Health & Fitness

Engine 64 going to work

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AUGUST 2013

Upcoming Events:

3rd Annual Ignite the Fight 5K
Saturday, Nov. 2nd
Bidwell Park, One Mile Area

Benefiting
the Fire
Cancer Support Network

INSIDE THIS ISSUE:

The Evidence Continues to Mount Against Chronic Cardio

By: Mark Sisson, www.marksdailyapple.com

It's been awhile since I did a post on chronic cardio. I had a good string of them going several years ago, and I thought I'd done a good job explaining why I was so opposed to excessive endurance training. Despite my attempts to clarify, though, I still receive a lot of questions and comments about cardio. People just have a tough time divorcing themselves from the notion that cardio – as much as you can cram into your schedule – is the key to health and fitness. I don't blame them, really. It's conventional wisdom, after all, and it's what I thought for years and years. Clearly, another post is needed.

Evidence against chronic cardio continues to mount, so there's a lot to cover. But before we get to all the research, I have a few thoughts about the heart.

Here's the thing about the heart: being an involuntary muscle, it has no say in the matter. It pretty much feels nothing, too. It's along for the ride. Just like the liver, kidneys, pancreas, thyroid, adrenals, etc., the heart responds to biochemical signals. It's a demand organ. Minor changes in blood chemistry (epinephrine, cortisol, insulin, lactic acid, hemoglobin-depleted RBC's, to name a few) cause it to respond by beating faster or slower, forcefully or not, to keep pace with the muscles' (and other organs') demand for oxygen and fuel. During exercise, it's the brain that starts this whole process with a (usually) conscious decision: "I think I'll run to that tree." That thought prompts the muscles of the legs to start moving faster and the arms to pump. The new, increased demand for oxygen and added fuel (over and above normal resting metabolism) signals the heart to start to fulfill the demand, to pump harder and faster. It's obliged to do so. Period. No choice. That's also why it's always a bit behind schedule: it takes more than a few seconds to ramp itself up once the action begins and a few seconds or minutes (or hours, in the case of an over-trainer) to ramp down, once it's over.

The problem with chronic cardio is that we can force our brains to override some of the tiredness (no pain, no gain, pal) and discomfort in the legs – and to a certain extent even the lungs – and keep doing these hard endurance workouts incessantly day in and day out. The ostensible limiting factor is the ability to burn fat or, at the very least, the amount of glycogen still left in our muscles. That's what eventually brings us to a halt, frequently because we have willed ourselves to keep going through the wall at all costs. But the heart is often over-worked in this scenario, just trying to keep up with that "inhuman" (and inhumane) desire to run, cycle, or swim further and faster in pursuit of…what? A medal? A ribbon? Bragging rights? It can't say no. It

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Bruschetta Chicken with Zucchini "Pasta"

Ingredients

Bruschetta
3 large heirloom or garden grown tomatoes, chopped
About 15 fresh basil leaves, chiffonade (cut into long strips)
2-3 garlic cloves, peeled & finely chopped
3 Tbsp. Extra-virgin olive oil
1 Tbsp. Balsamic Vinegar
Sea salt, to taste

Grilled Chicken Breast
4 Chicken Breasts
Juice and zest from one lemon
1 garlic clove crushed
3 Tbsp. fresh basil finely chopped
Sea Salt and Pepper to Taste
Walnut Oil

Zucchini Noodles
4 Medium to Large Zucchini
1 tsp. coconut oil
Garlic Salt
Olive Oil

Preparation

To prepare bruschetta combine chopped tomato, chopped basil leave strips, peeled garlic into a bowl. Drizzle with olive oil and balsamic vinegar and sprinkle with salt to taste. Gently mix together just to combine flavors. I suggest making this ahead of time so you can let the flavors combine. At least a couple hours in advance for best taste.

Marinade Chicken in the listed ingredients for 30 minutes to 24 hours. Grill chicken until cooked through and no longer pink in the middle.

Prepare Zucchini by slicing thinly. Or cut into thick strips using a knife.

