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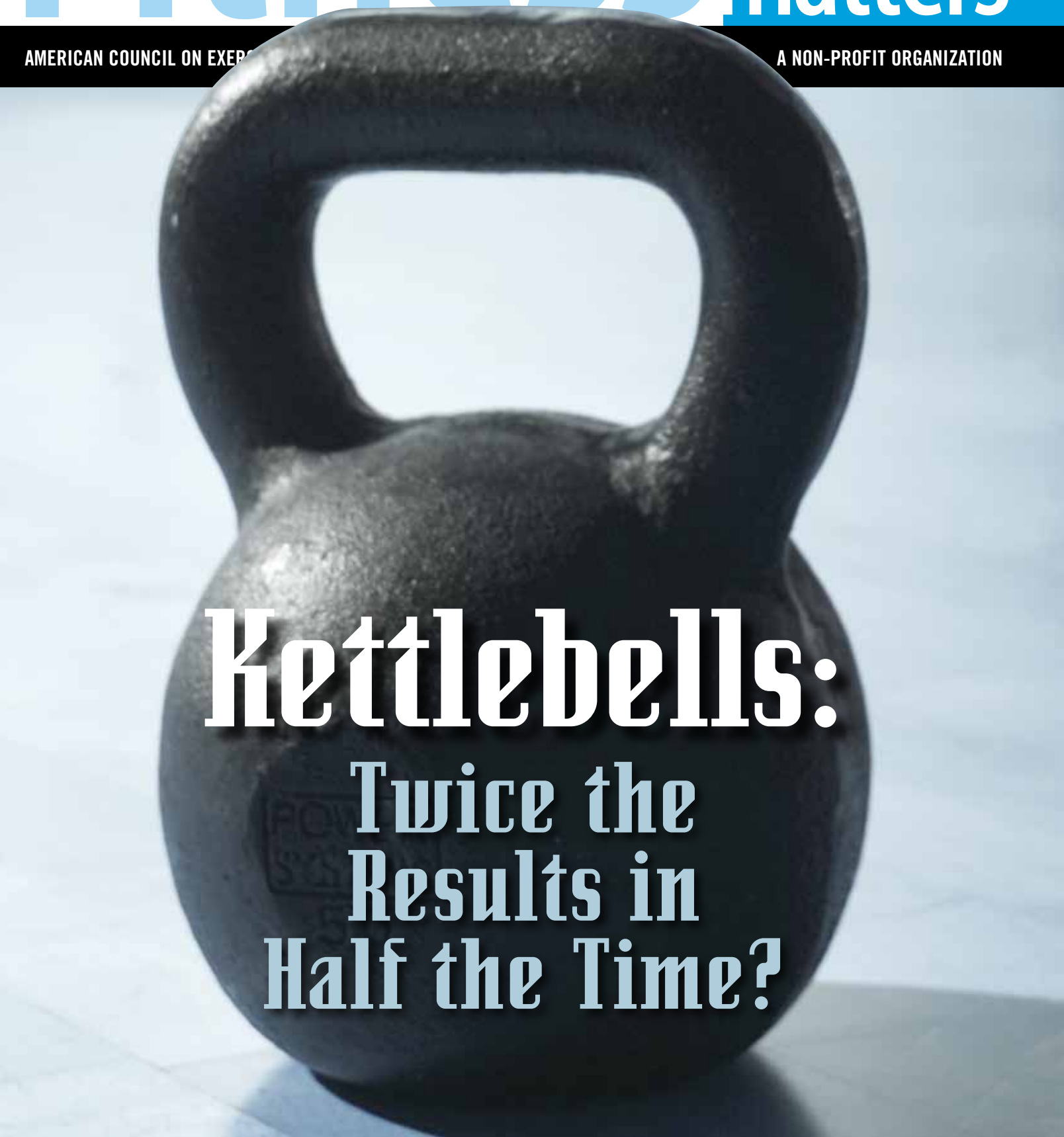
A NON-PROFIT ORGANIZATION



Kettlebells: Twice the Results in Half the Time?

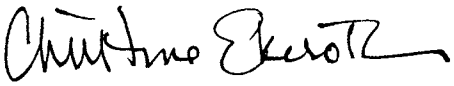
LETTER FROM THE EDITOR

Not only is 2010 the start of a new decade, it also marks a big milestone for the American Council on Exercise—our 25th anniversary. I have to admit I've had a hard time wrapping my brain around that number, especially since we celebrated our 10th anniversary not long after I was hired to launch the publication you hold in your hands. And yet the organization has grown and expanded in so many ways that it's remarkable to consider what has been accomplished in the past 25 years. Throughout the next year, we will be taking a look back and reflecting on some of those accomplishments, including some of our landmark research studies, such as ab stimulators, the Curves workout, and the best butt exercises. And you won't want to miss some of the anniversary-related features on our Web site—www.acefitness.org—including the top fitness milestones of the past 25 years.

