that most of us mere mortals simply cannot fathom.

Martial artists and Indian yogis have through the centuries honed the technique of using their bodies to bridge the physical and the metaphysical worlds. Their premise is simple: pushing through physical boundaries engages and allows the liberation of inner resources that often remain hidden when we allow our minds to scatter. Concepts such as tenacity, intention, drive, focus, and will power are all present; we simply need to be taught how to access and activate these resources. The highest goal is to harness this inner strength to keep us going when we feel challenged. Breaking through that physical inertia with exercise can help open the mind and sharpen awareness.

Scientists have long pondered the question of why some individuals possess the capacity to stick with exercise and others do not. In research studies of exercise behavior, one of the most reliable indicators of whether people will continue to exercise is whether or not they find the workout to be a satisfying experience. In other words, what leads some individuals to honestly derive enjoyment from active pursuits?

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The Java Jolt: Fitness Friend or Foe?

BY: Cathleen Kronemer

I will fully admit to being somewhat of a coffee snob. Preferring Starbucks' beans to just about all others, I have been brewing it at home for years. One of the greatest gadgets we have in our home is a coffee maker with a timer setting. Every evening before bed, I set up the pot, knowing with certainty that in the morning, when I am about halfway downstairs from the bedroom to the kitchen, the rich and delicious aroma will greet me, promising that a warm, wonderful wake-me-up is mere steps away.

Mixin' it up

While I do somewhat count on coffee to jump-start my day, I recently have taken to making a mix of 1/3 decaf to 2/3 "fully leaded". As it turns out, what I crave the most to start each busy day is the flavor and the warmth of my first mug, not so much the caffeine. Countless studies have extolled both the virtues and the hazards of coffee consumption, which is a primary reason for my switch to a partial decaffeinated blend. Fitness enthusiasts have long been proponents of caffeine as a pre-workout beverage, and as a bodybuilder I too have done research into whether I was harming or enhancing my training. As it turns out, athletes might be wise to take a deeper look into the exact effects contained within their coffee mugs.

Stimulate or Block the brain?

Caffeine as an isolated substance induces nootropic effects within the body, meaning it targets neurotransmitters and enables them to alter brain functions. While many consider caffeine to be a stimulant, its mode of action does not directly *stimulate* as much as *blocks* the action of the neurotransmitters responsible for promoting sedation and relaxation.

According to Dr. Liz Applegate, Director of [Sports Nutrition](#) at University of California in Davis and author of the "Fridge Wisdom" column in Runner's World magazine, caffeine can indeed act as an excellent performance booster if one is knowledgeable about how to consume it.

Performance enhancement awaits you

Dr. Applegate explains: "Caffeinated beverages like coffee or Diet Coke prior to a workout can help promote endurance as well as a lower rate of perceived exertion (RPE) during exercise". When embarking upon a race or other form of endurance exercise lasting under 2 hours, she suggests that caffeinating beforehand may help provide a bit more strength at the end of the event, adding the extra kick that is often needed to get across the finish line. Consuming the caffeine within an hour of the workout allows ample time for the substance to take effect. Most experts recommend a ratio of 3 milligrams caffeine to 1 kilogram of body weight. As a reference point, 20 ounces of Starbucks' coffee confers approximately 200 mg. of caffeine (lighter- roast coffee varieties actually contain a bit more caffeine than their dark-roast counterparts).

Many popular post-workout drinks contain caffeine, and many individuals wonder why the power jolt is necessary when the "heavy work", so to speak, has been completed. Caffeine ingested immediately after finishing a workout may improve the muscles' ability to replenish their glycogen stores. "It's not clear whether caffeine enhances carbohydrate absorption in the intestines, helps increase delivery of glucose to muscle cells, or whether the stimulation of adrenaline may promote enhanced uptake—these are all theories," says Dr. Applegate. Regular resistant training athletes are keenly aware that ample glycogen stores will not only aid in recovery, but also facilitate the performance of the next workout.

A group of researchers at Coventry University in England [recently recruited 13 young, athletic male subjects for a study on the effects of caffeine consumption prior to weight training](#). The men were required to engage in a typical weight-training regimen on several occasions. An hour before one workout, the men consumed a sugar-free energy drink containing caffeine. An hour before another, they drank a decaffeinated version

of the same product. The subjects were then instructed to lift, squat, and press to the point of exhaustion. Those who had consumed the beverage containing caffeine arrived at this point much later; the men also had been able to complete significantly more repetitions for each of the exercises than when the decaffeinated beverage was consumed. Perhaps the most surprising finding for the researchers was that subjects from the first group declared they were eager to repeat the whole workout again soon.

How the boost happens

“Essentially, we found that with the caffeinated drink, the person felt more able to invest effort,” says Michael Duncan, a senior lecturer in Sports Science at the University of Exeter in England, and lead author of the study. “They would put more work into the training session, and when the session was finished, in the presence of the caffeinated drink, they were more psychologically ready to go again.” Dr. Duncan elaborates further, saying that he believes caffeine “antagonizes adenosine,” a substrate found within muscle tissue that builds up during exercise and stifles the force of contractions. The more adenosine in a muscle, the less force it is capable of generating. Effectively reducing adenosine levels “then enables more forceful muscular contractions and delays fatigue,” Dr. Duncan says. “That’s the theory, anyway,” he adds.

It has long been accepted, in both scientific and athletic arenas, that a pre-workout cup of caffeinated coffee has the potential to enhance endurance sports such as cycling or running. By increasing the number of fatty acids circulating in the bloodstream, caffeine provides an impetus to run or pedal longer. This seems to be a function of the muscles’ ability to absorb, store and burn that fat as the primary fuel, reserving the body’s limited stores of carbohydrates to be drawn upon later in the workout. Since use of caffeine is considered legal by the International Olympic Committee rules, it now ranks as the most popular drug used in competitive sports. A recent report revealed that over 66% of 20,000 tested Olympic athletes had caffeine in their urine, with use greatest quantities found in triathletes, cyclists and rowers.

There is a catch...

Is there in fact a downside to coupling exercise with caffeine? As it turns out, that cup of Joe might indeed have a few drawbacks. During a workout, cortisol levels within the body increase, and consuming caffeine post-workout further stimulates cortisol when in fact one’s goal ought to be prioritizing the *reduction* of catabolic hormones. While it is not only possible, but common, to build up a tolerance to caffeine and its ability to stimulate cortisol, studies show that repeated exposure to caffeine during the day will still yield elevated cortisol levels within that time frame. For those among us who enjoy caffeine pre-workout, consuming caffeine after the gym or even later in the day would be considered repeated exposure.

It sounds like a mix of regular and decaf fulfills the morning need for a java jolt while also minimizing exposure later in the day. Experiment on your own, paying close attention to everything from fitness empowerment to jitters. One way or the other, the body knows, and then the body shows!

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Comprehensive Karate Training

BY: David Brancato

In combat and/or self-defense there is a need to understand how to develop a rock solid skeletal musculature to avoid the trauma, yes the trauma of being hit. When the body is hit the neuromusculature signaling to the brain becomes chaotic, disrupting response time. The body wants to temporarily shut down until equilibration of the neuromusculature signaling is regained. As an example, notice what happens to breathing when the diaphragm is punched.

The following are skill sets I favor with over 47 years in martial arts and as a professional trainer. The neck remains one of the prime developed areas for any athlete as the strengthening of the neck will prevent cervical injury and provide stability of the head when struck by a punch. I favor isometrics for the neck muscles followed by decompression the cervical vertebra which is accomplished through traction supervised by a physical therapist, trainer and/or chiropractor.

Strengthen your spine

The spine can only be strengthened by the muscles that surround it, and this thick group of muscles is called the erector spinae. From the base of your head all the way down to the bottom of your back is the erector spine. This muscle group can be strengthened by exercises such as a plank or bent-over row.

Consider the **“superman”** which is a body weight exercise accomplished by being face down on the floor with your arms extended overhead and your legs straight behind you. Engage your stomach muscles then contract your spinal and gluteal muscles to simultaneously lift your arms and legs off the floor. Hold the position for a count of two then slowly lower back to the floor.

The **straight-leg deadlift** is a free weight exercise that can be performed with dumbbells or a barbell. Stabilize your abdomen and, keeping your back and arms straight, stand upright by extending your hips. Carefully lower the bar back toward the floor.

Back extensions are performed by positioning your ankles under the supports on a Roman chair with the top of your hips level or above the hip support so that you can fully flex at the waist. Additionally, include bent over dumbbell swings and bent over rows.

Power, Speed, Endurance

Power

Strength training to focus on the white, fast twitch muscle fibers will allow those needed bursts of energy in combat. These fibers will store carbohydrates and for each gram of stored carbohydrate there are 3 grams of water that enter into this fiber. To train for strength will depend on how you manage weight and handle the accompanied fatigue.

The demand depends on the force. The heavier the weight the more recruitment of the fast twitch muscle fibers, whereas the lesser force, i.e. reduced weight, will recruit the slow twitch muscle fibers. Both are required for development in training to be a fighter. Powerlifting is needed for strength in combat, which will recruit fast twitch muscle fibers.

With powerlifting improvement occurs when the recruitment goes from slow twitch to fast twitch muscle fibers based on first causing fatigue of the slow twitch muscle fibers.

“Make this principle work for you throughout a workout by keeping your workout density high. Here’s what I mean: An athlete who takes 2 hours to perform 15 sets has low density, while an athlete who performs 15 sets in 30 minutes has extremely high density. By shortening your rest periods on traditional bodybuilding days, your slow-twitch muscle fibers will fatigue much sooner and fast-twitch muscle fiber recruitment will skyrocket.” (5)

“The existing evidence strongly supports the conclusion that heavy lifting and muscle fatigue largely dictate the recruitment of fast-twitch muscle fibers. To put these principles into action, perform a heavy training day for Bench presses, military presses, seated rows, dips, chin ups, triceps pulls, squats, and deadlifts every 2-3 workouts. A good training split for a given body part could look like this:

Workout 1: Heavy, 1-5 repetitions, 3-5 minutes rest, compound movements

Workout 2: 8-12 repetitions, 60-90 seconds rest, mainly compound movements

Workout 3: 12+ repetitions, 30-60 seconds rest, supersets, compound and isolation movements” (6, *ibid.*)

Speed

Next, develop explosive movements of the legs and arms, having inherent to it the rate of force development coupled with speed. For kicking I like the explosive movements that can occur by adhering to the exercises developed for sprinters and jumpers. This regimen includes [10 exercises for explosive movements](#). (7)

Power and Speed

Speed and power training for martial arts is best developed with the use of resistant bands. Your innate speed that is the result of triggering muscle fibers to move any part of your body needs to be quickened. Recruitment, rate of force development and increasing mitochondria all factor into power and speed.

For a continuation of punching and pulling power visit the specific drills to develop power by visiting [this link](#). (8)

[Note: Plyometrics are intense, so only work out with them 2 times a week.]

Endurance

The term endurance training generally refers to training the aerobic system as opposed to anaerobic. As a reminder this coach favors [High Intensity Interval Training](#). Please refer to [this HIIT article](#).

Endurance and Strength

“Most people reserve one day for strength and another day for cardio. Try combining the two instead,” says Will Torres. “Use a bench press, immediately followed by pull-ups, then run a mile as fast as you can... and repeat.” Another good example: Jump rope for a minute, followed by squats, then overhead press, and finally sit ups. Repeat. (10)

Will Torres suggests selecting a series of movements like 10 pull-ups, 10 squats, 10 push-ups, 10 sit-ups. “Do three rounds of the series back to back, taking as minimal a break as possible.”

Avoid doing an excessive amount of endurance-only training because this training causes the body to search for protein from the muscles, including the heart; and in some cases will cause a Charlie-horse of the heart, disrupting rhythm and causing cardiac death.

Increase stamina by doing compound, circuit, routines that require use of multiple joints in succession. For example, jump rope, lunges, push-ups followed by sit-ups.

Reduce complacency because the muscles need to be challenged and the mind needs to develop neuronal signals for you to sustain the challenges of the demands made by your sport.

The more muscle groups that are activated in a particular movement the more demand on the heart which in turn improves stamina. For example, explosive movements such as box-jumps at different heights, kettle bell squat/thrusts, etc.

To protect your abdomen follow the martial artist abdominal workout, read [Train to Sustain](#).

DISCLAIMER: This educational article is for informational purposes only. Consult a physician before performing this or any exercise program. It is your responsibility to evaluate your own medical and physical condition, or that of your clients, and to independently determine whether to perform, use or adapt any of the information or content within this article. Any exercise program may result in injury. By voluntarily undertaking any training/exercise within this article, you assume the risk of any resulting injury.