Melt coconut oil in pan and sauté zucchini until warmed through- approximately 2 minutes. You want your zucchini to be al dente so do not overcook! Season with garlic salt and drizzle with olive oil.

Place a small amount of noodles on your plate and top with chicken and bruschetta! Amazingly easy and fresh springtime meal.

Recipe courtesy of:

EverydayPaleo .com

Chronic Cardio (cont. from Pg. 1)

attempts to do as we bid it. And because the heart feels little-to-no pain – unless, perhaps, it feels the REAL pain of a heart attack – it very often suffers silently as a result without us ever knowing. The walls of the heart start to hypertrophy over time the same way a biceps muscle does when you do curls. But do a few too many curls and your biceps will get sore quickly. Force yourself to do a few more and you could even tear something and be out of contention for a few weeks. We know when to stop before that bicep tears.

Cardiac muscle doesn't tear that way when over-worked, but it does enlarge and thicken with chronic overuse. In some – most – people the thickening is probably not life-threatening, but in some cases, as with dozens of world class athletes I have personally known, this thickening can cause all manner of issues later in life. Atrial fibrillation has become a mild epidemic in my generation of life-long aerobicizers; several of my friends have had pacemakers or defibrillators implanted before the age of 40 to head-off those sporadic life-threatening cardiac enervation problems. A few more friends have lost significant cardiac function and a few have died.

But don't take my word for it. The silent epidemic of heart issues among endurance athletes is getting serious attention in the research community. Let's take a look at some of the latest research.

Cardiac Arrhythmias

Cardiac arrhythmias are abnormal electric activities of the heart. An arrhythmia can describe a heart that beats too fast, too slowly, too irregularly, or too "fluttery." An arrhythmia doesn't always indicate or foretell heart trouble, but it's a common risk factor. One of the more common varieties is atrial fibrillation (AF), which describes a fast, irregular heartbeat. AF is strongly linked to stroke and cognitive decline.

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Physiological Stress Associated with Structural Firefighting Observed in Professional Firefighters

By: Indiana University Firefighter Health & Safety Research
School of Health, Physical Education & Recreation
Department of Kinesiology

This study that was led by Dr. Jim Brown, from Indiana University, is a very comprehensive and detailed look at all the stressors that influence our bodies reactions and eventual degradation over the span of a career. The study is far too long to publish in this newsletter (90 pages) so here are a few key excerpts from the introduction and conclusions. If anyone wants to read the entire study themselves (highly recommended) you can by either getting a copy from myself or on the web at: http://www.saferesponder.com/main/Publications_files/Indianpolis%20Physiology%20Study%20Report.pdf.

Introduction

U.S. Department of Labor statistics indicate that firefighters are three times more likely to die on the job than any other occupation. Improvements in tactics and equipment have reduced the overall number of on-duty deaths. However, the number of annual firefighter deaths in the US remains high. Recently released data indicates that 104 U.S. firefighters lost their lives on duty during 2006 while 115 were lost in 2005. Of the deaths reported during 2005, more than half (54%) can be attributed to stress or overexertion including heart attacks, cerebrovascular events (stroke) or other types of cardio-respiratory system collapse (heat exhaustion etc.). These 2005 stress and overexertion deaths rates echo data reported over the last 25+ years. With the reduction of fatalities related to other causes, the prevalence of cardiovascular- related deaths has emerged as a significant problem for the fire service. On average, 50% of on-duty firefighter deaths are due to cardiovascular system failure. The fire service responded to this high incidence of heart attack and cardiovascular-related fatalities with programs to reduce this type of line of duty death (LODD). The National Fire Protection Association (NFPA) has established guidelines governing health and fitness characteristics of firefighters and firefighter candidates. NFPA 1582, outlines mechanisms of health-related physical fitness assessment and physical training programs to improve fitness. The stated goal of these standards is to reduce LODD by improving the general health of firefighters. Indeed, improving the overall health of firefighters would significantly improve their fire ground survivability, especially those with underlying cardiovascular disease or cardiovascular disease risk factors. However, recent investigation of the physical stress associated with firefighter training activities suggests these goals may fall short of protecting firefighters from the risk of physical overexertion. Data collected during a 2005 study by Maryland Fire & Rescue Institute (MFRI), indicate that firefighter fitness level and preparticipation hydration status were the primary determinants of the cardiovascular stress experienced by firefighters. More importantly, physiology of firefighters described as having average fitness levels responded in a manner similar to those of low fitness levels during training activities. The study also pointed out that firefighters demonstrating high levels of physical fitness experienced much less physical stress during the same training activities. In addition, that study pointed out that regardless of fitness level, firefighters demonstrating even moderate levels of dehydration experienced severe levels of cardiovascular stress. These findings suggest that firefighting activity may represent greater levels of physical stress than previously expected and may be in excess of what standing fitness goals may alleviate. Recent efforts to monitor training activities have provided much needed