In this issue, however, we feature the results of our latest study. Kettlebells have been around forever, but recently experienced a huge surge in popularity, with devotees making dramatic claims regarding the benefits of a kettlebell workout. We enlisted researchers at the University of Wisconsin, La Crosse, to test those claims and let's just say we were amazed by the results (page 6). If you're pressed for time and need a quick workout, you might want to try out our accompanying kettlebell workout, which begins on page 8.

Being pressed for time has become something of a natural state for me, especially since my daughter turned two. Not surprisingly, I haven't had too much time to consider making any New Year's resolutions (although procrastinating less is always at the top of my list). But like many people, I'm hoping to cut out the distractions and focus on the things that are most important to me—family, faith, friends and, of course, good health.

Happy New Year!



Christine Ekeroth

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Skip the Food Fights: 10 Ways to Get Kids to Eat Healthier

By Natalie Digate Muth, M.D., M.P.H., R.D.

"I do not like broccoli. And I haven't liked it since I was a little kid and my mother made me eat it. And I'm President of the United States and I'm not going to eat any more broccoli," the first President Bush infamously stated at a news conference.

His public denouncement of broccoli set off a firestorm and outrage among parents across the U.S. who had been diligently trying to shovel the vegetable into their children's mouths. It's hard to know if his disdain for broccoli would have been so profound had his mother never made him eat it, but certainly she had no idea that her desire for her son to eat his vegetables would lead to such a public lashing. Her well-meaning demands to "Eat your vegetables!" backfired. Parents around the world have tried the same tactic with little lasting success. Research suggests that if we want our kids to eat healthfully, we have to rethink our strategies. Here are 10 tips based on the latest research and expert opinion that will help even the pickiest of eaters to eat healthier.

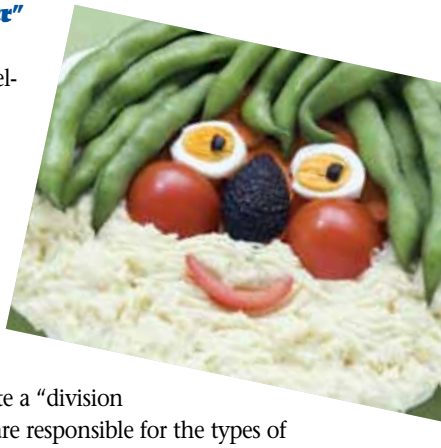
1. Model healthy eating. One of the most important actions adults can take to help children eat healthier is to eat healthier themselves. In one study, parental modeling was associated with increased milk, fruit juice and vegetable intake (Young et al., 2004). Another study found that children's intake of a novel food increased at meals during which they witnessed a teacher enthusiastically eat the food (Hendy and Raudenbush, 2000).

2. Eat together. In an era of single parenting and two-parent working families, multiple extracurricular activities to coordinate, and overall hectic lifestyles, family meals are on the decline. Not only are family meals generally more nutritious for children (Gillman et al., 2000), eating together also offers an opportunity to socialize about food and eating, and model healthy behaviors. Even if it is only twice per week, planning family meals into a weekly routine goes a long way toward helping children to develop healthier eating habits.

3. Increase exposure to healthy foods. As stated by Cook in a 2007 review article advocating that children be repeatedly exposed to a variety of healthy foods, "Children like what they know and they eat what they like." One of the best ways that parents can help their children develop healthy eating habits is to repeatedly expose them to a wide variety of foods. While children may not accept the novel food on the first try, with repeated attempts and familiarity with the food, they will become more likely to develop a preference for it. In one study, children exposed to a sweet, salty or plain version of a new food showed increasing preference for the food that became most familiar to them (even the plain version). They showed decreasing preference for the other versions *even though* children have an innate preference for sweet tastes (Sullivan and Birch, 1990). Just because a child shuns a food once, do not label it "rejected." Instead, continue to reintroduce it and expect that it may take up to 15 times before the child will accept it.

4. Let them choose the portion size. Adults can empower children to let their internal cues of hunger and fullness guide how much they eat by allowing children to choose their own portion sizes. Adults are notoriously bad at guessing how much food a child should eat. They typically offer too-big portion sizes and then require kids to "clean their plates." This scenario sets the stage for overeating. In one study, researchers offered preschool-aged children two plates of food: one with an age-appropriate portion and another with double the amount of food. The children ate about two-thirds of the food from the age-appropriate portion size. They ate 25 percent to 29 percent more food when offered the larger portion size. Notably, they did not even notice the increases in the portion size when given the larger serving (Orlet Fisher et al., 2003). Thus, similar to adults, kids will eat more food when portion sizes are big. And when adults force them to finish these oversized portions, children learn to override their internal hunger cues and develop a tendency for overeating. On the other hand, several studies have shown that when kids are allowed to choose their own portions, they tend to choose appropriate portion sizes and they eat less versus when adults decide how much they should get (Orlet Fisher et al, 2003).

