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Good News for Weekend Warriors

In a recent U.K. study of 63,591 middle-aged survey respondents self-reporting their leisure time physical activity several times over a decade and a half, the take-home message appears to be: To reduce mortality risk, get *some* exercise no matter what.

Survey respondents who reported even the lowest levels of exercise short of zero—a group categorized in the study as “insufficiently active”—still saw over a 30% reduction in mortality risk compared to sedentary controls.

It is not surprising that those at greatest risk are inactive adults, but once some level of physical activity was undertaken, it is striking how similar the health outcomes were across all activity levels for the three causes of mortality studied. Those three causes were: all-cause, cardiovascular disease (CVD), and cancer mortality.

In the observational study, which was published in *JAMA Internal Medicine*, activity levels were defined as follows:

- **Inactive:** No moderate or vigorous activity
- **Insufficiently active:** Less than 150 minutes/week of moderate and less than 75 minutes/week of vigorous activity
- **Weekend warrior:** Equal to or above 150 minutes/week of moderate or 75 minutes/week of vigorous activity, **but from only 1 to 2 sessions**
- **Regularly active:** Equal to or above 150 minutes/week of moderate or 75 minutes/week of vigorous activity from **3 or more sessions**

Household survey respondents 40 years and older from 11 cohorts in England and Scotland were included in the analysis. Data were collected from 1994 to 2012 and analyzed in 2016.

During the nine years of follow-up, 8,802 participants died. The results across activity groups are shown in the table below.

Reductions in Mortality Risk by Activity Group as Compared with Inactive Adults

	All-cause	CVD	Cancer
Total deaths	8,802	2,780	2,526
Insufficiently active	34% reduced risk	40% reduced risk	17% reduced risk
Weekend warriors	30% reduced risk	40% reduced risk	18% reduced risk
Regularly active	35% reduced risk	41% reduced risk	21% reduced risk

The regularly active—those spreading their exercise across three or more sessions per week at or above World Health Organization/U.S. Department of Health and Human Services recommended levels—enjoyed the greatest reductions in risk across the board, but in most cases barely so.

The WHO and HHS recommendations suggest that substantial health benefits accrue by meeting the recommended minimum level of physical activity and that additional benefit can be gained by performing more than the minimum level. These guidelines also advise that physical activity be spread throughout the week.

Yet the data suggest substantially similar benefits from compressing these recommended levels of activity into one or two days a week. Given the realities of time constraints for many people, and when compared to the significantly increased risk of performing no exercise at all, there is hope for people who find it difficult or impossible to adhere to prevailing physical activity guidelines.

It is important to note, however, that the study only looked at three specific health outcomes. Not only was further mortality benefit observed with more frequent activity, but there are other health outcomes to consider, for example, diabetes, which may be dramatically better regulated or even defeated by committing to a regular, daily routine rather than a sporadic or compressed one.

JAMA Intern Med. *Published online January 9, 2017,*
http://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2596007

JAMA Intern Med. *Invited Commentary, Published online January 9, 2017,*
http://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2596003

Physicians Panel to Healthy Women: Skip These Tests

Health fairs and clinics often promote screening tests for women you might not have heard of or ever had. Some of these tests, though widely offered for screening, aren't advised for generally healthy people and may lead to unnecessary procedures.

To resolve potential confusion, the United States Preventive Services Task Force (USPSTF) has compiled a list of tests they deem avoidable. The USPSTF is a panel of primary care physicians and epidemiologists funded by the U.S. Department of Health and Human Services. They develop clinical practice recommendations about various aspects of patient care. The guidelines are based upon the best available research evidence and practice experience and are meant to reduce undesirable variations in medical practice across different parts of the country by giving guidance to doctors for best practices.

To determine whether specific screening tests ought to be recommended, USPSTF panelists weigh the evidence of the potential benefits and risks of administering the tests to millions of people who have no signs of disease.

Their analysis considers whether the evidence is from "gold standard" randomized controlled trials, observational investigations or case studies. The issued guidelines then present who may and may not benefit from the tests.The USPSTF regularly examines new evidence to reassess the guidelines and issue new ones if necessary.

Tests currently not recommended
For low-risk women with no cardiovascular symptoms, these tests can generally be avoided:

Electrocardiogram (ECG). This test reveals abnormalities in the heart's electrical activity. The USPSTF recommends against using an ECG to predict the likelihood of heart attacks or related problems in people at low risk for heart disease and even says that there isn't enough evidence to determine whether it is useful for people at higher risk.

Carotid artery screening. The two carotid arteries pass through the neck, supplying blood to the neck, face and brain. Ultrasound imaging is used in carotid artery screening to detect narrowing of these major blood vessels, which is sometimes thought to predict an increased risk of stroke. However, the USPSTF says that there is little evidence to indicate that narrowed carotids increase stroke risk in asymptomatic people. This test may also lead to additional procedures, such as a surgical procedure to widen the arteries (carotid angioplasty), which carries a modest but real risk of complications.

Abdominal aortic aneurysm screening. The aorta supplies oxygenated blood to the circulatory system, and passes over the heart from the left ventricle, running down in front of the backbone. If the wall of the aorta weakens, it can develop a bulge (aneurysm) that if ruptured can cause fatal bleeding. This type of aneurysm is more common in older men than in women, and is also more common in smokers than nonsmokers. The USPSTF recommends against this

test for women who have never smoked and says there isn't enough evidence to make a recommendation for older women who are current or former smokers.