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IAPS Data from June & July 2013

Reportable Injuries:
Record Only Injuries:
Injury by Activity:
PT:
[illegible]dent:
Injury by [illegible]:
Head:
Torso/Back:
Extremities:
Heat Illness:
Exposure:
Internal:

UNAVAILABLE

"SAFETY CORNER"

6/12/13—TGST, LCES & Structure Fire Watch Outs
6/17/13—Safety Communication 2013-04, PPE & Firing Devices
6/17/13—USFS Fuels and Fire Behavior Advisory
6/17/13—Green Sheet, CASKU003538, ECT Accident
6/18/13—Local Blue Sheet, CABTU007829, Rhabdomyolysis
6/25/13—TGST, Marijuana Gardens and Fireline Safety
7/2/13—TGST, Heat illness and the Wildland Firefighter
7/3/13—Safety Stand Down
7/7/13—Blue Sheet, CARRU068054, Fatality Accident
7/11/13—TGST, Diff between Smoke and CO Alarms
7/13/13—Blue Sheet, CAMVU014084, Dozer Incident
7/19/13—Green Sheet, CARRU068054, Fatality Accident
7/19/13—Local Green Sheet, CABTU009491, PT Injury
7/30/13—Update to Mandatory Postings Board—Cal Osha Notice
7/30/13—Safety Communication 2013-03, Model 34 Regeneration
7/31/13—USFS Lessons Learned—LPF Chainsaw Accident
7/31/13—Local Blue Sheet, CANEU14307, Burn Injury

Research (cont. from Pg. 3)

insight into the stress of firefighting activities. However, little or no useful physiological data exists from real fire ground operations. Realization of this fact has led to recent initiatives to secure such information. A workshop convened by the National Institute of Standards and Technology (NIST) identified firefighter physiology as a significant need in the fire service. More recently, the National Fallen Firefighter Foundation (NFFF) conducted a symposium to identify and prioritize research needs within the fire service. The workshop report identified firefighter physiological responses to heat stress and acute physiological responses to emergency calls as high priority areas of research. The study described herein undertook this challenge by measuring firefighter physiology on the real world fire ground.

CONCLUSIONS

It is no surprise that heart rates, minute ventilation and blood pressures are elevated during firefighting activity. The physical work demand and the emotionally charged environment require these responses. However, prior to this study, the magnitude and duration of these responses were unclear.

