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## Forever Young

*I want to keep running.* That simple phrase has a different meaning now that I am in my mid-fifties. I am not the full-of-gusto distance runner I once was in high school. Over the past two years, I have encountered what I would label my first sports injury due to aging. I have narrowing in my right knee. Many would just use the phrase arthritis. I guess I prefer to avoid that term. I prefer to look at my sometimes pain in the knee as a bump in the road. Like any dedicated runner or athlete, I am not going to stop or give up running. I choose to find ways to both prevent further injury and help turn back the clock on my knee in safe and healthy ways.

Over the next few months, I will start a log of my treatment to try and grow cartilage on my knee. I am a patient of one of our noted AMAA sports medicine physicians, Thomas Howard, MD. His approach is a combination of a published treatment plan using platelet rich plasma (PRP) and combining it with stem cells extracted from my own bone marrow. This sounds pretty wild to me and several of my longtime running friends. PRP has been around a while. Use of stem cells from bone marrow concentration is more recent. The combination of the two in a series of injections intrigues me. It is motivating to think my own blood and bone marrow could possibly aid in the regeneration of cartilage and lead to pain-free running. So far, I have had one treatment involving the PRP process and extraction of bone marrow from my right rear hip. My blood was spun in a centrifuge machine for about 15 minutes. The resulting PRP was 10 to 15% of the original vile of drawn blood. The bone marrow went through a similar "spin" in a different machine. The next step was the injection using a mobile ultrasound to guide the needle insertion under the knee cap area. I immediately went to crutches for the next 24 hours to give my knee some time to relax, and was instructed to curtail my running for 10 or more days. Three additional treatments are scheduled over the next three months.

There is another path to the "forever young" goal. I recently saw a CBS News piece on the company Cenegenics. We have all seen photos in magazine ads of the Hulk-like bare-chested guy with tight jeans and bulging muscles. The guy in that ad is the chief medical officer of Cenegenics. What he advocates is using performance-enhancing drugs (PEDs) in much the same way known professional athletes have cheated in their sport. He takes and prescribes testosterone and human growth hormone (HGH) along with a cocktail of other supplements. Cenegenics appears to be pushing nothing short of doping or taking PEDs to be stronger and look significantly younger. Yet, this all brings up an important question. Will Cenegenics patients live longer and have a better quality of life than their peers? HGH has proven to work its magic in athletes; in fact, so much so that new testing is planned for the NFL and other professional sports.

Dr. Walter Bortz' mantra is also worth noting. He proudly wore a "DARE TO BE 100" imprint on a t-shirt when he ran Boston at age 75 and then again when he turned 80. It's not so much the end result that we should seek; it's how we live in a physically active and healthy way on the ride to 100.

Here's to all of us who run, swim, or do whatever activity that brings us satisfaction.

Enjoy the run...and be forever young!

Dave Watt, Executive Director

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## Preparing for the Racing Season: Do the Mental Work First

At this time of year, many of us are talking with patients, clients, colleagues, and friends about beginning the new season of distance racing, whether single sport or multi-sport as they transition from off-season training. As I've mentioned in previous editorials, I'm a multi-sport racer. I live in the Northeast and for me winter training focuses mainly on stretching, weight-lifting, and a 30 to 60 minute session or two of fast-walking/jogging on the weekends. With my first short duathlon scheduled for the end of March in New York City's Central Park, I'll get into my race-training routine early in March (once the weather becomes conducive for it). But in addition to the physical work, I feel that there is some important mental work to be done each spring to help me—and others—properly get ready for the next racing season.

The mental side of distance racing has to do with “keeping your head in the game.” This involves addressing such questions as: “Why am I racing?” “What do I expect to get out of it?” “What are the sacrifices I'm making, and are they worth

it?” And, “What is racing doing for me, mentally and physically?” These questions are part of the goal-setting process, the central element of which is to establish goals that are reasonable and achievable for *each individual*. In my experience, this is absolutely essential if they are going to stay in the sport, happily and healthily.

I suggest that when setting this season's goals, last season's experience should serve as the guide. For me, the most important question is, “Did I have fun?” For others, it may be, “Did I go fast enough?” or “Did I win enough times in my age-group?” or “Did I set the personal bests I wanted to?” If the goal or goals were achieved, great. If not, whether in terms of fun or speed or both, careful thought should be given to “why?” Was there something lacking that could be fixed, reasonably and rationally, with changes in training and/or technique? Or was there something wrong with the goals themselves? Over the last couple of years, with aging and

an occasional injury, to achieve my primary goal of simply having fun out there, I've had to slow down even more from my already slow pace. I am also doing shorter races, so *that I can stay in the sport*. I set my goals accordingly.

On the other hand, if increasing speed is important, was it to go faster last season comfortably and without injury? If so, great. The goals should work again and the training program can be designed accordingly. But say it was a tough season, in terms of speed and/or injury. In that case, it might be a good idea to take a closer look at the goals for this season, making sure they're reasonable in light of the difficulties you faced last season. Then design a training and racing schedule to enable you to meet them. Setting goals that are right for the person is the best way to make sure that they stay in the sport, happily and healthily.

Go well,  
Dr. Steve Jonas

*This column is based in part on an entry that will be appearing on the Falcon Guides blog (<http://www.falcon.com/blog>) of Globe Pequot Press, publisher of Steve's latest book, Duathlon Training and Racing for Ordinary Mortals®: Getting Started and Staying with It.*

The “Experience Tells Us” editorial shared by John C. Hagan III, MD (*AMA Journal*, Volume 25, Number 3, p. 9), and his reference to the research article written by cardiologist James H. O'Keefe, MD, “Cardiovascular Damage Resulting from Chronic Excessive Endurance Exercise,” generated discussion from the AMAA audience. Read on for thoughtful comments from AMAA members and an article submitted by Dr. O'Keefe and colleague Salman K. Bhatti, MD, in response to these comments.

Aaron Baggish, MD, will also address this topic at the AMAA's 42nd Annual Sports Medicine Symposium at the Boston Marathon this April with a look at the likelihood of adverse cardiac changes caused by long-distance running. Dr. Baggish was one of the authors of “Cardiac Arrest during Long-Distance Running Races” (*N Engl J Med*, 2012; 366(2):130-40), where the assessment of the incidence and outcomes of cardiac arrest associated with marathon and half-marathon races showed low overall risk of cardiac arrest and sudden death.



Dear Editor:

Even as a fellow physician and runner, I can hardly fathom the impact that the diagnoses of atrial fibrillation and high CACS have had on Dr. John C. Hagan III. It is understandable that the tone of his editorial is quite negative and fearful regarding distance running. The topic of what constitutes a safe

upper limit for endurance training deserves serious examination with robust prospective controlled studies. If Dr. O'Keefe's findings are reproduced and confirmed, the implications for all athletes would be profound.

How should we advise individual patients like Dr. Hagan? It may well be that if he was only running 30 to 40 miles per week and could not get his BMI under 25 that he was actually undertrained, and the damage occurred during the marathons and the triathlons themselves. In the absence of heart rate data from his training runs and races and of cardiac enzymes after “near maximal” exertions, we are left with speculation only. Also we don't know his lipid profile over the last several decades; perhaps he should have been on a statin years ago.

While I would agree that overtraining is a large problem generally, I also believe that it is very difficult to pinpoint an upper limit for a given runner. We recall that Bannister ran the 4-minute mile on 25 miles per week training and that Sebastian Coe was said to train only 50 miles per week, so

high mileage is not necessary to be extremely fit and fast. Nevertheless, imagine the 120 lb Haile Gebreselassie running for one hour alongside the 192 lb Dr. Hagan at a 10-minute pace; one man may be “maximal” and causing coronary endothelial inflammation, while the other may not have a pulse much over 100.

As physicians we are typically hyper-disciplined and hyper-competitive Type A personalities, working long hours in stressful environments with excess cardiovascular mortality compared to other professionals. It may be that 60 minutes of training is too much for a busy physician, while it’s just fine for a professional runner whose only daily tasks are to train, eat, and sleep, all under the watchful eye of expert coaches, dietitians, and physical therapists.

Until we have better data, I for one refuse to live in fear of exceeding an arbitrary amount of time to exercise, but rather will let careful awareness of my body and mindfulness of my diet, sleep, and job stress be my guide. I refuse to believe that a healthy human being over the age of 40 automatically needs to be on a statin or any other pill, outside of evidence-based indications. There really is no substitute for a healthy diet, combined with the good judgment and the humility to keep our exertional efforts truly easy to moderate in perceived intensity for most of our training, and keeping the occasional race fun and within our physiological reserve.