Unendorsed tests
No USPSTF guidelines have formally been issued for the following tests, but no reliable institutions that guide us have endorsed them for healthy women:

Whole-body CT scans. Many imaging centers promote full-body CT (computed tomography) to screen for tumors, aneurysms, osteoporosis, hernias, kidney stones and gallstones. However, the procedure hasn't been rigorously tested for that purpose. In fact, the National Cancer Institute warns that most abnormal findings on these tests do not indicate a serious health problem, but can lead to biopsies and other follow-up tests that are expensive, inconvenient and uncomfortable. In addition, whole-body CT delivers approximately four times the average yearly dose of natural radiation.

Coronary artery calcium score. A CT scan of the coronary arteries can detect calcium deposits that may signify an increased risk of myocardial infarction. The results of the scan are used to compute a coronary artery calcium (CAC) score. The USPSTF is currently evaluating the use of the CAC for screening. In the meantime, if your doctor hasn't advised you to have this test, there's no good reason to get it on your own.

Most women have likely had more than a few screening tests. Blood pressure and cholesterol screening, mammogram, Pap smear and colonoscopies are all fairly routine in this day and age, even as increased reports of false positives for some of these permeate the media as of late. Still, there are countless screening tests available that fall under the radar until they are presented to the patient, and it is good to have a sense ahead of time which if any of these are a worthwhile investment in your health.

Keep in mind that the USPSTF recommendations have been developed for the general population, and that only you and your doctor can decide on the screening schedule that is best for you.

***Harvard Women's Health Watch**, Jan. 2017, http://tinyurl.com/z8adb6l*

In U.S., Fish Widely Eaten is Largely Safe

Updated recommendations on fish consumption have been compiled by the FDA and Environmental Protection Agency, which examine the mercury levels in various types of fish.

It's important to note that the new recommendations are for young children and women who are breastfeeding, pregnant or may become pregnant. And the guidelines make clear that regular consumption of the many varieties of fish deemed safest is indeed very safe, even for these higher-risk demographics.

The agencies recommend that women of childbearing age eat every week two to three servings of "best choice" fish (types with the lowest mercury levels). Children should eat one to two servings of this category weekly. For adults, a serving is 4 ounces of uncooked fish; for children aged 4 to 7 years, a serving is half of that, or 2 ounces.

Best and good choice fish

"Best choice" fish includes canned light tuna, cod, crab, haddock, lobster, shrimp, salmon, tilapia and many other types. The FDA says that the "best choice" category includes 90% of all the fish eaten in the U.S.

One serving weekly of "good choice" fish is recommended. These types include yellowfin and albacore tuna, Chilean sea bass, snapper, halibut and mahi mahi.

An FDA analysis of fish consumption data found that 50% of pregnant women surveyed ate fewer than 2 ounces of fish per week, far less than the amount recommended. Because the nutritional benefits of eating fish are important for growth and development during pregnancy and early childhood, the agencies are advising and promoting a minimum level of fish consumption for these groups: a total of 8 to 12 ounces per week.

However, all fish contain at least traces of mercury, which can be harmful to the brain and nervous system if a person is exposed to too much of it over time. The maximum level of consumption recommended in the final advice is consistent with the previous recommended level of 12 ounces per week. The new advice is also consistent with the 2015 - 2020 Dietary Guidelines for Americans.

Fish to avoid

The "Fish to avoid" category includes king mackerel, marlin, orange roughy, shark, swordfish, bigeye tuna and Gulf of Mexico tilefish (while Atlantic tilefish is considered a "good choice" fish). A good rule of thumb is that larger fish with longer lifespans tend to accumulate more mercury. But the FDA and EPA have taken the guesswork out of choosing which fish to eat by providing a print-friendly downloadable chart for your convenience. The FDA encourages consumers, health professionals, educators and retailers to print, post and share the Fish Advice chart,

which categorizes over 60 different types of fish based on their average mercury levels. It is reprinted here:

When updating the advice, the agencies took a cautious and highly protective approach to allow consumers to enjoy the benefits of fish while avoiding those with higher levels of mercury, which is especially important during pregnancy and early childhood. The average mercury content of each type of fish was calculated based on FDA data and information from other sources.

Locally caught fish
For fish caught recreationally, consumers are urged to check for local advisories where they are fishing and gauge their fish consumption based on any local and state advisories for those waters.
If no information on fishing advisories is available, eat just one fish meal a week from local waters and also, avoid other fish that week. Consumers should clean and trim the fish they catch of fat and skin, since locally-caught fish may contain contaminants besides mercury that can be reduced by proper trimming and cooking. For example, broiling instead of frying can reduce some contaminants by letting fat drip away from the fish.

***USFDA**, Jan. 18, 2017, "FDA and EPA issue final fish consumption advice," http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm537362.htm*

***USDA**, Jan. 18, 2017, "Eating Fish: What Pregnant Women and Parents Should Know," http://www.fda.gov/Food/FoodborneIllnessContaminants/Metals/ucm393070.htm*

Biking Through Class for Better Behavioral Outcomes

One catch-22 in the treatment of children with behavioral disorders is that they demonstrate low participation in aerobic exercise, yet exercise has been shown to improve mood and behavior in children.

In an effort to move past this conundrum in the treatment of children with behavioral disorders, one randomized controlled study developed a new strategy to try and engage such children in physical activity with an eye toward improving their behavioral self-regulation and classroom functioning.

The study enlisted children and adolescents with “complex BHD,” or complex behavioral health disorders, meaning behavioral disorders with root causes in several genetic and environmental factors.

In the study, children with mental health disabilities attending a therapeutic day school were enrolled in an aerobic “cybercycling” physical education curriculum. This type of stationary bike combines the basic pedaling machine with virtual reality tours, competitive avatars or video

game features. The 14-week study of PE classes looked at both the chronic effects (over seven weeks) of exercise intervention and the acute effects a bout of exercise might have on behavior on any given day. A third factor under scrutiny was the overall programmatic effects the exercise intervention itself might have, as distinguished from the effects of the exercise.