Annual reports of firefighter deaths generally list the cause of on-duty heart attack deaths as "overexertion". However, overexertion is a relative term. Levels of work that produce overexertion in one individual might not do so in another, more fit individual. Therefore, several factors must be considered to put the data presented in to context. When we report means or averages of heart rates (70% of predicted HRmax) and levels of minute ventilation (50 L/min), some of the work does not seem all that strenuous. However, firefighters studied here were highly trained, medically supervised, healthy and relatively fit individuals. The same work in a less well trained and less fit group of firefighters would result in much higher levels of cardiovascular stress. In fact, work here that pushed studied firefighters to 100% of their maximal cardiovascular capacity could not be accomplished by some unhealthy and unfit firefighters. Even within this group, we see individuals with higher levels of body fat not being able to work as hard as their leaner peers. Another factor to consider is the fires themselves. We saw from the principle components analysis, the size of the structure and amount of fire involved have significant impact on the firefighter's response. Indeed, the average structure studied was a relatively small (2500 ft2) residential structure. As structures grow larger and more complex, the physical response grows. Yet, even some of these small structures pushed firefighters to their maximal abilities. Lastly, we must consider the weather conditions. We chose to conduct the study in the absence of ambient environmental heat stress. Unfortunately, firefighters must fight fire in all weather conditions, including hot humid weather that imposes extreme heat stress conditions on the fire scene. The process of thermoregulation can impart severe cardiovascular stress on firefighters before they set foot on the fire ground. During a 2005 study of training related physiology, a study conducted at the Maryland Fire and Rescue Institute (36) saw many firefighters reporting for duty in a dehydrated state. Dehydration exacerbates the cardiovascular stress associated with thermoregulation and can debilitate even the most fit firefighter.

REDUCING FIREFIGHTER DEATHS DUE TO HEART ATTACK

Unfortunately, many firefighters in the US are not only unfit for fire scene work but are generally unhealthy individuals. The discrepancy be- tween the physical preparedness of firefighters and the high physical demand of firefighting stands at the center of fire service line of duty deaths. Simply to expect to survive fire ground operations, a firefighter needs, as a minimum, to be healthy (including the absence of cardiovascular disease). The goal of this research is to support a service- wide effort to reduce the number of firefighter line of duty deaths. Because heart attacks account for nearly half of these deaths, much attention is focused on elucidating and eliminating the cause of these events. Unfortunately, no substantial improvements in firefighter health have occurred in the last 25 or so years. As a result, firefighter death statistics (as a result of heart attack) remains virtually unchanged. With improved research funding we are beginning to better understand the etiology of these events and to develop plans that will change the death statistics. Currently, there appear to be two primary approaches to the problem.

Some researchers are working on the development of physiology monitoring systems in hope of detecting severely elevated cardiovascular or respiratory responses during fire ground operations. This in turn would allow affected firefighters to be relieved before a catastrophic event is triggered. Unfortunately, the data presented here suggest this approach would not be successful. It is apparent that, in some cases, extreme physiological responses are appropriate on the fire ground. Simply re- moving a firefighter because his or her heart rate is extremely high would stand in the way of getting the job done. It is much more important that fire- fighters be healthy and fit enough to turn the output of their cardiac pumps up (increase heart rate) enough to do what they are expected to do and not experience adverse effects because of it. This seems to negate the utility of a monitoring device that simply alerts to extreme level of heart rate or ventilation.

Programs such as the Wellness/Fitness initiative undertaken by IAFF and IAFC, and the US Fire Administration's Life Safety Summit have recognized the need for improving the health of firefighters as a preventative measure. The national fire prevention association has issued guidelines for oversight of firefighter health programs. These programs set the stage for improvement in firefighter health. If successful, they will certainly result in a reduction in firefighter deaths due to heart attack. It is important however, that firefighters take advantage of such programs, either voluntarily or as a requirement for service.

Although there remain unknown factors on the fire ground that may increase a firefighter's risk of developing heart disease, we know now that the vast majority of heart attack deaths occur in unhealthy, unfit firefighters. This study clearly demonstrates the magnitude of cardiovascular stress placed on working firefighters and indicates firefighting activity can be a trigger for a cardiac event. Essentially, firefighting is triggering a cardiac death that is inevitable in persons with cardiovascular disease.

So how do we stem the tide of heart attack deaths in working firefighters? We must improve firefighter health and reduce their risk factors for heart disease. Whether the responsibility for that improvement lies with the firefighter, their department or their labor organizations is for the fire service to decide. The fire service is still asking why are firefighters dying of heart attacks and what can we do about it. Academic researchers have been demonstrating since the mid-seventies that firefighting is a substantial trigger for heart attack and preventative physical training should be required of

Exercise and Recovery

Exercise is the exertion of the body to achieve a physical purpose. Physical movements, no matter how structured, will require a period of rest to permit the body to be restored to a state where it can exercise once more. The observance of the fundamental rules concerning the perpetual process of exercise and recovery is essential to sport success; tired athletes can not train or compete at their highest possible level if they have not permitted themselves recovery.