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Experience vs. Education: What Do Clients Really Value?

BY: Cathleen Kronemer

As I was preparing to take my certification exam, a trainer at the gym shared with me a very profound tenet of the industry: *"Clients don't care how much you know, as long as they know you care."* Her words have remained with me all these years. There have certainly been times when I clearly saw this dynamic playing out as I interacted with clients. Yet I have also worked with individuals who already possess a respectable command of kinesiology; these are the ones who occasionally challenge my knowledge base, but always in a good way.

What is truly important to a client when seeking out a personal trainer?

Employment of fitness trainers and instructors, including personal trainers, is expected to increase by 13% between 2012-2022, according to the U.S. Bureau of Labor Statistics (BLS) (www.bls.gov). This meteoric surge is due in large part to an increase in awareness of the importance of fitness participation at all stages of life. In May 2014, fitness trainers earned a median annual salary of \$34,980. The issue confronting budding trainers is to decide which path might maximize earning potential.

Many gyms base a trainer's hourly salary on the number of nationally recognized certifications he or she holds, and some facilities bump up rates even further for trainers who have earned a college degree in a health-related area. These are the fitness centers that place a high value on the science behind the career, the complete package they can offer to their clients. However, there are just as many, if not more, gyms whose managers base salaries not on higher education but rather on years in the field. Experience, they contend, trumps formal education, which of course *is* extremely helpful when working with a novice or a seasoned client.

A brief search on the Internet will reveal a multitude of certification options that entitle the bearer to declare himself a "Certified Personal Trainer", ready to plunge headlong into a fitness career. While several of these are quite reputable, even highly praised within the industry, there are some which most professionals would consider less than comprehensive. Today, most gyms and fitness clubs will not hire an individual to serve in the capacity of a personal trainer without documentation proving his alliance with a certifying body. This not only serves to protect the gym's liability, but also allows the owner to proudly advertise that all of his employees are true professionals.

Operating under the assumption that all of the trainers at a health club are certified by a well-respected organization, what exactly distinguishes one trainer from another? This is where the debate comes into play. Continuing for a moment on the educational path, do clients place a higher value on trainers who are not only certified but college educated? Some individuals, especially those new to the fitness arena, feel they are in better hands with a personal trainer who has taken his chosen career to a higher level than that which a mere weekend-workshop certification can provide.

Higher Education

Indeed, there are many universities offering degrees in areas such as Sports Management, Anatomy and Physiology, Kinesiology, and Physical Education. A typical 4-year course load culminating in such a degree will certainly render a graduate completely capable of enhancing his PT certification's education, thereby extending such knowledge to clients in a useful manner. My own college degree was earned in Microbiology; I am grateful for the education that has enabled me to understand exactly what is happening within the body at a cellular level when it comes to strength training and nutrition. As I share ideas with clients, I am certain they appreciate the depth of knowledge that comes with a Bachelor's of Science degree.

Several years ago, an interesting study was undertaken by Deana I. Melton, Ed.D., CSCS, HFS, at the Human

Performance and Leisure Studies Department of North Carolina A&T State University in Greensboro. Seeking to address clients' attitudes vis-à-vis the performance of their personal trainers, female clients were asked to assess trainers on several variables. Viewpoints were to be given on the following topics:

- Selection Rationale ~ qualities that influence a client's decision to hire a particular trainer (e.g., physique, results observed in other clients, social skills);
- Personal Trainer Rationale ~ the clients' reasons (e.g., frustration with current fitness level) for hiring a specific trainer;
- Loyalty Rationale ~ the credentials of a personal trainer that anchor the client/trainer relationship;
- Negative Characteristics ~ qualities considered to be unethical or unprofessional.

Upon reviewing the data, the emerging picture revealed an interesting point: if in fact a trainer decides on pursuing higher education, undergraduate exercise science programs might devote more time toward the development of trainers' *affective* qualities, and that clients would benefit from information about the *credentials* of personal trainers.

Experience

Where does that leave the issue of what we often call “The School of Hard Knocks”, also known as experience on the job? There are still an abundance of trainers who do get hired without having completed a 4-year degree; and if they have been involved in sports their entire lives, will certainly make for positive role models. Every few years, it seems, a new “toy” or an innovative training style will happen upon the fitness scene. Then, a few years later, it has been discarded in favor of the new hottest trend.

For tried-and-true athletes, those traditional old-school moves – squats, bench presses, pull-up's, dips --- are just as impactful today as they were when good old Arnold was at his peak of competitive bodybuilding. For this reason, experience often can be the best teacher. Consistency in covering the basics, hitting all muscle groups, prioritizing rest days, and changing workouts every 4 weeks, will always achieve results.

The bottom line is...

This is your career, your passion, and you must decide on the optimal path for achieving your desired outcome. Whether you choose a college degree in addition to a recognized certification, or proceed solely upon years of hard work and experience, seek out the most appropriate clientele base to match with your background. The most important caveat to keep in mind: **Never Stop Learning!**

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Foreshadowing: Can Prehab Prevent Rehab?

BY: Cathleen Kronemer

The human body was designed to move. We are functioning at our very best when we take advantage of the blessing of mobility, and allow ourselves to become any “verb” that strikes our fancy. In fact, none of us would have chosen this particular profession if we were not, at any given moment, able to extoll the virtues of leading a dynamic rather than static lifestyle. What happens, then, when the tide turns against us?

Even something as therapeutic, challenging, fun and restorative as exercise has its share of pitfalls. If we engage in an active, physical lifestyle, chances are fairly good that at some point we'll be forced on the sidelines due to an injury or unavoidable health crisis.

On an average, the incidence of sports -related injuries nationwide is more than 50% over a 6-month period; and surprisingly, 30-50% of these injuries are actually preventable. As the saying goes “An ounce of prevention is worth a pound of cure”.

How might we prevent these injuries?

By training the body to be durable and resilient, we can put forth our best effort at protecting it... not only from the trauma of difficult and strenuous workouts, but also from unexpected accidents. For an avid athlete, the painful and time-intensive process known as rehabilitation can often seem interminable. What if there was a way to lessen its duration if it is required?

Prehab vs. Rehab

We're all familiar with rehabilitation, which is when one must seek treatment to recover from a condition or injury. Rehab comes into play only after the damage has already occurred. Prehabilitation, on the other hand, is all about injury prevention. Prehab exercises expose the body and brain to novel positions, thereby enabling an individual to break out of his/her habitual movements. In this fashion, the athlete becomes more adept at knowing how to react when life or sports throw him/her something new. In fact, a 2005 study found that prehab drills could reduce ACL injuries among female soccer players by as much as 88%.

Prehabilitation movements may also help to even out muscular imbalances, resulting in better posture, improved performance, and more efficient pain -free movement throughout the day. As our population ages, there is no reason for cessation of movement to become an eventual necessity. Prehabilitation training has a long-term focus: Embracing these exercises now may pay off 10 or 20 years down the road, when we see that most individuals are becoming inflexible, stiff and frequently succumbing to injury, while others remain agile, flexible and strong.

For a collegiate athlete, whose sports participation occurs for a few months per year and then cycles with an off-season, most trainers and athletic coaches are quick to recognize that prehab training does not begin as the season gets underway. In order to be maximally effective, prehab must be started during the pre-season training. The ideal format of such exercises should be to encompass elements and drills that are specific to the chosen sport, along with strength training and functional stretching exercises.

A well-structured program, tailored to the individual athlete, might target weak or tight muscles as it familiarizes the body with the forthcoming demands of the sport. Increasing strength helps the

body withstand impact forces (as in a football tackle); and more flexibility may diminish the rate of ligament strain from overuse. A coach or trainer with an eye on an athlete's progress will undoubtedly observe and intermittently adjust his/her prehab format as the athlete demonstrates improvements these areas.

Another important aspect of prehab training is sports planning. If a client is preparing his calendar for triathlon season, he may require some guidance in developing a well-balanced training schedule, recovery plans, and meal preparations, while leaving room for real-life setbacks that won't interfere with his goals. Such prehabilitation training formats may help facilitate this, especially for an athlete who is relatively new to the sport. Some trainers and physical therapists aim to proactively assess the individual before he/she takes on a new activity, such as a race, in an attempt to measure how he/she will progress, and highlight any deficits that may get in the way. Once the unique issues have been identified, a specific prehab format can be developed.

Prehab Example: Here are some prehab suggestions for a competitive Olympic lifter as he enters pre-season training and readies himself for a leg workout:

- Foam roller exercises, which focus on glutes, hamstrings, calves and quads
- Stretching exercises, for hip flexors, ankle mobility and for the lateral rotators of the hips
- Activation exercises, such as thoracic spine wall slides, glute bridges, bodyweight squats, and planks

Probably one of the most important applications of prehabilitation exercises is the benefit to patients who are facing an upcoming orthopedic surgery. Meaningful changes in postoperative functional exercise capacity can be achieved by participation in a prehabilitation program.

What the Docs are Saying

Heather Moore, PT, DPT, CKTP, provides her patients at Total Performance Physical Therapy in eastern Pennsylvania with prehab prior to undergoing surgeries for rotator cuff repair, ACL repair, total knee and total hip replacement. According to Dr. Moore, "Patients initially are skeptical about it, but then they're amazed by the speed of their recovery compared with that of people they know who didn't get prehab before the same surgery. That's when they recognize what a huge difference it made."

Rob Worth, PT, DPT, MS, ATC/L, OCS, owns a company called Advanced Physical Therapy & Sports Medicine, which operates 8 clinics in the eastern regions of Wisconsin. He characterizes prehabilitation as still being in "the infancy stages," and says it may take time for this format to become anything close to standard practice within the US health care system.

"Prehab" wasn't a word that anyone used when Dr. Worth became a PT more than 20 years ago. At that time, physical therapy might have been suggested as a last-ditch effort to avoid surgery, but it wasn't seen or even considered to be a viable pre-surgical tool. "What we've learned in the past 20 years," Worth says, "is that when surgery is imminent, there are things PTs can do to ensure the best possible patient outcomes. We can work to optimize range of motion, strength, and function, thereby placing the patient in front of the starting line when he or she undergoes surgery and has a head start afterward."

Patient education is a big part of prehabilitation, says John Mishock, PT, DPT, DC, owner of Mishock Physical Therapy & Associates in eastern Pennsylvania. Patients who are scheduled for an operation

and who choose to participate in prehab training are educated on what to expect and do before and after surgery, in order to maximize healing, range of motion, strength, and overall recovery. Beforehand, he says, “Patients are educated on their specific impairments and functional deficits, so they can begin to work on those deficits prior to surgery. Immediately following surgery, “Because patients know from their education that the new joint is stable, they quickly begin the early-activation process of movement that helps reduce swelling, initiates muscle contraction, increases range of motion, and reduces pain.”

Another benefit of prehabilitation formats, Worth observes, is that “knowing the patient’s range of motion, strength, and function preoperatively, through clinical examination and direct observation, allows the patient and PT to more accurately set realistic postoperative goals.” For example,” he says, “if the patient has 20° knee flexion contracture prior to replacement surgery, full knee extension may not necessarily be an attainable postoperative goal.”

What Research Says

A recent report published in the *Journal of Bone & Joint Surgery* found that physical therapy before total hip or total knee replacement surgery can help reduce the need for post-operative care by nearly 30 percent, saving the patient an average of \$1,215. A typical prehab program begins about six weeks prior to the scheduled orthopedic surgery, and includes cardiovascular conditioning, strengthening of key muscle groups, balance/posture assessment and training in addition to patient education. With prehab, patients have been found to experience the following benefits:

- Enhanced muscle strength, which helps the surrounding muscles, which often need to compensate for a lack of full function during recovery.
- Better body mechanics, balance and mobility, which helps patients as they re-learn movements like getting out of bed or climbing stairs.
- Less pain after surgery, which makes physical rehabilitation easier and improves quality of life.
- Greater stamina, confidence and motivation to recover.

While prehab isn’t meant to replace a post-surgical rehabilitation, it does carry with it the ability to help individuals get the most out of their rehab program.

The field of orthopedic surgery is not on a solo mission to incorporate prehabilitation into its pre-surgical protocols. Preliminary research shows promise of prehab exercises improving patients’ abilities to tolerate chemotherapy and return to normal physical functioning more quickly. In one randomized controlled trial of 77 individuals awaiting surgery for colorectal cancer, patients were divided into 2 random groups. While all participated in a program consisting of exercise, relaxation and nutritional counseling, half of the trial subjects went through the program in the 4 weeks prior to surgery; the other half participated in the same process 8 weeks following their operations.