5. Share the control. Several studies have shown that when a child is allowed to self-regulate food intake, free of any adult pressure or influence, total caloric intake and nutritional value differ only minimally from day to day (discussed in Birch and Dietz, 2008). On the other hand, encouraging children to eat by focusing on the amount of food left on the plate promotes more food intake and makes children less able to self-regulate caloric intake (Birch et al., 1987). Furthermore, several studies have confirmed that requiring a child to consume a particular food to receive a "reward" such as a dessert, led to increased dislike of the food the child was required to eat and increased liking of the typically unhealthy "reward" food. Higher levels of parental control and pressure to eat are associated with lower fruit and vegetable intake and higher intake of dietary fat (discussed in Birch and Dietz, 2008).



6. Refuse to be a "short order" cook. Picky eaters can wreak havoc on an enjoyable family meal, compelling some parents to make special accommodations for each child just so everyone will have something that they will eat. Parents can promote healthier eating by refusing to accommodate special requests, while at the same time making sure to serve at least one healthy food that the child likes at each mealtime. Birch and Dietz (2008) promote a "division of responsibility" in which parents are responsible for the types of food that are offered and children are responsible for deciding whether or not to consume those foods and how much to eat. If the children refuse what is offered, it is not up to the parents to offer them something else. Rather, the children can have ready access to the meal later should they become hungry. This may seem like tough love, and many parents may express concern that the child will go hungry, but by consistently following this rule, parents will go a long way toward helping their child to develop a taste for previously rejected foods.

7. Limit television time. While television viewing has been associated with a variety of negative behaviors including poor school performance and childhood obesity, it is also linked to overall worse nutrition. This may largely be due to the enormous amount of advertising for unhealthy foods such as sugary breakfast cereals, soft drinks, candy, salty snack products, and highly processed and fast foods. Research has shown that exposure to advertisements for food products increases children's choice of, and preference for, these advertised foods (reviewed in Birch and Dietz, 2008).

8. Exploit similarities. Susan Roberts and Melvin Heyman, authors of *Feeding Your Child for Lifelong Health* (1999), suggest that parents exploit similarities to develop a taste preference for new foods. Once a food is accepted, find similarly colored or flavored "food bridges" to expand the variety of foods a child will eat. For example, if a child likes pumpkin pie, try mashed sweet potatoes, and then mashed carrots.

9. Make eating healthy fun. Despite its accompanying demands, stresses, mistakes and disappointments, parenting is supposed to be fun. Adults can make learning about healthy nutrition and physical activity fun and educational. For example, what better way to teach a child about plants and the importance of eating them than having his or her own small garden? Families can grow the plants and then show the child how to use the produce in delicious recipes. Or, parents can take their

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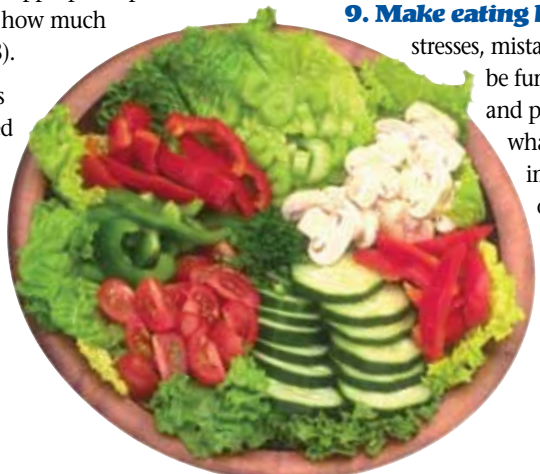

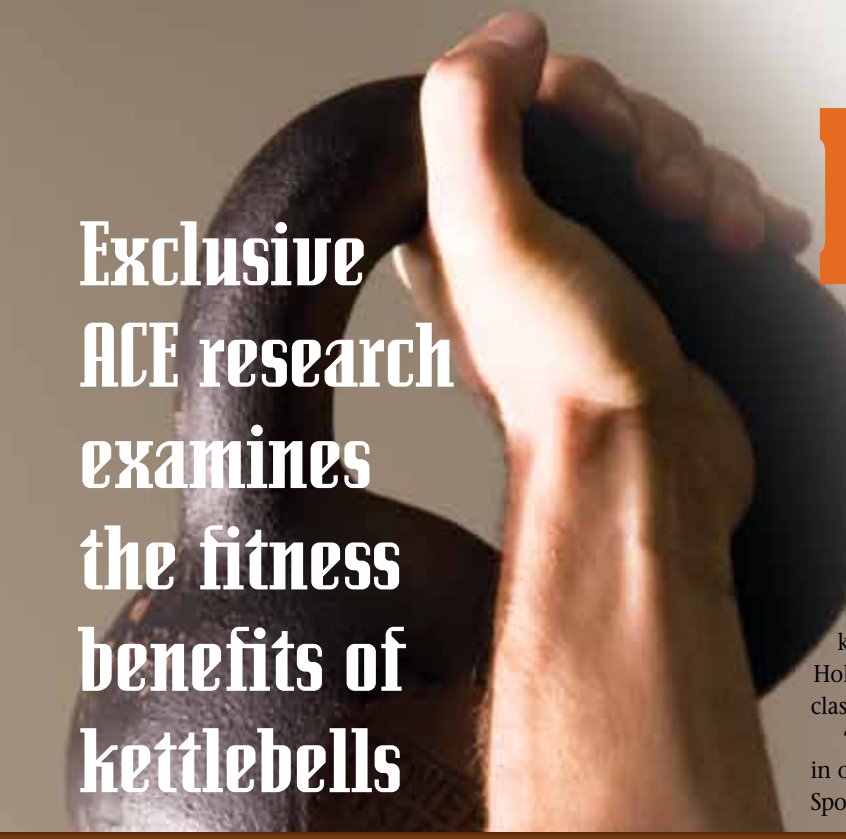

Exclusive ACE research examines the fitness benefits of kettlebells

Kettlebells:

Twice the Results in Half the Time?