All exercise, whether viewed as the workout on a particular day, or as part of a larger program or training system, has a built in recovery factor. Aerobic sports are those where the duration of the activity is relatively long, but not indefinite. Recovery from the aerobic exercise begins the moment that the activity ceases. Anaerobic sports are built on short intervals that naturally presume a rest or recovery space between them.

The length of the recovery period in relation to the active exercise period is a function of both the duration of the exercise as well as the intensity level at which the body performs the exercise. Assuming a constant level of fitness, the recovery period to follow a 10-mi (16 km) walk would be expected to be shorter than that following a 10-mile run at the maximum pace that the athlete can sustain.

Exercise recovery has four specific divisions, each of which has its own recovery principles. The divisions are: musculoskeletal recovery from the stresses and forces of training and competition; recovery of the large-scale systems that power the body during exercise, particularly the cardiovascular and cardiorespiratory systems; restoration of the energy stores depleted by exercise, especially carbohydrates and minerals; and psychological recovery often necessitated when competitive and training stresses place a mental burden on the athlete over a period of time.

Sore muscles and joints are the easiest aspect of any athlete to identify as being in need of a recovery period after training sessions or competition. One of the great challenges of athletic participation is a true understanding of the difference in the signals sounded by the body between the pain of an injury, physiological damage requiring decisive treatment and rehabilitation including probable enforced rest, and discomfort caused by exercise, which can be borne or otherwise tolerated as the athlete continues to perform at the highest level possible. The further an athlete advances in a particular discipline, the more often this decision will arise.

Muscle recovery is achieved by the athlete in a number of ways. Rest is the easiest solution to overtaxed muscles; therapy such as massage and various stretching programs suited to the muscle group in question; cool down stretches ease the body to recovery after vigorous workouts by taking the muscles gently through a full range of motion and help prevent cramping and stiffness. In the period following a hard workout or competition, cross-training exercises will serve to keep the body working, thus maintaining over all fitness, while not unduly stressing the muscles that were most stressed by the activity. Examples of effective cross training as a recovery tool are swimming or cycling after an event such as a run, or as a respite from a vigorous contact sport such as rugby.

Recovery of the cardiovascular and cardiorespiratory systems is achieved through a reduction in the intensity of activity through the recovery period. The heart, the organ central to the function of both systems, rarely will benefit from a recovery program that eliminates any stress on it above the sedentary level. It is the body's fluid level, primarily water, that is critical to the recovery of the cardiovascular system, as the reduction of body fluid that occurs through the heat generated by exercise will correspondingly reduce the volume of fluid in the blood plasma, which lessens the ability of the blood vessels to transport oxygen, fuel in the form of glucose and other nutrients throughout the body. When an athlete has lost from 2% to 3% of their body weight in fluids, the recovery of the cardiovascular system to an optimal fluid level can take several hours; the recovery of depleted minerals (such as sodium) to assist in the operation of the cardiovascular system may be a longer process, depending upon how much mineral was depleted. Fluid level recovery is one part of the bodily equation, the restoration of the energy available for exercise is the other.

The restoration of depleted energy stores will commence the moment that carbohydrates are consumed after the activity, either through energy drinks or by way of food. A return to the athlete's usual level of carbohydrates is a process that depends on the carbohydrates present in the foods consumed, and the level of physical activity in the rest period that may draw on these energy stores.

The recovery of the muscles, body systems, and energy stores of an athlete after exercise can each be estimated with reasonable precision, given the known and predictable qualities of the components involved. Psychological recovery from exercise is a true variable. Every athlete reacts in a different way to similar stresses. After prolonged and difficult periods of training, or key competitions, many athletes build short rest breaks into their program to maintain mental freshness in their approach to the sport. In some instances, the spirit of the maxim "a change is as good as a rest" is employed, when the athlete continues to train at a significant level, but in an alternate sport.