At the end of 8 weeks, 84 percent of the patients who had engaged in prehab exercises performance had recovered to or improved their baseline measurements during a six-minute walking test. In contrast, only 62 percent of rehab patients demonstrated similar statistics. The study was published last year in the medical journal *Anesthesiology*.

“Prehab could be a relatively cheap way to get people ready for cancer treatment and surgery, both of them stressors,” says Dr. Francesco Carli, a Professor of Anesthesiology at McGill University in Montreal who co-authored the study.

The health care service *Kaiser Health* published a news release about prehabilitation for patients with cancer who are about to undergo surgery, chemotherapy, or radiation. The *Kaiser Health* piece, which was reported by the *Washington Post* and other media sources, attempted to be clear about both the promise and the challenges of broadening the practice of prehabilitation.”It seems intuitive that people’s health during and after invasive surgery or a toxic course of chemo or radiation can be improved by being as physically and psychologically fit as possible going into it,” the news release noted. It cautioned, “Research to examine the impact of prehab is in the beginning stages.” The piece also quoted an *American Cancer Society* official as saying, “There are some physiatrists who don't believe in prehab. They feel like the science isn't there.” For oncology patients, a much more positive outlook comes from Cheryl Guarna, PT, MPT, CLT, STAR/C, owner of Oncology Rehab and Wellness Resources in Ashburn, Virginia. It is her strong belief that prehab affords “a sense of control at a time in their lives when they otherwise may feel helpless and overwhelmed. They’re taking an active role in their treatment,” she notes, “which makes them feel more positive about their experience. Various studies have shown that positive thinking can play a role in improving patient outcomes.”

Use Warm-Up as Your Weapon

For the average personal trainer working in the average fitness facility, how might we best incorporate these findings for our clients? We can start with the basic warm-up, gearing it specifically to the workout ahead. If a client happens to be a competitive athlete, include sports-specific moves to awaken the muscles that will soon be called upon to perform. Even with our average daily clients, we can heed the “ounce of prevention/pound of cure” adage!

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The Importance of Exercise in Lung Cancer Research

BY: Beverly Hosford

There's a good reason why Carol Michaels was awarded with *Personal Trainer of the Year* at the Idea World Fitness Convention this month. Cancer effects everyone. She's tapped into the needs of this population as an author and curriculum writer by applying her 20 years of experience with cancer recovery.

Lucky for us that she's sharing her knowledge in an applicable way for the fitness industry. We don't have to re-invent the wheel. Follow her successful footsteps by understanding what the research has to say and how to apply the information.

Set yourself apart as a fitness professional by aligning with this population.

The Research

Research has shown that exercise is helpful for those with lung cancer and that being physically active appears to improve survival and quality of life. Exercise can be beneficial for those with lung cancer by increasing strength, endurance and decreasing emotional issues. Physical activity may help cancer patients tolerate cancer treatments and lower fatigue levels. The thought of exercise might be overwhelming to those with lung cancer, but a well-designed exercise program may help them feel better physically and mentally, and it may also decrease the risk of further disease.

Key Tips

- *Gain medical clearance before exercising with a lung cancer client.
- *Breathing exercises are an important foundation for movement.
- *Stretching exercises help expand the chest cavity to enhance breathing.
- *Introduce aerobic exercise at a slow walking pace, especially if the client was sedentary.
- *Incorporate strength training in slow progressions.

Read the full article posted on NFPT Blog: [*Translational Lung Cancer Research*](#)

Your Role

Carol says, "Cancer survivors are looking to work with trainers who are knowledgeable in cancer exercise. The health and fitness industry as a whole is only just learning to work with this population and we have varying level of available resources throughout our country. There are some communities where a cancer survivor cannot find a trainer to provide safe and effective programs. Health and fitness professionals have a huge opportunity to make a great impact on the lives of those with lung cancer. [NFPT's Cancer Recovery Specialist course](#) can give you the foundation necessary to work with cancer survivors."

Static Versus Dynamic Stretching: Timing Is Key

BY: Cathleen Kronemer

If you are fortunate enough to be involved in a particular industry for a significant number of years, you will certainly gain experience in the field. There will always be a few basic tenets of the job that will remain with you, those “staples” that provide the groundwork for the industry. Also, as the years go by and new knowledge is attained, another aspect on which you can always count is *change* within a dynamic industry.

The shifts may be subtle, like designating Fridays as “Casual Day” in a company known for requiring proper business attire each day of the week. The changes can often be significant as well; think of the medical field prior to the discovery of antibiotics...or even anesthesia, for that matter! These are changes for which we can all be grateful!

The fitness field is no exception. We too have seen changes across the board, from gym attire to music options to body mechanics and safety. One of the more dramatic shifts pertinent to our industry is the viewpoint on stretching.

A Paradigm Shift

In a higher-impact aerobics class, such as “Cardio Kickboxing” or “Step It Up” step aerobics, a certified instructor will be knowledgeable on the time and nature of stretching during the hour of exercise. He will also choose stretches appropriate to the movements. In years past, *ballistic* stretching was believed to be the optimal warm-up for such programs. Ballistic stretching involves purposely forcing the body to move in such a way as to exceed its range of motion. The early parts of such classes often involved bouncing, twisting, and several other jerky and uncontrolled motions...all being performed on muscles that are cold and unprepared.

As research into kinesthetic awareness deepened, it became clear that ballistic stretching could possibly do more harm than good. It did not take too long for that significant change to spread throughout gyms nationwide. Soon instructors were beginning classes with motions that would better prepare the bodies of their participants for the exercises forthcoming over the course of the next hour. This form of stretching is known as *dynamic* stretching.

Dynamic stretching involves the active and purposeful tightening of muscles, in an effort to mobilize joints gently through their full range of motion. Although dynamic stretching requires a greater level of coordination, it is nonetheless increasing in popularity, most notably among athletes, coaches, trainers, and physical therapists. This is most likely due to its benefits in improving functional range of motion and mobility in sports. Dynamic stretching has been observed by athletes to improve such skills as agility, speed and acceleration, all of which are valuable when engaging in a variety of sports.

How Does Stretching Work?

What is the physiological action that enables the body to perform such movements? When preparing for any action, the human body’s multitude of mechanisms must be activated and stimulated. When the body executes a series of stretches while in motion, signals are sent from the brain to the muscle fibers and connective tissues in that particular anatomical area. Core temperature begins to rise, increasing blood flow to the areas in action; this is a critical component in the chain reaction of supplying the energy needed to move.

Concurrently, muscle fibers and connective tissues will gain more flexibility, ultimately rewarding the athlete with an increased motion. Over time, this has the added benefit of preventing injuries. Prior to lining up for a half-marathon, for example, dynamic stretching can alleviate any hip stiffness resulting from intense over-training. As any avid runner or cyclist knows, while training and performance are great, reducing the risk of an overuse injury is just as important.

Focus On The Goal

Another important factor in any competitive sport is what coaches refer to as “putting your head in the game”. Mental visualization techniques are used by many Olympians as well as competitive bodybuilders; if you are able to envision crossing that finish line, or lifting a personal best, chances are greater that your mind will allow you to work intensely enough to make this vision a reality. Along those lines, a regimen of dynamic stretching can facilitate getting mentally prepared for the challenges that lie ahead. Conversely, static stretching during

a warm-up tends to be more relaxing, potentially guiding the body into a state of being that may lead to a difficult transition into competition mode.

Even when just warming up, an athlete must still exercise caution. Therefore, it is suggested that dynamic stretching exercises be performed in sets of 8-12 repetitions. It is also important to stop when fatigue sets in. Tired muscles have less elasticity, which decreases range of motion; and that competitive event has not even begun yet!

Know When To Hold Still

There are, however, many proponents of *static* stretching, the method of holding a stretch in a challenging yet comfortable position for 10-30 seconds. Some research favors a sustained static stretch of up to 60 seconds. Static stretching is regarded as the most common form of stretching for the general public or average fitness participant, since it is considered safe and effective for improving overall flexibility.

As one might expect, the physiology of static stretching differs from the cascade of events occurring during dynamic stretching. In this scenario, the muscle fibers elongate, ultimately increasing flexibility in the muscle tissues. Doctors and physical therapists often see the unfortunate but inescapable results of immobilization, either after a cast has been removed, or upon attempting to become more active after a period of injury recovery. Since soft tissues will inherently shorten unless moved, experts suggest take each joint through its full range of motion once a day to increase mobility.

Risk/Benefit Decisions

There are many advantages and benefits to engaging in a static stretch regimen. Such movement prevents the soft tissues from absorbing high amounts of energy over a short period of time, which was ultimately the problem with ballistic stretching. If relaxation is one's goal, static stretching generally will not initiate a strong reflex response, making it an ideal way to ease into an athlete's badly needed "quiet time". Post-workout is the optimal time to perform static stretches, since the muscles are already warmed up, rendering joints and ligaments much more elastic than is found pre-workout. In fact, such relaxing movements after intense exercise are valuable in injury prevention and alleviating the intensity of natural muscle soreness.

As with most 2-sided issues, there are several drawbacks to the performance of static stretches, most of which relate to the timing of such stretching. When performed prior to an athletic competition, static stretching may have a negative impact on an athlete's physical mobility. This form of warming up may limit the body's reaction time as well as the muscles' ability to properly fire when called upon to perform. Such diminished effects may last for up to 2 hours...well past the competitive event.

A research study performed in 2000 looked at male army recruits in an effort to determine if static stretching would reduce the risk of injuries. It was determined that static stretching didn't result in a significant reduction of injury occurrence; rather, results showed that the greater predictor of potential injury was an overall poor level of aerobic fitness. Thus, the researchers concluded that there was little if any benefit to performing static stretching if injury avoidance is the goal. Moreover, static stretches may actually render a muscle more prone to injury, since such movement pre-workout can induce micro-trauma to the tissues.

Peak Performance

Whether your clients are seasoned participants, weekend warriors, or competitive athletes, they will look to you for advice not only on workouts and sports-specific exercises, but for safety as well. Learning the pro's and con's of these different stretching modes is one of the most important tasks you can undertake in an effort to best serve a client's needs.

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Keep Fitness Clients Active Through Allergy Season and Year Round

BY: Beverly Hosford

Allergies can interfere with staying active in the summer. And just when you thought you got used to summer allergies, the seasons are about to change again with fall approaching! Going indoors where there is filtered air conditioning is one way to get around this conundrum, but doesn't solve the problem. Especially if someone is sensitive to indoor allergens like dust or mold. Changing the environment is a short-term fix, just like allergy medicine. What if there was a way to play outside (or inside) AND breathe easy without getting drugged up? For some people there is.

Allergies happen when your immune system attacks a false invader. For example, pollen, fresh cut grass and dust are generally non-threatening to your body. Yet, symptoms like a runny nose arise to escort the *supposed* invaders out. There are other allergens that hide behind the scenes too, making allergies a year round concern.

Three Types of Allergens

Environmental - Outdoor air pollution (plants), indoor air pollution (dust, mold, chemicals), poison ivy and insects. The [chemicals found in sunscreen](#) and other products used on the body can be irritating whether harmful or not.

Food - Dairy, gluten, soy, peanuts, sugar and night shades are all examples. Sometimes they irritate the body causing gas, bloating or sneezing. Other times they can be a food intolerance and pose larger problems that affect gut health and digestion.

Stress - Work, relationships and fearful thoughts can place the body into attack mode when they pose a threat to the system. Stress can cause muscles to tighten, breathing to become restricted and effect normal bodily function. Almost all systems (digestive, nervous, endocrine, etc.) are effected by stress. When the body is trying to manage this and then summer environmental allergens get introduced - KA POW!

Exercise is a form of stress too. It's results are usually positive, but can be the opposite when it's done improperly. The goal of exercise is to break down muscles to make them stronger and to push the cardiovascular system so it's more effective. While it yields great benefits to most people, physical activity is yet another type of input that the body has to manage.

Your body: the chemistry lab

Think of your body like a chemistry beaker. You pour some of this allergen in and some of that one. There is inflammation as a result. Sometimes it's obvious on your skin or in your sinuses. But, you don't always see it. At any given time the body is coping with inflammation and stress from our normal routines.

It only comes into our awareness when the body is calling for help.

As this beaker fills up, the various systems in the body become over-worked. Then, you add the summer allergens in and physical stress. Exercise is a good form of stress, but does tax the system further. Eventually, this chemistry beaker gets over-filled and explodes! Enter in the symptoms: sneezing, coughing, itchy eyes, fatigue, irritable bowels etc.

What can a personal trainer do to help?