—Charles H. Stubin, MD, *Runner and Coach*

Dear Editor:

I thank Dr. Stubin for his comments. His concerns have been answered in the recent literature (1). James H. O’Keefe, MD, will respond to comments about the evolving paradigm that chronic excessive endurance exercise may be cardio-toxic in many ultra-exercisers like me.

In response to Dr. Stubin’s letter, I believe I need to clarify my health and fitness status. I have been a competitive athlete all my life (I am age 69) and a long distance runner since 1967. I am 6 foot, 1 inches tall and was thin until being put on beta blockers (which I have thankfully stopped and now weigh 178 lb). Entering private practice in 1975, I weighed 172 (BMI 23.3); in 2006, when I had my “lone” atrial fibrillation (2), my BMI was 24. My yearly lipids and inflammatory markers (CRP, sed rate) have been very good to excellent. While in residency at Emory, I took part in a study on runners and had normal stress EKG, ECHO, above average treadmill performance, and the cohort’s lowest triglyceride. Borderline lipids three years ago were

dramatically lowered with 5 mgm Crestor qod.

I have never been a plodder or “under-trained.” The whole point of my “Experience Tells Us” editorial is that I over-trained at near-to-maximum effort: I finished 2nd in the Georgia Medical Mile (1975) in 5 minute 40 seconds, ran over 25 Hospital Hill (Kansas City, Missouri) Half-Marathons (average pace 7.5 to 8.5 mph); four marathons (best 3:20), two Mid America Triathlon Championships (1.2 mile swim, 60 mile bike, 13 mile run) finishing in the top five of my age group both times. Besides running, swam weekly, bicycled, weight lifted and, at age 54, climbed Mt. Kilimanjaro and Rainier. There is no question in my mind and the cardiologists that care for me that my atrial fibrillation and high coronary artery calcium score (1606) are due to 44 years of “flat all out” excessive endurance exercise—not the competitive events themselves! If you are interested in references for my editorial and details of my family history, please e-mail lfeenor@msma.org.

I really must wonder where the rub is as I agree with Dr. Stubin’s conclusion, “*There really is no substitute for a healthy diet, combined with the good judgment and the humility to keep our exertion efforts truly easy to moderate in perceived intensity for most of training, and keeping the occasional race fun and within our physiological reserve.*”

—John C. Hagan III, MD, FACS, FAA; Editor, *Missouri Medicine*

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Dear Editor:

After reading the “Experience Tells Us” recount of Dr. John Hagan’s experience with endurance training and atrial fibrillation, I felt the need to comment. I, myself, have experienced the thrill of crossing a marathon finish line 20 times; in fact, at the 84th Boston Marathon, I ran my fastest with a finish time of 3:11:53.

While marathon training is no doubt cardio-protective, cardiac arrests may occur in previously healthy marathon runners during races. Research on the cardiac risk of marathon running and related studies on AMAA Boston marathoners shows that while the absolute risk of cardiac arrest during races is low, a greater than two-fold increase was observed in middle-aged men in a recent

prospective registry. We have also learned that the cause of death was atherosclerotic heart disease in over 90 percent of fatalities in runners over age 40 in two retrospective studies. In addition, elevated biomarkers of inflammation (increased IL-6, CRP) and procoagulant effects (in vivo platelet activation, elevated D-dimer) developed in asymptomatic AMAA runners during races, indicates a transient susceptibility to atherothrombosis.

As I write this, I have two research articles in press (*American Journal of Medicine* and the *British Journal of Sports Medicine*) discussing the use of antithrombotic prophylaxis to prevent cardiac arrest in marathon runners. Aspirin prophylaxis has been validated by evidence-based clinical paradigms to reduce the risk of acute cardiac events in runners such as ourselves. Perhaps, instead of giving up something we love because of increased risk to *some*, we should further explore the protective effects of aspirin to enable us to continue hitting the pavement more safely.

—Arthur J. Siegel, MD, *Associate Professor of Medicine, Harvard Medical School*

*Ed Note: Additional comments on this topic from readers are welcome. We always appreciate the opportunity to share knowledge and exchange ideas with fellow AMAA members.*

# When We Know Better, We Do Better

Salman K. Bhatti, MD and James H. O'Keefe, MD; Saint Luke's Mid America Heart Institute, Saint Luke's Hospital of Kansas City, Kansas City, Missouri and University of Missouri-Kansas City

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*Multiple surveys and observational studies have demonstrated that US physicians as compared to an age and gender matched general population eat healthier, exercise more, have lower rates of obesity and diabetes, and are more likely to receive recommended vaccines and screenings.*

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Physicians today do not have higher cardiovascular mortality than other professionals. In fact, the authors of the Physicians' Health Study, which found that aspirin reduced risk of myocardial infarction in healthy cohort of male physicians (1), also found that the cardiovascular mortality among the study participants was extraordinarily low. At the start of 20th century physicians had high mortality rates but they have been on a steep decline since (2). The most common causes of death 100 years ago were pneumonia, tuberculosis, and infectious dysentery—all infectious diseases (3). Those physicians practicing in the pre-antibiotic era faced serious occupational health risks on a daily basis in the form of contagious infectious diseases. With the advent of antibiotics, physicians' life expectancy rose to match that of a white male in the general US population in the 1940s (4). By the 1970s, physicians were clearly living longer than the general population (2,4). This is probably due largely to physicians taking a lead in adhering to healthier lifestyles.

In a recent study, the most educated Americans have made the highest gains in terms of life expectancy, whereas the life spans of least educated Americans have actually contracted in recent decades (5). In fact, the level of formal education attained, even after adjustment for other confounders, was by far the single strongest predictor of life expectancy (5,6). Perhaps when we know better, we do better. Multiple surveys and observational studies have demonstrated that US physicians as compared to an age and gender matched general population eat healthier, exercise more, have lower rates of obesity and diabetes, and are more likely to receive recommended vaccines and screenings (7,8). The rates of smoking among US physicians have come down drastically from 40% in the 1950s, to 19% in the 1970s, to 3.3% in the early 1990s, and to 1.1% in 2005 (9,10). Additionally, physicians are much more likely than the general population to take prescription drugs if their blood pressures and cholesterol levels are not in ideal ranges (7).

Physicians tend to be over-achievers and the common misconception that "more is better"

when it comes to exercise compels many doctors to take up marathon and ultramarathon running. Indeed, Dr. Thomas Bassler in 1975 proclaimed boldly that if one could complete a marathon, he or she was "immune" to dying from coronary heart disease (11). Recent studies suggest that excessive endurance activities especially when continued for decades may result in adverse cardiac remodeling, arrhythmias, and myocardial fibrosis (12,13). Veteran endurance athletes have a five-fold higher incidence of atrial fibrillation (14). Another study found an association between chronic marathon running (for at least 25 years) and increased plaque burden in the coronary arteries (15).

Along with formal schooling of 16 years or more, and not smoking, a habit of jogging will markedly improve life expectancy. We have recently published research showing that runners tend to have life expectancy about six years longer than non-runners, with mortality reductions of 19 to 44% during long-term follow up in two very large prospective cohort studies. However, those studies showed best longevity gains for those individuals running moderate distances (5 to 20 miles/week) at moderate paces (about 10 minutes per mile), at moderate frequencies (2 to 5 runs per week) (16,17).

In another very recent study, 72 older women between the ages of 60 to 74 were randomized to weekly fitness routines that included running 40 minutes one day and weightlifting for 40 minutes on another day. Participants were assigned to one of three regimens: one day per week of aerobic exercise and one day per week of strength training (1+1), or two days per week of aerobic exercise and two days per week of strength training (2+2), or three days per week of aerobic exercise and three days per week of strength training (3+3). Surprisingly, all three groups of women had equivalent gains in aerobic fitness and muscular strength. However, the women in the 2+2 group burned the most calories on a daily basis, likely because they were feeling more energized and physically capable and thus they expended much more energy in their daily routines and free time activities than did the women in the other two groups (18).



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*A recent study showed that CT-CAC has more prognostic importance than the Framingham Risk Score (FRS) or any of the other new coronary risk markers such as carotid intimal thickness.*

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Hippocrates, the “Father of Medicine,” taught his students 2,500 years ago that, “The right amount of nourishment and exercise, not too much, not too little, is the safest way to health.” A more modern take on that might be: “Everything in moderation, including moderation itself.” So, if you have your heart set on doing an ultra-endurance event, train properly for it and do it ... then cross it off your bucket list and adopt healthier long-term exercise patterns.