The researchers compared the students' behavioral self-regulation scores when participating in the intervention curriculum with scores assessed during periods of standard, nonaerobic PE curriculum. The control in this case then, was not a separate group of subjects unexposed to the exercise intervention, but the periods of time (half, or seven weeks) when the same students were participating in standard PE instruction without an aerobic component.

During the intervention period, children used cybercycle stationary bikes twice per week during 30- to 40-minute PE classes. During the control period, children participated in standard nonaerobic PE. The data were analyzed to assess relationships between intervention exposures and clinical thresholds of behavioral outcomes, accounting for both individual and classroom random effects.

The study found that children experienced 32% to 51% lower odds of poor self-regulation and "learning-inhibiting disciplinary time out of class" when participating in the intervention as compared to the control condition, results the authors report as both clinically and statistically significant. Effects were appreciably more pronounced on days that children participated in the aerobic exercise, but carryover effects were also observed.

On days when children participated in the intervention cybercycling class, odds of disruptive levels of behavioral dysregulation declined between 71% and 76% relative to the control condition. Although there seemed to be chronic exercise and programmatic effects of this intervention on behavioral self-regulation and classroom functioning even on days when children did not bike, acute exercise appears to be the primary driver of the intervention effect.

The authors write, "This school-based exercise intervention may significantly improve child behavioral health without increasing parental burden or health care costs, or disrupting academic schedules."

In addition to aerobic exercise, the cybercycling PE classes may hold several other advantages over standard PE programming. They require fewer transitions, which are often challenging to children with BHD. Also, the cybercycling PE allowed students to avoid peer judgments of performance, because other students could not see their performance data unless they shared it. Standard PE classes confer their own benefits, however, including motor skill acquisition, team sports practice and socialization.

***Pediatrics**, 2017, Vol. 139, No. 2,*
http://pediatrics.aappublications.org/content/139/2/e20161985

Warning Your Teen Athlete Not to Heed Supplement Sellers' "Advice"

Health food stores provide ready access to dietary supplements for teen athletes, despite American Academy of Pediatrics recommendations against them, a new study finds.

Specifically, the AAP recommends against pediatric use of creatine and testosterone boosters, yet research suggests that many young teenagers take these dietary supplements. Many male athletes are interested in improving muscle mass and strength and may use nutritional supplements and muscle-enhancing products to achieve this goal. The study's objective was to determine to what extent health food stores would recommend and/or sell creatine and testosterone boosters to a 15-year-old male customer.

A research assistant posing as 15-year-old high school football player called a national sample of 244 health food stores and told the sales attendant he was involved in strength training and wanted recommendations about supplements. If the sales attendant did not initially recommend creatine or a testosterone booster, the research assistant then asked specifically about these products.

It turns out that two-thirds of sales attendants at health food stores recommended creatine and 10% recommended testosterone boosters for an adolescent male athlete, despite current recommendations against these supplements.

Prevalence and dangers of youth creatine use

Young boy athletes often perceive themselves as less muscular than their ideal body image, and therefore may take supplements to try to increase their muscle mass. In 2005, one study reported that 12% of boys reported using supplements to improve appearance, muscle mass or strength. More recently, in a 2012 study of 2,793 adolescents at 20 urban middle and high schools in Minnesota, 34.7% of boys reported using protein supplements, 5.9% used steroids and 10.5% used some other muscle-enhancing substance.

Even setting aside the well-known dangers of steroid use, creatine is one of the most popular weight gain supplements among this age group; several studies report between 8.8% and 21% of high school boy athletes admit creatine use. In a study of 37 public high schools in Wisconsin, 30.1% of high school football players reported creatine use.

Clearly, there is widespread use of creatine among adolescents despite the recommendations of the AAP, as well as the American College of Sports Medicine, against creatine use by those under age 18. The physiologic effects claimed by dietary supplement companies in advertising and marketing are often not supported by research. Moreover, use of creatine and/or testosterone boosters may pose significant health risks to adolescents.

Creatine use has also been associated with an increased risk of compartment syndrome, a condition where pressure builds in a muscle compartment and prevents blood flow. Furthermore, because dietary supplements are subject to little oversight by the FDA, the safety and efficacy of supplements available on the market are not rigorously established. In fact, research shows that dietary workout supplements are often adulterated with pharmaceutical drugs and can lead to adverse effects, such as hypertension, stroke and liver injury.

Often high school creatine users either do not know how much creatine they are taking or are intentionally taking more than the dose recommended on packaging provided by manufacturers.

Details of the health food store study
Overall, 67% of the 244 sales attendants recommended creatine (94 without prompting and 70 after prompting); just 30% recommended against its use. More encouragingly, almost 90% of sales attendants recommended against a testosterone booster; of the 24 who did recommend it, only 2 did so without prompting. Still, overall, 74% of sales attendants told the caller he could purchase creatine on his own; 41% said the same for a testosterone booster.

This study documents that health food stores nationally often recommend age-restricted supplements to young male teenagers. It highlights the need to review how supplements are promoted and the important role pediatricians play in counseling youth about the risks of supplement use.

Parents and pediatricians should inform teenagers, especially athletes, about safe, healthy methods to improve athletic performance and discourage them from using creatine or testosterone boosters. Retailers and state legislatures should also consider banning the sale of these products to minors.

***Pediatrics**, Jan. 2, 2017, e-pub,*
http://pediatrics.aappublications.org/content/early/2016/12/29/peds.2016-1257

Heartburn: When to See a Doctor

According to a 2012 article published on *Healthline*, 60% of the adult population will experience some type of gastroesophageal reflux disease (GERD) within a 12-month period. Those suffering from weekly symptoms are estimated at 20% to 30%. Approximately seven million people in the U.S. have some symptoms of GERD, aka acid reflux or heartburn.