Advanced Medical History Bracelets

http://theemtspot.com

"Check for medical alert tags or bracelets."
Your EMT instructor probably made you repeat this phrase dozens of times through the course of your EMT class. Checking for medical alert bracelets is a staple of the EMT medical and trauma stations. It's right up there with, "I'm wearing my BSI. The scene appears to be safe." and "Checking for DCAP BTLS TIC."
If our medical education is any indicator, the emergency medical community has fully embraced the medical alert bracelet concept. Now that these types of wearable medical histories have become common, it was predictable that they would evolve.
Which brings me to the meat of today's post.
Has anyone else noticed that checking for medical alert information has become increasingly complex and technical? Like so many other things in our society, the world of fashion and technology have both added utility and complexity to the search for wearable medical information. In the future, our EMT students may be reciting a more complicated dialogue that sounds something like, "Look for medical alert bracelets, hidden USB devices, smart phones, jewelry with inscriptions and medical tattoo art."
Whatever happens next, we in the emergency field need to become aware of some of the alternative ways that patients are communicating their medical histories. Like it or not, medical alert methods are evolving and these wearable medical histories occasionally contain valuable patient information. If our patients are willing to carry their medical histories with them everywhere they go, we should make an attempt to look for them.
Here are a few of the non-traditional medical alert methods you may encounter:

Smart Phone Applications

Putting medical and emergency information into your cell phone predates the smart phone. Placing emergency contact info and medical notes in your contact list under the contact name ICE (In Case of Emergency) has been a common piece of urban folklore for at least a decade. The cell phone companies caught on a bit more recently and started adding emergency contact options that default to the top of the contact list.

Whether the phone is a smart phone or a dumb phone, emergency information may be hidden in the phone contacts or the app menu. Medical alert applications can place a medical icon on the apps menu screen and the app itself will contain the patients medical information and emergency contact info. Some apps will also give the user an option to instantly call emergency services or text a list of predesignated contacts.

Medical Alert Jewelry

From hemp bands and beaded necklaces to gold dress bracelets and crucifixes, any jewelry can now serve a dual purpose as a medical alert bracelet. Most (but not all) of these alternate forms of medical ID have some form of a classic caduceus and star of life on them, but they still require a closer look.
Often times, our secondary assessment in our unconscious patients is short and to the point. Thin gold bracelets and leather bands could easily be dismissed as everyday jewelry. If knowing the patients medical history is high on the priority list, slow down and take a closer look at anything that patient has added to their body as a fashion wearable. You might find medical information hidden somewhere on it.

Wallet Cards, Health Logs and Passports

There are any number of medical cards and logs that patients with extensive medical histories are being encouraged to fill out and carry with them. Once upon a time, searching through a patients billfold, purse or wallet might have been taboo, but today it may very well contain valuable information. (It should still be done in the presence of at least one other person.)
Health information cards can be ordinary paper stock or flexible plastic. They can be the size of a credit card or as large as a traditional passport book. Ideally, the patient will have left the information in an obvious or easily accessible area. However, anyone who has ever had a patient go digging through their wallet or purse for their prewritten medications list knows, these things can often be difficult for the patient to find. (And they know what it looks like.)

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Medical Alert (cont. from Pg. 6)

Stickers, Vials and Magnets

Here in Colorado, the vial of life program became very popular about ten years ago. Patients were encouraged to place their medical histories in a vial and place it in the refrigerator somewhere obvious. Medical personnel were educated to look for the vial when they were searching for medication (primarily Insulin) in the refrigerator. Some folks also placed a sticker on the outside of the fridge alerting responders that a vial was placed inside.

Some folks are still encouraged to leave detailed medical histories in the refrigerator, though I've encountered none outside of the formal vial-of-life program. However, stickers warning of medical histories and allergies can be purchased on the internet and stuck in any number of places, from doors and wheelchairs to car windows. Don't be surprised if you find a sticker on your patients personal effects announcing a peanut allergy or seizure history.