We often suggest a Computed Tomography derived Coronary Artery Calcium (CT-CAC) score for middle aged and older endurance athletes. An abnormal CT-CAC of >100 usually qualifies them for a statin, after discussing the pros and cons of this class of drugs with them. A recent study showed that CT-CAC has more prognostic importance than the Framingham Risk Score (FRS) or any of the other new coronary risk markers such as carotid intimal thickness (19,20).

A recent long-term study of over 10,000 adults being treated for high cholesterol found that both statin treatment and increased fitness were independently associated with improved survival. Those who maintained a high fitness level and who were also taking statins had the best survival (21). In our survey study of cardiologists’ personal health habits, we found that these physicians were 10 times more likely to be on a statin than age- and gender-matched controls (7).

When it comes to health and longevity, we American physicians have many powerful advantages including 25 years of formal schooling and remarkably low smoking rates. If you can also adopt a moderate jogging routine and use statins when indicated, it is likely that you will live long, live well, and stay young.

Below is an example of what we recommend as a fitness routine for our patients:

- Run 2 or 3 miles at a comfortable pace 2 to 4 times per week.
- Once a week do high-intensity intervals, 8 repeats, each for 20 to 45 seconds.
- Make swimming a regular part of your fitness routine.
- Lift weights or do other strength training 20 to 40 minutes 1 to 3 times weekly.

- Do yoga or some other stretching regularly.
- Walk and/or garden as much as your heart desires.
- Get outside and play with your friends and/or your dog.

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# Weight Loss and its Role in Reducing Chronic Inflammation

By Edward R. Sauter, MD, PhD

## Introduction

Whereas the frequency of acute inflammation has not been clearly linked to chronic disease, the duration and severity of inflammation and the failure of resolution are thought to increase the risk of developing a wide array of human diseases (1). Chronic inflammation is involved in the pathogenesis of autoimmune diseases such as rheumatoid arthritis, and in many of the most common diseases of aging that are not known to have an autoimmune etiology (2). These include atherosclerosis, cancer, and type 2 diabetes. The precise identity of the inflammatory stimulus for many of these diseases is unknown and, if known, difficult to remove (3). The consequences of chronic inflammation vary based on the disease. Thus for rheumatoid arthritis and asthma, chronic inflammation leads to fibrosis, which disrupts organ function (4). For cancer, chronic inflammation and associated chronic upregulation of growth factor expression leads to tumor initiation and growth. In the prevention or treatment of chronic inflammation, when there is the potential to decrease or remove the inflammatory stimulus, such as by decreasing lipoproteins in atherosclerosis or weight loss in obese individuals, this should be the primary focus. When this is not possible, treatment often involves targeting the inflammatory response.

## Strategies to Decrease Chronic Inflammation: Overweight and Obesity as a Paradigm

Obesity is a well-known cause of chronic disease and is associated with chronic inflammation (5). Causes of inflammation with obesity are not fully understood. They include a stress reaction by the body and adipocyte hypertrophy which leads to increased expansion of pro- and anti-inflammatory mediators called adipokines, and eventually may progress to cell rupture with a resulting inflammatory response (6). While for some conditions there is no proven way to decrease the inflammatory stimulus, in the case of obesity there is: weight loss. We will therefore consider two approaches to obesity-induced chronic inflammation, the first decreasing the stimulus through weight loss, the second targeting the inflammatory response.

## Decreasing the Inflammatory Stimulus

Many studies have evaluated the potential benefit of weight loss on chronic inflammation. In most cases, this was done by correlating the amount of weight lost with changes in circulating levels of inflammatory mediators. Fat cells (adipocytes) produce adipokines, including leptin, tumor necrosis factor (TNF)- $\alpha$ , interleukin (IL)-6, C reactive protein (CRP), and adiponectin. Abnormal expression of adipokines can affect insulin signaling (7), leading to the development of the metabolic syndrome. Altered expression of adipokines is also associated with the development and progression of many cancer types (8).

The effects of weight loss on chronic inflammation have used a variety of strategies to get participants to lose weight, including surgical intervention, diet, or diet and exercise. Each approach has led to favorable alterations in mediators of chronic inflammation.

**Weight loss after surgery:** In a study involving obese and morbidly obese individuals, alterations in three markers of chronic inflammation (IL-6, leptin and adiponectin) correlated with body mass index (BMI). With weight loss, these markers changed toward normal levels, and insulin resistance decreased (5). With the goal of determining the potential breast cancer preventive effects of weight loss, we evaluated the effects of weight loss after gastric bypass surgery on adiponectin (a regulator of glucose levels and fatty acid breakdown) both in the breast as well as in the circulation (9). Adiponectin levels in the circulation are inversely associated with breast cancer risk and while obesity is correlated with the metabolic syndrome, people with high adiponectin levels do not appear to develop the metabolic syndrome, which has led to the term "benign" obesity (6). We observed significant increases in adiponectin both in the breast and in the circulation three and six months after surgery, in association with dramatic weight loss.

**Weight loss with diet and/or exercise:** Three hundred and sixteen overweight or obese sedentary individuals were assigned to 18 months of diet-induced weight loss, exercise, diet plus exercise, or a control group. The weight loss group had significant reductions in inflammatory biomarkers CRP, IL-6 and TNF $\alpha$  receptor 1. Exercise training did not have a significant effect on these biomarkers, and there was no

significant interaction between weight loss and exercise training (10). Thirty-eight obese and 30 non-obese controls were enrolled in a study in which the obese subjects underwent a diet and aerobic exercise program, losing on average 4.3 kg/m<sup>2</sup>. Baseline TNF $\alpha$  levels were significantly higher in the obese participants than controls, and with weight loss there was a significant decrease in TNF $\alpha$  (11). The effect of exercise independent of weight loss was not addressed. A third diet and exercise study enrolled individuals in a one-year program of weight reduction (12). In this last study, approximately a quarter of the participants underwent liposuction as part of their weight reduction. There was a significant reduction of inflammatory adipokines, which did not differ between the liposuction and the non-liposuction group. The potential independent effect of exercise was not addressed.

On the other hand, multiple studies have reported that exercise decreases chronic inflammation (10). In at least some of the positive studies, the intensity of the exercise was significant, such as with individuals training to run a marathon (13). It is possible that the intensity of the exercise required to elicit an anti-inflammatory response independent of weight loss is greater than what was included in the exercise programs of studies that did not detect an independent beneficial effect.

In summary, weight loss leads to reductions in circulating levels of pro-inflammatory adipokines and increases in anti-inflammatory adipokines. The influence of exercise, independent of weight loss, is uncertain but may be related to exercise intensity. The changes in these adipokines toward normal with weight loss may be associated with longer life, as chronically abnormal levels reduce lifespan (10).

## Targeting the Inflammatory Response

Many therapeutic strategies have been proposed to treat cancer-induced chronic inflammation. These include inhibiting cancer promoting inflammation, boosting anticancer pathways, and reprogramming or depleting immune cells (14). The most common approach is to inhibit inflammation using glucocorticoids, nutraceuticals such as curcumin or resveratrol, omega-3 fatty acid (n-3 FA) containing substances such as fish oil, or medications such as



cyclooxygenase (COX) inhibitors, either nonspecific inhibitors such as aspirin or COX-2 specific inhibitors such as celecoxib.

Pharmacologic interventions using glucocorticoids and nonsteroidal anti-inflammatory drugs (NSAIDs) are used to decrease the level of inflammation in the body. They are beneficial in acute inflammation, but have dose-related side effects with chronic use which make them suboptimal to treat chronic inflammation. Dietary interventions using nutraceuticals show promise. Curcumin prevented weight gain, fat accumulation and the development of insulin resistance in animals fed a high fat diet. It appears to do this by decreasing inflammatory markers such as NF- $\kappa$ B, a well-described mediator of inflammation (15). Resveratrol has been shown to have cardioprotective effects in animal studies involving cardiac injury, hypertension and type 2 diabetes, and vascular protection (16) consistent with an antiinflammatory action which mimics dietary restriction (17). Resveratrol treatment in mice has been shown to decrease colitis and colon cancer associated with colitis (18). In humans, it has been shown to decrease tumor proliferation in patients with colorectal cancer (19). Additional human studies are needed to validate the beneficial effects of curcumin and resveratrol on chronic inflammation to determine optimal dosing.