For many people suffering from heartburn, watching what they eat, o.t.c. medications and stress reduction can bring relief. But when symptoms don't improve and start to interfere with sleep or daily life, it is time to get your doctor's help.

Your doctor will ask detailed questions about the nature and pattern of your pain, including:

- Is it worse after you eat a heavy meal or eat certain food, such as high-fat foods or dairy products?

- Does bending over to tie your shoelaces or lying down aggravate the symptoms?

- Does the pain seem linked to anxiety or stress?

If your symptoms are typical for GERD, the first step is usually to try a medication such as omeprazole (Prilosec) or lansoprazole (Prevacid). If symptoms improve, you can switch to a less powerful medication. That might be an H2-receptor antagonist (H2 blocker) such as cimetidine (Tagamet), ranitidine (Zantac), or famotidine (Pepcid), or an antacid like Tums.

If, however, medication doesn't seem to help, your doctor might suggest some tests to confirm reflux or rule out other possible causes for your symptoms.

Be aware that reflux symptoms can be similar to heart attack symptoms. *If what you feel is more like a constriction or pressure rather than burning, call your doctor.* Even if you know you have reflux, always seek medical attention if you experience chest discomfort brought on by exercise. Pay attention to the severity and length of your chest pain. Severe, pressing or squeezing discomfort, especially if it lasts a while, also warrants a call to your doctor.

7 ways to get heartburn relief

Indigestion comes in a variety of forms, but it is a real phenomenon. The medical term for persistent upper abdominal pain or discomfort without an identifiable medical cause is *functional dyspepsia*, meaning "bad digestion." Sometimes after a meal, your stomach just doesn't "feel right." Or you may feel bloated and uncomfortable. It can take on the classic burning sensation we refer to as heartburn. Some people feel queasy or become nauseated. You might say you have an "upset stomach." The symptoms can come and go at any time, but often eating is the trigger. Sometimes the discomfort begins during the meal; other times, about half an hour later.

Functional dyspepsia afflicts women and men about equally, and is responsible for a significant percentage of visits to primary care doctors, in part because many people worry they might have an ulcer. While it's frustrating that the cause of functional dyspepsia is unknown, it's even more frustrating that there is no surefire cure.

The good news is that there are simple things you can try to help get some heartburn relief:

- Avoid foods that trigger your symptoms.

- Eat small portions and don't overeat; try eating smaller, more frequent meals throughout the day, and be sure to chew food slowly and completely.

- Avoid activities that result in swallowing excess air, such as smoking, eating quickly, chewing gum, and drinking carbonated beverages.

- Reduce your stress. Try relaxation therapies, cognitive behavioral therapy or exercise. An aerobic workout 3 to 5 times per week can help, but don't exercise right after eating.

- Get enough rest.

- Don't lie down within two hours of eating.

- Keep your weight under control.

***Harvard Health Publications**, The Sensitive Gut, 2016*

***Healthline**, June 30, 2012, "Acid Reflux (GERD) Statistics and Facts," by Julie-Ann Amos, medically reviewed by George Krucik, MD, http://www.healthline.com/health/gerd/statistics*

Red Meat Tied to Significant Diverticulitis Risk Increase

Diverticula are small pouches that can form in the lining of the digestive system, most often in the large intestine (colon). They are common in people over age 40, and in and of themselves do not generally cause problems.

However, one or more of the pouches can become inflamed or infected, a condition known as diverticulitis. This can cause severe abdominal pain, fever, nausea and a marked change in your bowel habits. While mild diverticulitis can be treated with rest, changes in the diet and antibiotics, when diverticulitis is severe or recurring, it can require surgery.

So it is significant to the extent that a new study has found that red meat consumption appears directly implicated in greater diverticulitis risk. The increasing nuance with which the media reports the potential roles that fat in general, saturated fat in particular, animal proteins and red meat may or may not play in the risk of heart disease, metabolic syndrome, atherosclerosis and other negative health outcomes has led more than a handful of people to conclude few if any foods can neatly be described as absolutely "bad for you" nowadays (a view not exactly shared by most medical professionals).

The present study, then, offers at least one clear cut aspect of high levels of red meat consumption that virtually all of us would consider undesirable. Researchers looked at 46,461 male health professionals *without diverticular disease at baseline.* The large cohort was drawn from those enrolled in the Health Professionals Follow-Up Study (1986-2012).The men

completed dietary questionnaires every four years during this time frame, which saw the onset of 764 cases of diverticulitis.

Compared with men in the lowest 25% of red meat intake—just 1.2 servings per week—those in the highest quintile—consuming some 13.5 servings of red meat weekly—had a nearly 60% increased risk for diverticulitis. In particular, *risk increased 18% with each daily serving of red meat.*

The association was stronger for unprocessed red meat than for processed red meat. *Higher consumption of poultry or fish was not associated with risk of diverticulitis.* In fact, when a substitution of poultry or fish was made for just one serving of red meat per day, diverticulitis risk was reduced by 20%.

The study authors suspect chronic, low-grade systemic inflammation, exacerbated by high levels of unprocessed red meat consumption, could be one cause of the increased risk. (Of course, *processed* red meat has its own drawbacks, including high nitrate and sodium levels thought to increase cancer and hypertension risk.)

While the study makes a renewed case for limiting red meat consumption, increasing fiber consumption is one known preventive measure for diverticular disease. This step, combined with substituting more servings of red meat with poultry or fish, could help stave off the disorder even if red meat, which is particularly rich in iron, is not entirely phased out of one's diet. For an overview of present governmental recommendations on fish consumption, see "In U.S., Fish Widely Eaten is Largely Safe," in this issue.