Doing an end-run around the whole look-inside-the-refrigerator program, refrigerator magnets can also be purchased and placed on the outside of the fridge with the info in plain sight.

Wearable USB Devices

My first encounter with the new wearable USB devices is what inspired me to write this post. While loading a fully immobilized patient into my rig, she held up her arm in response to my medical history question. I inspected the black, plastic wrist band looking for some indication of her medical history, allergies etc. only to find a small USB plug hidden inside the band.

The patient fully expected that I would have a USB reader handy and I would plug her bracelet into my computer and find out everything I needed to know. I told her that, if I had the time, I would plug her bracelet into my Toughbook and take a look at the info. The tech geek in me really wanted to see what would pop up. Alas, our transport time was too short and I never got to see just what would happen if the device was plugged in. Maybe next time. Somehow, I'm certain there will be a next time.

Medical Alert Tattoos

With the resurgence of tattoo popularity, the idea of medically significant tattoos is increasing in popularity as well. It's now becoming common for military personnel to tattoo vital medical info (blood type, allergies) on their upper chest, arms or wrist. Some of these tattoos are even expressing advanced directive information like, "No CPR."

Individuals choosing the medical tattoo route are being cautioned to use a universal medical symbol like the star of life and place the tattoo away from other body art in an area commonly assessed for bracelets or necklaces. Some of the tattoos even resemble the medical alert bracelets themselves with a tattooed chain or band. Others integrate the medical history with art such as a caduceus or a skull and bones.

If the art suggests a medical theme, it may be worth the time to take a closer look at the writing and see if the patient has left you a medical history clue in their body art.

Chronic Cardio (cont. from Pg. 2)

Endurance athletes are at a greater risk for atrial fibrillations than the general, non-running public. One recent study of cross country skiers even found that the best athletes, the top performers, were more likely to have cardiac arrhythmias than the rest. Moderate exercisers, meanwhile, are at a lower risk for AF than the general, non-running public. A recent comprehensive study offers several potential explanations for the increased risk:

•Increased fibrosis (scar tissue formation) in the heart.

•Myocardial injury to the heart, as evidenced by post-training elevated cardiac biomarkers typically used to diagnose injury. Probably not a big deal so long as you recover fully from your training, but most cardio junkies can't wait that long to log more miles.

•Excessive amounts of inflammatory markers brought on by training. These markers have been linked to AF.

Endurance-related AF usually starts off infrequent. The older you get and the more miles you log, the more entrenched and regular your atrial fibrillation may get. Some studies found that around 40% of athletes with AF eventually progress to persistent AF, where it's happening on a regular basis. That's the troubling kind of AF that may presage serious cardiovascular problems, like stroke.

Atherosclerosis

It's totally counterintuitive to think that endurance athletes are at risk for arterial plaque. "You mean to tell me that the wispy greybeard whizzing past my house in short shorts every evening could have clogged arteries? No way." Maybe, just maybe.

A 2011 study found evidence of carotid and peripheral atherosclerosis in a group of marathoners. Although there was no control group of non-runners in that study, another study compared the arteries of marathon runners to a control group of sedentary non-marathoners. Marathoners had more calcified plaque in their coronary arteries, which has been linked to stroke and dementia. The tricky thing about these cases is that endurance athletes with atherosclerosis don't evince the regular signs. Whereas your typical sedentary guy with extensive atherosclerosis will probably have all the hallmarks (metabolic syndrome, abdominal obesity, hypertension, etc.), marathon runners with atherosclerosis don't fit the traditional cardiovascular risk profile.

It might be time to add "trains for endurance athletics" to the list of risk factors.

Oxidative Stress/Overtraining

It's no secret that endurance training induces oxidative stress on the athlete. That's how we get better – by encountering a stressor, being broken down a bit, and then recovering stronger than before so that the next time we encounter the stressor, we'll be better than the last time. Whether we're talking strength training, marathon running, cycling, gymnastics, martial arts, or even studying for a trigonometry class, we have to challenge our physiology to get better, and challenges to the physiology mean oxidative stress. Problems arise when we don't let up, when we keep the intensity elevated and the days off few and far between. We're constantly in that post-workout state, and it starts to look like chronic oxidative stress for all intents and purposes. Even if our times are improving, we're not truly recovering. It's a two steps forward, one step back kind of thing.