Humans have endogenous mechanisms to control an acute inflammatory response and return the body to normal. Perhaps the best studied endogenous mechanism is that involving inflammation resolving lipids (lipoxins, resolvins, protectins, and maresins) that are synthesized during resolution of self-limited inflammation (20). They stimulate macrophages to remove excess neutrophils, promote tissue regeneration, and control pain. Inflammation resolving lipids are all derived from one of three fatty acids: arachidonic acid-AA (lipoxins), eicosapentanoic acid-EPA (resolvins), or docosahexaenoic acid-DHA (protectins and maresins). AA can be converted by COX to prostaglandins (PGs) which are pro-inflammatory, or oxygenated and hydrolyzed to form anti-inflammatory lipoxins. Lipoxins can also be generated by aspirin, but not other NSAIDs (20). Aspirin also facilitates the conversion of EPA to resolvins. N-3 FA, EPA, and DHA are thought to work both by preventing AA from producing pro-inflammatory PGs and by producing resolvins, protectins, and maresins.

Transgenic mice overexpressing the fat-1 gene, which encodes desaturase, an enzyme catalyzing conversion of n-6 FAs (thought to primarily be pro-inflammatory to corresponding n-3 FAs (considered primarily anti-inflammatory), are protected from inflammatory insults and have higher levels of resolvins and protectins

(20). Furthermore, in mice without n-3 FA diet supplementation, intraperitoneal injection of resolvins conferred significant protection against pathologic retinal angiogenesis (20). Clinical studies are less clear regarding the ability of n-3 FA to decrease the risk of chronic disease.

D type resolvins counteract both local adipokine production and monocyte accumulation in obesity-induced adipose inflammation (21). Resolvins are anticipated as desirable therapeutics for inflammation treatment as they exert receptor-specific actions, possess both anti-inflammatory and pro-resolving effects and reduce inflammation without immunosuppression (20). Recently, Rexolvyx Pharmaceuticals developed resolvins as therapeutics for the treatment of multiple inflammatory diseases, such as dry eyes, retinal diseases, asthma, inflammatory bowel diseases, rheumatoid arthritis, cardiovascular diseases, and lung inflammation. The clinical study with RX-10001 (RvE1), formulated for oral delivery, showed positive Phase I results in eye diseases.

### Monitoring the Anti-Inflammatory Effects of Intervention

Some experts have proposed measurement of plasma cytokines and acute-phase reactants, including TNF $\alpha$ , IL-6, and CRP (3) as indicators of chronic inflammation. Monitoring inflammation at the site of disease is now becoming feasible through the use of functional (positron emission tomography-PET) and anatomic (computerized tomography or magnetic resonance-MR) imaging (22). In this regard, 18F-fluorodeoxyglucose PET and fluorine-19 MR imaging may be especially useful.

### Summary

Many of the common diseases that kill adults, including atherosclerosis, cancer, and type 2 diabetes, are associated with chronically elevated inflammation. Obesity is also associated with chronic inflammation and an increased chance of developing these common diseases. It is known that weight loss results in lower rates of atherosclerosis, cancer, and type 2 diabetes (23). Strategies to decrease chronic inflammation in obese individuals include decreasing the inflammatory stimulus through weight loss, or targeting the inflammatory response. It does not appear to matter how weight loss occurs (decreased dietary intake of calories, exercise, gastric bypass, or liposuction).

There are endogenous and exogenous approaches to target the inflammatory response. The body produces endogenous lipid products termed resolvins, lipoxins, maresins, and protectins. They work to remove inflammatory mediators, but can become overwhelmed with higher levels of

mediators which are often present in obese individuals. In this case, exogenous medications such as glucocorticoids, ASA, or other NSAIDs can be tried, but have dose-limiting side effects. Dietary agents such as curcumin and resveratrol show promise with few side effects, but require further investigation before they can be recommended for routine clinical use. Pharmacologic preparations of endogenous mediators such as resolvins are currently being investigated to control chronic inflammation, but are not in standard clinical use. Although not often practiced, health care providers can tailor their treatment of chronic inflammation through monitoring levels of inflammatory mediators in the circulation.

*Ed. Note: Dr. Edward Sauter, Professor of Surgery and Cancer Center Director at the University Health Science Center in Tyler, Texas, will be presenting on this topic at the 42nd Annual Sports Medicine Symposium at the Boston Marathon on Sunday, April 14.*

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## Heart Rate Training(Part III)

### Workout Intensity and Heart Rate

By Douglas E. Munch, PhD

Have you ever worked out and thought, “I feel like I’m working at my regular intensity but feel exhausted. What is going on?” I’m sure we have all felt that from time to time. I ran track in the years before wireless heart rate monitors for athletic training were invented. Jumbo Elliott’s workouts typically consisted of distance in the morning and speed work in the afternoon, every day except Sunday which was an easy day. Pain was followed by more pain. If you didn’t get sick you weren’t working hard enough. I can only imagine what our heart rates were doing. In those days, however, it worked because everyone else was doing the same thing.

In the 21st century we have many different ideas about training and they are much better articulated. Three variables are key to the design of a fitness program. If we consider frequency of training, duration of the workout, and exercise intensity, we find that the first two are easy to monitor. If your coach wants you to work out at moderate intensity, how does one determine what that is on any given day? Can we measure and monitor intensity in a useful way? One of the first approaches to monitoring energy output was to envisage one’s perception of workout intensity, a qualitative measure. Swedish physiologist, Gunnar Borg, proposed a 16 point scale called “rating of perceived exertion” (RPE) in 1970 (1). While helpful at times, RPE is not a reliable reflection of metabolic rate due to its subjective nature. The best measure of metabolic rate is  $VO_2$  (oxygen consumption). As we saw in Parts I and II of this series,  $VO_2$  is directly related to metabolic demand during exercise which is closely followed by heart rate. Unfortunately,  $VO_2$  is a laboratory determination and cannot be measured during normal training. Subsequently, it should be no surprise that heart rate is the most convenient and useful tool for monitoring one’s metabolic intensity during a workout.

Invented in 1977 and commercialized in 1983, wireless EKG transmission became available as a tool for athletes to monitor their cardiac performance during training and competition to their heart’s delight. Wireless monitors today are reliable, accurate, and easy to use. Some even receive a GPS signal and can later be synced to your computer for convenient download and tracking of your personal performance data and route of travel.

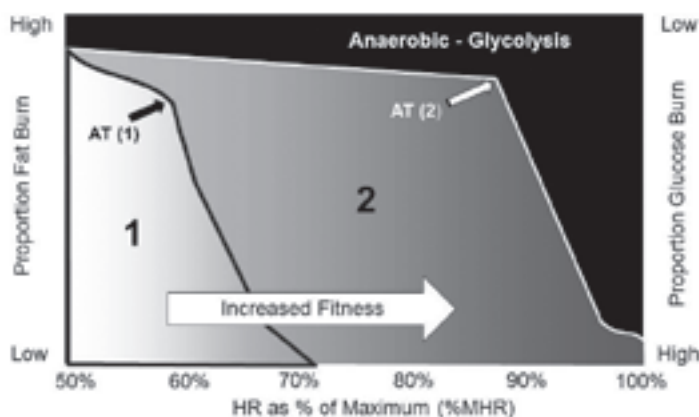
#### Training Effect and Energy Systems Employed

In qualitative terms, we can examine the effect of training on a subject’s anaerobic threshold (AT), also referred to as the lactate threshold. First, let’s define what we are looking at here in Figure 1. The “y” axis represents the metabolic mix of fat and glucose metabolism. The black area denotes anaerobic metabolism, the glycolytic pathway. The gray tone areas represent aerobic Krebs cycle, fat metabolism, and oxidative phosphorylation. At any given heart rate, indicated as a percent of maximum heart rate (%MHR) along the “x” axis, the relative proportion of black and grey areas indicates the qualitative metabolic mix. When fat metabolism dominates during a workout, the gray area commands most of the “y” axis. Increases in glucose metabolism are reflected by the black shaded regions of the figure. The greater the black portion at any given %MHR the greater the amount of glucose metabolized and the greater amount of lactic acid produced. When glucose consumption dominates, we find ourselves producing an abundance of lactic acid and therefore oxygen debt. See Part II of this series (*AMAA Journal*, Volume 25, Number 3, p. 13) for a more detailed discussion of intermediary metabolism (2).

Let’s start with a person who is untrained or an athlete who has not been active for a long time. The lightly shaded area “1” at the bottom left may represent the performance curve of this individual. For this person we have to imagine that the black shaded portion would extend from the upper and right boundaries of area 1. Note that this individual has a very low anaerobic threshold (AT1), shown here at the elbow of the curve at about 60% of their MHR. In such a person, this is also the beginning of the “red zone.” Exertion above 60% MHR quickly induces a rapid buildup of lactic acid as their aerobic metabolism can no longer meet their energy demand. This person must then burn a richer mix of glucose. Between 60% and 70% MHR, the same individual would be consuming so much glucose that their metabolism will fall clearly in their “red zone” resulting in a large oxygen debt.