***Gut**, published online Jan. 9, 2017, http://gut.bmj.com/content/early/2017/01/03/gutjnl-2016-313082*

***The Mayo Clinic**, Diseases and Conditions: Diverticulitis, http://www.mayoclinic.org/diseases-conditions/diverticulitis/basics/definition/con-20033495*

Are You D Deficient?

In "Vitamin D: What's the 'right' level?" *Harvard Health Blog* contributing editor Monique Tello, MD, MPH writes that many of her patients who come into the office for physical exams ask to have their vitamin D levels checked. They may have a family member with osteoporosis, or have even had bone thinning themselves. All seem to want to know that they're doing everything they can to keep their bones strong. Vitamin D is critical for healthy bones. But when physicians check blood levels for vitamin D, precisely how to act on the result is still the subject of great controversy.

What is a "healthy" vitamin D level?

What is the current threshold at which vitamin D levels are considered low? The answer is not just academic, as too low a level puts people at risk for developing bone thinning and increased fracture risk. To be clear, the measure is for blood level of 25-hydroxy-vitamin D, most commonly quantified in nanograms per milliliter (ng/mL).

In 2010, the Institute of Medicine reported on a thorough examination of the data that estimated a vitamin D level of 20 ng/mL or higher was adequate for good bone health, and a level below 20 was considered a vitamin D deficiency.

Dr. Tello observes that in clinical practice it is not uncommon to see a vitamin D level less than 20. When that happens, she writes, doctors often tell patients that they are deficient and recommend fairly aggressive replenishment, as well as ongoing supplementation. As she describes it, “The majority of folks have a level between 20 and 40, in my experience, and this is corroborated by the IOM’s findings in that 2010 report.”

But in 2011, the Endocrine Society—an international medical organization founded in 1916 that monitors the field of endocrinology and metabolism—issued a report urging a far higher minimum blood level of vitamin D. The society’s clinical practice guideline was developed by experts in the field assigned to a vitamin D task force, and they concluded: “Based on all the evidence, at a minimum, we recommend vitamin D levels of 30 ng/mL, and because of the vagaries of some of the assays, to guarantee sufficiency, we recommend between 40 and 60 ng/mL for both children and adults.”

And yet the most recent opinion on the right target level of vitamin D is presented in an article published in *NEJM*. In this piece, entitled, “Vitamin D Deficiency: Is There Really a Pandemic?”, several of the leading epidemiologists and endocrinologists who were on the original IOM committee argue for *a lowering of the currently accepted threshold level of 20*, stating that the level they estimated as acceptable was never intended to be used to define vitamin D deficiency. They feel that clinicians are overscreening for vitamin D deficiency, and unnecessarily treating individuals whose levels are perfectly acceptable.

Based on this analysis, a more appropriate threshold for vitamin D deficiency would be a much lower 12.5 ng/mL. The researchers examined a massive amount of data from the National Health and Nutrition Examination Survey (NHANES) for 2007 through 2010, and found that less than 6% of Americans had vitamin D levels less than 12.5. And so a threshold of 12.5 ng/mL would most certainly eliminate the “pandemic” of vitamin D deficiency.

What is and isn’t vitamin D deficiency

Tello spoke with osteoporosis expert Dr. Joel Finkelstein, associate director of the Bone Density Center at Massachusetts General Hospital, whose research in this field spans over three decades. He agreed with the authors of the *NEJM* article that we are currently overscreening for vitamin D deficiency, and overtreating people who are getting enough vitamin D through diet and sun exposure. “Vitamin D has been hyped massively,” he told her. “We do not need to be checking the vitamin D levels of most healthy individuals.”

He points out that from an evolutionary standpoint, it doesn't make sense that higher vitamin D levels would be beneficial to humans. Finkelstein reminds us that "vitamin D is actually quite hard to find in naturally occurring food sources. Yes, we can get vitamin D from the sun, but our bodies evolved to create darker skin in the parts of the world that get the most sun. If vitamin D is so critical to humans, why would we evolve in this way, to require something that is hard to come by, and then evolve in such a way as to make it harder to absorb?"

Who should be screened for vitamin D deficiency?

Dr. Finkelstein and his colleagues recently published a study of over 2,000 perimenopausal women who had been followed for almost 10 years, and they found that vitamin D levels less than 20 were associated with a slightly increased risk of nontraumatic fractures. They concluded that because few foods contain vitamin D, vitamin D supplementation is warranted in women at midlife with levels less than 20 ng/mL. "For perimenopausal women or other groups of people with higher fracture risk, certainly a level of 20 or above is ideal," he says, adding that "for the vast majority of healthy individuals, levels much lower—15, maybe 10—are probably perfectly fine, and so I would say I agree with what the authors [of the *NEJM* article] are saying."

Dr. Tello points out that most experts, including Dr. Finkelstein, agree that physicians should be checking vitamin D levels in high-risk people, such as patients with anorexia nervosa, people who have had gastric bypass surgeries, those who suffer from other malabsorption syndromes like celiac, or who simply have dark skin or wear total skin covering (and thus absorb less sunlight).

In addition to perimenopausal women and the high-risk groups mentioned above, other patient populations that likely require a 20 ng/mL vitamin D level include people diagnosed with reduced bone density short of osteoporosis, those with osteoporosis or other skeletal disorders, and pregnant and lactating women. All of these groups should be screened and treated appropriately.

***Journal of Clinical Endocrinology & Metabolism**, 2011, "Evaluation, treatment, and prevention of vitamin D deficiency: An Endocrine Society clinical practice guideline"*

***Harvard Health Blog**, Dec. 19, 2016, "Vitamin D: What's the "right" level?" by Monique Tello, MD, MPH, http://tinyurl.com/zvgaswg*

***Ann. Fam. Med.**, Vol. 15, No. 1, pp. 68-70, http://www.annfammed.org/content/15/1/68*

THE CLINIC

30 Weekly Miles is Not Likely to Affect Fertility

I am a 37 year old male runner with fertility problems. 85% of my sperm are abnormal and their mobility is poor. Last fall I was running between 50 and 70 miles per week; I am presently down to 30. Could my distance running be a contributing factor?