Just like identifying habitual bad posture or ergonomics to help clients avoid injuries, you can help people identify stressors in their life to avoid allergen overload. You can't stop mother nature from blooming or people from polluting the air. You can call attention to what's in the control of your clients.

A medical doctor or naturopath is the best person to refer a client to if they need a specific diagnoses. Some doctors can run an allergy test in their office and identify exactly what's causing the problems. Consider partnering with someone who can speak to your clients about allergens and provide a paper survey to help them identify what might be happening inside.

Allergy medicine: keep it on your radar

If your clients are taking medication for their allergies, it's important for you to know. The side effects are different for everyone. They can cause heart rate changes, so monitoring this during a workout is a good idea. Some people have a suppressed appetite from the drugs they've ingested. They may not have eaten enough before coming to workout. Confusion, dizziness, drowsiness and vomiting occur in the worst cases from antihistamines - a type of allergy medicine. Decongestants, another common ingredient in allergy medicine can cause high heart rate, high blood pressure, anxiety, seizures and dryness among a few. [Educate yourself further about allergies](#) so to keep your clients active all year long! It's a fascinating topic and each person really is a unique chemistry lab, changing with the seasons.

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Reduce Trigger Points after Travel and / or Office Work

BY: Stephanie Lane

Clients who spend an extended amount of time seated such as during travel or office work likely suffer muscular imbalances. Some muscles are constantly shortened while others are lengthened. This dysfunction leads to a cumulative injury cycle. After ensuring your client has proper ergonomics at work, and proper posture while seated, implementing a self-myofascial release protocol is the next step in avoiding and preventing pain.

Self-Myofascial Release (SMR)

Self-myofascial release is a flexibility technique using gentle force to release trigger points or micro spasms and break up fascial adhesions. Adhesions in the fascial system can prevent the client's ability to lengthen his or her muscles through stretching techniques. **The fascial system** is a connective tissue network that surrounds, supports, separates and connects every cell, muscle, bone, nerve, blood vessel, and organ of the body. Dysfunction in this system can entrap nerves, blood vessels, cause ischemia, pain and loss of function.

Dr. of Physical Therapy John F. Barnes gave the term myofascial release to methods aimed at healing this system. His analogy of a "straight-jacket" surrounding the muscles paints a perfect image. On his website myofascialrelease.com he explains this in further detail and writes about the 2,000 pounds of pressure per square inch of connective tissue dysfunction. Myofascial release can be done by a series of modalities such as foam rollers, yoga/lacross/bouncy/tennis/massage balls, thera-canes, pvc/abs pipes, myofascial release therapists and more. Research on self myofascial release is derived from evidence surrounding ischemic compression and myofascial release.

Ischemic Compression is simply pressure into a trigger point. Doing so simulates the golgi tendon organ (our receptors sensitive to tension), providing an inhibitory effect to the muscle spindles. A randomized, controlled trial of 119 patients found that ischemic compression therapy provides immediate pain relief and trigger point sensitivity (Hou). Another randomized trail of 40 adults found a program including ischemic pressure was shown to be effective in reducing trigger point sensitivity (Hanten).

Put SMR into practice

Training your clients to pay attention to the following regions using Self-Myofascial Release (SMR) techniques (shown by clicking links below) can help unbundle muscle fibers, stretch fascia and prevent pain. These muscles are shortened while seated:

Feet & Ankles:

[Soleus](#)

[Gastrocnemius](#)

Upper Leg:

[Bicep Femoris](#)

[Rectus Femoris](#)

Hips:

[Hip Flexors](#)

[Adductor Group](#)

[TFL](#)

[Piriformis](#)

Back:

[Quadratus Lumborum](#)

[Erector Spinae](#)

*each video linked may need modification for individual conditions

SMR Program Design

Choosing an area

Pick four muscles from above that a) you've deemed tight through an assessment (postural analysis, overhead squat, single leg squat, star balance, etc. b) you're comfortable instructing your client through, c) he/she can do despite any limitations. Stick with these four for a month and note any difference in static and dynamic posture. Move to another four after a month.

How Often

SMR should be performed daily.

When

On days of exercise clients should SMR muscles deemed tight, but aren't being worked that day. For instance, on a leg day for someone with an anterior pelvic tilt, you'd want to SMR the soleus, calves, adductors and hip flexors but maybe not the piriformis as SMR'ing the piriformis may also deactivate the gluteus maximus, and you don't want to "deactivate" or "turn them off" before activating them in exercise. After exercise the client should SMR the muscles worked that day to bring them back to the proper resting length. SMR'ing should be done before stretching as breaking up fascial adhesions (knots) can help improve the tissue's ability to lengthen through stretching techniques. On days of no exercise SMR can be performed at any time.

How Long

It is crucial the client roll from insertion to origin within the muscle to find the most tender spot. Once found, have them hold the pressure for a minimum of 30 seconds and up to 90 seconds depending on the intensity. Ischemic pressure at a high intensity (max pain tolerance / 5-7 on a pain scale of 1-10) for a low duration (30 seconds) or ischemic pressure at a low intensity (minimal pain threshold / 2-3 on a pain scale) for a longer duration (90 seconds) significantly reduces pain and trigger point sensitivity (Clark). Suggest the client record which modality was used (roller/ball), and the tenderness each day. This way they have numbers that demonstrate their progress.

Travel

A massage ball can essentially be carried anywhere with you including kept in your desk, purse, gym or travel bag. I have a massage ball with me at all times and also have a short PVC pipe I keep in my gym bag.

Contraindications

It is ok to practice SMR techniques with your senior clients, if tolerated by them. With obese clients, use SMR with caution. Ensure your client is always, ALWAYS, comfortable during a training session. These clients might not be comfortable doing SMR techniques in the gym. Can be performed at home. Those with diabetes need extra care when SMR'ing. Those with peripheral neuropathy should avoid it completely. Anything involving lying down can be a contraindication for those with hypertension. Consult with a licensed physician for anyone with coronary heart disease. Teach SMR to clients with arthritis only if tolerated by the client. Avoid SMR on anyone undergoing chemotherapy or radiation. Clients who are pregnant can SMR but avoid varicose veins and areas of swelling.

Read about SMR tools you can use:

Roll Out the Kinks with Myofascial Release (<https://www.nfpt.com/blog/roll-kinks-myofascial-release>)

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Shake It Up ... Or Not? The Post-Workout Puzzle

BY: Cathleen Kronemer

Choosing to become a certified personal trainer requires a level of commitment to helping individuals lead healthy, active and fit lifestyles. As we have no doubt discovered, this dedication extends past the Fitness Center's doors...right into the kitchen! Plenty of articles have been written by experts in our industry stressing the importance of post-workout "fuel" as a complement to rigorous training. We try to pass some of this information on to our clients, feeling remiss in our professionalism should we neglect to address this vital component of a healthy lifestyle. However, the type of fuel that we suggest is the subject of much scrutiny, and such action inevitably leads to a debate.

The Ubiquitous Protein Shake

You are probably familiar with the research indicating the need to replenish glycogen stores within a magical "window of opportunity" immediately following a workout, which lies somewhere between 45 minutes and 1 hour. During my years as a competitive bodybuilder, I strictly adhered to my Coach's dogma of downing a protein shake and simple carbohydrates immediately after removing the workout gloves. If you too are a member of this camp, you are keenly aware of the cost factor involved in living like this! I extolled the virtues of the highest quality whey protein powder, isolate derived through a cold-filtering process, to maximize its bioavailability. I also hydrated the powder shortly prior to consumption, so that the protein structures themselves would not have a chance to degrade. Does any of this sound familiar?

Liquid Or Solid?

Athletes and scientists have recently begun questioning whether post-workout fuel is necessarily optimized in the form of a whey protein shake. Former Academy of Nutrition and Dietetics Spokesperson Christine Gerbstadt, MD, MPH, RD, CSSD, is in favor of experimenting with both shakes and whole foods. However, her window is much smaller, suggesting the athlete refuel within 15 to 20 minutes of a workout's final lift. She advocates a 3:1 ratio of carbohydrate to protein at this time, followed by a regular whole food meal 3 to 4 hours later. This combination will help prevent the body from using its own hard-earned muscle tissue for energy and also encourages that all-important anabolic muscle synthesis. Dr. Gerbstadt makes the following suggestions for post-workout replenishing:

- ~A smoothie made with low-fat milk and fruit
- ~A serving of low-fat chocolate milk
- ~A whole-grain wrap containing lean turkey and vegetables

As you can see, she does not discriminate between liquid and solid food, stressing the timing and the proper ratios over the method of delivery to your system. As a scientist myself, I question the use of dairy products at this time. Casein, which is the protein found in dairy products, is a much slower digesting protein than whey. I would typically consume casein protein during the afternoons and before retiring for the night, so that muscles could be "fed" throughout the hours between workouts. However, many dietitians do suggest chocolate milk as an easy and inexpensive recovery drink.

And Then There's The Science

A study *published in the Journal of the International Society of Sports Nutrition* poses the surprisingly potent question, "Do you really need a post-workout meal?" This inquiry seems to fly in the face of both liquid *and* whole food choices! The primary researchers delved deeply into the science behind this particular meal. The purpose of post-exercise nutrition is to replenish depleted glycogen stores. As we know by this point, glycogen is one of the primary fuels needed for effective muscular contraction. Just 3 sets of 12 reps can reduce the body's glycogen stores to almost half of what they were prior to entering the gym. Most bodybuilding workouts encompass far more volume than a mere 3 sets, thereby depleting glycogen even more severely. Refueling lost glycogen is critical to the next training session; and since muscle tissue is in a prime anabolic state after resistance training, the post-workout window of opportunity has traditionally been viewed as the critical time to commence this process. Countless studies have demonstrated that consuming a protein and carbohydrate mix post-workout is the optimal solution.

The authors of one such study found this to be a well-documented dogma, but only in cases when significant

resistance training was repeated again within eight hours. Many elite athletes perform what are called “2-day’s”, expending considerable amounts of energy within a time frame of less than 12 hours. Those who trained only once a day seemed to be garnering sufficient glycogen recovery, but the recovery was spread over many hours. The researchers therefore concluded that starting this process with a post-workout meal seemed to be irrelevant, as long as the daily total caloric needs were met during the next 24 hours.

Another study further corroborated these findings. When it comes to proper nutrition for muscle building, meeting your body’s individual overall calorie/macronutrient needs for the day is the most important component, and these macronutrients can just as simply be derived from clean whole foods sources or a protein shake.

A new study from the University of Texas Medical Branch finds that eating a mix of **protein types**—whey, casein and soy—immediately post- workout may help athletes meet their desired muscularity even more effectively than ingesting a fast-acting protein alone. Research indicated that the combination of the three proteins seems to prolong the body’s amino acid delivery to muscles, increasing the amount of time that the muscles remain in their anabolic “growth state.” Different forms of proteins are absorbed by the body at different rates. Soy is largely considered an “intermediate” deliverer of amino acids, whey offers a “fast” protein and casein is “slow to digest”, taking a few hours to be effectively processed in the body. The longer the muscle tissue can be plied with amino acids, the building blocks of proteins, the better it is for growth and recovery, according to Mark Cope, Nutrition research scientist at Solae Global, the consumer goods company that backed the aforementioned study.

The Final Analysis

There is no denying the convenience and simplicity of a protein shake post-workout. I dispense the appropriate amount of protein powder in my shaker bottles for the entire week, toss one in my gym bag each day, and hydrate it prior to consumption. On most days I have a brief amount of time between the end of my workout and the arrival of my first client, so again, convenience wins out. However, science has shown us that a whole food meal of the appropriate macronutrients and calories can be just as beneficial. If you find yourself with the luxury of time after the gym, you will most likely savor the food choices over the liquid supplement. A serving of lean chicken coupled with brown rice would be a perfectly adequate replenishing meal, as would a sweet potato and a piece of fish. Keeping in mind the protein to carbohydrate ratio that works best for you, preparing food-based post-workout meals often will satisfy a hungry athlete more readily than a shake.

The Role Of The Personal Trainer

As eager as we are to point our clients in the right direction nutritionally, we must keep in mind the definition of our professional limits. We may find ourselves tiptoeing around mine fields in terms of the personal trainer’s scope of practice. For more insight into this dilemma and process, please refer to my past articles on this topic ([references 10](#) and [11](#) listed below).

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Recent Evidence-Based Nutritional Guidelines

BY: Susan Ricardo Buckley

There are general guidelines that Certified Personal Trainers should be aware of when it comes to nutritional recommendations to support increased physical activity. Recently, the Academy of Nutrition and Dietetics published a position paper outlining recent research on sports nutrition guidelines; therefore, I wanted to share findings which are evidence-based. Keep in mind that these are general guidelines for athletes. Clients should be referred to sports dietitians for individualized nutritional assessments, especially clients with health conditions such as diabetes, kidney disease, heart disease, hypertension, gastrointestinal issues, vitamin/mineral deficiencies and other conditions.