As one’s fitness improves through training, we teach our bodies to change its “metabolic diet” at higher levels of exertion. Training shifts the boundary between aerobic and anaerobic metabolism gradually to the right and slightly up, as we see in the moderately shaded area “2”. Thus, training teaches the metabolic systems to burn more aerobically (fat) at higher heart rates, sparing the use of glucose and forestalling

Figure 1. Training Effect



*One primary objective of endurance training is to expand the zone of fat burning and spare glucose metabolism as much as possible, moving from Area 1 to Area 2 in Figure 1, thus staying away from generating excessive lactic acid.*

Table 1. Typical Sports

Sport	% Aerobic	% Anaerobic
X-C Skiing	97.5	2.5
Marathon	90	10
Cycling (road)	80	20
Rowing	73	30
Distance swimming	70	30
Soccer	50	50
100 m sprint	5	95

oxygen debt. In this example, our hypothetical athlete who is well-trained and operating in shaded area 2 can perform comfortably at 80% MHR or more. In some cases, he/she may not hit their anaerobic threshold (AT2) until a %MHR of 90% or greater before entering the red zone.

One primary objective of endurance training is to expand the zone of fat burning and spare glucose metabolism as much as possible, moving from Area 1 to Area 2 in Figure 1, thus staying away from generating excessive lactic acid. It is important to observe that irrespective of one's fitness, glycogen or glucose is always necessary as a metabolic fuel as it works in coordination with oxidative phosphorylation. Glycolysis is the continuous pilot light that feeds the anaerobic boiler. Without enough glucose (and other supplemental metabolites), we "bonk" or "hit the wall" and that is no fun!

#### Typical Sports Aerobic/Anaerobic Load

Every sport demands a different mix of fuel to support the energy needs of the event. Intuitively speaking, sports that require high levels of explosive power will demand more anaerobic fuel (glucose) while sports that demand endurance will consume much more aerobic fuel (fat and oxygen). Table 1 (3) shows us the approximate proportions of aerobic and anaerobic metabolism for several sports. It will be the objective of many athletes to expand their aerobic capacity as much as possible. Even weight lifters, sprinters, and other power athletes can benefit from some endurance training as their recovery from

anaerobic events requires aerobic metabolism to burn off the accumulated lactic acid.

#### How Can We Use Heart Rate Training to Achieve Increased Levels of Fitness?

Numerous books, articles, and web pages have been written addressing this useful tool. Wikipedia identifies over 409,000 results with the phrase "heart rate training" alone. Is it possible to boil down such a large subject into something manageable and useful? I believe so if we limit our discussion to three essential concerns that are all actionable:

- 1) Determine your maximum heart rate for each sport in which you train and/or compete.
- 2) Design and employ a training schedule that uses your heart rate as a personal tachometer and workout guide.
- 3) Use your heart rate as a biofeedback tool to determine your level of exertion, recovery, daily health and guide to step 2 above.

The remainder of this article will address the determination of one's maximum heart rate. The second two concerns will be addressed in a fourth installment of this series.

#### Theoretical Maximum Heart Rate Determination

Practically speaking, determining your maximum heart rate is the first step to effectively integrate heart rate training into your routine. Your MHR is mainly determined by your genetics and

your age, not by your level of fitness or how fast or strong you are. Therefore, asking your training buddies for their heart rate targets probably won't be of value to you, and may even be harmful. The first and most commonly used estimate of MHR was developed by Drs. William Haskell and Samuel Fox (4) from a metadata analysis of heart patients in 1970. These cohorts were not healthy or athletically active individuals. Haskell and Fox never intended their heart rate formula to be representative of a healthy population. Despite this, their analysis determined that, for this population, one's MHR could be estimated as 220 minus one's age in years. Somehow, this simple equation stuck in the medical literature and has long been considered a standard for use. Numbers vary, but this result could have a standard error of (+/-) 15 beats per minute or more (5). Polar, a popular manufacturer of wireless heart rate monitors, uses the Haskell and Fox formula as their default for their monitors (3) although they also provide a method for a direct measurement of MHR on their web site. Many authors observe that this method of prediction may underestimate one's MHR and in doing so, lead to actual exercise intensities below one's training objectives. In cases where the estimate is above the actual MHR, the target training may be too intense for the athlete leading to overtraining, injuries, or other problems. In a 2002 study, Robergs and Landwehr (6) reviewed 43 different formulae proposed for estimating MHR, including the one above. They concluded that all were unreliable. The formula they deemed the least objectionable was:  $MHR = 205.8 - (0.685 \times \text{age})$ .

It is impossible to tell, *a priori*, which formula is right for you. Unless you happen to be the "model" for any of these predictive equations, these formulae may incorrectly calculate your personal MHR. For simplicity, I have recommended to some of my training buddies that the Haskell and Fox formula may be a simple temporary starting point.

#### Practical Determination of Maximum Heart Rate

Your calculated MHR numbers may not make sense when you compare them to your training experience. If so, you may want to complete a sport specific test to determine your true MHR. How should one do this? Is my determination really my MHR or is it a close approximation?

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*For those of you who are content with a less exacting number, just start with your calculated MHR. Use it until you have a better MHR number based on your training experience, practical determination of MHR, or a maximum exertion stress test at your cardiologist's office, or exercise physiologist's lab.*

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Numerous heart rate training books, Internet sites, and journal articles endorse a several step procedure to determine your MHR. It is often suggested to conduct this with a training partner but only after consulting your physician. There are as many specific methods to obtaining a MHR as there are books on the subject but they all have common requirements. I've listed a few of these in the bibliography if you would like to use a specific coach's methodology (7,8,9). Typically, authors recommend the following generalized steps for runners. A similar pattern can be used by athletes in other sports.

- 1) Find a venue that suits your sport and gives you a good circuit (laps) to conduct repeats or intervals. Hills work well for runners and cyclists but, unfortunately, not for swimmers! The uphill part of the circuit should be long enough to sustain an all-out effort to exhaustion.
- 2) Be well warmed up before beginning your test, including several short intervals to elevate your heart rate followed by a full recovery.
- 3) Do a series of five repeats with a short easy effort rest in between. Check your heart rate monitor frequently during your repeats, especially during the last two. You may hit your max on the penultimate interval rather than the last, depending on your level of fatigue. As an example,

build your effort going up the hill and jog back to the starting point to lower your heart rate, then immediately start again. Serially increase your effort from easy on the first interval to an all-out effort on the last repeat.

- 4) The last half of your last repeat should be as hard as you can go where you finally finish with that eagerly anticipated feeling of total exhaustion. In most cases, this effort should achieve your actual maximum heart rate, so watch your monitor while gasping for breath and hanging on to your knees for support.

For those of you who are content with a less exacting number, just start with your calculated MHR. Use it until you have a better MHR number based on your training experience, practical determination of MHR, or a maximum exertion stress test at your cardiologist's office, or exercise physiologist's lab. When you see a higher number on your monitor when doing an interval workout, or a high intensity distance workout or a race, then that number becomes your new MHR. It may not be as accurate as the steps above, but it may be much less stressful.

In the next issue of the *AMAA Journal* we will have the final installment of this series. In it I will discuss workout design and use of a heart rate based training program to extend your AT to higher %MHR and other related biofeedback.

*Dr. Douglas Munch is a medical consultant and long-time competitive athlete in track, swimming, and cycling. He received his doctorate in medicine and biomedical engineering from the Johns Hopkins University, School of Medicine in Baltimore, Maryland.*

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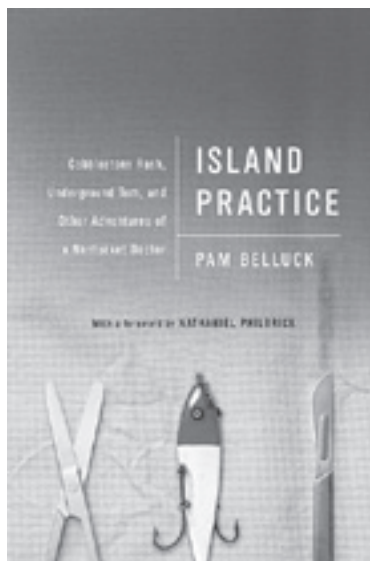
## BOOK REVIEW

# SAINTS and SINNERS within the Healing Arts 'Island Practice' and 'Charlatan'

By Paul J. Kiell, MD

## Island Practice: Cobblestone Rash, Underground Tom, and Other Adventures of a Nantucket Doctor

By Pam Belluck  
Hardcover, 274 pp, PublicAffairs, 2012



Two non-fiction books trace recent and past medical personalities reflecting polar opposites, each expressing variations on the theme of good versus evil.