Hershel Augious
Stockton, CA

It's clear that excessive running may affect the hormone status and menstrual cycle in women, and men are not that different from women. So it is possible that excessive running may be preventing your testicles from performing the job they were meant to do, though at 30 miles a week, this does not seem to be the problem. Be sure to visit a urologist who specializes in male infertility. The national organization Resolve can help you find one in your area.

Jon Pryor, MD
Minneapolis, MN

Studies have shown that overtraining lowers testosterone levels and sperm counts. With decreased training, counts return to normal, though this takes several months. I reviewed the literature, and did not find any reports on exercise affecting sperm morphology and mobility, however. This, combined with the fact that you have decreased your training, leads me to believe that running is not the source of the problem.

Cathy Fieseler, MD
Tyler, TX

Evaluate Blood Pressure if Cramping Persists

I am a 44-year-old brain stem stroke survivor, very fit before my illness. Most of my deficits are involuntary (such as balance problems), and not muscle-control related. I am running again but at about 45 minutes into the run, I experience cramping in my left foot and lose control of my left ankle and foot. Is this what is known as spasticity? Is there anything I can do to reduce this? I'd like to be able to run longer, and I certainly can't see myself giving up running.

Cory Scofield
Annapolis, MD

Muscle spasticity during exercise is not uncommon in your situation, and may represent blood flow problems triggered by the running. Most neurologists would probably caution you about

running, which is vigorous exercise, but as a runner I appreciate your addiction. Before asking you to abandon the exercise, I advise you to take a treadmill stress test—not to evaluate your heart, but your blood pressure, during running. If it is aberrant, taking an appropriate medication might spare you complications and be helpful to alleviate your symptoms.

Ron Lawrence, MD
Malibu, CA

Hamstring Rehab

I am a 37-year-old male who runs four to five days per week, totaling about 25 miles per week. I recently injured my right hamstring playing football. I made a sudden, quick dash and felt it pull right in the middle. I fell to the ground immediately. I iced it on and off for four hours. I now wear an ace bandage, and follow the RICE treatment. What else can I do to help this heal quicker? What shouldn't I be doing? Should I stretch it? Is weightlifting OK? How long before I should run again? How can I prevent this from occurring again, especially since it has already happened once?

Stephen Grimlich
Washington, NC

The hamstring consists of three muscles in the back of the knee that cross both the knee and the hip joint. It functions both to flex the knee and extend the hip. When the muscles in the quadriceps are much stronger than the hamstrings, they can be injured, as well as when they are tight with limited range of motion and flexibility. Rest, Ice, Compression and Elevation are good first steps toward healing. Massage therapy often expedites recovery.

When the pain subsides (and it may take some time), you should add a stretching and strengthening exercise program for full range of motion in the hip and knee joints. Start with gentle isometrics such as tightening the quads to straighten the knee. Proceed to wall slides in which you straighten your leg against a wall while lying down and moving forward until a gentle stretch is felt. Finally, stand with your leg extended and supported on a table (or similar object at a comfortable height) and lean forward from your hips

All stretches should be performed slowly and held 15 to 30 seconds for three to five repetitions (see stretches below). Strengthening is also essential for full recovery and can be accomplished with hamstring curls. Start with 60% of normal maximum weight (for one repetition) and work up to three sets of 10. Add weight when this becomes too easy.

Carol Hamilton Zehnacker, PT
Frederick, MD

My experience has been that people rupture a hamstring muscle on the functionally shorter leg (and quads on the longer leg). If there is no history of fracture in the leg to cause the leg length difference, you might check for a lumbo-pelvic dysfunction as well.

Mitchell Goldflies, MD
Chicago, IL

Post-Marathon Pain One Month Out

Last year I ran my first marathon and about halfway through the race I began to feel pain in the groin at the point where my thigh meets my torso. The pain did not get much worse, but it didn't go away. It continued to hurt a month or two afterwards (most noticeably while running) and sometimes seemed to travel to the hip joint on my right side. What can I do to stop this pain from returning when I train for my next marathon?

Andrea O'Donnell
Cincinnati, OH

Many different conditions can contribute to pain in this region, including stress fracture, iliopsoas irritation and sacroiliac joint dysfunction. Therefore, an accurate diagnosis by a sports medicine doctor is very important. One likely possibility is that you have irritated either the rectus femoris tendon or one of the surrounding bursae (protective fluid sac). If so, I would suggest icing to help control the pain and swelling; 20 minutes on followed by 30 minutes off, repeating as often as needed. A non-steroidal anti-inflammatory medication such as ibuprofen can also help to control any related inflammation and pain.

Next, you may need to modify how you are training. Your body needs variety to continue to improve fitness levels and to prevent overuse injuries. Vary your distances, speed, terrain and time on a regular basis. It's far too easy to get into the rut of simply piling on the miles as you train for a marathon.

Don't neglect stretching. Even though research hasn't confirmed its benefits, most experts believe stretching is vitally important to prevent injury or recover from one. Because the rectus femoris (one of the quadricep muscles) flexes the hip and extends the knee, in order to stretch it effectively, you must oppose its actions at both of the joints—that is, flex the knee while extending the hip. This stretch can be performed while standing, lying on your stomach, or lying on your side.