Energy (Caloric) Recommendations:

Energy requirements will vary based on type of workout routine (volume and intensity) and whether clients need to lose, gain, or maintain weight. Other factors to consider that will increase energy needs include high altitude exposure, cold or heat exposure, physical injuries, medications, and phase of menstrual cycle.

In order for clients to maintain weight, energy in (calories) should equal energy out (expenditure). For weight loss, intake should be less than expenditure, and for weight gain, energy in should be higher than expenditure. It is important to remember that bodyweight should not be the sole consideration. It is best to measure bodyfat percentage and lean muscle in clients to ensure that muscle is not being lost due to insufficient energy intake. In order to avoid loss of performance, achieving a light energy deficit is preferable versus a deficiency that promotes rapid weight loss as lean muscle may be compromised.

A general guideline is to decrease energy intake by 250 to 500 calories a day while maintaining or slightly increasing energy expenditure.

Carbohydrate Recommendations:

Carbohydrates are key fuel for the body and should be recommended in adequate amounts. It is important to maintain high carbohydrate availability (glycogen stores and blood glucose) to minimize fatigue and decreased concentration, and to sustain lean muscle. Carbohydrate recommendations vary according to amount/intensity of exercise, and are provided as grams per kilogram. In order to convert pounds to kilograms, divide pounds by 2.2. Hence, 110 lbs = 50 kg. Recommendations based on expenditure are as follows:

*Low intensity or skill based activity: 3.5 grams per kilogram of athlete's bodyweight per day.

*Moderate intensity or moderate exercise program (about an hour a day): 5-7 grams per kilogram of athlete's bodyweight per day.

*High intensity or endurance program (about 1-3 hours a day moderate to high intensity): 6-10 grams per kilogram of athlete's bodyweight per day.

*Very high or extreme program (about 4-5 hours per day moderate to high intensity): 8-12 grams per kilogram of athlete's bodyweight per day.

Protein Recommendations:

Proteins are key for maintaining muscle mass and connective tissues (tendons, bones). Inadequate protein intake will have a negative impact on lean muscle synthesis and repair; however, excessive protein intake may have a negative impact on body function as well as body is working hard to

eliminate excess protein. Keep in mind that adequate carbohydrates are needed so that protein synthesis is not impacted.

Protein guidelines range from 1.2 to 2.0 grams per kilograms per day. Additionally, protein intake is encouraged in terms of regular spacing (0.3 grams per kilogram of bodyweight after exercise and throughout the day). These intakes can be met from food sources versus supplements.

Fat Recommendations:

Fats are key in providing energy and are essential elements for cell membranes and absorption of fat-soluble vitamins. Saturated fats should be limited to less than 10% of total calories per day; therefore, fat intake should mostly come from unsaturated fats. We should discourage clients to reduce fat intake below 20% as a way of losing fat since our bodies need fat-soluble vitamins and essential fatty acids. Hence, a general guideline is that total fat intake should range from 20-35% of calories per day.

Fluid Recommendations:

Adequate hydration leads to optimal health and exercise. Fluid intake will vary depending on environmental conditions (heat, cold) and amount of sweat. Dehydration is a concern; however, over-hydration can be dangerous as well. Because fluid intake depends on many factors, there is no general guideline specified in this particular article. A specific post-exercise recommendation made by current research suggests 1.25 to 1.5 liters of fluid replenishment for every kilogram of bodyweight lost per exercise. One liter is equivalent to four cups.

Alcohol:

Overconsumption of alcohol can interfere with fitness goals as it suppresses breakdown of fat, and increases energy intake. Alcohol intake can have a negative impact on strength and performance several hours after ingestion by interfering with glycogen storage and affecting hydration. Alcohol should be minimized or avoided during post-exercise period while muscles and tissues are recovering.

Vitamin/Mineral Supplements:

If clients are meeting the above requirements, supplementation may not be necessary unless an energy restricted diet is in place. Supplementation should be individualized and, hence, assessed by a sports dietitian.

For more detail on these findings, please refer to the actual article (reference below) as I am only presenting a brief synopsis.

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Medical Fitness News Flash

BY: Natalie Johnson

The healthcare industry has undergone tremendous change in the past five years. Physicians, hospital systems and health plans are recognizing the benefit(s) of preventative medicine, well-being and patient empowerment. The Fitness Industry has traditionally not been successful in working directly with physicians and medical groups due to barriers that involve the most appropriate way to access and integrate medical records, lack of knowledge on how to find qualified professionals and the inability to see eye to eye on managing disease vs prevention of disease.

In a world where medical professionals are trained to treat diseases and fitness professionals are trained to prevent disease there is finally a light at the end of the tunnel with both industries finding ways to partner in an effort to provide more holistic care that lowers health risks, treats disease and educates patients.

The Past

Historically, hospital systems were the first to recognize the benefits of a medical and fitness collaboration and invested in multi-million dollar fitness centers on their properties to offer better care to their patients. This trend started approximately 30 years ago and it was also at this time that the Medical Fitness Association was born. The Medical Fitness Association (MFA) is a member driven, non-profit organization that provides support to medically integrated fitness centers world-wide. For many years the MFA membership consisted of individuals and facilities located in hospitals.

They were seeking better ways to collaborate with each other to create a more comprehensive continuum of care. There were barriers with hospital electronic medical records (EMR's) and inconsistent health plan coverage for patients. Successful referral networks were sparse and there was a clear issue with successful collaborations between the medical and fitness professions. There were few stories of successful patient treatment plans long-term due to the lack of collaborative management systems and the non existence of data from the fitness centers. The hospital focused as its own entity and the Fitness Centers were separate. Although on the same property most medical fitness center received most of their revenue from community memberships and very little from direct referrals from their hospital and healthcare systems.

In 2010 the Affordable Care Act (ACA) was implemented. With it came provisions that are meant to lower healthcare costs and improve healthcare efficiency. There are specific focuses on employee wellness programs as well as preventative exams offered to patients free of charge and paid for by Medicare. There are 63+ preventative services that Physicians need to provide to their patients. These services include screenings and procedures such as blood pressure, Diabetes, cholesterol, colorectal Cancer, obesity screenings, diet counseling, alcohol misuse, immunizations and Tobacco use to name a few.

The Present

With the implementation of these screenings Physicians need to provide resources so their patients better understand their own health and are given an opportunity to change and improve any existing health risks. This has created a tremendous amount of opportunity in the Fitness Industry as well as in other wellness professions. (Health Coaches, RD's Diabetes Educators, etc). Fitness & Wellness Professionals can collaborate with Physicians to provide education, coaching and exercise prescription to empower patients and provide more well-rounded treatment plans for a more holistic approach.

Medical providers and health plans now, more than ever see the benefit to provide Fitness Trainers, Health Coaches and nutritional services to their patients. Many of these services are now covered by Medicare and health plans. By Physicians offering these services there is a creation of a better continuum of care and health improvements that empower patients and save on personal and healthcare costs. In addition these services are beneficial to healthy populations to keep them thriving. Medical professionals are not typically trained on fitness, nutrition or behavior change. They need additional resources and professionals in order to engage their patients. Medical providers, healthcare systems and employers are seeking fitness professionals that have additional training and experience in disease management and are familiar with the coaching process and behavior change. There are fitness certification programs that give a high level overview but most don't educate on the in depth knowledge needed to work in the medical field.

Possibly the most exciting news in the industry was a partnership developed this year between the Medical Fitness Association (MFA), the American College of Sports Medicine (ACSM) and the American Council on Exercise (ACE) to bring together healthcare systems, providers, fitness professionals and community resources across the nation to better integrate physical activity into the nation's healthcare. This partnership is the first of its kind and will lead to standards that will provide higher quality collaborative systems, facility standards, medical fitness trainings & Certifications and a wide variety of resources for fitness and medical professionals nation-wide.

Your Future

Fitness Professionals looking to become more involved in medical fitness should ideally reach out to their local providers to initiate conversations about the community and practice needs and ways to complement each other's practice. There are a variety of resources for Fitness Professionals. Below are resources available to assist with attaining the ideal training and exposure to become more knowledgeable and qualified in the industry:

- **The Medical Fitness Association** – www.medicalfitness.org

A supporting organization that provides education, best practices, networking and resources. Offers the only Medical Fitness Facility Certification.

- **The Medical Fitness Network** – <https://medicalfitnessnetwork.org>

*A free national referral service for fitness & healthcare professionals. As a Fitness Professional on this network you receive exposure to a number of national organizations supporting disease management.

- **The Medical Wellness Network** – www.medicalwellnessassociation.com

*Promotes and integrates professional development of medical wellness programs, professionals, products, facilities and services.

- **Medical Exercise Training Institute** - <http://postrehab.com/>

*Certifications as a Medical Exercise Specialist, Post Rehab Conditioning Specialist and Medical Exercise Program Director.

- **Exercise is Medicine (EIM)** – www.exerciseismedicine.org

*A global initiative (managed by ACSM) that focuses on encouraging Physicians & other Healthcare Providers to include physical activity as part of treatment plans. They offer an EIM Credential to assist Fitness Professionals with getting more recognition from their local medical providers.

Resistance Training: Is Fast Or Slow The Way To Go?

BY: Cathleen Kronemer

Working with clients can be one of the most rewarding experiences of a fitness career. We see it all, from fads to tried-and-true principles to each client's favorite exercise that they deem necessary to perform each time they set foot in the gym. Based upon our knowledge and years of experience, we realize there are many theories on strength training, extolled by experts and novices alike. With every theory, we also see the ongoing debates about "the best way" to work one's muscles.

The Tortoise Or The Hare?

Fast versus slow lifting has been a raging issue for decades. There are many proponents on either side, and the purpose of this article is to shed some light on the science behind each option as well as their unique benefits and detriments.

Performing resistance training in a slow and controlled manner is based upon a single concept: placing a greater demand upon a muscle for a longer period of time (time under tension), without invoking momentum. Some claim that extreme slowness of the repetitions is the safest and surest manner in which to train for size and strength.

Richard Winett, Ph.D., Director of the Center for Research in Health Behavior at Virginia Tech and publisher of the *Master Trainer* newsletter, explains the advantages of lifting slowly, based upon his personal experience. "I actually find moving slowly more interesting, because it requires such unbelievable focus and intensity and, of course, it's different from all my past training," he claims. "But the biggest plus is no joint inflammation" To support this, one must understand the mechanics of such movement.

Considering The Variables

The case for training using slower repetitions revolves around a number of interrelated points:

1. the difference between demonstrating and building strength
2. the role of intensity in building strength and muscle
3. how muscle fibers respond to intensity
4. how to increase intensity.

To begin, there is an abundance of confusion surrounding the difference between *demonstrating* strength and *building* strength. At competitions such as Olympic lifting, the demonstration of strength also involves a demonstration of power. An Olympic lifter is dependent upon technique, as well as a tremendous amount of momentum, to not only lift the weight off the floor but to throw the weight overhead from the shoulders. The more technique and momentum he recruits, the better the performance. In fact, the idea is to capitalize on technique, momentum and neuromuscular learning and efficiency to facilitate the motion.

Power is defined as work performed per unit of time. Thus, it might stand to reason that the quicker a lifter can execute a move with a large weight on an Olympic bar, the more power he is demonstrating. But is training with such an explosive nature necessarily the best way to *build strength*?

Physics? In The Gym??

From a physics point of view, the process of using technique and momentum does not necessarily subject a specific muscle group to a high intensity stimulus. In fact, once technique and momentum are introduced into any movement, the effect is just the opposite: intensity becomes reduced. While we can observe that an enormous weight may have been hoisted and thrown, involving a high level of *force* (mass x acceleration), this is not necessarily the same as an intense stimulus and high *muscle tension*. *High force* varies significantly from *high intensity*.

This is a perfect time to explore the key role that intensity plays in producing strength gains and lean muscle mass. Research seems to suggest that neither frequency nor volume, nor number of repetitions in a set is critical provided the lifter's intensity is high. *Intensity* is defined as reaching a state of momentary muscular fatigue. Once that has been properly achieved, there does not appear to be much difference in outcome between training two or three times per week, or perhaps even once. There also does not seem to be any consequence if the lifter executes 2 or 5 sets per movement or if sets are done with 6 repetitions or 20.