For the former trait, in *Island Practice*, you read about 68-year-old Dr. Timothy J. Lepore who does practice on an island, Nantucket Island. He is both expert surgeon and old-fashioned family doctor.

Immediately Lepore reminded me of Dr. Sam Abelman from the novel and movie, *The Last Angry Man*, who, like Lepore, was a noble anachronism. Abelman quotes Thoreau. Both Abelman and Lepore aspire to Thoreau's lifestyle. Abelman grows corn in the backyard of his office-home sitting amid the poverty and squalor of the decaying Brooklyn neighborhood where he practiced. Lepore, like Thoreau, treks through the woods, hunts, and arrives at some of his home calls. He also

arrives at becoming an expert in Lyme disease and other tick-borne disorders.

In other settings, both Abelman and Lepore speak out against the quacks, against the "galloots," against those conscienceless drug companies concerned only for profit, and against a medical world driven by insurance companies and health care chains.

With Lepore you can also find a touch of Lucas Marsh from the 1950s novel become movie, *Not as a Stranger*, a modicum of the TV neurosurgeon Ben Casey and a touch of Marcus Welby and Dr. Kildaire, even a bit of the seeming curmudgeon Dr. House seeps in at times.

But above all, like Dr. Sam Abelman (*Last Angry Man*) and like Thoreau, Lepore marches to the beat of his own drummer. For instance, you will read about a scalpel he carved out of obsidian (granite-like black volcanic glass).

Idiosyncrasies aside, he is scrupulously honest, caring, old fashioned, and unconventional in the sense that besides making house calls, he accepts payment at times per the old barter system. Above all, he is competent, the doctor we all thought we aspired to emulate until reality intruded its ugly countenance.

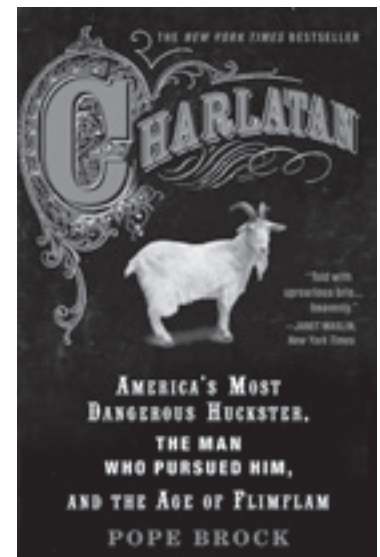
The book has many chapters telling of his medical escapades and the characters he befriends along the way, not unlike Thoreau roaming through the woods of Walden Pond. Possibly there are a bit too many vignettes because before long you get it. On the other hand, this is a story that must be told.

In the last chapter, Lepore's smaller community hospital on the island has been taken over by a larger healthcare chain. He must make some kind of compromise and more or less conform. That issue rages on supplying dynamic material for another book. What seems clear, sadly, is that a Dr. Lepore may not only be a dying breed but one that is soon to become extinct.

Not so extinct, however, rather like the cancer cell that has learned the secret of eternal life, so too has the not-so-fine art of quackery thrived over the ages. In fact, the subtitle of the next book *Charlatan*, "the age of flimflam" is misleading because medical flimflam has existed throughout the ages.

## Charlatan: America's Most Dangerous Huckster, the Man Who Pursued Him, and the Age of Flimflam

By Pope Brock  
Softcover, 324 pp, Crown Publishing  
Group, 2008



In the story *Charlatan* the focus is on a unique, if not malevolent, flimflammer, John R. Brinkley (1885-1942), a "doctor" with dubious medical credentials coupled with a persona of rather dubious grata—in clinical terms, a sociopath.

Brinkley enters the field of quackery with his virility treatments, specifically the transplant of goat testicles into the scrotums of farmers complaining of their seeming decline in virility.

The book is fast-paced despite having to cover much ground. The author's sentences are well-crafted often with a sense of wry humor, sprinkled here and there with both irony and euphemisms.

The reader is given some of the history of late 1800s and 1900s quackery with a few respectable scientists inadvertently adding their names to that ignoble gallery. For example, mentioned in the book is Dr. Charles-Édouard Brown-Séquard,

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## Joel B. Weber, MD *Informally, Taking AMAA Ideals Back West*

By Jeff Venables

Joel B. Weber, MD, marathoner, and nature enthusiast follows his bliss. Exploring one's interests and going where they lead is nothing terribly unusual within the AMAA family, but in Joel's case an open-minded attitude and an adventurous spirit might even be credited with his ultimately obtaining a position as an anesthesiologist and later OR director for The Permanente Medical Group, at Kaiser South Sacramento in California.

Having been raised in Lawrenceville, New Jersey (and a bit in Pennsylvania as well), he

feels his east coast roots are well-served in Sacramento. The suburban community there is reminiscent of the towns of his upbringing, with strong public schools and a family-oriented culture. The stellar outdoor life, with Sacramento sandwiched as it is between the Bay Area and Lake Tahoe, is an added bonus for Joel, whose love of the outdoors and desire to challenge himself to some degree seem to have genuinely paved the way to medical school: Long before settling in Sacramento, it turns out, Joel had seen California before.

### The Road to Medical School

Joel attended Johns Hopkins University in Baltimore, completing his undergraduate studies with a degree in Natural Sciences in 1983. While there, an improbable opportunity arose. He'd heard about a PhD student,

Susan Fortney, that was studying cardiovascular changes associated with various types of exercise, in particular the effects on VO<sub>2</sub>max. Joel approached Susan about collaborating on an informal study—with Joel and his undergraduate friend as the subjects. They worked out a plan to take a baseline VO<sub>2</sub>max measurement, then cycle across the United States, reach California, and cycle home. Their oxygen capacity measurements would be taken again, and Susan would compare and record any differences for a proto-journal article that could perhaps help serve as part of her dissertation.

And so in 1982 cycle they did, with many adventures along the way. The two college juniors relied on a combination of camping, cheap motels, friends, and even strangers to shelter them at various rest points during the trip. "One night we slept in a courthouse," Joel recalls. He had heard that certain counties would sometimes open empty jail cells for people to voluntarily sleep in; the official there felt the courthouse lobby might be more comfortable.

They made it to the west coast, rode down to San Diego, and took the southern route on their return, after deciding between 90-degree days at altitude in the north and 110-degree days over lower, flatter terrain. "It was still going to be 90 degrees in some places up north, so we just decided on the hotter temperatures to avoid the mountains," he says.

With this kind of decision always looming, it is unsurprising that Joel's maximal oxygen capacity measurably improved over the course of the trip. He says that the two probably each lost about 10 pounds from their already lean body frames. That wound up being central to their increased cycling efficiency and endurance, maybe more so, he recalls, than any direct, objective increase in VO<sub>2</sub>max—a lighter chassis basically made the trip home easier.

Joel credits this experience with having a significant impact on his attractiveness as a candidate for medical school. "It always seemed to be the first thing they wanted to talk about," he



*Dr. Joel Weber running to finish the December 2012 Tucson Marathon in 3:34.*



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says of the interview process. Having a novel, medical-study oriented experience that places him in the middle of it as the subject—and immediately opens the door to untold numbers of anecdotes about any and every step of the way—probably did augment Joel's academic record, knowledge, diverse enthusiasms, and amiability, or at least provided the perfect conversational context for those traits to shine.

His interest in medicine, he says, stems from a lifelong love of science. "My favorite class in high school was physiology," he recalls. Joel has two uncles who are doctors as well, providing an environment that he sees as helping foster the idea of medical school further.

Joel attended the Robert Wood Johnson Medical School at Rutgers University in New Jersey, followed by an internship at the University of Southern California in 1988. He completed his residency in anesthesiology in 1991 at George Washington University Hospital in Washington, DC.

Dr. Weber has been with the Permanente Medical Group ever since. Over the last several years, "I've gotten into some leadership roles," he says modestly. He was chief of the department for 10 years before becoming OR director. In addition, Joel is currently Assistant Physician-in-Chief of Med-Legal and Compliance.

"My practice now is 50% clinical and 50% administrative," he says. "Med-Legal is a fascinating thing. It's a very sensitive issue when physicians try to be perfect but they can't always accomplish that. It's always tough to work with them and get through times when it didn't go perfectly." Several years ago Joel even completed a year of law school online. "Then something had to go. There was no way I could be marathon training, doing all this studying, and still be married," he jokes.