Avoid common mistakes with this stretch by keeping the pelvis tucked under, knees close together and a "neutral" back (no arching). Grasp the lower leg and pull your heel towards the buttock until a strong pull is felt along the front of the thigh. Be sure to keep your knees side by side. Hold for 20 to 30 seconds and repeat three to five times daily. If this preventive stretching

program fails, see a sports professional at the earliest sign of a return of the pain to get an accurate diagnosis.

Maribeth Salge, PT
Rockledge, FL

The Back Page

The Longest Run

Cancer was not new to me. I first confronted it when I was 26 and it was melanoma. In February 1983 I had not idea what the word melanoma meant other than anything ending with "oma" was not good. Well, I managed to survive that encounter. It led to leaving the Navy and starting a second career. Speed ahead to 2010 and I have a 2nd melanoma found. Was I a bit complacent after 26 years? Sure, but I charged ahead and thought that my surgeon had gotten ahead of things. Well, this time, cancer decided to take a different path, just like going on a run. And once again like 1984, I had to find that path to get ahead and defeat the melanoma cancer cells.

It was just prior to the 2014 Boston Marathon and I felt a hard marble-like ball in my left upper shoulder. It was just above the surgical site of my 2010 melanoma excision. My mind raced. Could the cancer have spread to an unknown or unforeseen lymph node? In 2010, I had surgery to excise the area around the site of the melanoma lesion. It was not pretty. In fact later that summer, my then-5year old nephew saw me and asked what happened to my arm? I said shark bite. It made him step back in awe. Not me. I knew that the surgery was the best step at the time to get ahead. One aspect of that surgery was to inject nuclear dye at the original cancer site and see where it would go inside my lymphatic system. This procedure is called the "sentinel node". In my case, the melanoma cells followed a less traveled path. On that day, I was both anxious and pissed. I had not been vigilant checking all areas around my left shoulder, yet I was told that I was free and clear. I had no scheduled visits to see the surgical oncologist or an oncologist. That was a medical mistake and that's what angered me that day in 2014. All I was thinking is could we stay ahead. [*Just like running a race, you want to stay ahead of your competitors to win; in cancer's case the race to win is critical to beating*

cancer]. I went in for surgery and had my entire left armpit lymph nodes removed. All the nodes were negative, good news. The one piece of news that jarred me came from the radiology oncologist. He said that while the other nodes were negative, the primary node that was positive (cancer) had broken through its wall lining. Now I was fighting the odds of staying ahead of cancer cells' moves.

I was on the way to the PENN RELAYS in late April 2015, one week after the Boston Marathon weekend. I got a call from the radiology lab where I had gone for a CT. Something was small yet visible on my liver. Now my heart was racing. I call my oncologist and we talked about possibilities. It could be a non-lesion or it could be a metastasized melanoma lesion. It was the latter. My path ahead was not full of roses. I did not hear many great outcomes. This is when I called out for help. My friend Bill and wife Debbie went to work and started researching the advancements that were occurring in fighting advanced melanoma *[I did not like using the term Stage for where I was clinically with cancer*]. All I was hearing from my then-oncologist was a shot to see if I was genetically pre-disposed for a type of mutated gene – the BRAF gene. It turns out that about half of melanoma patients are BRAF positive, meaning they have the mutated BRAF gene. A new immunotherapy drug was available for those patients who were BRAF Positive. In my case, I was in the other half – BRAF Negative or what I would hear later BRAF WILD.

Quick layman's talk on immunotherapy drugs and their remarkable effect: These drugs can halt a T-cell inhibitor and unleash the ability of your immune system to go beyond the T-1 inhibitor and find the melanoma cells and lesions. [*Pardon me if I have screwed up the medical terminology and description]*.

It is now early May and I feel directionless. Yet my team let me emphasize the point of "team"; yes my team had come up with options that sounded futuristic and potentially a miracle cure. No oncologist likes to use that "C" word when it comes to defeating cancer. Bill had uncovered through his research on Pubmed.org that there were highly successful clinical trials involving other immunotherapy drugs. The good news was that these drugs were working on patients who were "BRAF WILD" (*remember I talked about a test for a mutated BRAF gene*). We all met, Debbie my wife and Bill. Looking over things it appeared there were options that my oncologist was not offering nor even mentioned to me in our meetings. Time was ripe for a summit meeting. In fact the doctors had their own meeting ahead of meeting with us. It was their "tumor board". They said to us that it was their opinion that I start taking the immunotherapy drug that was not a great match for me --- Pembrolimab. The three of us were a bit perplexed. Fortunately another new to the team oncologist agreed to talk to us privately. He had come to this new team from Georgetown University Hospital's LOMBARDI CANCER CLINIC. Bill brought up the clinical trial that involved two immunotherapy drugs, nivolumab and ipilumumab. This oncologist had just come from the Melanoma team at Georgetown. I asked him the one question that few others would answer: "What would you do if in my position?"

Three days later I had an appointment at the Lombardi Clinic at Georgetown University Hospital. The three of us went to the appointment with the Clinical Trial team. The very first thing I felt was a sense of calm. These people were here to help me. They were upbeat and

talked about how the Trial would work. Downsides were discussed along with side effects. What remained was the upbeat and positive nature of this team. I know it's whoey, but I felt like I belonged. That day the #2 oncologist for the Melanoma team told me I was accepted. In a matter of a week after some blood tests and a follow up scan, I could start treatment.

Onto the phase of infusion. Not Chemo! What the dual immunotherapy drugs were hoped to do: I came up with my own suspense imagery. The drugs were the magic potion that allowed the "wild wolves", aka the Super Cancer Fighters to go bounding throughout my body and seek, encompass and destroy all melanoma lesions and cells. Sounds like a video game, right? That is what I hoped would happen. Based on the initial results in the first two phases of the clinical trial, the duo of NIVO and IPILU were out there unlocking the wild wolves in over 60% of cases; plus that percentage was rising. Now it was my time. Infusion is done in similar way to Chemo. The main difference is Immunotherapy is not poison. Also as a patient, I did not get a "port". My first infusion was in mid June. The plan was to have 4 infusion dates of the dual immunotherapy drugs. The protocol involved coming in every week for blood work. Everything went fine. A week later, all was normal. I was still running and felt good.