The **size principle** states that muscle fibers are activated in order of their size. In simpler terms, this means that smaller slow-twitch fibers are going to be activated before larger fast-twitch fibers. As the smaller fibers fatigue, larger and larger muscle fibers become activated. However, once a fiber is activated, it remains activated. Hence, over time, it ends up generating less and less force until the lifter completes the exercise. A commonly held misconception is that speed of movement is the determining factor. Though it seems intuitive, the notion of moving slowly in training only activates slow-twitch fibers, while fast-twitch fibers are only activated in exercises that are performed rapidly, simply does not hold true. Admittedly, one existing problem is to define the level of intensity which fatigues muscles fibers sufficiently enough to produce the desired adaptations.

A New Variation

There is *slow* lifting, and then there is *super-slow* lifting. Ken Hutchins developed the super-slow method in 1982, while working with a group of elderly, delicate women. These females were participating in an [osteoporosis](#) study being conducted at the University of Florida. The protocol he followed had the women lifting weights for a count of 2 seconds and lowering them in 4 seconds. It was upon observing the subjects' unsteady and erratic form that spurred Hutchins to develop his novel approach.

The idea of super-slow is to bring the muscles to exhaustion by keeping them loaded throughout the movement. "The basis of our belief is the in-road theory," Hutchins says. "Basically we train your muscles by putting a weight load on them so that the muscle goes from the fresh strength that you start with to where, after several reps, it is reduced to the point where you can't move the [weight]. Somewhere on the in-roading process the muscle gets progressively more fatigued and we cross a ... threshold, which turns on a signal to the body to produce greater strength and to grow muscle."

Hutchins goes on to point out that the super-slow method targets the body's skeletal muscles, called skeletal muscles, the ones he refers to as "the body's engines". These supportive engines work very hard, the result being that they produce more heat, consume more calories, and receive more [blood](#) flow than any of the body's other muscles. Hutchins suggests a lifter determine how much he/she can lift and then reduce that load by 30%.

The Other Side Of The Fence

Dr. Patrick O'Shea is a proponent of lifting weights at a fast pace. Dedicated to resistance training for most of his life, Dr. O'Shea became a Professor (Emeritus) of Exercise and Sports Science at Oregon State University. He, too, has science and logic behind his stance. He reminds us that strength x speed = power. With that key idea in mind, a typical force-velocity curve will clearly illustrate a relationship between strength and speed. Only training intensity that either increases force (resistance) or speed or both will have an effect on strength and power; most likely, hypertrophy will accompany that increase. It bears mentioning here that there are many factors that influence muscle hypertrophy: type of training, intensity, nutrition and heredity.

Slow lifting also involves an element of danger not observed in faster training methods, where there is no prolonged breath holding. Put simply, slow and deliberate lifting impairs blood flow to and from the heart. When the force of a muscle's contraction effort reaches 80 percent of its maximum potential, obstruction is virtually complete. The extent to which the heart must work during a lift is determined

largely by the arterial blood pressure required to facilitate the flow of blood to the muscle tissue that is contracting the hardest. Therefore, performing sustained forceful lifting movements has the potential to increase the muscle tissue pressure, requiring a very high perfusion pressure. This reaction is part of a cascade that will then cause a large increase in pressure and reduction of blood flow back to the heart. During lifting, insufficient venous return not only impairs the heart's blood supply, since it is incapable of functioning anaerobically, but it also causes a drop in stroke volume (the amount of blood pumped with each heart beat) due to insufficient filling of the heart's chambers.

A research study funded by NIH (National Institutes of Health) yielded results pointing to how a light level-heavy volume protocol may offer an equal if not better training stimulus for muscular adaptation than a high level-light volume protocol, owing to the greater time under tension, power, force, and work output when allowing for equating the total volume.

It's Time For Tempo

In order to develop slow-twitch fibers one must train aerobically. This entails lifting weights that are light enough to properly execute 12 to 20 repetitions per set, and resting for 60 to 90 seconds between repetitions. To the contrary, in order to cultivate fast-twitch muscle fibers, it is necessary to train anaerobically. This can be accomplished by lifting weights that are heavy enough to only allow 4 to 6 repetitions per set, followed by a rest interval of 3 to 5 minutes. To achieve a balance of both strength and endurance, thereby developing both slow-twitch and fast-twitch fibers, a prudent approach might be to blend both forms of training. In this scenario, an athlete lifts weights with proper form proper that allow for the completion of 8 to 12 repetitions per set, then resting 2 to 3 minutes between sets.

There are four values that define the tempo of an exercise:

- The amount of time it takes to lower a weight (the "negative" or "eccentric" motion);
- The transition time between lowering and lifting;
- The amount of time spent lifting the weight (the "positive" or "concentric" motion);
- The duration of the pause at the completion of the exercise

Bottom Line: Strike A Balance

Over the course of 4 weeks, both the neural pathways and muscle tissue adapt to a familiar training program. Most experts agree that in an effort to thwart the dreaded performance plateaus, it is best to change up the workout. Try lifting fast on some days, and at a moderate-to-slow pace on the other days of the week. This rep-timing technique helps to achieve many different goals: boosting power, growing muscle, and building endurance. Tweaking exercise tempo also goes a long way in alleviating boredom and burnout.

One can benefit from weightlifting in either a slow or fast manner, the real difference lying in one's ultimate goals. As with anything worth pursuing, start with the end in mind.

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BP Low? You Can Still Get Up and Go!

BY: Cathleen Kronemer

As trainers, we have many goals for our diverse client base. Most trainees are striving to improve body composition, lose weight, increase endurance, and in general become healthier versions of their current selves. To accomplish this effectively and safely, we must be aware of any potentially dangerous exercises when designing a workout program; this requires us to be vigilant about a client's underlying health issues.

A client of mine, who has made considerable progress through resistance training, diet modification, and an increase in cardio exercise, informed me very early on that she has always had low blood pressure, or chronic hypotension. Since this was not a situation that I often encounter, it was important for me to have some background on the subject.

Be Proactive With Insight

Hypotension is defined as a blood pressure reading below 90/60mmHg. The top number indicates the pressure of blood in the blood vessels when the heart is contracting to pump blood around the body. Most doctors consider blood pressure to be chronically too low only if it causes noticeable symptoms. Other experts claim that even if only one number is in the low range, the individual should be considered hypotensive.

There has always been a tremendous focus placed upon high blood pressure, or hypertension, in our society. Many medications are prescribed to treat this condition. Dietary restrictions, such as limiting one's salt intake, propelled the nutritional world to develop sodium-free herbs and spices. The ever-popular Mrs. DASH is aptly named: **D**ietary **A**pproach to **S**topping **H**ypertension. Since the prevalence of high blood pressure is seen in disproportionately high numbers compared to hypotension, there previously has not been much advice available to those individuals who wished to maintain an active lifestyle with little to no risk.

Become Aware Of The Symptoms

During exercise, muscles require an elevated amount of both blood and oxygen. This increase in demand can lower blood pressure, thereby decreasing blood flow to the brain. For individuals who are already coping with hypotension, therefore, exercise has the potential of further exacerbating the problem. Knowing and recognizing the symptoms of dangerously low blood pressure is very important for a trainer.

As is the case with many underlying health issues, symptoms of hypotension vary on a continuum. Some individuals experience no symptoms at all, while others might have a brief sensation of feeling dizzy when standing up too quickly. While this may clear within seconds, some hypotensive clients might present with much more significant symptoms, such as sweating, slowing of cognitive processes (often referred to as 'brain fog'), weakness, unusual fatigue, an irregular pulse, blurring of vision, nausea, a feeling light-headedness, and even fainting.

A much more common occurrence, which many of us may have experienced once or twice, is that of orthostatic hypotension; we often find ourselves saying "Whoa! I stood up too fast!" In fact, any sudden postural change during exercise, such as rising from a position of the head being below or level with the heart, poses a risk for bringing about orthostatic hypotension. Other situations that may bring about a drop in blood pressure include standing in one place for a long period of time (think of waiting in line for a ride at Disneyworld) or allowing oneself to become dehydrated, commonly seen with outdoor exercisers. A change of 20 points in blood pressure can be quite significant. If such a drastic plummet can happen for individuals and avid exercisers whose blood pressure hovers in the normal range, it becomes infinitely more dangerous for a client who is already hypotensive.

While we know what happens in an individual's circulatory system, there can be many other reasons why a client may exhibit chronic low blood pressure. Common causes include diabetes, allergic reactions, heart disease and shock. It is interesting to note that heart disease may render an individual either hypertensive or hypotensive, depending upon the nature of the cardiac disorder.

Designing a Safer Workout

Because a sudden change in posture can bring on symptoms, a prudent trainer can design a workout that is effective while also avoiding exercises in which the head is lifted suddenly from below or level with the heart. For any trainers who also wear a yoga instructor hat, this can be a bit challenging. Experts suggest that a hypotensive yoga participant be instructed to refrain from engaging in any positions requiring movement from a supine to a seated position. Also contraindicated are poses that move the body from a seated to a standing position, as well as front-bending exercises (the risk here being the second half of the movement, rising up).

In terms of resistance training, being aware of which exercises may have a negative impact upon a hypotensive client is helpful in designing a workout. Any exercise where forward flexion or sitting up between sets is involved may be problematic. A few examples are bench press, sit-ups, bent-over rows, reverse flies, and step classes where there is forward bending. Before thinking that a productive workout is unattainable, consider the following exercises and find creative ways to incorporate them into a training session: rowing, lower-body resistance training, light upper-body resistance training, walking, cycling and jogging. Before engaging your client in his training regimen, provide a warm-up that allows the heart rate to elevate gradually. At the end of the session, a safe cool-down is one performed while standing or sitting, as opposed to one in which the client must be in a horizontal position.

Food and Drink---Think!

Knowing about and sharing the information that he or she has chronic low blood pressure is definitely the client's responsibility. There are, however, gentle reminders you can offer for life outside the fitness center. A prime example is nutrition-based. The body requires blood as it attempts to digest food. Suggest that your client eat smaller meals prior to training, and be certain to stress the importance of hydration.

Researchers at the University of North Carolina found that chronic hypotensive individuals as well as those with orthostatic hypotension are 1.34 times more likely to develop heart failure than patients whose blood pressure hovers within a normal range. Knowing that exercise is always beneficial in staving off many illnesses, a client with low blood pressure will appreciate your dedication to writing a safe program in which they can engage.

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Back To Basics - Optimizing Alkalinity In Your Diet

BY: Cathleen Kronemer

As athletes, we are quite accustomed to fastidiously nurturing our bodies. From sculpting the external to feeding the internal, we are always focusing on ways to achieve optimal health. We juggle and calculate protein intake, carbohydrates and good fats, thinking we are doing the right thing for our bodies. However, recent research indicates we may be missing a key component in balancing this crucial equation.

Aside from muscles, bones and organs, the human body comprises an average of 50%-60% water, or approximately 45 quarts. Water is considered to be a neutral fluid, with a pH designation of 7. The technical definition of pH is the measure of activity of the hydrogen ion (H^+), and is reported as the reciprocal of the logarithm of the hydrogen ion activity. Therefore, water with a pH of 7 contains 10^{-7} moles per liter of hydrogen ions. A pH value below 7 indicates an acidic environment, whereas a value over 7 defines an alkaline, or basic, environment. Striking a delicate pH balance within our bodies can be an important indicator of overall health. Indeed, many biochemists and physiologists have recently recognized that the acid-alkaline ratio is among the most important aspects of a balanced, healthy body. In the words of Dr. Louis Pasteur, "The germ is nothing, the inner terrain is everything."

How Did We End Up Here?

Various changes within the body can also throw off the delicate pH balance, which can cause a surge of acidity, the result of which is often metabolic acidosis. Various disorders and diseases can be hidden culprits; stomach ulcers, obesity, kidney disease, liver problems, anorexia, adrenal disorders, diabetes, and fever can rob the body of its alkaline environment.

The protein sources we consume as part of the typical American diet have a very powerful effect on the pH of our internal environment. Animal protein sources, such as beef, venison, eggs, chicken and turkey, are categorized as acidifying foods. Since the diet of most athletes tends to be higher in protein, this can become a very real issue. It is not that the acidifying foods are unhealthy; quite the contrary! The concern arises when the internal environment becomes too highly acidic, when its pH drops well below 7.

Since a body tends to favor homeostasis, it will do whatever is necessary to preserve the balance required to thrive optimally. If protein consumption has created a significant pH imbalance toward the acidic level, the body compensates by "borrowing" minerals (calcium, potassium, sodium) from vital organs and bones in an effort to buffer and neutralize the acid. Over time, due to this strain, the body can actually suffer damage undetectable from the outside. Even mild acidosis can eventually lead to premature aging, joint pain, aching muscles, immune deficiencies, and acceleration of free radical damage. According to the *American Journal of Clinical Nutrition* (January 2001, Volume 73, No. 1, pp. 118-122), such borrowing of calcium in order to balance pH may also result in a decrease in bone density.