#### **An Active Family Life**

Joel met his wife Kimberly Weber while she was in nursing school in Los Angeles as Joel was completing his internship at USC. He'd chosen that school in part because of a growing fascination with California, the genesis of which could



*Dr. Joel Weber at the finish line with his 15-year-old daughter Molly, a cross-country runner.*

likely be traced back to the 1982 bike trip. Joel again ventured west for the 1984 Olympics in Los Angeles, as well as a third time to visit Yosemite and other national parks one year.

He was already set to complete his residency at George Washington University back in DC, but he did not let that deter his longer term plans to settle in the west; he looked for practices primarily in Arizona and California. Kimberly is a native of Southern California, but the couple ultimately decided to settle in the northern part of the state, in 1991, and the family is happy there today.

The Webers have three children, Abigail, Thomas, and Molly. Molly, a high school sophomore, runs for the school's cross-country team. Abigail is a senior at Johns Hopkins, where international studies have recently outpaced pre-med as the most popular field of concentration.

Joel and his son Thomas, a sophomore at UCLA, ran the Surf City USA Marathon in Huntington Beach together, as well as the San Diego Rock 'n' Roll Marathon, both back when Thomas was in high school. Their latest impulse is to sign up for so-called "mudder races," which this 50-plus runner often wins within his age group.

"The last one we did, near Temecula, was only eight miles, but it took almost as long as a marathon. You're going through swamps, there's barbed wire and all kinds of obstacles, and they all have a mud pit," Joel happily reports. The father-son duo has plans to top that effort with a 13-miler in Salt Lake City scheduled for this summer.

Back up north, Joel enjoys hiking in the Yosemite Valley up to Half Dome, an iconic

outlook that rises nearly 9,000 feet above sea level. The 16-mile round-trip hike can take upwards of 12 hours, and includes an ascent up two medal cables, which allow hikers to climb the last 400 feet to the summit without rock climbing equipment. The National Park Service web page for Yosemite National Park notes, presumably in an optimistic spirit, "Since 1919, relatively few people have fallen and died on the cables."

#### **A Late Marathoner**

Joel had run track in high school, but left it behind after a short stint in college to focus on his coursework. And so, despite staying fit with various adventures and regular physical activity over the years, it wasn't until 2007 that he really took up distance running.

Like most things, he went at it headlong and hasn't looked back. "I've done 38 so far, on my way to 100," he says, making both his ambitions and enjoyment of the sport clear. "I have six Bostons, and I need 19 more to join the club!" Joel is referring to the Quarter Century Club, a proud group of runners who bear the distinction of having completed 25 consecutive Boston Marathons.

He says, "James Flanigan, MD, PhD, long-time AMAA member, and anesthesia colleague of mine, has been an incredible marathon mentor for me." Dr. Flanigan is himself a member of the Quarter Century Club, and has run 99 marathons. "He's provided so much encouragement to me in my running endeavors. His knowledge of the sport and its history is truly impressive. He continues to race at a very high level while

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leading by example.” Fittingly, James’ 100th marathon is set for Boston 2013. “As you can tell, he has had a profound effect on me,” says Joel.

His marathon career certainly got off to a strong start. At his first race in 2007, despite muscle cramps that nearly sidelined him at mile 18, Joel ran an astonishing 3:39. He recalls thinking, “Wow, if I could find an easier course and shave nine minutes off this thing, I could actually qualify for Boston.” He had the bug. The next marathon he ran was the Sacramento CowTown Marathon, which was a double-loop course. “So it was pretty fast,” Joel says, “and I did a 3:22.” The race is now just one of those loops, a half-marathon called the Urban Cow, and sponsored by his own Kaiser Permanente. The 3:22 meant Joel solidly qualified for Boston 2008, and he has continued to qualify each year up to and including the race this April. It does not in the least discourage him that, even though he’s seven years older, Joel is punished by Boston’s revised, faster qualifying times and so still must break 3:30 for the race in 2014.

#### An AMAA West, for Everybody

At the California International Marathon (CIM), held typically on the first Sunday in December, Dr. Weber heads up an annual sports medicine clinic. Adjacent to the race expo, the clinic is open to anyone who wanders by and so it draws a broad cross-section of marathoners and their friends and families, an aspect that

Joel likes, and one that departs a bit from the AMAA meeting model.

“I really love the Sports Medicine Symposium at Boston,” he says. So when Joel had occasion to meet the CIM race director, John Mansoor, he broached the idea of starting something similar. “He was very much interested in being a kind of Boston of the west.” Joel came to learn, at the 40th anniversary of AMAA in Boston in 2011, that the organization in fact had its roots in California. Returning west felt right, and Joel considers AMAA executive director Dave Watt something of a mentor in helping the CIM clinic take shape.

“It also had a synergy with what my CEO was doing,” says Joel, referring to Kaiser’s increased race sponsorship role in the past several years. “He was interested in having Kaiser’s name on both the sports symposium and the marathon, and it just all came together,” Joel explains. Naturally, Joel brought in as speakers some Permanente Medical Group physicians, several of whom were doing sports medicine research at the time. The list of panelists Joel was able to and continues to attract includes renowned running coaches/exercise physiologists Jack Daniels and Greg McMillan, long-time *Runner’s World* editor Amby Burfoot, and USATF team physician Daniel Vigil, who has a sports medicine practice at Kaiser West Los Angeles. After experimenting with CME one year, Dr. Weber ultimately decided to go forward with the one-day clinic as a “come one, come all” for race entrants and the general public.

He says, “The one difference between what I do and what Dave sets up is that my info is

not quite as physician-oriented. Most runners, though, regardless of their profession, have an interest in the science of sports medicine, nutrition, optimizing their training, and learning about injury prevention and treatment strategies. I only need to tone down my talks a little bit.”

He is still an avid AMAA meeting attendee. “It’s such a great peer group. It’s nice to be in a room with so many people that you have so much in common with. You just strike up a conversation with any random person and it always works.” Again Joel recalls fondly the anniversary year in Boston, and learning much of the history of AMAA. He marvels at AMAA’s humble origins: “Medical support in a marathon; that was the genesis of it,” he says.

#### Ever New Adventures

On February 2, Joel ran his very first 50K race. “I thought, why don’t I go beyond the [marathon] distance, try that technique, because I’d never done that before.” This endeavor was largely part of his ongoing effort to capture a seventh qualifying time for Boston (in 2014). Clearly, though, it’s also symbolic of a man who pushes his limits, continues to see the joy in challenging himself, and refuses to succumb to bodily breakdown. Like that 20-year-old cross-country cyclist, today’s Joel Weber knows that if getting there feels good, it’s the journey itself that feels great.

*Jeff Venables is the editor of Running & FitNews® and a regular contributor to the AMAA Journal.*

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a prominent neurologist and researcher who ferreted out the pathology of what would be labeled the Brown-Sequard Syndrome, where there is hemi-section of the spinal cord giving sensory symptoms on one side of the body and motor on the other side. Another “finding,” the product of his research, was where Brown-Sequard claimed to have regained his previous virility after *eating extracts of monkey testis*.

Many other “scientists” devised their own variations on the theme of animal testicles. But Brown-Sequard, whose purported regain of virility was likely placebo effect since his work could not be scientifically replicated; nevertheless, it was a serendipitous venture leading to sex-gland research with later isolation of testosterone and steroids. Speaking of serendipity, as a result of its battles with Brinkley, the American Medical Association would grow to become a more viable oversight body in medicine.

Back to Brinkley—he would meet his Waterloo at the hands of Morris Fishbein, muckraking

editor of the *Journal of the American Medical Association*. Having made anti-semitic remarks about his ardent pursuer it was Brinkley who had the chutzpah to sue Fishbein for defamation, a suit Brinkley would lose, while at the same time suffering public exposure revealing him for what he was. That and a high casualty rate among his patients ultimately destroyed Brinkley.

But he put up a good fight along the way. Even earlier, 1930, undaunted by having lost his medical license, three days later he announced his candidacy for governor of Kansas, narrowly losing. He would also open an unregulated one million-watt radio station in Mexico from which he could broadcast his “cures” statewide. And in 1939 he was one of the dignitaries at Hollywood’s premier showing of *Gone with the Wind*.

How did he get away with it as long as he did? One clue not developed in the book is manifest in the story of Harry Hoxsey. Hoxsey, if I may digress, was one of Berkley’s aides and is only mentioned briefly at the beginning of chapter 27. Hoxsey had devised a mixture of herbs as a cure for cancer. Sans medical license he opened

clinics only to shut them down and move away to new locations. His cure of 400 cancer patients was totally discredited. In fact the Hoxsey Method was no help to him for his prostate cancer from which, in 1974, he died. But like Brinkley, his gig metastasized to Mexico where it now flourishes. It is enlightening to do a Google search for Harry Hoxsey and read the current testimonials of his adherents.