By Chad Schnettler, M.S., John Porcari, Ph.D., and Carl Foster, Ph.D., with Mark Anders

It's funny how workout trends come and go, and how a centuries-old piece of cast iron can inspire legions of exercisers in 2010. That's the way it seems to be going for the good ol' kettlebell.

These cannonball-shaped iron orbs with handles lifted in a swinging motion were developed by Russian strongmen in the early 1700s as a way to build strength, balance, flexibility and endurance quickly. And they do work well. If you want proof (at least anecdotal), rent the film epic *300* and take a look at the physique of lead actor Gerard Butler who plays King Leonidas of Sparta. Butler used kettlebells to prepare for his role in the film. But it's not just Hollywood types who are getting into it. Kettlebell-themed fitness classes are now being offered at gyms across the country.

"It's great because it brings cardio and strength training together in one quick exercise," says Michael Shade, kettlebell instructor at Sports Club/LA in Miami. "Instead of lifting weights for a half hour and doing the treadmill for another half hour, you can get everything done with kettlebells in 20 minutes."

Shade says that in his gym, kettlebells went from gathering dust in the corner to becoming so popular there is now a waiting list for his weekly kettlebell bootcamp classes. There are even kettlebell-only gyms opening around the country that attract exercisers who really like the simple, total-body exercises.

Given kettlebells' surge in popularity, the American Council on Exercise (ACE) decided to look into the science behind this workout trend.

The Study

To analyze the energy cost and exercise intensity of kettlebell workouts, ACE enlisted the help of the research experts at the University of Wisconsin, La Crosse Exercise and Health Program. The team, led by John Porcari, Ph.D., and Chad Schnettler, M.S., recruited 10 volunteers, male and female, ages 29 to 46 years, all of whom were experienced in kettlebell training.

"They [kettlebell enthusiasts] make these all-encompassing claims about increasing your muscular strength, endurance and aerobic capacity with kettlebells, like, if you do this, that's all you need to do," says Porcari. "So we wanted to look and see how much of an aerobic workout you really do get and how many calories you really burn."

Prior to beginning the actual study, each volunteer was given a maximal exercise test on a treadmill while oxygen consumption and heart rate were constantly monitored. Next, they surveyed each subject and their ratings of perceived exertion (RPE) for the treadmill test.

Once a fitness baseline was established, each subject returned to the Human Performance Laboratory on a separate day to perform a five-minute kettlebell $\dot{V}O_2$max snatch test to establish a baseline of their specific kettle-

bell fitness. For this test, the subjects used a 12-, 16-, or 20-kilogram kettlebell (depending on their gender, body weight, fitness level, and experience level) swinging it one-handed between their legs and up and over the head in a snatch motion. The subjects continuously performed snatches to a specific cadence during each minute, switching to the opposite hand for the snatch every other minute.

The maximal kettlebell test format went like this:

- First minute: 8 repetitions at a rate of 1 snatch every 7 seconds
- Second minute: 12 repetitions at a rate of 1 snatch every 5 seconds
- Third minute: 15 repetitions at a rate of 1 snatch every 4 seconds
- Fourth minute: 20 repetitions at a rate of 1 snatch every 3 seconds
- Fifth minute: The subject went all out, performing as many snatches as they could until fatigue.

Meanwhile, heart rate (HR) and oxygen consumption ($\dot{V}O_2$) were measured during each stage. A peak RPE was taken following the test as well as blood lactate levels, which were tested using the finger prick method three minutes after completion of the test.

The number of snatches each subject successfully completed during the final minute of the test determined the number of snatches they would be asked to perform during the actual kettlebell testing (to be conducted on a separate day). For example, if a subject completed 24 snatches during the final minute, this number was divided by four and they were required to complete at least six snatches during each timed 15-second period of the 20-minute kettlebell snatch workout.

After both the maximal exercise and maximal kettlebell tests had been completed, each subject then performed a pre-determined 20-minute kettlebell snatch workout typical of a common kettlebell routine. Following a basic warm-up, subjects did 15 seconds of one-armed snatches, first with their dominant hand, then after a 15-second rest period, they performed another 15 seconds of snatches with the other hand. The workout continued like that, with intervals of 15 seconds of work and 15 seconds of rest, for 20 minutes, followed by a five-minute cool-down.

Throughout the workout, researchers monitored each subject's HR at 60-second intervals, followed by a blood lactate test which was taken immediately following completion of the workout.