How Does Alkalinity Work?

When an alkaline environment is maintained in the body, the metabolic, we begin to "feel better" overall, yet may not know the reason. In a body whose internal landscape leans towards alkalinity, enzymatic, immunologic, and repair mechanisms function at their best. The acid-forming artifacts of stress and inflammation, as well as those from foods that are high in fat and animal protein, can only be effectively neutralized when sufficient mineral-buffering reserves are present. These buffering

reserves come from alkaline-forming foods. We have the power to provide these minerals simply by altering the food choices we make. A diet that is predominantly alkaline-forming, therefore, is essential to the maintenance of sustained health.

Most vegetables and fruits contain significant proportions of alkaline-forming elements. It may come as a surprise to learn that, despite a pronounced acidic flavor, citrus fruits form alkaline residues once inside the body. This is because the organic acids, (citric, succinic, fumaric, and malic) when metabolized, yield water and alkalinizing bicarbonate, while producing energy (ATP) inside the cell. In sharp contrast, foods containing large amounts of protein and fat provide an abundance of acid-forming elements. This can be a tricky and confusing path for many athletes seeking to modify their nutrient intake. Cow's milk and related dairy products, for example, are acid forming, while cheeses derived from goat's milk tend to yield less acid, due to a lower fat content. The one dairy product exception is clarified butter (also known as "ghee"), which contains alkalinizing short chain fats known as butyrates and caprylates. These substrates tend to promote healthy bacterial growth in the intestines, rendering the body better equipped to repair of the intestine wall. Such an internal landscape also suppresses any further growth of pathogens such as yeasts, if colonies happen to be present.

Train Hard, Eat Smarter

As one would expect, athletes in peak training are the most vulnerable to the effects of acidosis. Loss of bone mass, a decline in lean muscle tissue, and the reduction of naturally occurring growth hormones can be devastating to a body already undergoing extreme physical demands. The *American Physiological Society* published an article outlining a study on the effects of pH on cardiorespiratory and metabolic responses to exercise. The results were quite telling: compared to the control group: the subjects' measurable levels of endurance were reduced when their bodies were placed in a state of acidosis. Fruits and veggies are the cornerstone of an alkaline diet, and increasing consumption of these on a regular basis may facilitate the body's ability to hold onto hard-earned muscle mass. We do tend to lose muscle as we age, but this is by no means unavoidable. A recent study found that older adults who consumed more foods that are metabolized into alkaline residues (mainly fruits and vegetables), and fewer foods that are metabolized into acidic residues (mainly proteins and refined grains), were able to retain more muscle mass. The effect was nearly enough to offset the 4.4- pound loss of lean tissue that older adults typically experience per decade. This, in turn, could have a significant adverse impact on strength, metabolism and risk of injury. As with any meal plan, pursuing alkalinity becomes a lifestyle choice, and therefore need not be viewed as a "diet". The question many clients and avid strength-training athletes often have is how to include sufficient amounts of protein to meet the demands of their developing lean muscle mass. One must spend a bit of time becoming educated, followed by proper diligent planning, especially at the grocery store! Plant-based protein sources may be new to many individuals, who often question their validity as part of a bodybuilding regimen. To address this, one needs to look no further than the Animal Kingdom. Some of the largest and strongest mammals on earth consume a plant-based, alkaline diet – cows, hippos, elephants, gorillas, and rhinos. These are powerful animals with a commanding presence, and they derive all of their protein from plant sources.

Basic Yet Delicious

How can we help our bodies strike the perfect balance between an acidic and an alkaline environment? It has been postulated that an ideal balance favors a meal plan comprised of 80% alkalizing foods, and the limiting of acidifying foods to 20%. This is not as difficult as one might imagine. Most alkalizing foods tend to be raw, unprocessed and whole. Raw, sprouted legumes such as lentils, beans and

seeds, are superior sources of alkalizing proteins, as are chia seeds, hemp seeds or hemp hearts, quinoa, hummus and edamame. All of these foods are easily accessible at most large or specialty grocery stores. By complementing consumption with dark green leafy vegetables, which are high in chlorophyll, one can further enhance an internal alkaline environment. One can even go so far as to purchase alkaline water, pure water with a pH of 8.8.

Although the notion of maintaining a safe internal pH may be news to many athletes, the general idea of consuming more whole, unprocessed foods and many green leafy vegetables is a practice to which many athletes are already adhering. Keeping the body healthy at the cellular level can only lead to greater gains in overall wellbeing.

(Author's note: Prior to writing this article, I began researching this topic in depth. When bodybuilding competitively, I consumed protein from poultry, eggs, fish, and supplements, to the tune of 150 grams/day. Given that I barely break the 3-digit barrier on the scale, that is a lot for a body to process! Last week I jumped off the cliff and am building my wings as I go "basic"! My protein consumption is now reduced to 75 - 80 grams/day, my sources being spelt, buckwheat, quinoa flakes and hummus, along with certain approved fish, and of course vegan protein powder shakes. Yes, there are now 2 jugs of alkaline water in our refrigerator, also! Relinquishing my beloved breakfast (daily, for the past decade) of oatmeal and eggs whites has been the most difficult; however, both of those foods are highly acidic in the body, so I can enjoy them just on special occasions! I feel good, and lifting heavy again in the gym feels great! Back to Basics!)

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Holiday Feasts Within Your Scope

BY: Christine Oakes

The holiday season is difficult for everyone. Your clients will be surrounded by so much temptation at their workplace, home, and holiday parties. While it may be good job security for your clients to gain a few pounds, you still want to give your clients the best advice to remain healthy. If you are a registered dietitian, then you have a leg up. Otherwise, lacking this qualification can make your scope of practice seem a bit fuzzy. Most personal trainers are not qualified to provide medical nutrition therapy, yet avoiding the topic can prove to be a disservice to your clients.

Here are ways I help my clients survive the holidays:

Colors All Around

It is difficult for many to think of avoiding foods that look so tempting. Instead of focusing on elimination, steer your clients towards what IS healthy for them to eat. If they focus on loading up on loads of nutrient dense fruits and veggies, then there will be less room in their bellies for crap. Different colors provide a wide variety of benefits. Encourage your clients to play around with a mix of produce to absorb a large spectrum of micronutrients. You may consider doing a group event with your clients to the local farmer's market or grocery store to show them how to choose great ingredients. I always tell my clients, "The mo' colors the mo' betta!" Teaching your clients about nutritional benefits of foods are within your scope of practice as a personal trainer and good knowledge to pass on to give you credibility. Below is a list that reflects the benefits of a varied diet:

Reds

Contains lycopene and anthocyanins. These have the potential to reduce the risk of cancer as well as reduce the risk of high blood pressure. Fall foods include cranberries, pomegranates and radicchios.

Blues and Purples

This hue is full of anthocyanins. This antioxidant can not only reduce the risk of cancer, but also reduce the risk of Type 2 diabetes. Overweight individuals tend to be more at risk for this type of reversible diabetes. While you can't promise that eating these types of foods will cure any disease, they can have a positive impact on the health of your clients. In the fall, look for date plums, grapes and crowberries.

Yellows and Oranges

The fall is thriving with these fiery colored ingredients. You walk in the store and see pumpkin fill in the blank. Find carotenoids in this produce to work as an antioxidant for your eyes and for your body to naturally convert to Vitamin A. Think pumpkins, sweet potatoes, acorn squashes and persimmons.

Greens

You thought I forgot didn't you? As a fitness professional, you probably know that these foods reign in the kitchen. Consuming greens will fill you with vitamin K, folic acid, potassium, carotenoids and omega-3 fatty acids. My faves in the fall are brusselsprouts, swiss chard and broccoli. Here is a full list: www.fruitsandveggiesmorematters.org/whats-in-season-fall

Recipe Swap

You will find that with your newbie clients, their idea of what is healthy can be quite skewed. To guide my clients towards healthier meals, I coach them to make their plate half comprised of fruits and veggies. When discussing this with them, most only think of salads as a way to accomplish this

goal. So boring!

Do you have tasty recipes choked full of nutrients that you like during the holidays? Share away! While you can't prescribe specific foods, you can always suggest recipes for your clients that are exploding with flavor and nutrients. Consider using fruits and veggies that are in season (as listed above) to also make eating healthy more affordable.

Here's a link to access over [50 delicious holiday recipes](http://www.cookinglight.com/entertaining/holidays-occasions/holiday-cookbook-sides) (<http://www.cookinglight.com/entertaining/holidays-occasions/holiday-cookbook-sides>) from Cooking Light magazine to share with your clients.

Snooze Time

During the holidays, most are working more to meet those year end deadlines, attend parties, buy gifts and basically do it all. The problem that happens when we sacrifice sleep and have a spike in stress is our cortisol levels increase. This will throw your hormones off balance. For your clients, this can potentially make them feel hungry when they actually aren't.

When people have a lack of sleep they also tend to also make poor food choices due to these false signals. Hello boost in caloric intake! Encourage your clients to get 7-8 hours of rest each night to keep their hormones in check. Meditation is also a great way to reduce stress from the day even if only for 5-10 minutes.

Actions Outside The Scope Of Practice For Personal Trainers

While most of you are in the industry with a good heart to help your clients, there are some actions that go beyond your qualifications as a trainer. If you feel that you have someone that needs more specific nutritional direction, it is best to have a registered dietitian on hand to refer them to. This can work to your advantage, as this referral can also send clients your way who are in need of exercise in their lives.

Here are things you want to avoid:

- Completing nutritional assessments to determine specific nutritional needs.
- Coaching those that are in need of preventative/restorative health care (diabetes, cancer, etc).
- Evaluating and consulting for nutritional care standards.
- Prescribing the addition or elimination of specific foods.

What other ways do you help to keep your client's diet on track during the holidays?

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C'mon and Get Happy: Positive Attitude Equals Success

BY: Susan Ricardo Buckley and Melissa Stock

How can we tap into clients' ability to succeed in order to keep them motivated to reach their wellness goals? The key may be to cultivate and support a sense of optimism and a positive frame of mind. Indeed, among many individual variables, attitude is one of the most important things to consider when evaluating a client's potential for success. There is a long history of research that indicates that there is a powerful connection between a positive frame of mind and the successful achievement of goals, including health and fitness goals. With that in mind, it is important not only to help clients develop better nutrition and exercise habits, but to assess their state of mind and help them to develop and maintain an optimistic attitude toward achieving their goals and maintaining a healthier lifestyle over the long term.

Positive Attitude = Success!

The connection between positive attitude and the achievement of goals is well documented in the research of positive psychology. According to Aspinwall, Richter, and Hoffman (2001), optimists generally cope with all life situations—even stressful and challenging ones—with an attitude of self-efficacy and creative problem-solving. They don't quit in the face of adversity; rather, they learn and adapt. They tend to take better care of themselves physically and will engage in preventive measures to improve their health and well-being. This is in contrast to pessimists, who tend to exhibit health-damaging behaviors (Carver, Scheier, & Segerstrom, 2010) and who become discouraged when faced with setbacks. When clients come to us for training, then, it is essential to understand their frame of mind. Do they feel capable of losing body fat, getting fit, quitting smoking, eating better, or whatever their wellness goals are? Or are they skeptical of their ability to make these kinds of changes?

Working with Pessimists

It is not unusual for someone not to feel entirely positive about their wellness goals, and it should not be a reason to doubt their ability to achieve their goals. Indeed, many people seek out a trainer precisely because they have not had success on their own. The trainer should be ready to help the client to recognize small achievements that are building up to the ultimate wellness goal and to provide positive feedback about their progress. Over time, their small successes will engender greater self-efficacy and optimism in these clients as they begin to believe that they can do it. Help clients to reflect upon what is working well for them. Gasper, Lozinski, and LeBeau (2009) found that even though pessimism can hinder performance by increasing anxiety and lowering expectations, self-reflection can counteract pessimism. The propensity to reflect can increase goal importance, promote effort, raise initial expectations, and buffer an anticipated sense of failure. This is especially important when clients are faced with a setback on their fitness journeys. It is important to contextualize setbacks as a normal part of the wellness journey and to reassure clients that they are still making long-term progress.

In our experience working with clients, we have found that encouraging them to keep journals is one strategy that may help them in this reflection process. This allows them to assess what situations are leading to stress and anxiety and come up with strategies to minimize the negative thoughts that can sabotage their perceived ability to succeed. Joining support groups and working out with a buddy is another way for people to reflect verbally on their progress, as well as to give and receive encouragement and positive feedback from others who are also working on health and fitness goals.