For it is not necessarily the pathogenic organism that is the cause; rather it is the territory upon which it preys—us.

A typical Brinkley patient is quoted in *Charlatan* as saying, “I knewed he was bilking me, but . . . I liked him anyway.”

Early in the book, the author makes a profound statement of why in medicine, (and with some political and religious figures), the mountebank is so successful. “Unlike most scams which target greed,” he writes, “quackery fires deeper into Jungian universals: our fear of death, our craving for miracles. When we see night approaching, nearly all of us are rubes.”

Yes, nearly all of us. . .

## Impressive Line-Up Planned for Boston 2013

The 42nd Annual AMAA Sports Medicine Symposium at the Boston Marathon, being held on April 13-14, 2013, at the Colonnade Hotel in Boston, Massachusetts, will boast an impressive line-up of speakers. Among those to present are T. Colin Campbell, PhD, author of *The China Study*, a best-selling nutrition book examining the relationship between the consumption of animal products and chronic illnesses such as coronary heart disease, diabetes, and cancers of the breast, prostate, and bowel. The book's title is taken from the China-Cornell-Oxford Project, a 20-year study that began in 1983 and was conducted jointly by the Chinese Academy of Preventive Medicine, Cornell University, and the University of Oxford. If you enjoyed last year's lecture by Dr. Caldwell Esselstyn on the benefits of a plant-based diet, this is a presentation you won't want to miss.

We are also pleased to announce returning speakers Drs. Daniel Lieberman and Irene Davis. We've heard each of them give thought-provoking presentations in the past and are looking forward to learning more on running form and gait patterns from the experts. Another returning speaker is Walter Bortz II, MD. His lectures, based on years of research and experience on physical exercise in the promotion of robust aging, are always enjoyable. This year he will discuss the "Plasticity of Human Aging." Similar to the previous speakers mentioned, Bortz is someone you can listen to for hours.

Although we could go on about the many excellent speakers and topics lined up for this year's symposium, we don't have the space to do so here. To view the full agenda, please visit [www.amaasportsmed.org](http://www.amaasportsmed.org). If you have questions regarding the symposium or weekend events, please write to Barbara Baldwin at [bbaldwin@americanrunning.org](mailto:bbaldwin@americanrunning.org).

## Sports Medicine Fellowship Awarded

Robert Fawcett, MD, associate residency program director of family medicine at Wellspan York Hospital couldn't be happier. He and the other doctors of Wellspan have been conjoining their expertise to raise the patients' services to a whole new level. Recently the ACGME, the Accreditation Council for Graduate Medical Education, approved a new dual fellowship at Wellspan. It is a Family Medicine-Sports Medicine Fellowship program sure to attract individuals looking to be specialists.

Dr. Fawcett will serve as director of the Sports-Medicine Fellowship, which will enhance their family medicine program, recruit new



talent, expand the medical coverage to the York, Pennsylvania community, and improve the training of post-graduate physicians as well.

As a regular participant and speaker at the AMAA's Sports Medicine Symposium at the Marine Corps Marathon, Dr. Fawcett is sure to enhance the audience's intellectual dialogue with a new group of "recruits" to both attend the meeting and volunteer in the medical tent on race day.

## Despite Ups and Downs, Saxena Keeps On Moving

Amol Saxena, DPM, recently received the Alumnus of the Year and Honor Medal from Scholl College of Podiatric Medicine, had a book published, and qualified for the World Duathlon. This highly awarded surgeon, speaker, and inventor had quite a year in 2012.

As a practitioner of podiatric medicine and surgery in Palo Alto, California, Saxena is a pioneer in several surgical procedures for the ankle and foot and an inventor of surgical instruments including an arthroscopic drill guide and a bone grafting retractor. On top of that the California native is influential internationally. He serves on the editorial board for the Italian *Muscle, Ligament & Tendon Journal*, he is an instructor for the German Association for Foot Surgery, and has operated on Gold Medalists and World Record holders from around the globe as well as in his own back yard.

Dr. Saxena is also the editor of a new book published through Springer Press (2012) entitled *International Advances in Foot and Ankle Surgery*. The book is a collaboration of internationally renowned surgeons in the fields of orthopedics, podiatric medicine, and trauma.

Unfortunately, Amol had his own trauma this past June 30 while he was out for a bike ride. He was hit by a careless driver and ruptured a disk in his back. Although he is still in the recovery stages, Dr. Amol Saxena keeps going. The World Duathlon Champ candidate knows what it takes to stay focused on the prize, even if momentarily it is the prize of recovery.

## Olympic Swim Coach Listed As Elite

Coach Ed Nessel, a frequent contributor to the *AMAA Journal*, must have seen the incredible potential in Cullen Jones when he began to coach him, but the team of Cullen and Coach Nessel have accomplished something few ever do, Olympic status and world class. Cullen currently holds the rank of second fastest swimmer in the world. Adulations go out to both swimmer and coach. Due to Cullen's ranking, Coach Nessel was recently listed in the top 30 most influential coaches to the 2012 Olympic Swim Team, an elite list reserved for the best. Congratulations Coach!

## Runner's Performance Institute Opening in Leesburg, Virginia

George Lane, DPM, had a vision of a place where runners could come for medical treatment, physical therapy, and education under one roof. Dr. Lane believes that a comprehensive approach to injury recovery and prevention is key to running longevity (as many of you have also concluded). Bringing his idea to fruition, this May Dr. Lane will open The Runner's Health and Performance Institute (RUNHAPI) in Leesburg, Virginia.

RUNHAPI will be a trifecta of services to runners combining comprehensive medical services for all running-related injuries of the back, hip, leg, ankle and foot with adept physical therapy designed for quick, thorough injury recovery and prevention and an exhaustive performance lab and education facility for thorough analysis and guidance. The facility will also house an anti-gravity running machine called the Alter-G to allow runners to continue to train while recovering from injury.

RUNHAPI is currently hiring specialists of all genres and running-passionate staff members. If this is you or someone you know, please call 571-252-7930 or email Dr. Lane at [footmender@aol.com](mailto:footmender@aol.com).

## Join the Elite Group

The AMAA recently held a successful Premier Membership drive, adding many members to the one-year upgraded options: *Supporter* (\$100), *Patron* (\$150), and *Olympian* (\$250). Anyone who joins the Premier group will receive a thank you gift based on level of support and recognition in the *AMAA Journal*, as well on the association's website, and at its Boston symposium. To upgrade your membership, go to [www.amaasportsmed.org](http://www.amaasportsmed.org) and click on "Join AMAA."



# PREMIER MEMBERS

The American Medical Athletic Association wishes to thank those members who have contributed to the organization beyond their annual dues. This list reflects membership upgrades received from January 1, 2012 to February 16, 2013.

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To become an AMAA Premier Member, please go to [www.amaasportsmed.org](http://www.amaasportsmed.org) and click on "Join AMAA." The funds from this program help support the AMAA running medicine awareness campaigns and the American Running Association's signature national outreach campaign event *National Run A Mile Days* held annually in May.

\* Contributions surpass Olympian level

± Life Member making contribution at the level of Premier Member



In October 2003, the American Road Racing Medical Society (ARRMS) was formed as a division of the American Running Association (ARA). The organization, a vision of the Twin Cities Marathon Medical Director Bill Roberts, MD, was designed to serve the road race community in North America as an educational and medical resource for all road races, triathlons, and charity walks. Then, in January 2012, the

organization reevaluated itself to ensure the organization and its mission included a more global approach.

The organization is now proud to announce a newly formed partnership with the Matthew Good Foundation and the Good Family from the United Kingdom. Through their support and guidance, the *new* International Institute for Race Management (IIRM) will promote the health, safety, and awareness in all participants of endurance events and marathons *throughout the world*. They will be driven by the principles of education, research, and the development of medical standards. IIRM will provide its

members with continuing education through a website portal, as well as networking opportunities, membership services, and advocacy.

During the lunch hour on Saturday, April 13, at the AMAA's 42nd Annual Sports Medicine Symposium at the Boston, Chris Troyanos, ATC, (Medical Coordinator/Boston Marathon and Executive Director of the IIRM) will provide a brief presentation to outline the goals of IIRM, an estimated action timeline, and answer questions about the new organization. Announcements will be made as we approach April to provide you with the exact time of the talk.



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To view the symposium agenda and register for the two-day event, go to [www.amaasportsmed.org](http://www.amaasportsmed.org) and click on "Medical Meetings."