It was now August and I had had my third infusion. One thing had happened on my neck. An obvious lymph node that had been enlarged as considered cancerous had disappeared – gonzo. I was a couple weeks out from my 4th and final infusion. We had planned a vacation to Cape Cod with a rental home. So on the way to the house I started feeling exhausted, a plain case of no energy. On Day 2 of vacation it was worse. I felt like a big sloth just sitting there. We call the on-call oncologist fellow and I was advised to go to the local ER. It turns out in Falmouth MA; this was their biggest event of the year, the Falmouth Road Race. The hospital was semi-deserted when I arrived. Most of the ER staff had worked the event and the basic crew was there. Next thing I know after a chest x-ray and CT, I am being admitted. It was a Sunday night and I am miserable. It turns out I had had the first major side effect of the dual immunotherapy drugs. My endocrine system had been overwhelmed. The wild wolves can attack things at-will that are not cancerous. So it went with my pituitary gland, thyroid gland and adrenal gland. Now came the powerful steroids to right my system.

It's September and I had started the dual infusion treatments in early to mid June. It was time for scans. I also found out that the oncology team felt the 4th dual infusion would be overkill. In addition, the Clinical Trial director at Bristol-Myers-Squibb removed me from the Trial due to my side effects. I wanted back "in". Through this period of misery in the hospital and good results visually of my neck lymph node, my lead oncologist and the team felt that they'd see a stable or shrinking scene on my liver. The CT scans confirmed it: my cancer was stagnated and the lesions appeared to be shrinking or surrounded. [*Previous biopsies on similar patients earlier in the Trial showed dead tissue surrounded by immune cells and material*]. Good, actually really great news! It appeared that the immune system had found the cancer lesions and cells and was attacking or had attacked and defeated the cancer. Could this be a cure?

It is now February 2017. I am coming up on the two year mark. This is the time that a couple of melanoma oncologists initially felt was a good marker for survival. Nothing is guaranteed. Yet

the most experienced of the oncologists who have worked on defeating melanoma for decades are now smiling. Dr Atkins, the lead oncologist on melanoma at Lombardi, sent out invitations in March 2016 to come attend a "Melanoma Survivors Luncheon". Anytime a cancer patient receives an invitation that says you are a "Survivor", please do attend. Since that day, I keep battling side effects that have been tough yet somewhat tolerable. I am not back to running….yet. I may never be able to play golf again due to the shoulder deterioration caused by the "wild wolves". Still, it's a miracle. I am convinced that the success in beating cancers like melanoma with immunotherapy drugs will have success in other cancers. You are seeing transferable use in treatment against lung cancer. I knew it as named NIVOLUMAB or NIVO. On TV it is *Opdivo*.

This story does not define me. It has opened a door to a second chance at life. For all of you who have had to endure cancer and continue to battle it today, I offer you hope.

With sincerity,

Dave Watt
ARA and AMAA Executive Director

Seen and Heard…while coaching

Ron Hill. This guy was a stud distance runner unlike no other. As he reached his 70s, the running streak became more than a news item only known to the "Streakers Association". Ron Hill was not your ordinary jogger or long distance runner. He was one of the best of the early running boom. He won the Boston Marathon in a then-record time of 2:10 and change. The previous record was 2:13. He was a 3 time United Kingdom (UK) Olympian who really likes to run. You do not run every day for at least one mile each day unless you love to run. On January 29, 2017 Ron Hill decided it was time to quit the streak. The day prior he ran a mile where his heart rate and general feeling were just not good. Some would say it was a strong sign. His streak record of 52 years 39 days may never be broken. But don't say that to our own **Mark Courtney**. Mark and I have grown to be good friends since I met him in my first year on the job at our AMAA Boston meeting in 2002. Little did I know when I ran an easy 2 mile run in and around Back Bay in Boston the day after Mark ran a 2:40 something Boston Marathon that I was just a witness to the daily routine of running for Mark. His own streak continues since it began in 1979. See Mark and I are the same age and I sometimes wonder what I would have had to do to keep a streak alive like Mark. I believe he told me that he did take out a catheter in the hospital once for a kidney stone to go run a mile. This is the mindset the streak runner must have to keep going. I am sure Ron Hill has it too, except when he saw that he might die on one more mile run, he better call it quits. If Mark does break Ron's record, I think it will happen just as it began: not a lot of fanfare and just will be that day when a few of us will be waiting with freshly tapped beer at the end to celebrate.

High School aged runners up to the Pro's are running the mid-Distance faster than ever *(and history gives us some foreshadowing of why runners today are setting American and World records)*. Just this past month, the indoor 800m records for women was broken on the same track by two different women in the same race. The winner of the race, Ajee Wilson, broke the World Indoor record in the 800m to run 1:58+. Back in 6th place was a high school runner from New York, Sammy Watson. She ran 2:01+ and broke the National High School record in the 800m. How could this happen in one day and in the same race? For one, female athletes are moving into events in the mid-distances like the 600m, 800m and 1000m. Many of these young girls and women in the past were inclined to stick to the sprint events where their natural speed was first noticed. Coaches simply put these athletes where their first time trials showed them to be dominant. Then along come the men in the 800m several years ago. Guys like Jeremy Wariner were natural 400m guys. Then a coach or two would realize that you could harness that 400m speed and give it some longer distance training and end up with an athlete who could be dominant.

---Dave Watt