The Results

During the 20-minute workout, the average calorie burn was 272 calories, not counting additional calorie burn due to the substantial anaerobic effort.

"We estimated oxygen consumption and how many calories they were burning aerobically, and it was 13.6 calories per minute. But we also measured the blood lactate, so anaerobically they were burning another 6.6 calories per minute," explains Porcari. "So they were burning at least 20.2 calories per minute, which is off the charts. That's equivalent to running a 6-minute mile pace. The only other thing I could find that burns that many calories is cross-country skiing up hill at a fast pace."

Researchers credit the brisk calorie burning to the fact that the kettlebell snatch workout is a total-body movement that is also done very quickly due to the interval-training format. "We knew it would be extremely intense," says Schnettler. "It's a quick workout, and you do get a big bang for your buck in a very short amount of time."

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TABLE 1

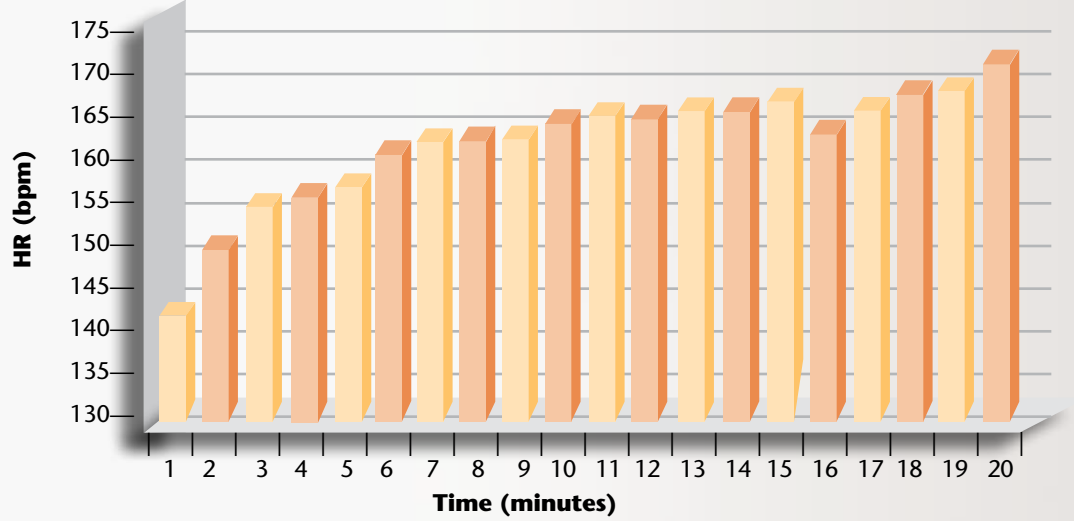
Average HR, $\dot{V}O_2$, RPE and Caloric Expenditure Values for the Kettlebell Workout*

	Mean ± SD	Range
HR (bpm)	164 ± 14.7	128 – 180
% HRmax	93 ± 4.5	86 – 99
$\dot{V}O_2$ (ml/kg/min)	31.6 ± 3.71	24.6 – 36.6
% $\dot{V}O_2$max	78 ± 8.0	67 – 91
Kcal/min	13.6 ± 3.08	8.75 – 17.85
RPE	15.9 + 2.21	10 – 18

*All HR and $\dot{V}O_2$ values are compared to maximal values measured during the kettlebell snatch test.

FIGURE 1

Average HR During Kettlebell Workout



This study was funded solely by the American Council on Exercise.

Kettlebell exercises begin on page 8

Ring in the New Year with Kettlebells

Kick start your get fit resolution with a centuries-old workout revved up for 2010 by ACE exercise physiologist Fabio Comana

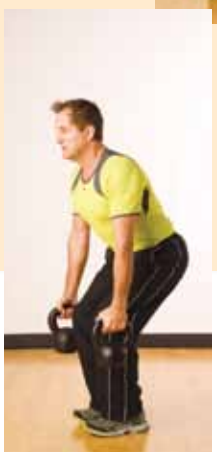
As our ACE-sponsored research demonstrates, kettlebells can offer a highly effective workout. In addition to boosting your strength and cardiovascular fitness, it is likely you'll also increase your balance and flexibility, too. And since kettlebell training is so efficient, you may be able to get better results while spending less time in the gym.

We tapped Fabio Comana, M.A., M.S., one of ACE's resident exercise physiologists, to design the following total-body kettlebell workout and six-week training regimen. While traditional kettlebell training calls for 18-pound kettlebells for women and 35-pound kettlebells for men, it's a better idea to choose a lighter weight and focus instead on developing correct technique. For women, kettlebells weighing 8 to 15 pounds would be a good place to start. Men may want to go with 15- to 25-pound kettlebells. As you become stronger and more skilled, add reps and shorten your recovery time between sets. If you still need a greater challenge, only then should you increase the weight of the kettlebell you're using.

Aim to do this kettlebell routine at least two to three times a week, performing each of the exercises in the order shown below. For a more detailed progression, see Comana's Six-Week Training Plan. As always, warm up before working out and cool down and stretch afterward as needed.

1. Kettlebell Deadlift (targets glutes, quads, back)

- Stand with feet hip-width apart, arms at your sides, and place a kettlebell adjacent to each foot.
- Engage your core and abdominal muscles ("bracing") to stabilize your lower back and maintain this contraction throughout the exercise while breathing normally.
- Depress your shoulders and squeeze your shoulder blades together ("setting your shoulders") and maintain this position throughout the exercise.
- Initiate your downward movement by pushing your hips backward ("hip hinging") before lowering your body toward the floor.
- Avoid allowing your knees to travel forward to initiate your downward movement.
- Firmly grasp the kettlebell in each hand, pausing momentarily to check your body alignment.
- Your heels should be in contact with the floor and remain in contact with the floor throughout the exercise.
- Your tibia (shin bone) and torso should be parallel to each other, with your shoulders positioned directly over the kettlebells or slightly in front of them.
- Maintain your "bracing" and "shoulder set-position," exhale while firmly grasping each kettlebell, raising your body until you return to a full standing position.
- Inhale and slowly return to the lowered position.
- Complete the recommended number of repetitions.



2. Kettlebell Single-Arm Swing (targets glutes, quads)

- Stand with feet hip-width apart, and place a kettlebell between your feet.
- Set your shoulders and brace, maintaining these contractions throughout the exercise.
- Hip hinge to lower your body down to grasp the kettlebell with one arm.
- Exhale, initiating an explosive upward movement to swing the kettlebell upward, returning to a vertical standing position (do not swing your torso beyond vertical).
- The momentum gathered through the lower extremity should allow the kettlebell to swing until the arm is parallel to the floor. Maintain alignment through the wrists, preventing them from flexing or extending past the parallel arm-position.
- Remember that this is not a shoulder exercise, but an exercise to generate explosive forces in the hips. If you are unable to achieve the desired arm position, attempt to thrust harder with your glutes from the lowered position.
- Complete the recommended number of repetitions and then repeat with the opposite arm.

The number of reps and circuits listed are just a recommendation. It's important that you select an intensity (number of reps and circuits) that allows you to challenge your body, yet still complete all the reps without compromising your exercise technique or body alignment.

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3. Turkish Half Get-up (targets abs, core, shoulders)

- Lie flat on the floor with your right leg in a bent-knee position and a kettlebell placed close to your right shoulder.
- Using both arms if necessary, pick up the kettlebell and rest it against the back of your right forearm while maintaining a neutral wrist.
- Extend your right arm out to the side and rest it on the floor.
- Set your right shoulder, slowly exhale and then gently press the kettlebell upward, extending the elbow while maintaining a neutral wrist position.
- Begin the half get-up by exhaling, contracting your abdominals, and pushing off your left arm to curl your trunk upward to a vertical position while keeping the kettlebell pressed overhead.
- Hold this position briefly before slowly uncurling your trunk and lowering yourself back to the floor, using your left arm for support.
- Complete the recommended number of repetitions and then repeat with the opposite arm.

4. Kettlebell Push-up (targets chest, triceps, core)

- Grasp the handle of each kettlebell and assume a full or bent-knee push-up position. Maintain neutral wrists throughout the exercise.
- Brace to stabilize the trunk, and maintain a stiff, rigid trunk throughout the exercise.
- Inhale and slowly lower your body toward the floor to a level where the chest is aligned with your hands.
- Exhale and slowly press your torso upward.
- Complete the recommended number of repetitions.

5. Kettlebell Single-arm Row (from push-up position) (targets back, biceps, core)

- Assume the starting push-up position, but place one kettlebell beneath the left shoulder.
- Open up your stance, widening your feet to help stabilize your body.
- Brace to stabilize your trunk, and maintain a stiff, rigid trunk throughout the exercise.
- Grasp the kettlebell in the left hand, exhale and slowly perform a row movement, lifting the kettlebell toward your left shoulder, holding it in the raised position briefly before lowering it back toward the floor.
- Attempt to prevent any rotation of your torso throughout the movement.
- Complete the recommended number of repetitions and then repeat with the opposite arm.

Six-week Training Plan

EK 1:
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mum of two
this week.

WEEK 2:
Do one circuit of 10 to 12 reps per exercise with a 30-second recovery between each exercise. Aim to do this workout a minimum of two times this week.

WEEK 3:
Do two circuits of eight reps per exercise with a 30-second recovery between each exercise. Aim to do this workout a minimum of two times this week.

WEEK 4:
Do two circuits of 12 reps per exercise with a 30-second recovery between each exercise. Aim to do this workout a minimum of three times this week.

WEEK 5:
Do three circuits of 10 reps per exercise with a 30-second recovery between each exercise. Aim to do this workout a minimum of three times this week.

WEEK 6:
Do three circuits of 15 reps per exercise with a 30-second recovery between each exercise. Aim to do this workout a minimum of three times this week.

More exercises on page 10

6. Kettlebell Walking Lunge

(targets quads, hamstrings)

- Stand with both feet together while holding a kettlebell at chest height, close to your body.
- Slowly perform a series of lunges while holding the kettlebell close to your chest.
- When lunging, attempt to "hip-hinge" to initiate the lunge movement (when your lead foot touches the floor) and avoid driving your knee forward too prematurely.
- Complete the recommended number of repetitions and then repeat with the opposite arm.

7. Kettlebell Shoulder Press

(targets shoulders, triceps)

- Stand with both feet together while holding a kettlebell in your right hand.
- Set your shoulders and brace, maintaining these contractions throughout the exercise.
- Pull the kettlebell upward to assume the starting position as illustrated. The forearm should be positioned vertically, slightly inside the hips, with the kettlebell resting against the back of the forearm and wrist in a neutral position. [Note: Due to possible breast interference that may prevent one from positioning the elbow inside of the hips, some women may need to shift their hips outward to the same side (a).]
- Exhale and slowly press the kettlebell upward, maintaining a neutral wrist position.
- Some individuals may favor using both arms to press the kettlebell upward. Grasp the right forearm with your left arm and press the kettlebell overhead (b).
- Complete the recommended number of repetitions and then repeat with the opposite arm.

a.

b.

8. Kettlebell Halo

(targets core)

- Stand with feet hip-width apart and hold a kettlebell in both hands.
- Set your shoulders and brace, maintaining these contractions throughout the exercise.
- Exhale and slowly raise the kettlebell above your head (bent-elbow position) as illustrated.
- Perform slow circles around the head ("halo"), keeping he wrist neutral and elbows bent.
- Complete the recommended number of repetitions and then repeat in the opposite direction.

Can Running Save Your Knees?

By Jim Gerard

By now, if you're a runner—a hardcore runner, recreational runner or barely running runner—you've heard (probably ad nauseum) the refrain that running will ruin your joints. That it's homicide on your knees and that each step you take is a step closer to the surgeon's knife. That running is a one-way ticket to Arthritisville (which is adjacent to Margaritaville, where you can dull its pain).

As more people are running into middle age and beyond, that assertion becomes more strident; the Cassandras point to the joint damage incurred by baseball, football and soccer players, wrestlers and other athletes to buttress their argument. And especially to some runner they know who did blow out her knee, throw out his back or turned his Achilles heel into such a mash-up of torn tendon that not even Achilles would recognize it.

But take heart, you running fiends: Two studies over the past few years have created a growing chorus of dissenters who believe that not only is running not damaging to your knees but that it can actually help protect them.

Continued on page 12

First, in 2007, researchers from Danube Hospital in Austria published the results of a study in the renowned journal *Skeletal Radiology;* the study examined the knees of marathon runners using M.R.I. imaging, before and after the 1997 Vienna marathon and again in 2007. Astonishingly, they found no new damage to the marathoners' knees. In fact, the only runner who had a torn-up knee had stopped running before the 1997 marathon. In the intervening years the knee further degenerated. The Austrian researchers surmised that this ex-runner might have staved off the ensuing degeneration by continuing to run, no matter how counterintuitive that might sound.

Their conclusion was that the kind of continuous exercise provided by running was protective, rather than destructive, to the knees.

Next, in 2008, a Stanford University study published in the *Journal of Bone and Joint Surgery* replicated the results of the Austrian study (although not its methodology). It traced middle-aged long-distance runners for two decades starting in 1984 and compared the results to a control group of similar age. Once again, the runners' knees were healthier.

Neither set of researchers has an iron-clad explanation for their results. The leading hypothesis is that by running you develop a "motion groove" that conditions your cartilage to the pounding of running and acts as a partial guard against arthritis.

The Critics Weigh In

This theory has generated much controversy. Dr. Stuart Willick, associate professor at the University of Utah Orthopaedic Center in Salt Lake City, feels that the two studies should be placed in the context of a wide body of literature—animal, lab and human studies—looking at running and arthritis. He poses several caveats to the studies. "Human studies are difficult to carry out because you need a large number of participants [the Austrian study included only 22 runners] and a long period of time over which to study them, and you risk selection bias. For example, do the runners whose knees held up after 10 years only seem like they've been protected because many other runners had to give up running due to injury before the study was conducted?" He also says that the studies may not apply to high-volume running (ultramarathons or running more than six marathons a year).

Despite his misgivings, Willick sides with the Austrian and Stanford researchers. "Most of the studies show that moderate running for recreation does protect knees by improving joint cartilage and has not been shown to have an association with osteoarthritis."

Dr. Francis D. O'Connor, medical director of the Consortium for Health and Military performance at the Uniformed Services University of the Health Sciences (USUHS) in Bethesda, Md., opines with guarded optimism: "These studies are all observational or cross-sectional studies. There aren't enough with suitable control groups, and so the literature is difficult to interpret. While good longitudinal [long-term] studies in runners have not demonstrated a consistent risk of arthritis, there haven't been many such studies, because it's hard to find good aged-matched controls. What happens to those who run versus those who don't run who are equal in every other way? We don't really know."