So. Those are just a few of the reasons I am no fan of chronic cardio (and don't get me started on the bad backs, osteoarthritis, hip and knee replacements and chronic tendonitis among my former elite endurance peers). A strong will can be a great thing for survival, for business and for relationships, but it can also get you in trouble if you don't pay attention to your training load.

Having said all that, I am still a big fan of weights, of brief, intermittent interval training and I am all for doing a fair amount of mixed low-level cardio, the kind that doesn't overstress the heart or involve so much repetitive joint motion that it

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Chronic Cardio (cont. from Pg. 7)

causes chronic injury. That makes sense in an ancestral context. You're expending energy at a high rate, but you're not going long enough that it becomes a liability. Or, if you're going long, you're taking it easy enough that you have the energy to make it back home, possibly carrying food.

I'm not even against a long training run or ride once in a while, provided you are trained, rested and allow enough recovery afterwards. I'm even OK with running marathons occasionally or jumping into a short triathlon now and then. As a species, we obviously have the capacity to go long and relatively hard every now and again. It's the chronic, day-in, day-out long, hard stuff that is counter-productive. If you did that twenty thousand years ago, when your next meal – and that of your entire family/tribe – was on the line, when calories were somewhat precious, when you didn't have an air-conditioned caravan of trainers, massage therapists, and coolers filled with electrolyte drinks following along after you, you'd be foolish. You simply wouldn't do it.

That we can run marathons (and do other stupid things) and know that we'll get out alive is a luxury of modern living. There are so many other less damaging ways to achieve what I would call high-level adaptive fitness by using a variety of training methods, all of which can be cardio-protective and joint strengthening when done the right way in at the appropriate times. Heck, when it comes to hypertension, blood lipids, and type 2 diabetes, walking is just as effective as running - without the potential downsides. Everyone can walk. Everyone thinks they can run, but running is a skill that must be learned. To run with poor form is to welcome injury, doubly so if you're running an excessive amount. And all this will be addressed in detail in my forthcoming book, Primal Endurance. For now, use your brain and listen to your body.

My point, of course, is that the human organism is made for short, intense bursts of activity laid atop a foundation of frequent slow moving. We aren't "supposed" to run as hard as we can for two or three hours. We're not supposed to run with the express purpose of "burning calories." We can certainly choose to do those activities, and we'll become adapted (or perhaps injured) to them, and they may even make us "fit," but they're not the healthiest, most efficient path to fitness. Chronic cardio is the meandering, roundabout trail that will get you there with a ton of bruises, scratches, a tick or two, and a sprained ankle. Oh, and you might get eaten by a bear along the way.

Your choice.

Men's Marathoner Men's Sprinter

Which body type, from the pictures above, would you like to resemble?

CE Answer Sheet: Medic Alert Bracelets

Complete this answer sheet from the previous CE article and forward it to the Training Office for grading and credit. (1 CE hour Credit for successful completion)

A quick search for medic alert tags, should be part of a secondary survey on unresponsive patients.

☐ True
☐ False

ICE applications are standard on today's smartphones

☐ True
☐ False

.A patients wallet can contain important health information cards.

☐ True
☐ False

Around a patients residence, there are can be stickers or labels for important information.

☐ True
☐ False

Vial –of –life is a common over the counter vitamin supplement.

☐ True
☐ False

Whenever responding to schools, the local nurse usually can provide health related information if applicable.

☐ True
☐ False

USB bracelets can store a lot of information but present a challenge in requiring equipment to view.

☐ True
☐ False

Tattoos can provide valuable patient information.

☐ True
☐ False

SSV policy allows the honoring of a medical tattoo that reads, "DNR"

☐ True
☐ False

Fancy jewelry can contain hidden medical information.

☐ True
☐ False

Name:

Station:

Comments: