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THE
CrossFit JOURNAL

DEVIL IN THE DIET

BY ANDRÉA MARIA CECIL

“Fear thee not fat.
Sugar is evil.”

“Fat is the devil. Have a
Coke and a smile.”





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In 1972, John Yudkin literally wrote the book on sugar: "Pure, White and Deadly." Ancel Keys, on the other hand, suggested fat was to blame for cardiovascular disease.

In the 1800s, Sylvester Graham scornfully wrote of fatty meats' driving sexual desire. His cure: whole wheat.

Later in the century, John Harvey Kellogg, a Graham follower, espoused the same wisdom, adding that too much lard would cause bowel backup. His solution: vegetarianism.

This way of eating, both men argued, was also a way to avoid disease and prolong life.

But our disdain for dietary fat started much earlier than the 19th century—years before either man created his intentionally bland recipe for Graham crackers or Kellogg's cornflakes.

Lipophobia

The diets of most native peoples the world over—from the aboriginals in Canada to the Maasai in East Africa—have been characterized by animal fat. Some indigenous groups have regularly drunk animal blood for dietary sodium. From this act was born the derogatory term "bloodthirsty savages."

"Civilized people" did no such things, said Dr. Steve Phinney, a physician scientist who has spent more than three decades studying diet, exercise, fatty acids and inflammation. "Civilized people" ate bread and other agriculture products.

"It was a cultural differentiation that probably wasn't spoken but it just kind of was there. It made it easier to vilify fat than to vilify corn or soybeans or potatoes," he explained.

But perhaps the single most effective affront to dietary fat was a man named Ancel Keys. Beginning in the 1940s, the University of Minnesota physiologist began correlating dietary fat with cardiovascular disease. He was an opponent of fat and a proponent of sugar.

At the time, Keys was the country's most influential nutrition scientist. And his reach was international. He was the man after whom **K-rations** were named, being their creator, and he was known as bold and brash to the point of arrogance, as described in Nina Teicholz's book "The Big Fat Surprise." His influence on nutrition, she wrote, was "unparalleled."

In his so-called Seven Countries Study, which he began in 1958, Keys found an association between fat and saturated-fat intake and heart-disease mortality. This finding made him a savior to an American public living in fear of heart disease, which medical professionals of the time had been billing as an inevitable fate.

Standing on the other side of that argument was John Yudkin, a physiologist at Queen Elizabeth College in London, England. He was internationally known as a purveyor of a low-carbohydrate diet and **repeatedly warned** that excessive consumption of added sugar—not dietary fat—was toxic.

In the first chapter of his 1972 book “Pure, White and Deadly,” Yudkin wrote, “I hope that when you have read this book I shall have convinced you that sugar is really dangerous.”

“I hope that when you have read this book I shall have convinced you that sugar is really dangerous.”

—John Yudkin,

“Pure, White and Deadly,” 1972

The two men became rivals, and Keys was sharp in his continual criticism of Yudkin’s findings.

“It is clear that Yudkin has no theoretical basis or experimental evidence to support his claim for a major influence of dietary sucrose in the etiology of (coronary heart disease); his claim that men who have CHD are excessive sugar eaters is nowhere confirmed but is disproved by many studies superior in methodology and/or magnitude to his own; and his ‘evidence’ from population statistics and time trends will not bear up under the most elementary critical examination. But the propaganda keeps on reverberating,” Keys wrote in **“Sucrose in the Diet and Coronary Heart Disease,”** published in *Atherosclerosis* in 1971.

Keys was successful in his efforts to discredit Yudkin. By the time Yudkin died in 1995, his sugar warnings had fallen on deaf ears.

In recent years, however, Keys’ reputation has unraveled.

He has come to be known as a scientific fraud, as outlined in the documentary film **“Sugar Coated.”**

Not only was Keys’ collegiate laboratory funded by the sugar industry for decades but he also conveniently omitted data that would have disapproved his theory that dietary fat caused heart disease and that sugar had no role in metabolic derangement. He ignored other nutrients people were eating and used tiny samples to prove his hypothesis. Had his Seven Countries Study included 21 additional countries, **two scientists later noted**, the association between fat and saturated-fat intake and heart-disease mortality would be weak and “a similar association could be advanced between animal protein intake and heart disease.”

But in 1961, Keys was nutrition lord.

That year, he graced the cover of **Time magazine**, and the American Heart Association Report **advised** Americans to “reduce intake of total fat, saturated fat and cholesterol. Increase intake of polyunsaturated fat.”

The guidance continued for decades and Americans dutifully adhered. In turn, their waistlines grew and their medications multiplied. The culprit, you see, wasn’t just the lack of fat but the type of food that replaced it.

“Diet is a trade-off,” said Gary Taubes, investigative journalist and best-selling author of “Good Calories, Bad Calories” and “Why We Get Fat.”

If you eat less of one type of food, you need to eat more of something else if you’re keeping calories constant, he explained.

“Protein tends to stay pretty much fixed in a Western diet (and) protein typically comes with fat attached to it,” Taubes said. “So if you want to restrict fat, you end up trading it off with carbohydrates in practice.”

He added: “When we targeted dietary fat, the effect of that, perhaps the unintended consequence ... is to jack up the carbohydrates.”

By the 1980s, carbohydrates were considered heart healthy and sugar relatively harmless.

“We based all of those decisions back in the ’70s ... on correlative science,” said Dr. Robert Lustig, a pediatric endocrinologist of 32



istockphoto.com/CHUYN

At the height of the fat-free craze, people did not discriminate: Even healthy fats were often avoided.

years at the University of California-San Francisco. “And correlation is not causation. I am a great believer in that you have to have causation in order to do something.”

Defining Fat

Compounding the problem is the fact that there are multiple types of dietary fat. Seven, specifically. And they aren’t created equal.

“There is not one thing called ‘dietary fat,’” Lustig explained.

From best to worst, they are: omega-3, monounsaturated, polyunsaturated, saturated, medium chain, omega-6 and trans fat. Generally speaking, the healthiest fats are those from plants and animals, while the unhealthiest are those created during the food-manufacturing process.

Omega-3 fats can be found in wild fish and algae, while monounsaturated fats can be found in olive oil, avocado and some nuts. Polyunsaturated fats are also present in nuts, as well as in seeds and fish. Saturated fats are part of foods such as fatty meats, butter, cheese and cream. Medium-chain fats are man-made by processing coconut and palm-kernel oils. Corn oil, safflower oil and soybean oil are some examples of omega-6 fats.

And finally, artificial trans fats are those created by industrial-food producers; one example is partially hydrogenated oil that can be found in margarine and shortening.

“In 1977, we didn’t know any of this,” Lustig said.

That year, the U.S. Senate Select Committee’s **Dietary Goals for the United States** advised Americans increase carbohydrate consumption to account for about 55 to 60 percent of energy intake and reduce overall fat consumption to 30 percent of energy intake. It also said saturated fat should account for about 10 percent of total energy intake and recommended that consumption be balanced with polyunsaturated and monounsaturated fat, which should each account for 10 percent of energy intake.

“So when we threw out dietary fat, we may have thrown the baby out with the bath water,” Lustig said.

And when manufacturers removed fat from food, it became bland. To make it taste good again, they devised a simple solution to keep consumers buying.

“The flavor was in the fat,” Lustig said. “So what did we do? We added sugar.”

Added sugar can be found in nearly every processed food imaginable—bread, ketchup, yogurt, meat and salad dressing are a few examples. And it goes by a plethora of names, including cane sugar, high-fructose corn syrup, honey, fructose, sucrose, glucose, agave, molasses and fruit-juice concentrate.

That ubiquity has contributed to Americans' sugar consumption.

While the World Health Organization **recommends** no more than 6 teaspoons of added sugar a day for normal-weight adults, the average American **consumes** 19.5 teaspoons every day.

“So in essence,” Lustig said, “it wasn't the vilification of fat but what we substituted it with.”

He continued: “I would argue that for sugar we already have causation. I can make a very, very strong case that we have causation. And we never had causation for fat.”

Yudkin would have agreed. He reached the same conclusion nearly 60 years earlier.

Unintended Consequences

For more than half a century, federal guidelines have pointed Americans to a low-fat, high-carb diet in the interest of saving them from pain, suffering and early demise.

The result was anything but: **earlier death and later years spent languishing with disease**. Americans became sicker than residents of poorer countries—such as South Korea, Slovenia and Portugal—that spend far less on health care.

Jennifer Poli/CrossFit Journal



With flavorful fat cut from products supposedly to improve health, many manufacturers turned to sugar to improve taste. The results have been disastrous.

Now the United States is in the throes of two epidemics: obesity and diabetes.

More than one-third of U.S. adults and 17 percent of youth were **obese** in 2011-2012, according to The Journal of the American Medical Association. Meanwhile, half of U.S. adults had **diabetes or prediabetes** in 2012, the journal found. America spent \$245 billion on diagnosed diabetes in 2012, **according to the American Diabetes Association**. Of that, \$176 billion was in direct medical costs and \$69 billion was in reduced productivity.

Today, diabetics in the U.S. number about 24 million. That number could grow to anywhere from 76 million to 100 million by the year 2050, according to a 2010 report published by **Population Health Metrics**.

“In simple terms, this fat phobia that's been created by (federal) guidelines and health organizations who have embraced these guidelines (has) backfired as people have tried to replace fat with carbohydrates, especially sugars and starches. So we're over-consuming carbohydrates relative to our tolerance,” explained Jeff Volek, kinesiology professor in the Department of Human Sciences at The Ohio State University.

Volek focuses on the clinical application of ketogenic diets, including the management of insulin resistance and Type 2 diabetes, as well as athletic performance and recovery. With Phinney, Volek co-authored “The New Atkins for a New You,” “The Art and Science of Low Carbohydrate Living” and “The Art and Science of Low Carbohydrate Performance.”

“The average person is now metabolically ill,” Volek continued. “It's just unbelievable that that's where we're at. And it's getting worse. We're definitely not plateauing or going in the other direction.”

Fixing Broke

The solution, Lustig said, is simple.

“Processed food is the problem. There's one diet that always works: It's real food.”

Real food is whole, clean, unprocessed fare rich in nutrients, high in fiber and free of additives, according to the **Institute for Responsible Nutrition**, an organization of which Lustig is one of the founders and board president. That includes produce, meat and dairy—the food found at a grocery store's perimeter.

But Taubes sees potential problems with how people might interpret the directive “eat real food.”

Fresh-fruit smoothies, for example, are real food, he noted, but provide an unusually high serving of fructose that the body rapidly ingests because it's liquid. That, in turn, overwhelms the pancreas and leads to body-fat accumulation.

“In an ideal world we get back to the place where the food environment is such that the choices you're making from birth onward don't predispose you to obesity and you can eat what's around you and you can remain healthy and lean,” Taubes said.

How to get there he said he doesn't know.

Jean-Marc Schwarz, a professor and researcher in the College of Osteopathic Medicine at Touro University in California, said more research needs to be done on nutrition because scientists have provided the public with confusing and contradictory messages for centuries.

“I wish that people would value the capacity of prevention, of having a good lifestyle and of nutrition, and for that we need to have good science associated with this.” ■

About the Author

Andréa Maria Cecil is assistant managing editor and head writer of the CrossFit Journal.

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—Jeff Volek



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SUCK IT UP

Marion Nestle talks about how Big Soda is under attack from communities and people who are tired of obesity, diabetes and bad science.

BY HILARY ACHAUER

SODA POLITICS

TAKING ON BIG SODA (AND WINNING)

MARION NESTLE

FOREWORD BY MARK BITTMAN
AFTERWORD BY NEAL BAER



The ingredients in soda are simple: carbonated water, high-fructose corn syrup and sucrose, caramel color, phosphoric and citric acids, caffeine, and natural flavors.

The ingredients may be simple, but their impact is profound.

Selling this flavored sugar water has turned The Coca-Cola Co., PepsiCo Inc. and Dr Pepper Snapple Group Inc. into multi-billion-dollar companies. As Marion Nestle points out in her exhaustively researched 500-page book “Soda Politics: Taking on Big Soda (and Winning),” the reach of these companies is global. They spend millions to influence health science, drive public policy and affect legislation. Nestle holds a doctorate in molecular biology and is a professor at New York University. She’s the author of numerous books about food safety, food politics and nutrition.

For decades, most of Big Soda’s dealings were unseen by the public. Then in August 2015, [The New York Times](#) revealed that Coca-Cola funded the Global Energy Balance Network (GEBN), a nonprofit organization dedicated to promoting the idea that the obesity epidemic can be pinned on a lack of exercise, not poor nutrition.

The reaction to these revelations, especially from those involved in public health, was [swift and negative](#). In response, Coca-Cola CEO Muhtar Kent wrote an Aug. 19 Wall Street Journal [op-ed](#) in which he vowed to improve transparency in the company’s research funding and promised to publish a list of partnerships and funded research on Coca-Cola’s website.

At the beginning of November, the University of Colorado School of Medicine announced it would [return a US\\$1 million gift from Coca-Cola](#). The money was intended to fund GEBN science that downplayed the link between sugar-sweetened beverages and obesity. At the end of that same month, the Associated Press obtained [emails](#) sent between Rhona Applebaum (Coca-Cola’s chief health and science officer) and GEBN president James Hill, a professor at the University of Colorado. The emails show Coca-Cola influenced the group from the beginning.

A few days after the correspondence came to light, Applebaum resigned and the GEBN [ceased operations](#).

The GEBN incident was perhaps the most prominent example of Big Soda’s influence on health science, but it’s far from the only one. In “Soda Politics,” Nestle details how beverage companies spend millions to affect government regulation, influence science,

promote sales to children and low-income groups, and expand into developing countries. In this interview, we explore what Nestle uncovered in the three years she spent writing the book.

CrossFit Journal: What led you to tackle this huge topic?

Marion Nestle: I was asked to do it by my agent ... it sounded like enormous fun. I thought the idea of writing about sodas just made really a lot of sense because I’m interested in food advocacy and there’s a lot of food advocacy around drinking less soda ... and there’s plenty to write about. I mean, I knew about soda marketing, and I’d been writing about soda marketing for a very long time and sort of tracking what the soda industry is doing. As more and more research was coming up that linked sodas to poor health, it seemed like this would just be a terrific opportunity to kind of show the way a food industry operates: following the tobacco-industry playbook and how advocates are fighting back and winning. In many instances soda sales are down.

In public-health terms, sodas are low-hanging fruit. And they are really easy targets. And so they are really easy to write about.

CFJ: Soda uses water from municipal supplies, so it makes that ingredient cheaper for them. You have a chapter in the book about how Coca-Cola ranks water as the second most prominent risk to profitability after obesity. Can you talk about some of the problems access to water poses for soda companies going forward?

MN: Because they are an international company, they have bottling plants in pretty much every country in which they do business, and a lot of those countries have water shortages.

And in countries like India, where the water supplies are very limited, a Coca-Cola bottling plant will deplete the local water supply, lower the water table, make it impossible for farmers to grow their crops, and reduce the availability of drinking water for the local community because the volume of water that’s needed is so great.

CFJ: You write about the debate surrounding whether or not soda should be included in the United States Department of Agriculture’s Supplemental Nutrition Assistance Program (SNAP, formerly known as the Food Stamp Program). Can you tell me the argument for including sodas in SNAP purchases and why you think they should be removed?

MN: The original proposal when food stamps ... were first being considered was to keep sodas out. There was a big argument in Congress about it, and eventually the lobbyists won. The soda (industry) lobbies extensively—it always has, it still does. It puts an enormous amount of lobbying effort and dollars into protecting anything that's going to affect its sales, and that was fine up until the time that obesity became a problem.

Low-income people have a higher prevalence of obesity and obesity-related diseases than do people with higher incomes. So, again, soda is low-hanging fruit. There's sugars and water and nothing else (in soda). SNAP recipients don't buy candy, so why should they be allowed to buy soda?

So that's the public-health argument. But that comes against very, very strong counter arguments from the anti-hunger community, who are very concerned about stigmatizing the poor, and who if you talk to them ... they just think it's insulting to tell SNAP recipients what they can and cannot buy with their SNAP benefits. But if you talk to anti-hunger advocates quietly and not for public consumption, they'll say that they are just terrified if there's any change made to the program that Congress will use it as an excuse to cut it. And they are right. They are right about that.

(They want to) keep it off the radar. When I was on the president's commission on SNAP ... we just spent a day lobbying, and we went and talked to staff of a great many senators and congress-people and people at the White House, and they told us the same thing: That until the advocates for the poor can get together on this one, nothing will happen.

CFJ: What can we learn from the successful soda-tax legislation in Berkeley, California, and Mexico?

MN: For a place in America, Berkeley did everything right. They did advocacy by the book, and what I mean by that is that they thought very carefully about what kind of frame they were going to use for it, and their frame was Berkeley against Big Soda. It wasn't being promoted as something that was good for health, although that was certainly part of it. But it made it very clear that this was (an) anti-corporate initiative, and what that did was it made it impossible for the soda industry to do anything without showing off its muscle.

What I was told by people in Berkeley was that they were really offended by the soda industry plastering the BART (Bay Area Rapid Transit) station with anti-tax posters. BART

stations never had advertising before, and people felt this was really inappropriate and pushy and Big Soda acting like Big Soda, and they were really offended by that. Every time the soda industry did anything, it was immediately revealed as Big Soda. So that was one thing. The other was they did very serious community organizing and went everywhere in the entire Berkeley community—rich and poor, hills and flats—and canvassed in every single community, discussing the issue with people. That was how they were able to get a 76 percent majority, which is pretty amazing.

That explains the Berkeley tax. The Mexico tax had other reasons for it. Mexico has the highest per capita consumption of sugary drinks, obesity rates are very high, its Type 2 diabetes (rates) are very high, sodas are deeply embedded in Mexican culture, so it's difficult to do anything about them, but the health issues in Mexico are extraordinary. They are really facing a health catastrophe if people don't reduce their obesity and their Type 2 diabetes and so forth.

So there was sympathy at the governmental level for passing a tax, particularly if the tax was tied to improving the water supply, which is a big problem in Mexico. And so the advocates wanted a 20 percent tax; they got a 10 percent tax, and there is evidence that that has reduced soda consumption by about 6 percent—about half of what they wanted, but still a step in the right direction. The soda industry was so upset by that that it came back and said, "We want the tax cut in half," and the advocates got busy again and that has not happened. But one of the things that Mexico is going for it is \$16 million in Bloomberg Foundation money.

CFJ: Why do you think the Bloomberg Foundation targeted Mexico? Because it felt it could have success there?

MN: The advocacy groups in Mexico are extremely well organized and extremely smart. There's a group coalition of about 30 groups, an alliance that has worked on this, and one of the groups in particular is just amazingly skilled at advocacy. They have a lot of connections in government. It looked like if they had some help with the television advertising and bringing in consultants and doing some of the other things that they would be able to rally a great deal of support, and that's what happened.

CFJ: It feels like we are at a turning point right now. Do you think public opinion and awareness are changing?



In 2014, Berkeley, California, became the first city in the United States to place an excise tax on sugary beverages. "Berkeley did everything right" in its fight against Big Soda, Nestle said.



“The New York Times piece this summer was a catastrophe for Coca-Cola. It was an enormous public-relations disaster for Coca-Cola.” —Marion Nestle



Bill Hayes

Marion Nestle

MN: Oh yeah. And I think all of the tax initiatives, the soda-cap initiative, and the advocacy is raising public awareness. That's why sales are down. Sales are down, and they've been going down for 10 years. More than 10 years: 15 years. And there's no sign of them leveling off, and the soda industry is very well aware of that. [The New York Times piece](#) this summer was a catastrophe for Coca-Cola. It was an enormous public-relations disaster for Coca-Cola. They were completely blindsided by it. They weren't expecting it. They hadn't thought about it in that way.

Their response to it was to go transparent, and that has had pretty amazing consequences where Coca-Cola has ... gotten divorced from the organizations that raised the most negative publicity. All three of the organizations (the Academy of Nutrition and Dietetics, the American Academy of Pediatrics, and the American Academy of Family Physicians) where the partnership has been severed are organizations with a lot of internal dissent about the Coca-Cola partnership.

Now it's done and the medical school at the University of Colorado is giving back (the money from Coca-Cola) ... I think there will be more of that kind of thing going on. It's starting to look like what happened to Phillip Morris.

CFJ: Have any of the soda companies responded to your book?

MN: I was on [The Diane Rehm Show](#) in Washington, D.C., and she asked a representative of the American Beverage Association (ABA) to come on with me, and the ABA refused, but they issued a press release that's pretty funny. I posted it on [my website](#). It was hilarious. I mean, it talked about how it was going to engage with critics, but then it didn't engage. Then the International Food Information Council, which is an industry group, somebody did a [blog post](#) that was quite critical of the book, but it was pretty clear that whoever wrote it hadn't read the book because the kinds of things she was criticizing I hadn't said.

CFJ: Where do you think we are in getting a nationwide soda tax?

MN: In this administration? I don't think so. Regime change (has to happen). It's not going to happen because there is so much industry opposition and Congress is so in thrall to industry.

CFJ: What has been the impact of the Berkeley soda tax, and why is it important for the consumer to feel a price increase?

MN: Consumers are paying higher prices for sodas now (in Berkeley). And they are paying enough higher prices so that it's generating \$100,000 a month for child health programs.

(More expensive sodas are important) because higher prices discourage sales. (It's) economic price elasticity. And that's what you hope, is that it will make the public think twice about buying ... it makes the cost of the product more expensive, and it makes people think twice.

And yes, it's regressive ... but so is Type 2 diabetes.

Nestle writes about the latest in health and food politics at [foodpolitics.com](#). ■

About the Author

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DIRT ROWED

BY EMILY BEERS

Filthy, under-maintained rowing machines cost affiliates money and add seconds to workouts.





Courtesy of James Lister

Rows and rows: Regular maintenance and cleaning are required to keep fleets in top shape.

You're finishing the 1,000-m row during Jackie and can't afford to waste time before moving to the thrusters. In a rush to unstrap your feet, you complete your last stroke, release the handle and let it smash into the monitor.

Your affiliate owner might admire your intensity but loathe your carelessness, and if you dismantled the rowing machine with such abandon at Syracuse University in New York, you'd find yourself in the doghouse with the crew.

"If a novice rower let go of the handle like that, everyone around would stop, and eyes would look over with a 'who did that?' look. It's an unacceptable norm in rowing to let the handle snap back against the cage," explained James Lister, assistant rowing coach of the Syracuse women's crew.

Worst-case scenario: "Throwing the handle" can damage or break the monitor, the most expensive part of the machine, explained Greg Hammond, a member of the marketing team with Concept2 Inc., manufacturer of rowing products since 1976.

"Usually it just breaks the glass screen, but if it gets slammed hard enough the whole monitor can break," he said.

Throwing the handle can also ruin the slotted chain swivel—the brass ring—that attaches to the handle and protects the chain.

"The chain and the bungee cord are the most vulnerable things on the machine. If you don't take care of the chain, you'll have to replace it," Hammond said.

Releasing the handle recklessly is just one ergometer faux pas Hammond said athletes should avoid. Proper rowing-machine etiquette and maintenance go a long way in saving affiliate owners time and money replacing parts or even entire machines, he added.

"The rowers are probably the most expensive machines you buy as an affiliate owner. It's important to learn how to take care of them."

Cleaning Crew

Keeping ergometers free of dirt is a great way to prolong the lifespans of the machines. That might seem obvious, but few people take the time to run a cloth over a machine that usually sits in a somewhat gritty warehouse space full of dust and chalk.

“I sit down on some (rowing machines) at CrossFit affiliates and I’m like, ‘How do you even know if these are running right? They feel so bumpy,’” said Hammond, who trains at Champlain Valley CrossFit in Williston, Vermont. “Owners need to mandate at their box that wiping a machine is the same as putting your plates away.”

Keeping ergometers free of dirt is a great way to prolong the lifespans of the machines.

When machines aren’t wiped down, dirt builds up on the monorail and seat rollers, preventing the seat from tracking smoothly. Eventually, seat rollers become dented and must be replaced. A bumpy ride also means athletes are forced to work harder by using their hamstrings more than they should to pull themselves up the slide, Hammond added.

Keeping machines dirt-free is simple: Handles, seats and monorails should be wiped with a cloth and disinfectant or soap after every use. To promote compliance, Hammond suggested keeping cloths and spray bottles—as well as posting a list of cleaning duties—near the ergometers. Included on that list should be a reminder to athletes not to store the handles in the holsters.

Using the holster stretches out the bungee cord and ruins the recoil feature of the bungee, Hammond explained.

“When the bungee doesn’t return the handle properly, the chain doesn’t get retracted fast enough between strokes.”

The only time the holster should be used is when an athlete is taking a break between intervals, Hammond added. The rest of the time, handles should be kept against the cage.

When Lister coached at Duke University in North Carolina, he said he removed the holsters from all the ergometers, which immediately solved the problem.

Finally, educating clients to speak up when they notice problems—such as a low battery or a loose screw—goes a long way in keeping ergometers running well.



When dirt builds up on the rails, athletes are in for a bumpy ride.

Emily Beers/CrossFit Journal

“When screws are loose, they cause the frame to wobble. That puts extra stress on the machine and can damage it over time,” Hammond said. Numbering the machines makes reporting problems easier, he added.

“Then when someone gets finished with class, they can say to the coach, ‘Rowing machine Number 13 feels bumpy,’” Hammond said. “This will help the affiliate owner save time figuring out which machine needs maintenance.”

Annual Maintenance

Oiling the chain, cleaning the flywheel and updating the monitor are three other maintenance concerns.

Determining how often you need to oil your machine and clean your flywheel largely comes down to climate. Ergometers in cold-weather gyms don’t need to be cleaned as often as those in dry, dusty, hot locales, Hammond explained.

On average, he recommends oiling the chain twice a year. The most effective way to do this is to pour a teaspoon of lightweight oil, mineral oil or [3-in-One oil](#) onto a cloth, pull the chain out as far as it will go and gently rub it down, Hammond said.

“Don’t drip oil directly onto the machine,” he warned. “If you drip oil, it just goes everywhere and makes a mess.”

Cleaning the flywheel is also simple and should usually be done about once a year, Hammond said. Open the cage and [wipe or vacuum](#) the flywheel until all the dust and debris have been removed. A dust-free flywheel is important to ensure an accurate drag-factor reading, he explained.

“Air goes in and out (of the flywheel), and when it is clogged the air doesn’t leave as fast as it should, so the flywheel spins longer between strokes. This is essentially the drag factor,” Hammond said. When air doesn’t leave the flywheel as fast as it should, the drag decreases, meaning an athlete has to increase the drag by raising the damper on the side of the cage to generate the proper tension.

A higher number on the damper—numbers range from one to 10—increases the drag, but the only way to know the exact drag on an ergometer is to test the machine’s drag factor. This can be done by selecting “display drag factor” on the monitor and then taking a few hard strokes until the monitor spits out a number between 90 and 150.



Wiping sweat off the machine after every use will prevent dirt and grime from accumulating.

Emily Beers/CrossFit Journal



Courtesy of Greg Hammond

Greg Hammond of Concept2 said recent upgrades to monitor firmware were designed to make life easier for CrossFit athletes.

Lightweight rowers usually keep their drag at around 110—which corresponds to about three or four on the damper of a well-maintained machine—while heavyweight rowers often prefer to row in the 130-range with a damper set at about five or six.

“One-third of our company is doing CrossFit now. It’s a huge part of our culture, too. And our updates reflect this.”
—Greg Hammond

The last piece of the maintenance puzzle is updating your monitors whenever Concept2 releases new firmware—the computer program embedded into the monitor. This requires going to the Concept2 website and following the updating instructions.

“Just like your iPhone, these updates fix little things in the monitor that you might not even know are happening,” Hammond said.

On the new [Performance Monitor 5 \(PM5\) models](#), this can be done with a USB flash drive, while the slightly older [PM4](#) and [PM3](#) models must be linked directly to a computer with a printer cable. It only takes five to 10 minutes to update the monitor, Hammond explained.

Concept2 updates firmware if it finds a bug in the system or if it introduces a new feature to the monitor, Hammond explained. The most recent PM5 update—Version 20—was released in October 2015, so if you haven’t updated your firmware since then, your rowers are out of date.

One recent addition Concept2 added to the monitors is the undefined-rest feature, a monitor update for PM3, PM4 and PM5 models.

“The only exception would be the very first run of PM3s, but those (machines) are over 10 years old,” Hammond said.

Undefined rest was introduced specifically for the CrossFit community—yet another reason for affiliate owners to stay on top of what’s new, Hammond added.

While rowers tend to know exactly how long they plan to rest during an interval workout, CrossFit athletes usually don’t. For example, athletes often won’t be sure how long the deadlifts and box jumps will take them after each 500-m rowing interval in a workout such as Christine—3 rounds of a 500-m row, 12 deadlifts and 21 box jumps.

Older firmware caused the monitor to shut off after two minutes of inactivity, but now athletes can plug in an undefined rest period, ensuring the machine doesn’t go blank in the middle of the workout.

“One-third of our company is doing CrossFit now. It’s a huge part of our culture, too. And our updates reflect this,” Hammond said.

Better Performance, Longer Life

Natalie Mastracci rowed for Syracuse University from 2007 to 2013. Her erg performances suffered when she rowed on improperly maintained, bumpy machines, she said. The handful of times she rowed at globo gyms, she was struck by the disrepair of the machines.

“Oh my goodness. The chains are always so rickety (at globo gyms). They don’t coil back into the machine the way they should,” Mastracci said. “I think it would make at least five to 10 seconds’ difference on a 2-km row, depending on how poorly the machine is maintained and how inaccurate the drag factor is. If the cord is totally stretched out, I don’t even think you could get the right split if you tried.”

Like competitive rowers, CrossFit athletes are also committed to their numbers. So knowing a poorly maintained machine will negatively affect a score should be incentive enough to make sure machines are kept in tip-top shape, Hammond said.

A properly maintained machine is a win for the athlete, but it’s also a cost-saving win for the affiliate owner, he added.

“If you take good care of the machine, it can last 20 years.” ■

About the Author

Emily Beers is a CrossFit Journal contributor and coach at [CrossFit Vancouver](#). She finished 37th at the 2014 Reebok CrossFit Games.



THE **CrossFit** JOURNAL

DEFENSE NEVER RESTS

Tim Pipes explains how CrossFit Defense prepares athletes to stay alert, cultivate the warrior mindset and respond to threats.

BY TIM PIPES

I SHALL ONLY ASK FOR A LONG LIFE
AND THAT I MAY CONTINUE TO RISK IT
SO OTHERS DO NOT HAVE TO.
A STRONG SHIELD, A SHARP SWORD
FOR I INTEND TO GO IN HARM'S WAY.
AND WHEN I STAND IN JUDGMENT,
MEASURE MY QUALITY BY
THE EVIL I STOOD AGAINST.
AND BY THE EVIL
I REMOVED FROM
THIS EARTH.



Dave Re/CrossFit Journal

Violent attacks are terrifying, but training and preparation can help you achieve the best results possible should an attack occur.

One-on-one human violence: It's often up close and personal, overwhelmingly uncomfortable, brutally intense, and devastatingly traumatic. Many prefer to imagine violence doesn't exist, but make no mistake about it: Evil and violence are real, and complacency and denial are useless when we experience violence by chance or by choice of profession.

I don't make these statements to frighten, intimidate or discourage. I only want you to ponder your preparedness when it comes to personal protection and self-defense.

I also offer up good news: "There is an athlete and a warrior within everyone. We differ only in degree and purpose," said former Navy SEAL Cmdr. Mark Divine, a colleague in the CrossFit and tactical fields.

You see, athletes and warriors are among us in many capacities: current and former SWAT-team members and military operators; law-enforcement officers and firefighters; emergency medical technicians, paramedics and rescue personnel; high-school, college, amateur or professional sports athletes; CrossFit competitors and CrossFit box members; and stay-at-home moms and other everyday civilians with the warrior heart and mindset.

"Who cares how much you deadlift if you're dead?" is the provocative question CrossFit Defense founder Tony Blauer often asks.

We all understand how warriors demand the most from themselves and must maintain exceptional fitness for operational/mission readiness. Warrior fitness combines conditioning of the mind, body and spirit in the warrior tradition of extreme training and preparedness. The beautiful effects of such intense training include marked improvement with vital skills that relate to real-life scenarios warriors encounter. Preparation for and involvement in extreme challenges tests these skills in individuals and builds team camaraderie and dynamics like nothing else.

That is why we love CrossFit. But let's be honest: No amount of physical, fitness or tactical training can prepare an individual for a real one-on-one violent attack.

"Elite fitness doesn't guarantee your safety," Blauer has said.

Enter CrossFit Defense—the study of human movement as it relates to violence, fear and aggression for the CrossFit athlete. How cool would it be to take the constantly varied functional movements that we have performed at high intensity for thousands of reps and seamlessly combine them with a lightning-fast, genetically ingrained method of self-protection?

CrossFit Defense theory accomplishes just that.

Getting off the X

In the early days of my law-enforcement training, police officers were taught to immediately seek cover if ambushed with gunfire. Once in cover, officers would draw their weapons, find the source of the attack and return fire. Infantry training was similar in concept, but infantry members were taught to kneel, go prone, look for and find natural cover, and then seek shelter. In shelter, soldiers could ask “what next?” or await orders from command.

During my 10-plus years on the SWAT team, the training shifted to a more appropriate response: immediate and accurate return fire that caused the ambusher to seek cover. Special forces operators respond the same way by laying down immediate and accurate return fire and aggressively suppressing and flanking the ambush or disengaging if needed.

This response is triggered by a personal mental directive that shifts the mind from reactive to aggressive. If realistic training has acclimatized combatants to violence and favorable outcomes, then the mental directive and the associated tactical response become second nature once danger is encountered. The personal mental directive establishes a positive, assertive and motivating inner dialog that creates a natural “this then this” scenario.

“All fights are dangerous, but the most dangerous of all is the ambush.”

—Tony Blauer

In an ambush, we are already well behind the curve. In reality, every street fight is a surprise of some kind because we don't walk around performing our everyday business while expecting or fearing a violent attack. But if we became more aware of

our surroundings to some degree and picked up on some pre-contact cues from potential attackers, could we potentially avoid the ambush altogether?

The spot where the ambush attack occurs is symbolically referred to as the “X.” Blauer would submit that self-defense can begin far before you step on the X. Response to an attack must be quick and decisive, but responding before the attack is even better.

Mindset is key to getting off the X and out of harm's way. We must possess an aggressive “when/then” mindset sparked by a mental directive we have already determined and practiced—and have ready to implement when trouble appears. The mental directive will change the body's involuntary fight-or-flight response into an active and aggressive fight response enabling actions that prevent an attack or help someone get off the X.

If a victim senses something is wrong even before the attack, the body's built-in survival system can become frozen with fear or indecision. “Fear causes hesitation, and hesitation will cause your worst fears to come true,” as said in the movie “Point Break.” We may be occupied with thoughts of “why?” “what now?” or “oh no,” or we may be frozen in utter surprise. This is fear-induced psychophysical inertia.

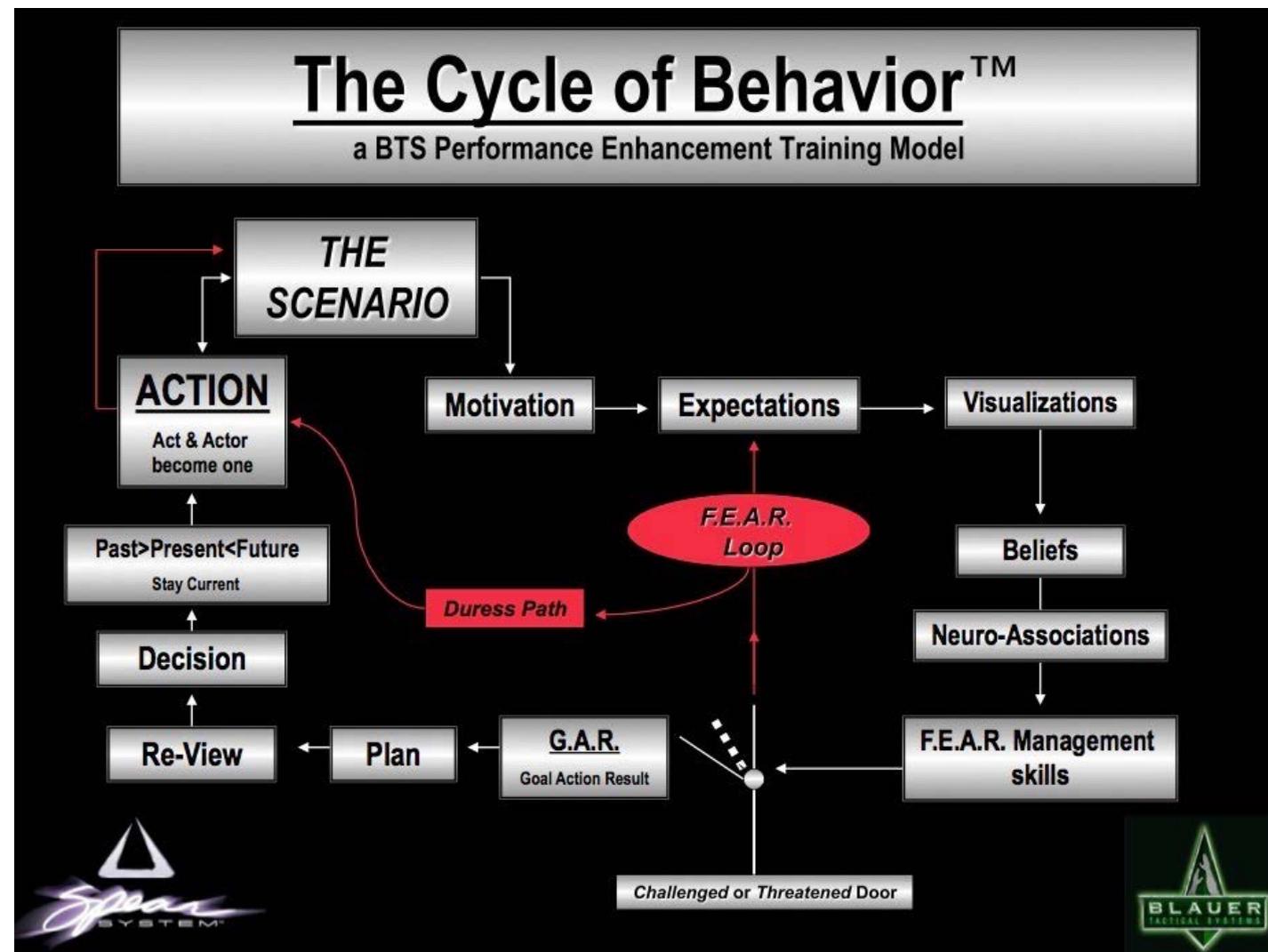
A mental directive creates a pathway to an immediate response. We also scientifically understand that action is faster than reaction. In a typical street fight, the bad guy's action is faster than the good guy's reaction. Therefore, a way to beat the bad guy is to be “in-action” beforehand. In Blauer's SPEAR System (spontaneous protection enabling accelerated response) and in CrossFit Defense, we want to operate forward of the bad guy's action. In-action is faster than both action and reaction, so we must tune into our intuition and immediately act upon it.

The bad guy wants at least one of three things: our body, our property or our life. We don't necessarily have the luxury of waiting around to determine which. If the hair on the back of your neck is standing up, it's time to initiate a directive and get off the X.

Consider the potential cost of ignoring survival instincts. Erring on the side of safety is never wrong.

The Cycle of Behavior

Several years ago, my wife, my son and I were in Red River, New Mexico, for an event under a huge outdoor tent with seats



The Cycle of Behavior shows how the FEAR Loop derails goal-oriented actions that can bring positive results in a conflict.

for several hundred people. During the evening, the threat of an impending mountain rainstorm was apparent, and the storm soon hit with a vengeance. In a matter of seconds, it appeared as though the wind was going to pick up the tent, drop the poles and tear the place to pieces. I was wide eyed and frozen because I had not been paying attention. I had not even thought of a plan or response to anything like that. Frozen due to lack of preparation or forethought, I was sorely unprepared to protect my family and myself from violence—natural violence, this time.

Having grown up as a military brat and living in Maryland for part of her childhood, my wife was no stranger to preparing for, encountering and surviving hurricanes and tornadoes. She immediately pushed down on top of my head and crammed me underneath a table. She knew that we needed to be protected from anything falling, and the table was the closest sturdy protection. We sought refuge there for a few minutes, and the wind let up.

We came out completely unscathed, and my mind and body were still playing catch-up. I was amazed at how quickly and precisely she had responded to the impending threat. She saved us all. Had it been up to me, we might have been injured or even killed.

I had used visualization in sports to increase performance, and I had learned to push through fear or pain to accomplish a goal, a mission or even a CrossFit workout. In the tent, I was frozen with fear and stuck in a rut. I was trapped in a FEAR Loop. It was years after my incident in New Mexico that I saw Blauer's chart and explanation of The Cycle of Behavior, including the FEAR Loop (false expectations/evidence appearing real). Once I saw the chart, it all made sense, and I was able to apply it to scenarios involving not only combat and self-defense but also sports, CrossFit workouts, business projects, relationships, and so on.

Tony Blauer/Blauer Tactical Systems



Dave Re/CrossFit Journal

An ambush puts the victim at a disadvantage. Having a pre-programmed mental directive helps him or her “catch up” and deal with the threat.

The chart provided a map for understanding the pitfalls of being threatened or trapped in the FEAR Loop, and it laid out the performance-enhancing pathways to proper fear management and appropriate responses.

The Cycle of Behavior is not absolute or exhaustive, but it's certainly a great tool to help you understand fear, fear management and performance. It applies to violent scenarios but can also be applied to increase safety and performance in non-violent situations.

Intro to SPEAR

Blauer describes people as “hard-wired human weapon systems.”

Self-defense was around long before the various martial-arts systems and styles; the martial arts grew out of organic self-defense. That doesn't discount the value of those systems and styles, but it does make Blauer's SPEAR System the first and only behaviorally inspired and genetically wired self-defense system. The SPEAR System was designed to help us convert the universal flinch into a protective response to danger or attack.

Blauer had immersed himself in traditional martial arts since a young age. In the late 1970s, as Blauer began developing a way to teach self-defense to others, he questioned the application of typical self-defense training to real-life scenarios.

In 1988, something remarkable happened while Blauer was conducting an experimental drill, later called “the sucker-punch drill.” The drill was simple: Blauer, with a mouthguard, would maintain a natural stance; his aggressor, wearing 16-ounce gloves, would encroach, taunt and gesture before launching a punch at any time and from any angle. Blauer could block, counter or evade but not strike.

In attack after attack, Blauer found his technical martial-arts-inspired blocks and counters were often ineffective at protecting him from the unpredictable angles, ranges and timings of the strikes. When pain, discomfort and fear of impact prompted a flinch as opposed to the typically regimented martial-arts movements, Blauer was far more successful in avoiding the brunt of the blows.

The martial-arts systems were simply not as fast and effective in intercepting a sucker punch during a drill that very accurately simulates the unpredictability of a real-life fight. Once Blauer's swelling and headache subsided, the SPEAR System was born.



Dave Re/CrossFit Journal

In an attack, remaining frozen is not an option. Immediate assertive action is required.

It literally had to be pounded into Blauer's head that sport fighting and the random reality of a real fight are vastly different. We now have lots of video evidence to easily prove the point Blauer discovered through years of research: The body can be refined into a completely natural, subconscious, lightning-fast, tactical human weapon system.

The SPEAR System uses the body's genetically ingrained survival system and response to danger, and Blauer has pointed out the three-dimensional integrity of the system.

The first aspect of the three-dimensional model is the emotional power of the spear as an icon. A spear is a sharp, powerful impaling weapon. It invokes images of Spartan warriors, strength, precision and domination. In Blauer's system, we are the weapon—the spear. The second aspect is the psychological benefit of the phrase “spontaneous protection enabling accelerated response.” A suspect's aggression triggers a spontaneous reaction, and the lightning-fast flinch response both protects from the initial attack and enables a response that can result in control or dominance. The third aspect is biomechanical/physical: When we put our arms in the full SPEAR position, we resemble the shape of a spear.

Golden Rules

In a fight or violent encounter, our mindset is dynamic, and Blauer has three golden rules regarding the psychological aspects of a violent encounter.

Once we imagine or fear pain or damage, or if we doubt our ability to be victorious or survive a violent confrontation, we are at a significant mental disadvantage. The losing mindset of a helpless victim often stems from apathy, and the victim's thoughts are clouded with denial born of an inability to accept the reality of a dangerous situation. If we don't inherently possess a warrior mindset, acceptance is the first step toward that mindset. Acceptance is the key to action and the remedy for fear- or panic-induced inertia. The golden rule is that we must simply accept the situation and move on.

In the Cycle of Behavior model, a decision must be made to exit the FEAR Loop. Remaining frozen in a threatened state keeps us in the loop, and so the second golden rule is to be challenged immediately upon recognition of a potential threat. We must accept our circumstances, get challenged, examine the goal, and start figuring out strategic plans and tactics to make it happen.



The warrior mindset can help victims turn into survivors.

The third golden rule: Don't stop thinking. Many people freeze in situations because they stopped thinking about other options or because they keep trying to force something that isn't working. In wrestling, if one move does not work, we keep thinking and immediately move to another—and another if needed. If we miss a double-leg takedown, we snatch up the single. If that doesn't work, we try something else. We call it “chain fighting.” We link the moves together and go from one to the next without pausing, never getting stuck on one option. If this mentality is practiced and drilled, it becomes second nature.

These three golden rules are effective psychological fear-management tools. The mind can be your greatest ally or your most formidable foe, so get your mind right. The warrior mindset is an invaluable asset.

Be Your Own Bodyguard

I recently had the honor of once again co-instructing the boxing block of instruction in the Abilene Police Academy in Texas. The block is always scheduled for the beginning of the second week of training. We regularly lose between one and five new cadets during the first two weeks, and the boxing portion is often one of the main catalysts.

We don't have time to teach the police cadets how to box, and that's not the intent of the training. Cadets view videos of officers in fights, and we teach them the basic boxing strikes, then encourage them to relax, keep their hands up, throw straight punches and throw punches in combinations. We tell them to avoid turning their backs on opponents, and we tell them to show some heart and never ever quit.

I always point out that fitness is foundational, with skill and application following. Even with an experienced fighter, skills go out the window once he or she is tired. I explain how much it sucks to be tired and scared in a real-life street fight, and I let them know they are worthless to me as a police officer if they are unwilling or unable to fight.

To motivate, I ask them to identify the meaningful thing or things in their lives and use the mental images of these things to help them prepare for and finish the fight. I tell them they are expected to finish any fight—quitting is never an option.

When the cadets cram in a mouthpiece and put on headgear and gloves and then fight, any remnant of boxing skill goes right out the window after about 30 seconds. They almost immediately forget most of what we taught them, and they only have the opportunity to show the cadre and academy staff members their heart.



Quitting is never an option: Your life is on the line.

It becomes painfully apparent which cadets are woefully lacking in mental strength. Place a young, inexperienced, scared, intimidated, out-of-shape or mentally weak cadet a couple of minutes deep into a round with someone pounding his or her headgear, and that person's heart, mental strength and mindset become clearly visible.

Some cadets who have chosen a profession involving the warrior craft simply do not exhibit the desire to survive. The discomfort of their body outweighs their will and causes them to forget the things that matter to them. They are unprepared, and they lack the warrior mindset. However, the will to survive and the determination to never quit are vital to us all regardless of profession.

Each individual has the inherent right and ability to protect himself or herself, his or her family and those who cannot protect themselves. Find what motivates you. Cultivate the heart and mindset of a warrior. Get indignant and stay in the fight. Be your own bodyguard. ■

About the Author

Tim Pipes has been in law enforcement for 22 years, with work experience ranging from corrections and patrol to street crimes, undercover narcotics, instructing, and SWAT. Tim currently serves with the Abilene Police Department in Texas as a detective in Criminal Investigations/Major Crimes Against Persons, and he's been assigned to the department's SWAT Team for 11 years. Tim is a frequent instructor on law enforcement, fitness, pursuit driving, firearms/weapons and tactics, and combatives for Abilene Police, West Central Texas Law Enforcement, Texas Tactical Police Officers Association and the U.S. Department of State. Tim owned CrossFit Benedictus in Abilene for five years and holds the following CrossFit certificates: Level 1, Coach's Prep Course, Endurance, Movement and Mobility, and Judges Course. He holds CrossFit Defense Instructor's, CrossFit Striking Instructor's and Blauer Tactical Systems Personal Defense Readiness Instructor's certificates. He is also a USA Weightlifting Level 1 Sports Performance Coach.

SODA WARNING LABEL STILL ON AGENDA IN CALIFORNIA

Bill dies in committee but supporters say anti-soda legislation is just a matter of time.

BY ANDRÉA MARIA CECIL

STATE OF CALIFORNIA SAFETY WARNING: Drinking beverages with added sugar(s) contributes to obesity, diabetes, and tooth decay.



Sen. Bill Monning



Harold Goldstein



Sen. Monning (second from right) on the future of soda-label legislation: "My intent (is) let's use the 2016 campaign season to inject it as a campaign issue in California."

The effort to pass a recently failed bill requiring health-warning labels on sugar-sweetened beverages in California is a marathon, not a sprint, said sponsoring Sen. Bill Monning.

"While it's obviously a disappointment that we don't have an immediate vehicle ... we won't just lie dormant. We will use 2016 to continue to educate members, and I think the most powerful persuasion for members here (is) in their districts," Monning told the CrossFit Journal on Jan. 15.

He might be right.

On Jan. 13—the same day Monning withdrew [Senate Bill 203](#) for consideration by the Senate Health Committee—Field Research Corp. released a [statewide poll](#) stating that 78 percent of voters support a warning label on sugary beverages. That's a [slight increase from 2014](#), when 74 percent of California voters supported such a measure.

Monning, a Democrat from Carmel and the Senate majority leader, first introduced the Sugar-Sweetened Beverages Safety Warning Act in February 2013 as [Senate Bill 1000](#).

The bill passed the Senate but ran out of time during the regular legislative session before the House could consider it. In February 2015, Monning again introduced the act—this time as SB 203. It failed to make it out of the Senate Health Committee.

"I think it's a tragedy for the democratic process in California, where 78 percent of voters want warning labels and the influence of the American beverage industry has trumped the wishes of California voters."

—Harold Goldstein

Although Monning didn't have the votes in the Health Committee to get the legislation to the Senate floor this year, he said he remains cautiously optimistic about 2017, when lawmakers will receive new committee assignments.

"My intent (is) let's use the 2016 campaign season to inject it as a campaign issue in California," he said.

After a third consecutive failure, Harold Goldstein called the bill's death "a tragedy."

"It's a tragedy for the health of the people living in California. I think it's a tragedy for parents who want and need information about sugary beverages so that they can make healthy choices for their children. And I think it's a tragedy for the democratic process in California, where 78 percent of voters want warning labels and the influence of the American beverage industry has trumped the wishes of California voters."

Still, the executive director of the California Center for Public Health Advocacy expressed confidence that warning labels on sugary beverages will become a reality in The Golden State.

From his 15 years of experience working on food policy in California, Goldstein said he has found that "the truth wins out, and that when voters want policy change it sometimes takes a while, but it happens."

A day after Monning withdrew the bill from the Health Committee, the journal [Pediatrics](#) published research saying warning labels on sugar-sweetened beverages improved parents' understanding of the harmful health effects associated with over-consuming them and "may reduce parents' purchase of (sugar-sweetened beverages) for their children."

While Monning's proposal to add warning labels on sugar-sweetened beverages is the first of its kind in the country, it's not the only one. New York Assemblyman Jeffrey Dinowitz [last year modeled](#) his proposed Sugar-Sweetened Beverages Safety Warning Act after the California measure. And on Jan. 11, Baltimore City Councilman Nick Mosby [introduced a similar bill](#) with the city's health commissioner at his side.

"It is our duty as public-health officials to inform individuals, inform our community about it so they can make the best choices

for themselves, for their families,” Dr. Leana Wen, Charm City’s health commissioner, told the CrossFit Journal.

She continued: “You know you’re doing something right when there is such opposition from special-interest groups that do not have the interest of children at heart.”

Big Soda has spent US\$106 million between 2009 and 2015 to defeat public-health initiatives at the local, state and federal levels, according to “[Big Soda vs. Public Health](#),” a report published by the Center for Science in the Public Interest.

The news that Monning withdrew his bill, representing its third demise, did not dishearten Wen.

“When I hear about examples about what’s happening in California, it gives me even more momentum to do what we’re doing in Baltimore City,” she explained. “We have science, evidence and the best interest of children in our hearts.”

“You can remain resolute against the sugar people and want their role in everyone’s lives diminished, and that’s going to happen.”

—Greg Glassman

For his part, CrossFit Inc. Founder and CEO Greg Glassman remains committed to the cause of getting warning labels on sugary drinks—first in California, then on the East Coast, then nationwide.

“We just gotta get the labels on the can once and it’s gonna be there forever. I don’t know how long it’s going to take, but we’re not done. This is the first skirmish.”

In November, Glassman embarked on a two-week tour of CrossFit affiliate gyms in California to rally support for the bill in the state where his company is headquartered. On tour, [he explained](#) why he wants a warning label on sugary beverages: toxicity, corruption and targeting of CrossFit affiliates.

“Once you realize the significance of this issue, there aren’t a lot of options for you. You can just stop caring, but that’s unusual. You can wait for human physiology to change, but that’s a long wait. You can remain resolute against the sugar people and want their role in everyone’s lives diminished, and that’s going to happen.” ■

About the Author

Andréa Maria Cecil is assistant managing editor and head writer of the CrossFit Journal.



Harold Goldstein believes warning labels will eventually be a reality in California: “When voters want policy change it sometimes takes a while, but it happens.”

Dave Re/CrossFit Journal

THE

CrossFit JOURNAL

VIRTUOSITY

Photography Call for Submissions: Guidelines

Tell a CrossFit story in pictures and receive \$500 in cash plus \$500 in gear for your gym or affiliate.

By Staff

January 2016



Rashmi Cole

1. Photos must be original and owned by the person submitting. Photos taken by others may be submitted provided the owner has given permission. Photographers selected for publication will be supplied with legal documents to be filled out prior to publication. Those selected for publication will receive US\$500; their affiliate or garage gym will receive a US\$500 gift card.
2. The submission should tell a story. We are not looking for random collections of photos but a package that makes a cohesive statement. The CrossFit Journal reserves the right to resize images for layout and to present the images as we see fit, though we will always respect the work of the photographer.
3. Maximum number of photos: 12. The CrossFit Journal reserves the right to present all or some of the images.
4. Photos should be a minimum of 2000 pixels on the long side. Photos must be in focus, well lit and free of watermarks.
5. Photos must be attached to the email as JPEG files. Photo file names should indicate preferred order and the name of the photographer in this format: Number-Photographer-Name.jpg. Example: 1-Jane-Smith.jpg. Feel free to submit smaller files to limit email size; we might request larger files from those selected for publication.
6. Feel free to include a short intro (100 words maximum) or captions if needed.
7. Due to the anticipated volume of submissions, we will not respond or confirm receipt. Only those selected for publication will be contacted.

Virtuosity@crossfit.com is open for submissions. Tell us your story in pictures, and do it uncommonly well.

THE
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Virtuosity in Photos: California Invasion

PHOTOGRAPHER DAVE RE



Open happiness or open diabetes?

Big Soda's advertising would have you believe its products are all part of a healthy, active, vibrant life. The reality is much different: Sugary sports drinks and sodas are fueling chronic disease and ruining the health of millions. It's time to push aside celebrity endorsements, catchy jingles and clever slogans to tell people the truth: Sugar is toxic.

From Nov. 8 to 19, CrossFit Inc. Founder and CEO Greg Glassman visited nine California affiliates as part of CrossFit's "California Invasion: Rally to Fight Big Soda." At each affiliate, he asked attendees to stand with him and support a warning label on sugary beverages in California.

Websites: CrushBigSoda.com WeBuiltThisBox.com



"There's a war going on. It's a war
for your clients' metabolism. It's a
war for the world's metabolism."

CrossFit Riverside—Nov. 9, 2015





CrossFit Kinnick Ontario—Nov. 8, 2015



"No one's going to fuckin' Mars if 100 million people have diabetes."

Trojan CrossFit—Nov. 10, 2015



CrossFit Downey—Nov. 12, 2015



WWW.CRUSHBIGSODA.COM
#CALIFORNIAINVASION
#CRUSHBIGSODA
#SIB203

SAN DIEGO COUNTY
DIABETES 160,000
OBESITY 575,000

"I got all I need: toxicity, corruption,
targeting you."

Fathom CrossFit—Nov. 18, 2015



"Anything that is anti-affiliates is
pro-chronic disease."

Carson CrossFit—Nov. 14, 2015



"I want to drive the American Beverage Association and its constituent partners out of the health sciences."

CrossFit Downey—Nov. 12, 2015

"(CrossFit affiliates are) the single bright spot in the world in the battle against chronic disease."

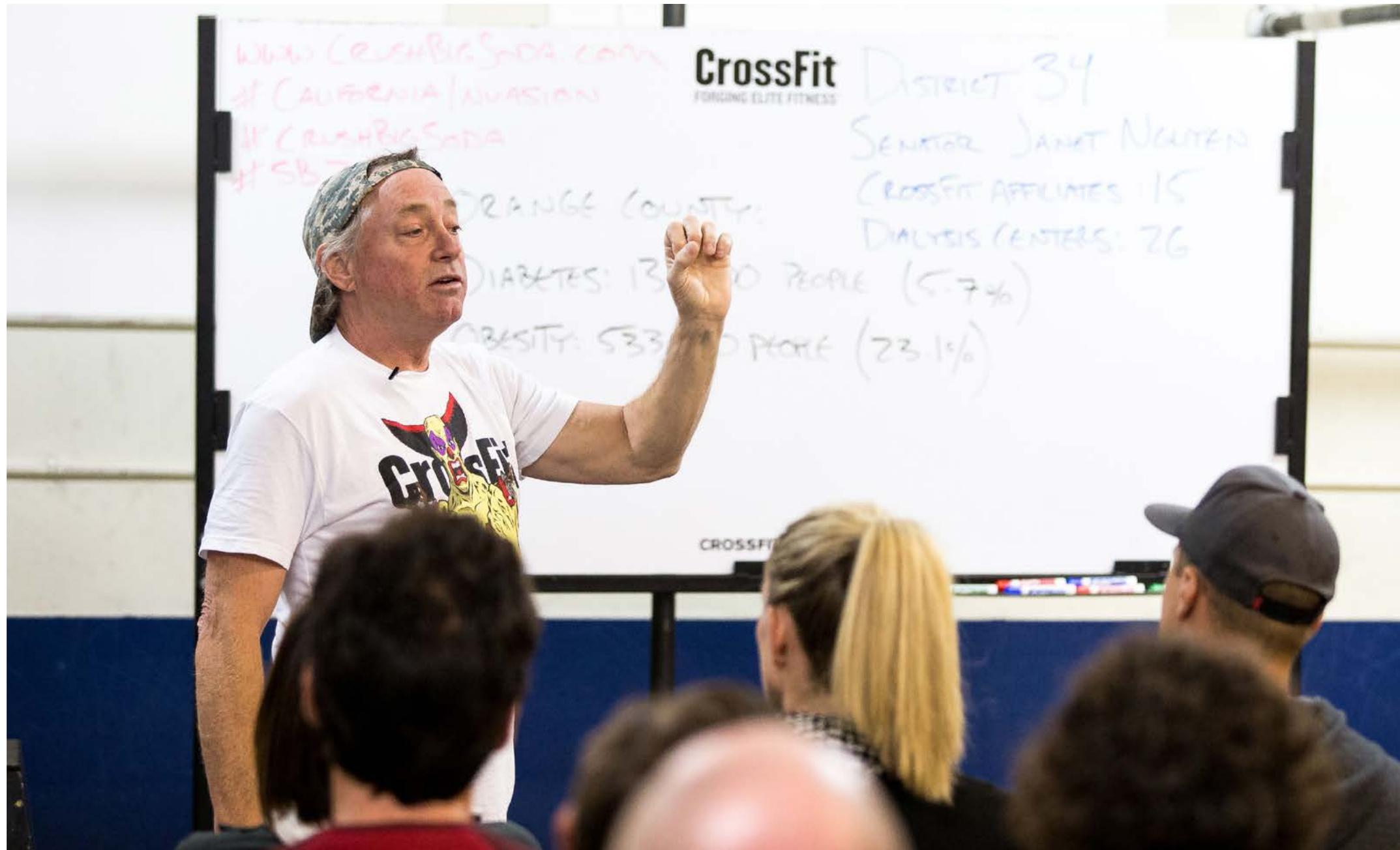
CrossFit Walnut Creek—Nov. 19, 2015



"(CrossFit affiliates) are the only effective, successful and growing response to chronic disease in the world today."

CrossFit Reality—Nov. 13, 2015





"There are other things that are toxic.
There are other things that are corrupt,
but they're not coming after you."

CrossFit Marina—Nov. 15, 2015

"Once you label something, it's kind of
obvious what the danger is."

CrossFit Kinnick Ontario—Nov. 8, 2015



THE

CrossFit

KITCHEN



LEMON-PEPPER CHICKEN WITH BUTTERNUT SQUASH

By Nick Massie

Overview

Nick Massie of PaleoNick.com brings us a zesty recipe for finger-lickin'-good lemon-pepper chicken with butternut squash. The end result is a dish that looks as good as it tastes and will satisfy the heartiest of appetites.

Ingredients

- 1 plate of chicken (4 legs; 4 thighs; 4 boneless, skinless breasts)
- 4 c. chicken stock
- 8 c. mushrooms, quartered
- 4 c. onions, julienned
- 4 c. roasted bell peppers, julienned
- ½ bunch Italian parsley, leaves pulled from stems and roughly chopped
- ½ c. Lemon Pepper Love spice blend, plus some for seasoning to taste
- 1 tbsp. olive oil
- 2 oz. grass-fed butter
- 8 cloves garlic, sliced
- 3 large butternut squashes

Directions

1. Preheat oven to 400 F.
2. Place butternut squash on a foil-lined sheet pan.
3. Add chicken and Lemon Pepper Love to a large mixing bowl and toss until coated evenly.
4. Transfer chicken to a foil-lined sheet pan, placing breasts in the middle and legs and thighs at the perimeter.
5. Put both sheet pans in the oven. Cook the squash until it is soft. Cook the chicken until the breasts reach 165 F and the legs and thighs reach 185 F.
6. While chicken and squash are cooking, start the vegetable and jus topping by heating a cast-iron skillet over medium-high heat.
7. Add olive oil and garlic and stir until garlic is toasted. Add onions and a pinch of Lemon Pepper Love. Place the lid on the pan and cook for 2-3 minutes.
8. Add mushrooms and a splash of chicken stock, stir, place the lid on the pan and continue cooking for 3 minutes.

1 of 2



9. Remove the lid, season with another pinch of Lemon Pepper Love and stir.
10. Add the roasted bell peppers and chicken stock and bring to a simmer.
11. Reduce heat, add butter and stir constantly, melting butter slowly. The vegetables and jus are done at this point.
12. Once the squash is done, peel and seed, then cut into chunks the size of half an apple.
13. Slice the chicken breasts to your desired thickness.
14. To serve family style, place the squash onto a platter, place the chicken over the squash, top the chicken with the vegetables and jus, and garnish with parsley.
15. This can be portioned individually and lasts for up to 1 week in the fridge or 6 months in the freezer.
16. Enjoy!



THE
CrossFit JOURNAL

ADDICTS AND ANECDOTES

More and more, science is confirming what athletes report:
Avoiding sugar can improve health and performance.

BY EMILY BEERS



Food is fuel. Choose wisely and you'll complement your hard work in the gym. Choose foolishly and you'll derail it.

The first week was hard. Really hard.

"My body told me it wanted sugar," said Tanya Chick.

An athlete at CrossFit E-Town in Evanston, Illinois, Chick said she was addicted to Trader Joe's freeze-dried mangoes.

"I would buy 15 bags at a time," she added.

Chick's mango fetish came to an end the moment she signed up for her affiliate's No Sugar November nutrition challenge last fall. She said conquering her sugar addiction was difficult.

"But once you get through those first two weeks, then it's mind over matter," Chick said.

Soon, her cravings went away and she started feeling better, sleeping better, performing better.

"Little performance things, like my shoulder that had been bugging me for a while, suddenly didn't hurt. All the little nuances in my body felt better," Chick said.

Kevin Teborek, owner of CrossFit E-Town, instituted the no-sugar challenge. Through research—which included a [CrossFit Kids Facebook post](#) he came across—Teborek realized sugar comes with zero benefits and many risks to the body.

"I wanted to introduce some of the dangers of (added) sugars to my community and get them thinking about what they're doing on a daily basis," he said.

Although generating awareness was the impetus behind No Sugar November, the challenge did more than that: Teborek's athletes experienced significant physical and emotional improvements from just one month without sugar.

Interested in using science to prove a sugar-free diet improves health quickly, Teborek is running a second challenge in spring 2016; he plans to partner with a lab to measure his athletes' blood chemistry.



Dr. Robert Lustig

Short Study Shocks

The Lustig study monitored 43 children between the ages of 8 and 18. All were obese and displayed at least one symptom of metabolic syndrome. The children received low-sugar catered meals for 10 days. Their metabolic health was measured at the beginning and end of the study through blood and glucose-tolerance tests and through dual-energy X-ray absorptiometry, which assessed their bone, fat and fat-free mass.

The goal of the study wasn't to promote weight loss or healthy carbohydrates, Lustig explained: The goal was simply to control for and measure the effects of reducing sugar by keeping the children's total calories consistent with the totals in their self-reported diets.

"We kept (the subjects') fat and protein content the same and the total calories the same, but within the carbs, we took out sugar and put starch in. We took out the sweetened yogurt and put in the baked potato chips. We took out the doughnuts but put bagels in," Lustig said. "We took their total dietary sugar from about 28 percent to 10 percent (of their total calories)."

The result: metabolic-health improvements in every category, Lustig explained—from triglycerides to LDL levels (the bad kind of cholesterol), diastolic blood pressure, glucose levels, glucose tolerance and fat-free mass.

"We expected change, but we were astonished by the magnitude of the changes."

—Dr. Robert Lustig

"Their insulin went down by 33 percent. And their liver fat decreased 22 percent," Lustig said.

The results were so dramatic Lustig's colleague and co-author Jean-Marc Schwarz jokingly accused the doctor of tampering with the test tubes.

"My colleague—the biochemist on the study—called me up and said, 'Rob, did you spit into the tubes?' I replied, 'Are you high?'"

An Oct. 26 study in the journal [Obesity](#) supports Teborek's anecdotal evidence from the November challenge. In "Isocaloric Fructose Restriction and Metabolic Improvement in Children With Obesity and Metabolic Syndrome," Dr. Robert Lustig and company replaced foods with added sugars with other foods but kept caloric intake steady for participants. The resulting data indicated metabolic health markers improved dramatically in the study's 43 subjects after just 10 days of following a low-sugar diet.

Teborek said he wasn't surprised when he heard about the results of the study.

"Consuming sugar affects us negatively more than anything else," he said.

What do you mean?" And he said, 'If I had made this data up the results couldn't have been better.'"

He added: "We expected change, but we were astonished by the magnitude of the changes. Every aspect of their metabolic health improved."

A Quick Return on Investment

CrossFit E-Town is far from the only affiliate to motivate members to remove sugar from their diets. CrossFit City Line in Watertown, Massachusetts, CrossFit Springfield in Missouri and CrossFit Southie in Boston, Massachusetts, have also committed themselves to eliminating added sugar.

Melissa Wistrom of CrossFit Springfield said reducing added sugar helped her and her children.

"My son gets bright flaming-red ears and a weird rash around his nose (when he eats sugar). It almost looks like fever blisters around his nose. And it's harder for him to focus," Wistrom said.

The moment she removed sugar from her son's diet, his rash and red ears went away, and his behavior changed for the better, she said.

"When he isn't eating sugar, he's a totally different kid."

While the link between diet and skin-related problems such as eczema and acne has long been debated, research links diet to skin. In "Acne: The Role of Medical Nutrition Therapy," published in 2013 in the [Journal of the Academy of Nutrition and Dietetics](#), authors Jennifer Burris, William Rietkerk and Kathleen Woolf reviewed the literature on diet and acne. With regard to a modest number of studies done over the last 52 years, the authors suggest that sugary foods might aggravate acne-prone skin.

Christina Morris is another who witnessed big changes in athletes at CrossFit Southie when she held a 21-day no-sugar challenge in 2015. The challenge required athletes to avoid dried fruit as well as sweeteners such as high-fructose corn syrup, agave syrup, maple syrup, honey and coconut sugar, Morris explained. Participants had to limit their natural-sugar intake to only one piece of fresh fruit per day.

Just one week brought noticeable positive changes, said Morris, a head coach at the affiliate.

"(They dropped) pounds and inches off their waistline," Morris explained. "And they couldn't believe how they no longer had crazy food cravings throughout the day."

Chick noted improved sleep and reduced aches and pains shortly after she eliminated sugar from her diet. While sugar has long been associated with [diabetes and obesity](#), research also suggests sugar causes inflammation—which can lead to chronic muscle and joint pain.

Also consistent with Chick's experience, sleep and diabetes websites such as [diabetes.co.uk](#) note blood-sugar levels can affect sleep patterns, and a 2014 study in the [European Respiratory Journal](#) reported links between severity of sleep apnea and increased levels of blood sugar.

The 2014 Open Heart article "[The Wrong White Crystals: Not Salt but Sugar as Aetiological in Hypertension and Cardiometabolic Disease](#)" added evidence to the growing theory that consumption of sugar—particularly fructose—leads to inflammation and insulin resistance as well as metabolic dysfunction.

Other recent research—including the 2012 article "['Metabolic Syndrome' in the Brain: Deficiency in Omega-3 Fatty Acid Exacerbates Dysfunctions in Insulin Receptor Signalling and Cognition](#)"—suggested sugar and fructose negatively affect brain function, and the [National Institute of Diabetes and Digestive and Kidney Diseases](#) noted sugar can also cause gastrointestinal problems.

When CrossFit athlete Simon Anolick eliminated sugar during CrossFit E-Town's No Sugar November, he said he immediately noticed the effect it had on his bowel movements and digestive system. They just seemed to function better, said Anolick, who also lost 15 lb. during the challenge.

He added: "I'm not waking up as many times in the middle of the night. And my clothes fit better. I just feel much better."

Mat Frankel, owner of CrossFit City Line, was convinced by the growing amount of evidence.

"I heard about this type of study (Lustig's) a lot through Facebook and on TV and read about consequences of sugar, like childhood obesity," Frankel said.

Frankel launched a no-sugar challenge in April 2015 and held a second one last fall. Like Teborek, Frankel set a main goal of generating awareness.

“People don’t realize (sugar is) everywhere. It’s in ketchup. It’s in Jif peanut butter,” Frankel said. There are 3 grams of sugar in 2 tablespoons of Jif peanut butter and 4 grams of sugar in 1 tablespoon of Heinz ketchup.

Anolick discovered his favorite treat—Kraft peanut butter—has added sugar, and he was forced to eliminate it from his diet. Breaking his peanut-butter addiction wasn’t easy, he said.

“Everyone usually has one thing—one thing that feels harder to give up than others.”

While Anolick’s “one thing” was peanut butter, many of the athletes at CrossFit Springfield had a hard time letting go of their sugary beverages.

“People really struggled with giving up Coke and Diet Coke and the Gatorades and things like that,” said Wistrom. But once they got over the first week or two of detox, life improved, she explained.

Despite the challenge of breaking their addictions, Wistrom, Anolick and Chick agreed doing so was well worth it.

“It’s hard to put into words what (avoiding sugar) does to you. It just makes you feel better,” Chick said.

Chick might not have the words to describe exactly how reduced sugar consumption affected her, and many affiliates only have anecdotal evidence to justify the success of no-sugar challenges, but researchers are providing more and more backup. The science is sound, Lustig said, and has helped bring the negative consequences of consuming added sugar into the mainstream. ■

Feb. 24, 2016—Corrects to clarify relationship between blood sugar and sleep.

About the Author

Emily Beers is a CrossFit Journal contributor and coach at [CrossFit Vancouver](#). She finished 37th at the 2014 Reebok CrossFit Games.



Tanya Chick said her health and performance improved when she addressed a sugar addiction fueled by freeze-dried mangoes.

Kevin Teborek

THE

CrossFit

KITCHEN



CHIPOTLE CHICKEN FRITTATA

By Nick Massie

Overview

This new recipe from Paleo Nick's Nick Massie combines eggs, chicken, bacon and veggies for a delicious breakfast-inspired dish you can enjoy anytime. Top with cilantro and Massie's salsa chipotle for an extra kick.

Frittata Ingredients

- 1 lb. ground chicken
- 12 eggs
- 3 slices bacon, chopped
- 3 yams, roasted until soft, peeled and sliced into $\frac{3}{4}$ -in. disks
- 2 yellow onions, diced
- 4 poblano peppers, diced
- 2 c. sun-dried tomatoes, soaked in warm water and strained
- 2 tbsp. Ga Ga Garlic
- 4 sprigs cilantro, to garnish

Salsa Chipotle Ingredients

- 5 large tomatoes
- 1 serrano pepper, stemmed, halved and seeded
- 2 garlic cloves, smashed with palm of hand
- Juice of 1 lime
- 2 tbsp. chipotle in adobo
- Kosher salt, to taste



Frittata Cooking Instructions:

1. Preheat your oven to 375 F.
2. Add bacon to a preheated cast-iron skillet and stir once or twice while you season the chicken.
3. Season ground chicken with 1 tbsp. Ga Ga Garlic. Push bacon to one side of the pan and place chicken, seasoned side down, on the other side of the pan. Season top side of chicken with another tbsp. of Ga Ga Garlic.
4. Use a wooden spoon to chop up chicken and fold in Ga Ga Garlic, keeping chicken and bacon separate at this point. Cook for 2-3 minutes.
5. Add onions, poblano peppers and sundried tomatoes and fold all ingredients together.
6. Continue cooking while you line the bottom of a 9-by-13-in. pan with the yam disks.
7. Stir chicken/bacon/veggie mixture, then crack and beat the eggs.
8. Pour chicken/bacon/veggie mixture over yam disks, spread evenly and top with eggs.
9. Bake in the oven for 30 minutes or until eggs are set throughout.
10. Cut into 8 3-block portions, top each portion with 2 oz. of salsa chipotle and refrigerate for up to 5 days or freeze for up to 6 months.

Salsa Chipotle Cooking Instructions:

1. In a saucepan, combine tomatoes, serrano pepper, garlic cloves and a pinch of kosher salt.
2. Cover tomatoes with water and bring to a simmer.
3. Cook until tomatoes are soft.
4. Transfer tomatoes, serrano pepper and garlic to the pitcher of your blender and blitz at high speed until smooth and saucy.
5. Add chipotle in adobo and lime juice and blitz once more.
6. Season with kosher salt to your liking, and—boom!—you are a culinary ninja with a fresh batch of salsa chipotle.

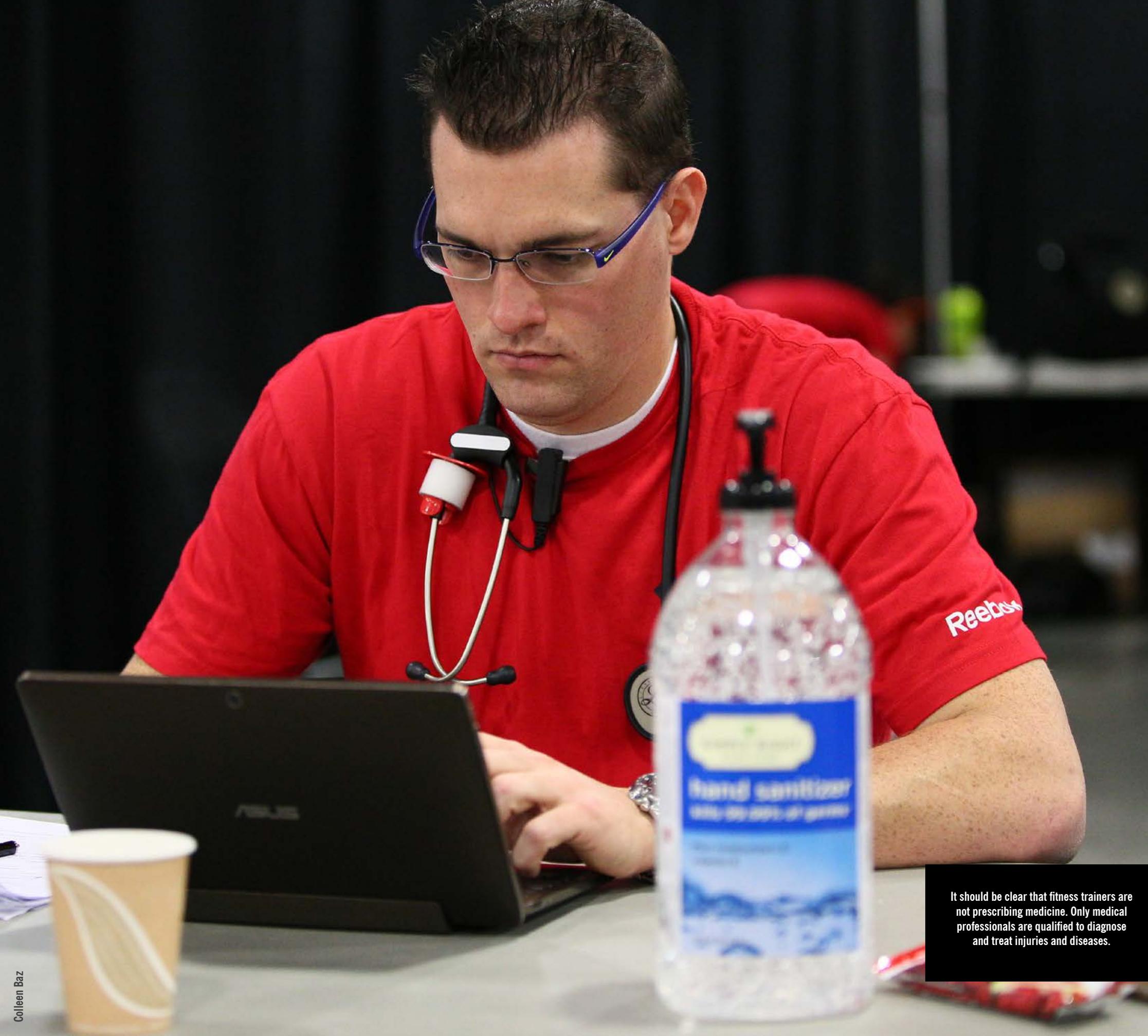
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EXERCISE IS MEDICINE: IMPRECISION AND IMPRACTICALITY

Exercise is not medicine, and suggestions to the contrary do nothing to help fitness trainers improve the health of their clients.

BY LON KILGORE





It should be clear that fitness trainers are not prescribing medicine. Only medical professionals are qualified to diagnose and treat injuries and diseases.

“An apple a day keeps the doctor away.”

“Milk: It does a body good.”

These popular sayings portray certain activities as having the ability to improve health. Most people accord a notion of truth to the adages, but would anyone suggest a farmer or retailer could be held out as an exemplar of a health or medical profession?

Probably not.

Yet this is exactly what the American College of Sports Medicine (ACSM) is trying to do with Exercise Is Medicine (EIM)—a media campaign, a proposed system of physician-based physical-activity prescription and referral, and a revenue-generating set of credentials offered by the ACSM.

EIM is a multi-organizational global initiative first launched in 2007 by the ACSM. As described by its other founding partner, [The Coca Cola Co.](#), EIM is designed to promote physical activity and make it a “vital sign” that is routinely assessed at every patient interaction with a health care provider. EIM provides materials and training to help health professionals motivate patients and the public-at-large to get moving and improve their health.”

The logic of EIM seems sound: Get physicians to perform fitness screenings and physical-activity behavior assessments as part of every patient visit, then motivate the patient to become physically active for a health benefit.

However, an easily evident practical problem must be overcome: The average physician visit is 15.7 minutes in duration in the United States. During a visit, five topics are generally discussed, with the longest period of discussion about five minutes for major issues and about one minute for minor issues (9). Given the extent of the physician’s list of tasks recommended by EIM in its “[Healthcare Providers’ Action Guide](#),” discussion of physical activity would require at least five additional minutes.

Assuming physicians maintain their current average work week of 51 hours, the additional time spent with each patient would reduce the number of patients who could flow through a physician’s office from approximately 89 per week at present to about 66.

Even if physical activity was treated as a minor topic and only one additional minute was spent on counseling, the weekly flow through the physician's office would drop to about 82 patients.

Regardless of its potential effect on availability of timely medical care, EIM should demonstrate efficacy if it has any value at all.

Most current research documents evaluating cost effectiveness of physical-activity interventions report their findings in the context of “quality-adjusted life years” (QALY)—an estimation of how something affects quality of life. QALY for a healthy year is 1.0. A diseased year has a fractional value (less than 1.0). Researchers use the QALY value in a formula to estimate the potential cost savings of a treatment (compared to no treatment) over the life of an individual. When physical-activity interventions are presented to the government or to the public, it's generally suggested tens of thousands of dollars could be saved over a lifespan if an individual becomes physically active. But we need to look beyond the statistical modeling of hypothetical circumstances and consider the real world.

In “Disease Control Priorities in Developing Countries,” a chapter is spent reviewing relevant research on interventions for musculoskeletal conditions. Physical activity—as it is currently theorized to be delivered in interventions—is not considered cost-effective in developed countries, and the weight of support demonstrating any effectiveness was specifically described as “currently meager” (2). This position seems at odds with what the ACSM argues is accepted convention, and we should therefore question convention.

EIM proposes that ACSM-certified clinical-exercise physiologists or those with the EIM certification will be chosen to deliver interventions intended to get members of the public active for health and financial benefit. But no one remembers that every intervention requires money—up-front money.

A number of other issues are similarly neglected. Who identifies those in need of intervention? Where are the interventions delivered? Who arranges the interventions? What equipment and supplies are used? What labor is used and who provides it? How much does all that cost? And who pays?

Who Prescribes and Who Implements?

The answers to these questions are widely variable in research literature, but the EIM model would suggest that physicians are the source of prescription or referral (see above right).

EXERCISE PRESCRIPTION & REFERRAL FORM



PATIENT'S NAME: _____ DOB: _____ DATE: _____
 HEALTH CARE PROVIDER'S NAME: _____ SIGNATURE: _____

PHYSICAL ACTIVITY RECOMMENDATIONS

Type of physical activity:	Aerobic	Strength
Number of days per week:		
Minutes per day:		
Total minutes per week*:		

*PHYSICAL ACTIVITY GUIDELINES

Adults aged 18-64 with no chronic conditions: Minimum of 150 minutes of moderate physical activity a week (for example, 30 minutes per day, five days a week) *and* muscle-strengthening activities on two or more days a week ([2008 Physical Activity Guidelines for Americans](http://www.acsm.org/physicalactivity)). For more information, visit www.acsm.org/physicalactivity.

REFERRAL TO HEALTH & FITNESS PROFESSIONAL

Name: _____
 Phone: _____
 Address: _____

 Web Site: _____
 Follow-up Appointment Date: _____
 Notes: _____

In the Exercise Is Medicine model, it's likely this form would be completed by a physician.

15 minutes d'activat  physique = 1 cube  nergie



In Canada, the Quebec Federation of General Practitioners model features prescribed 15-minute “cubes” of activity.

These prescriptions or referrals can be for home exercise or a simple behavior-modification protocol similar to quit-smoking programs. It's remotely possible physicians will refer to a fitness facility with clinically qualified staff. Note that referral to a fitness trainer is in no way guaranteed.

A physician-generated prescription within the EIM system will most likely be a simple re-statement of ACSM recommendations (provided for reference at the bottom of the EIM form) written into the form by a physician, nurse or office assistant; the patient is to implement on his or her own at home.

Another example of physician prescription can be found in the Quebec Federation of General Practitioners initiative to prescribe 15-minute “cubes” of activity to patients. This example is clearly intended to promote home or workday physical activity, not exercise, as the walking-shoe graphic on the prescription sheet suggests.

It really needs to be understood that telling someone to go do something for X minutes Y days per week does not constitute a responsible prescription. Would any physician tell a patient to pick any dose of any medication as long as it's above a low threshold that might or might not provide benefit?

Regardless, the ACSM is positioning itself to benefit from potential referrals to external obesity and physical-activity counselors and providers. It provides physicians with an information package that promotes referrals to degreed individuals with ACSM/EIM credentials in hopes of establishing a flow of clients from physicians to a specific group of practitioners with ACSM/EIM credentials. This can be seen in the guidance offered to physicians in the EIM package. The “Questions to Ask an Exercise Professional” section in the “Healthcare Providers’ Action Guide” includes the following:

- “Do they hold a 4-year degree from an accredited university in Exercise Science, Kinesiology, Exercise Physiology, or a related health and fitness field?”
- “Do they have additional training and certification by a nationally-recognized organization?”

In addition: “To ensure that the health fitness professionals in your network are trustworthy, EIM has developed a credential program that will provide health fitness professionals with an additional skill set that will allow them to work closely with the medical community (such as your clinic) and receive patient referrals.”

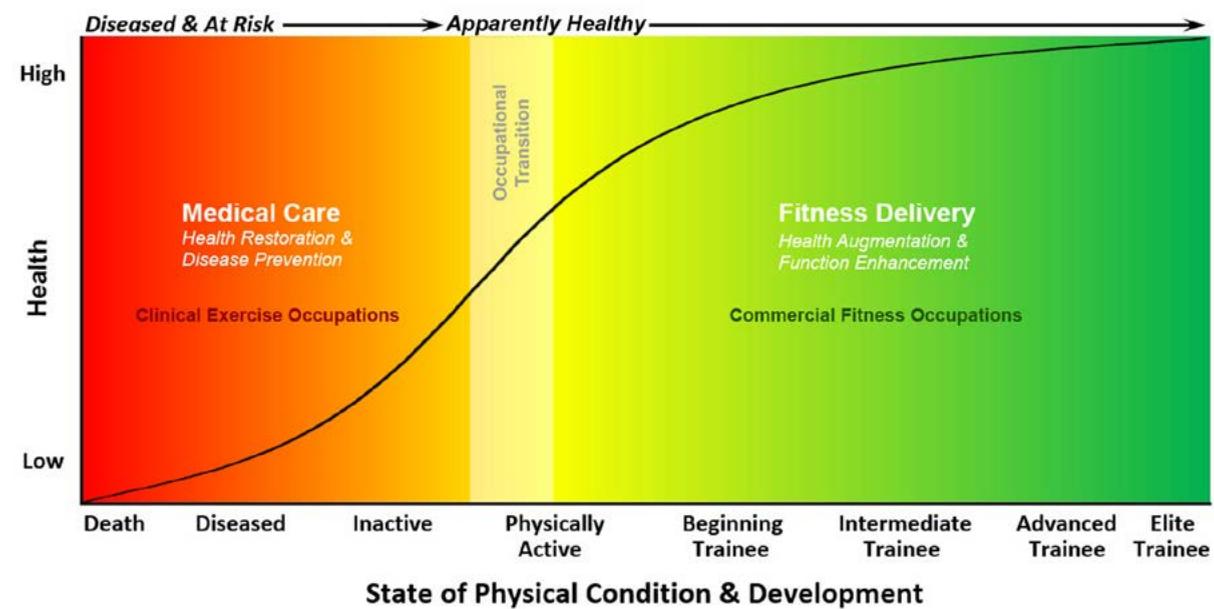


Figure 1—Clinical exercise, as framed within the ACSM and EIM proposals, can be considered medical health care only for those who are diseased and those inactive individuals with risk factors for cardiovascular and metabolic disease (red side). Anyone who is without disease or risk factors (apparently healthy) benefits most directly from the delivery of commercial fitness-training services (green side). It is important to note that a large improvement in health status occurs when one simply becomes physically active.

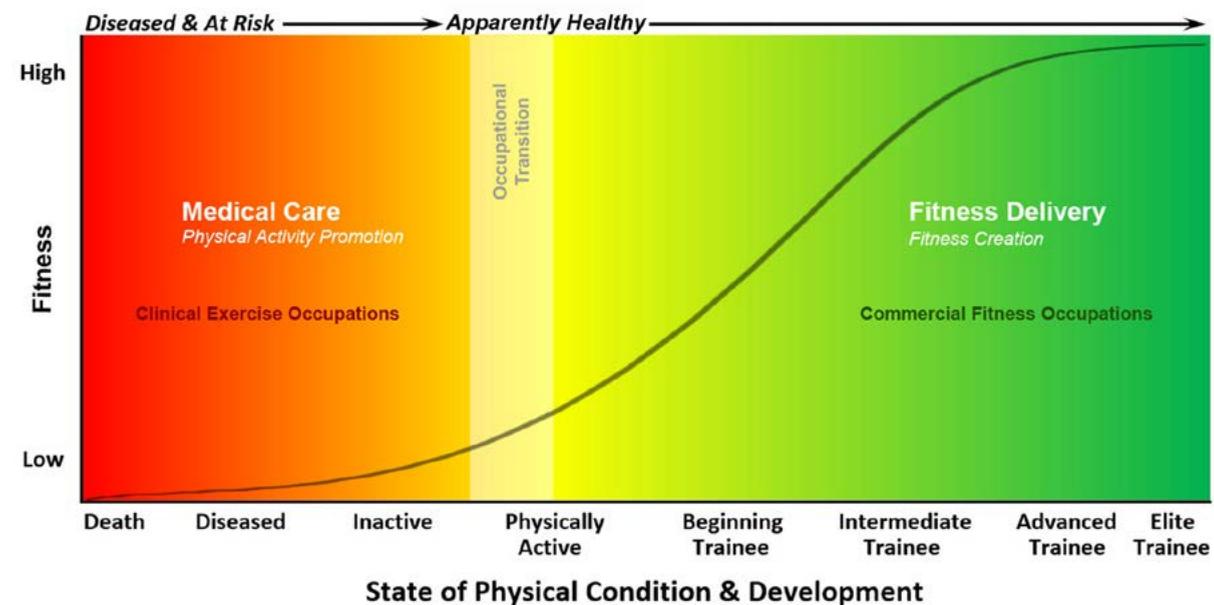


Figure 2—Clinical-exercise occupations are not intended to and do not create optimal fitness. They are concerned most with reaping health benefits through promotion of physical activity in diseased and sedentary populations. The majority of fitness development occurs outside clinical environments.