Working with Optimists

Optimists can usually be guided gently, as they tend to be intrinsically motivated to achieve their goals. Optimists understand that there are ups and downs along the way, and they will tend not to be overly discouraged by temporary setbacks during the process. Trainers can thus focus on providing optimists with sound advice and strategies about achieving their wellness goals. We can also give direct feedback without worrying that clients will be deterred if the feedback doesn't match their expectations. Srivastava and Angelo (2009) noted that optimistic individuals possess sufficient self-efficacy such that it is not necessary to sugar-coat important feedback about their goals when it is not entirely positive (for example, when a client is not meeting their fitness goals). Optimistic individuals are likely to view such feedback as helpful information

toward achieving their goals and will take proactive steps to adapt and change their health, fitness, and nutrition strategies.

By assessing and monitoring our clients' frame of mind, we can develop individualized approaches to helping them. With optimists, we can foster and support their generally positive frame of mind, and with pessimists we can use strategies that will help them to improve their generally negative frame of mind and shift to a more optimistic mindset.

Assessing Clients' Attitudes

In assessing whether clients are optimists or pessimists, there are different strategies that trainers can use. A question that trainers can ask clients during an initial assessment might be "How confident are you that you will succeed?" Having an idea of a client's self-perceived ability to succeed can help us approach clients differently. Asking this question throughout their fitness journey is important as well in order to assess whether they remain confident and motivated.

Mind, Body, and Spirit

It can be helpful, too, to take a holistic approach that acknowledges the mind-body-spirit connection. Many people benefit from taking part in spiritual practices such as meditation, prayer, yoga, breath work, reiki, tai chi, etc. Even if these activities are not done in conjunction with a particular spiritual practice, they can be adapted and used simply as stress-reduction strategies; and they can help to gently restore and support a positive frame of mind. Barton and Miller (2015) note that "spiritual wellbeing has been shown to be negatively associated with life stress and positively associated with happiness and psychological wellbeing" (p. 830). Guiding clients toward activities that will increase their happiness and well-being will help them to approach their health and fitness goals with a greater sense of optimism and confidence.

Brief Case Studies

In our experience, we found that praising clients' successes empowers them and allows them to become and/or persist in being confident in their ability to succeed, regardless of whether they have an optimistic or pessimistic outlook. The difference is in how we provide feedback. Clients that have increased drive and intrinsic (internal) motivation may not need as much support; whereas clients whose drive is initially low or dwindling will benefit by extrinsic (external) motivation that we can provide. In our experience, the latter benefit by more frequent support, such as additional check-ins in the form of text messages and/or phone calls.

Our approach in holding clients accountable if they do not meet their goals is different as well. Optimistic clients will take constructive criticism as a challenge; however, pessimistic clients may view constructive criticism as failure. Hence, reviewing journals with these type of clients and allowing them to come up with their own self-evaluation and realistic strategies is an approach we have found to be effective.

Conclusion

Every client is different, and it is important that we adapt to individual variables in order to motivate clients to remain committed in reaching their health and wellness goals. Helping clients develop and maintain a positive frame of mind will benefit them physically and emotionally. Using an individualized, holistic approach can help clients remain positive as they encounter the challenges of meeting their goals.

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ABOUT THE AUTHORS

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SUBJECT **December 2016 Self Test**

PERIOD _____ DATE _____

SELF-TEST: December 2016

1. How many total gluteals do we have?
 - a)1
 - b)2
 - c)3
 - d)8

2. Which of the following is NOT a gluteus maximus movement?
 - a)Extension
 - b)Abduction
 - c>Adduction
 - d)External rotation

3. Which of the following is an exercise for the gluteus maximus?
 - a)Squats
 - b)Stair climbing
 - c)Swimming
 - d)All of the above

4. Which of the following is the gluteus medius an antagonist to?
 - a)Gluteus maximus
 - b)Gluteus medius
 - c)Gluteus minimus
 - d)Hamstrings

5. Which of the following is NOT a gluteus medius movement?
 - a)Abduction
 - b>Adduction
 - c)Flexion and extension
 - d)Internal and external rotation

6. Which of the following is a gluteus medius exercise?
 - a)Squats
 - b)Leg curls
 - c)Leg lifts
 - d)All of the above

7. The gluteus minimus is the _____ glute.
 - a)Smallest
 - b)Largest
 - c)Strongest
 - d>Weakest

8. Which of the following is not a gluteus minimus movement?
- a) Abduction
 - b) Flexion
 - c) Internal Rotation
 - d) External rotation
9. Which of the following is a gluteus minimus exercise?
- a) Side kicks
 - b) Squats
 - c) Donkey kicks
 - d) Stair climbing
10. Which of the following is the popular term 'mindfulness' typically associated with?
- a) Meditation
 - b) Yoga
 - c) Practices of spirituality
 - d) All of the above
11. Which of the following is not a physical effect of meditation?
- a) Slower breathing
 - b) Increased heart rate
 - c) Quieting of brain activity
 - d) All of the above
12. What is a separating factor between the highest level of athlete and the average elite competitive warrior?
- a) Their ability to produce more endorphins
 - b) Their ability to concentrate and stay calm under pressure
 - c) Their ability to push through the pain
 - d) All of the above
13. Which of the following is more true of caffeine?
- a) Caffeine stimulates neurotransmitters.
 - b) Caffeine blocks neurotransmitters.
 - c) Both a and b are equally true.
 - d) Neither a nor b are true.
14. What ratio of mg of caffeine to kg of body weight do most experts recommend consuming within an hour of the workout?
- a) 1:1
 - b) 1:3
 - c) 3:1
 - d) Caffeine is not recommended before a workout.

15. Caffeine ingested immediately after a workout may improve the muscles' ability to replenish their _____ stores.
- a) Glycogen
 - b) Fatty acid
 - c) Protein
 - d) None of the above
16. Which of the following is an exercise to help strengthen the spine?
- a) Superman
 - b) Straight-leg deadlift
 - c) Back extensions
 - d) All of the above
17. Which of the following is true regarding the relationship between weight and muscle fibers?
- a) The heavier the weight, the more recruitment of fast twitch muscle fibers.
 - b) The lesser the weight, the more recruitment of slow twitch muscle fibers.
 - c) Both a and b are true.
 - d) Neither a nor b are true.
18. Speed and power training for martial arts is best developed through the use of _____.
- a) Free weights
 - b) Resistance bands
 - c) Bodyweight exercises
 - d) A mixture of all of the above
19. Which is true about the traditional old school moves: squats, bench presses, pull-ups, dips, etc.?
- a) They are just as impactful today as they were back when Arnold was at his peak in bodybuilding.
 - b) They are outdated and need modified to keep up with today's athletes.
 - c) They are impactful only if they are used along with today's innovative training styles.
 - d) They are impactful only if used very sparingly.
20. Which is better for a personal trainer to have?
- a) Education
 - b) Experience
 - c) They are both equally important
 - d) There is no way to measure the answer to this question with certainty as there importance is weighed differently for every trainer, the most important caveat is to never stop learning (through experience and formal education).
21. What is the expected change in employment of fitness trainers and instructors/personal trainers from 2012 to 2012?
- a) An increase of 50%
 - b) An increase of 13%
 - c) A decrease of 31%
 - d) A decrease of 5%

22. On average, the incidence of sports-related injuries is more than 50% over a 6 month period. What percent of these injuries are preventable?
- a)0-30%
 - b)30-50%
 - c)50-70%
 - d)70-100%
23. 'Prehabilitation' movements may help to even out muscular imbalances, which in turn will do which of the following?
- a)Better posture
 - b)Improve performance
 - c)More efficient pain free movement throughout the day
 - d)All of the above
24. Which of the following is NOT a prehab suggestion for a competitive Olympic lifter?
- a)Foam roller exercises
 - b)Stretching exercises
 - c)Activation exercises
 - d)Meditation exercises
25. For those with lung cancer, being physically active appears to do which of the following?
- a)Improve survival
 - b)Improve quality of life
 - c)Both a and b
 - d)Neither a nor b
26. Physical activity does what to cancer patients?
- a)Tolerate cancer treatments and lower fatigue levels
 - b)Tolerate cancer treatments and increase fatigue levels
 - c)Make cancer treatments intolerable and lower fatigue levels
 - d)Make cancer treatments intolerable and increase fatigue levels
27. How can exercise be beneficial for those with lung cancer?
- a)Increase strength
 - b)Increase endurance
 - c)Decrease emotional issues
 - d)All of the above
28. What type of stretching, which can do more harm than good, involves purposely forcing the body in such a way to exceed its range of motion?
- a)Ballistic
 - b)Static
 - c)Dynamic
 - d)All of the above

29. What type of stretching involves the active and purposeful tightening of muscles, in an effort to mobilize joints gently through their full range of motion?
- a)Ballistic
 - b)Static
 - c)Dynamic
 - d)All of the above
30. When is the optimal time to perform static stretching?
- a)Pre-workout
 - b)During workout
 - c)Post-workout
 - d)All of the above
31. Allergies happen when your _____ system attacks a false invader.
- a)immune
 - b)endocrine
 - c)nervous
 - d)digestive
32. Which of the following is NOT a side effect of allergy medications?
- a)Heart rate changes
 - b)Increased appetite
 - c)High blood pressure
 - d)Anxiety
33. What system is a connective tissue network that surrounds, supports, separates, and connects every cell, muscle, bone, nerve, blood vessel, and organ of the body?
- a)Skeletal
 - d)Muscular
 - c)Fascial
 - d)Cardiac
34. Ischemic compression is simply pressure into a trigger point, which simulates the _____, providing an inhibitory effect to the muscle spindles?
- a)Golgi tendon organ
 - b)Central nervous system
 - c)Muscular system
 - d)Skeletal system
35. What ratio of carbohydrate to protein post workout does former Academy of Nutrition and Dietetics Spokeswoman, Christine Oakes, recommend?
- a)1:1
 - b)1:3
 - c)3:1
 - d)None of the above

36. The purpose of post-exercise nutrition is to replenish depleted _____ stores?

- a)Protein
- b)Carbohydrate
- c)Fat
- d)Glycogen

37. Which of the following is true about the relationship between calories and expenditure?

- a)To maintain weight, calories should equal expenditure.
- b)For weight loss, calories should be less than expenditure.
- c)For weight gain, calories should be higher than expenditure.
- d)All of the above

38. What percentage of calories per day should fat intake range from?

- a)5-20%
- b)20-35%
- c)35-50%
- d)50-65%

39. What suppresses breakdown of fat, and increases energy intake? This also has a negative impact on strength and performance several hours after ingestion by interfering with glycogen storage and affecting hydration.

- a)Sugars
- b)Saturated fats
- c)Unsaturated fats
- d)Alcohol

40. Which of the following was the first to recognize the benefits of a medical and fitness collaboration?

- a)Physicians
- b)Hospital systems
- c)Health plans
- d)None of the above

41. What is defined as work performed per unit of time?

- a)Power
- b)Intensity
- c)Strength
- d)Force

42. What is defined as reaching a state of momentary muscular failure?

- a)Power
- b)Intensity
- c)Strength
- d)Force

43. Which of the following equations is true?

- a) Strength x speed = power
- b) Strength x power = speed
- c) Power x speed = strength
- d) All of the above are true because they're the same equation just in a different order.

44. Hypotension is defined as a blood pressure reading below?

- a) 60/90
- b) 90/60
- c) 60
- d) 90

45. Orthostatic hypotension occurs when the following occurs?

- a) Sweating
- b) Brain fog
- c) Irregular pulse
- d) Standing up too fast

46. What is a common cause of chronic low blood pressure?

- a) Diabetes
- b) Allergic reactions
- c) Shock
- d) All of the above

47. What is the ideal balance of alkalizing foods to acidifying foods?

- a) 80/20
- b) 50/50
- c) 20/80
- d) No ratio needed, the body regulates with mineral-buffering reserves.

48. Which of the following is acid forming?

- a) Stress and inflammation
- b) Foods high in fat
- c) Foods high in protein
- d) All of the above

49. What color of produce has the potential to reduce the risk of cancer as well as reduce the risk of hypertension?

- a) Reds
- b) Blues and purples
- c) Yellows and oranges
- d) Greens

50. What are suggestions you can make to your clients when it comes to holiday nutrition?

- a) Make their plate half comprised of fruits and vegetables
- b) Get 7-8 hours of rest each night to keep their hormones in check
- c) Meditation
- d) All of the above

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