Money Matters

Cost and payer are somewhat known.

Several but not all papers have reported the direct costs of intervention, with costs ranging from a few hundred dollars up to thousands—\$435 (5) to \$5,308 (6). Results are not guaranteed to be stellar: In one paper (8), the average cost of intervention per patient was \$2,359; when calculated, each kilogram (2.2 lb.) of weight loss cost \$2,040 and every millimeter of mercury drop in blood pressure cost \$574.

So we are led to believe that if we spend somewhere between \$435 and \$5,308 we can save maybe \$20,000 in health-related expenditures over an individual's lifetime (the QALY value). This too-good-to-be-true projection sounds much like an appliance salesman's upsell attempt: "Buy this model of washing machine and you'll actually save on your electric bill over the life of the machine. It will pay for itself."

But where does the money for these interventions come from? Most of the interventions researched were funded by scientific and medical grants. But if these interventions were to be implemented on a large scale, the money would either be allocated as a government-funded initiative or become a reimbursable expense through an insurance instrument. In either case, the individual—as a taxpayer or insurance subscriber—will pay for the intervention. It will not be free.

Let's do a few calculations using a cost of intervention of \$1,134 per person (3).

Most literature would suggest that anyone who is sedentary or overweight/obese would be targeted, creating a large pool of participants. It has also been suggested that EIM interventions should be provided to the entire population. With the latter premise, we're no longer dealing with medicine, because no physician would prescribe medication or therapy for a healthy (disease- or injury-free) person. For exercise to be medicine it must be delivered to diseased individuals as illustrated in the figures to the left—but remember "exercise" in Exercise Is Medicine actually refers to "physical activity."

In the United States, that would qualify 66 percent of the population for an intervention, according to [overweight/obesity status](#). In the U.K., about 62 percent of the adult population is considered [overweight/obese](#).

This means about 212 million Americans and 40 million British would be referred to interventions if EIM recommendations were adopted. The actual cost of providing an intervention to each person would be staggering:

U.S.—212 million x \$1,134 = \$240,408,000,000

U.K.—40 million x \$1,134 = \$45,360,000,000

That's right: \$240 billion and \$45 billion, respectively. In the U.S., the entire Department of Transportation receives just over 35 percent of that amount (**\$84 billion**) to maintain the nation's transit infrastructure. The U.K. spends about 40 percent (**\$19 billion**) on transportation.

It's hard to fathom, but EIM recommendations could require commitment of 1.4 percent of the \$17 trillion U.S. GDP and 1.5 percent of the \$3 trillion U.K. GDP to obesity and physical-activity counseling or intervention if the initiative were supported by taxes.

Of course, no government or private system could deliver 212 million or even 40 million behavior-modification instances in a single year. These numbers would require long-term investment of funds and labor—and far more than EIM's creators would like to acknowledge.

At this point, we must ask how long it will take for interventions to have an effect.

A Multi-Generational Model

Aside from the monetary problem, physical-activity behavior interventions are only partially successful in actually creating long-term change. It cannot be assumed that the individual will act on the information delivered or continue with the guided physical activity for life.

In fact, the dropout rate for physical-activity interventions is quite high. Getting people to adopt better behaviors is problematic during intervention delivery and becomes even harder and less effective in the months and years after an intervention. A 75 percent dropout rate within the first 42 days has been reported (4). The research in the area is riddled with studies that report high attrition rates (as above) or report lower rates of attrition around 14 percent (1). Regardless of how many fail to remain physically active post-intervention, we know that a 100 percent success rate is impossible.

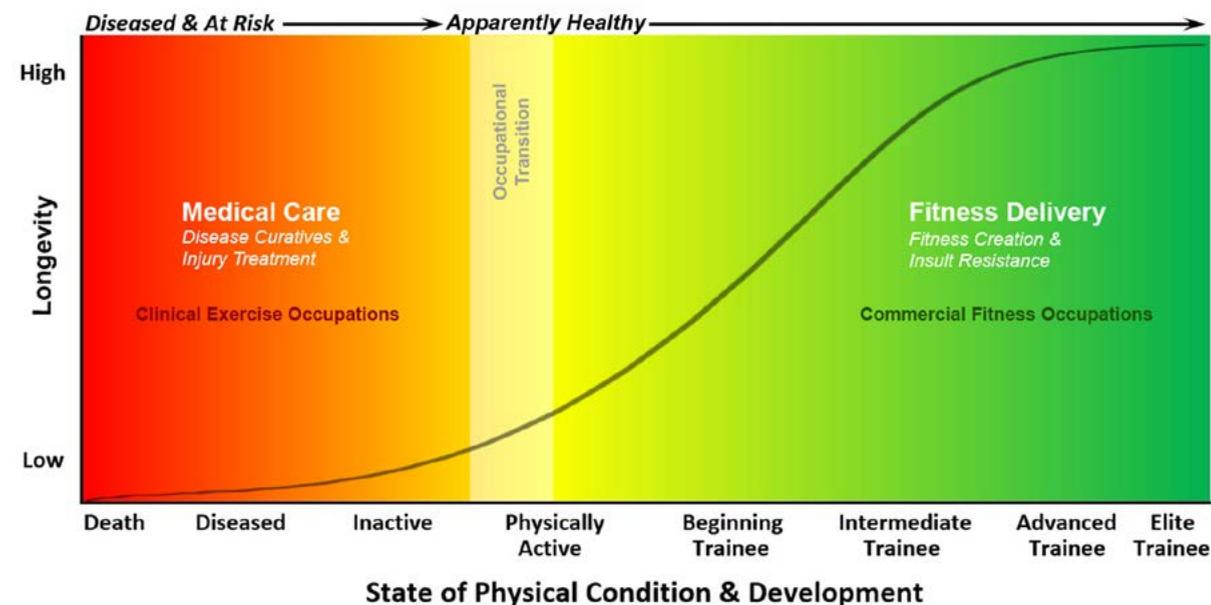


Figure 3—Survival rate or longevity is affected by fitness. Clinical-exercise occupations, as part of the medical community, aid in the diagnosis, treatment, and cure of disease and injury. This significantly increases longevity. Higher levels of fitness, as delivered by the commercial-fitness industry, also significantly improve longevity: Those in the upper quartiles of endurance and upper two-thirds of strength reap a stepwise increase in lifespan.

If, for example, the EIM intervention successfully converted about 30 percent of the subjects who passed through the system, we would only achieve about 30 percent of the associated QALY benefits. The costs of the 70 percent who dropped out would then be applied to the 30 percent who were compliant over the long term, thus significantly reducing the overall economic and social benefits.

If we repeat the intervention on those who drop out, recidivism would require the dropouts to remain in the program longer and thus increase the direct costs. Simplistically calculated, it would take approximately 18 intervention cycles to convert about 90 percent of the population—if simple repetition was effective.

If the first repetition cost \$252 billion in the U.S. and \$40 billion in the U.K., how much would 17 more cycles cost? In the U.S. it could create a total cost of about \$838 billion; in the U.K. it would cost \$133 billion. Combined, that's almost \$1 trillion.

And how long will it take? If there is a 70 percent failure rate for an intervention, and if that rate stays constant with every repetition, then over 700 million individual interventions will need to be delivered in the U.S. to reach an approximate 90 percent overall compliance status. Keep in mind repeat interventions do not guarantee success with reluctant populations.

As of 2014, the U.S. was home to 6,600 exercise physiologists—the individuals the ACSM and EIM propose to deliver interventions. If an intervention requires 10 hours of labor per individual over a 20-week intervention, then about 7 trillion labor hours would be required to deliver all 18 cycles needed to achieve about 90 percent compliance. That means the 6,600 exercise physiologists currently working would each need to put in over 1 million hours of work time to deliver that volume of interventions. A 40-hour work week 50 weeks a year would require each of the 6,600 exercise physiologists to work exclusively on intervention delivery for 534 years—about 21 generations.

Even if these calculations overestimate costs and time and were found to be off by a factor of 10, the fact remains that EIM-proposed intervention is not financially or operationally tenable.

Efficacy?

Some readers may view this article as a hatchet job intended to discredit the hard work of researchers. It's not. We learn from failures. We learned much from the failures of Healthy People 2000 and Healthy People 2010 in achieving their physical-activity goals, and we should welcome new, innovative ideas and research on the topic.

However, a rather dire indictment of the potential failure of the EIM model comes from within the program (7). Dr. Felipe Lobelo was quite pointed when describing the state of knowledge regarding such interventions in a 2015 presentation to the ACSM: “We don't have concrete data yet showing that we can help save money by improving fitness or improving steps or activity levels.” He further stated that in some instances the actual engagement of targeted individuals with interventions can be abysmally low, providing an example where only 4 percent of the individuals offered a free fitness-center membership as part of an intervention actually engaged and improved their health status (7). If this 4 percent success rate were seen with EIM, 96 percent of the funds expended would return no medical, social or functional benefit.

These observations are reflected in the U.S. Department of Health and Human Services document “Strategies to Prevent Weight Gain Among Adults,” in which it was determined:

- “The strength of evidence is not high for any of the tested interventions or the approaches described in observational studies to prevent weight gain as measured by changes in BMI, weight, or waist circumference.”
- “When adherence was reported, it tended to be poor, with less than 80 percent adherence to interventions.”
- “Very few studies reported on obesity-related clinical outcomes (mortality, quality of life, or cancer recurrence) or adverse effects. All evidence for these outcomes was graded as low or insufficient.”

If data to demonstrate the financial viability, broad participant behavior change and outcome value of the EIM-proposed system is nonexistent, how can a responsible organization justify the EIM stance and propose to add a significant—and quite possibly unaffordable—financial burden to the general population? Ethics aside, the ACSM—with support funds from Coca-Cola—is lobbying the U.S. Preventive Services Task Force (USPSTF) to do just that.

The task force works to improve health “by making evidence-based recommendations about clinical preventive services such as screenings, counseling services, and preventive medications,” according to its website. Currently, the task force rates general physical-counseling activity a C. The ACSM, via EIM, is bent on convincing the task force to upgrade that rating to a B. If that occurs, then by virtue of the tenets of the Affordable Care Act, insurance companies would be required to cover physical-activity counseling.

This adds an additional billable service for a physician's office at the expense of adding more paperwork and draining physician time from treating disease and injury. Of note, an upgrade to a B rating does not create an insurance-billable line of services for anyone who delivers training in gyms, recreation facilities, spas, clubs or sports, so most trainers would not be served by any changes.

So What Now?

The fitness industry is not medicine. Any organization that argues fitness is medicine is overreaching its operational scope and pandering to its members and the populace, all in hopes of weaseling into a place alongside medicine, nursing, physical therapy and athletic training as a licensed profession. Organizations within the commercial fitness industry—including nonprofit businesses such as the American Council on Exercise and the National Exercise Trainers Association—need to understand that EIM is not relevant to their scope of practice, nor does the ACSM-driven initiative benefit the trainers they serve unless those trainers are also ACSM/EIM credentialed.

The ACSM must be encouraged to cease its attempts to confuse and misclassify fitness delivery to healthy individuals as medicinal physical activity in order to advance its own agenda at the expense of its partners, its competitors and fitness trainers everywhere. Although fundamentally different, physical activity and exercise can indeed be medicine—but only if disease or injury is present.

In 1954, when it broke from the American Association for Health, Physical Education, Recreation & Dance, the ACSM chose to abandon the teaching and delivery of fitness as an organizational mission in favor of being an organization dedicated to science and medicine. And that is precisely where it should focus current efforts: The ACSM should concern itself with physical activity and exercise as therapy for disease and as rehabilitation. It should leave fitness for the masses to others.

CrossFit Founder and CEO Greg Glassman has described exercise training as “non-medical health care that works.” In the context of the gym, this means trainers in the fitness industry aren't diagnosing or prescribing anything. They are teaching and training fitness, and the byproduct of their services is better health and function in their customers. In contrast to the outcome goals of the ACSM and EIM, these are outcomes CrossFit and the evolving fitness industry can deliver. ■

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About the Author

About the Author: Lon Kilgore earned a Ph.D. from the Department of Anatomy and Physiology at Kansas State University's College of Veterinary Medicine. He has competed in weightlifting to the national level since 1972 and coached his first athletes from a garage gym to national-championship event medals in 1974. He has also competed in powerlifting, the first CrossFit Total event, wrestling and rowing. He has worked in the trenches, as a qualified national-level coach or scientific consultant, with athletes from rank novices to the Olympic elite and as a consultant to fitness businesses. He was co-developer of the Basic Barbell Training and Exercise Science specialty seminars for CrossFit (mid-2000s) and was an all-level certifying instructor for USA Weightlifting for more than a decade. He is a decorated military veteran (sergeant, U.S. Army). His illustration, authorship and co-authorship efforts include several best-selling books and works in numerous research journals. After a 20-year professorial career in higher academia, he currently delivers vocational-education courses through the [Kilgore Academy](#), provides online [commentary and analysis](#) of exercise-science papers, and works as a writer and illustrator.



According to the "Certified CrossFit Trainer Candidate Handbook," a trainer "recognizes the limitations of his or her own knowledge and skill set and refers clients to other healthcare professionals when appropriate."