Dr. Timothy Hewitt, professor and director of the Sports Medicine Biodynamics Center at Cincinnati Children's Hospital, is more skeptical of the studies' findings. He raises some of the same questions about the studies being insufficiently large and having inherent biases. "If you have shock-absorbing shoes and you change them every 500 miles, and you're running on a compliant surface with perfect mechanics—that is, your ankle doesn't turn in or out—it's likely that over the long term, running could be beneficial. But the reality is that most runners don't have those shoes or don't change them often enough, run on those types of surfaces or have perfect mechanics. They run with poor mechanics, on hard surfaces, with shoes that are past their peak level of elasticity and lose their shock-absorbing capacity. Also, many runners run through pain because they're addicted to the benefits of running. The point is that the studies posit a perfect world, one most of us don't run in."

And in that imperfect running world, the most accurate predictor of running-induced osteoarthritis is a prior injury. "If you run with pain and swelling in your joint, you will destroy cartilage," says Hewitt. Studies back him up; they consistently demonstrate that if you have a prior meniscus or ligamentus injury, you may be at risk for osteoarthritis.

The two agents that cause most injuries are, according to O'Connor, running too much, too soon and too fast, which leads to stress fractures, and being neuroanatomically or structurally abnormal. For example, if you're bow-legged you risk injury and osteoarthritis. However, O'Connor adds, "If you're built normally, running is not going to be harmful. That doesn't mean everyone should train for a marathon. In fact, I counsel some overzealous patients, 'Maybe you shouldn't run a marathon, but a 5k instead.'"

What are the Risks of Not Running?

So far we've examined the relative effects of running on the knees. And yet, what are the risks of *not* running?

Here, there is a consensus: Inactivity is not good for the joints. Numerous studies, including one done on rhesus monkeys in the 1970s, have proven this. "If you have a normal neuroanatomical joint and sit in a chair all day, you have an increased risk of osteoarthritis," says O'Connor. "Normal joints need to be stimulated and are not at risk from repetitive, low-impact recreational exercise. And running, compared to other sports, is considered low-impact." When you run, you put three to five times your body weight on the joint, a much lighter load than when playing a stop-start contact sport such as basketball or soccer that requires nonlinear movement.

> *"Most of the studies show that moderate running for recreation does protect knees by improving joint cartilage and has not been shown to have an association with osteoarthritis."*

And yet, runners must take every precaution, for the simple reason that from an evolutionary standpoint, running, like throwing a baseball, is an unnatural act. As Hewett puts it, "Our ancestors started on all fours, but then we sat up on two legs and ran, which

meant that each time our foot hit the ground, the ground hit back. We went from four points of contact when on all fours, to two, which put enormous force on our bodies that has to be managed. Without optimal conditions, a lot of torque is transferred to our ligaments, cartilage and joints. Remember: The fastest runners in the world aren't two-footed, but four-footed."

Presuming that we're not about to start running on all fours, here are some expert suggestions to help you ensure optimal running conditions:

- Have your gait analyzed by a sports medicine physician, physical therapist or expert running coach. This is done on a treadmill; it's convenient, and the testers can have you run at different speeds and inclines. You could learn to make minor adjustments that could prevent injury and strengthen your knees.
- Even better, attend a runner's clinic where experts will videotape your running and examine it. You can alter your motor control patterns to improve your gait, which is the key to preventing injuries, Hewitt says.
- O'Connor recommends having your joints evaluated by a physician.
- Learn good mechanics—how to run while keeping your pelvis and knees relatively stable. One way to foster good body mechanics is to do regular lower-body core-conditioning exercises. This keeps the pelvis and spine strong.
- Get the best running shoes for your feet and change them every 500 miles.
- Don't run on concrete, asphalt or any other non-compliant surface.
- Follow Hewett's "10 percent and 30 percent" rule. This means don't increase the volume of your running by more than 10 percent a week, and restrict your longest run to no more than 30 percent of your weekly total of miles. For example, if you do 20 miles a week, your longest run shouldn't be more than six miles.
- Monitor your recovery; take note of pain and discomfort and treat it.
- Maintain proper body mass index, eat a healthy diet and do strength training.

The evidence is mounting that running properly is good for you. And it certainly beats being sedentary. O'Connor, who recently ran the Boston Marathon at age 50, puts it, "Given a choice, it's better to wear out than rust out."

Skip the Food Fights

Continued from page 5

children to a farmer's market and let them pick out a new vegetable or fruit to try at home. Whatever it is, parents should try to take a break from the mealtime battles, and take advantage of a child's wonderment of the world to teach a lesson about health and fitness.

10. Skip the food fights. A survey published by the American Dietetic Association revealed that the number one eating concerns of mothers are that their children do not eat enough fruits and vegetables (ADA, 2006). Recognizing the powerful health-promoting benefits of these nutrient powerhouses, parents insist that their children eat their vegetables. The alternative, they fear, is that their children will be unhealthy and malnourished. The truth is that the more parents pressure their children to eat certain foods, the less likely they will be to develop a taste for them and continue to eat them often as an adult. In fact, several research studies have shown that encouraging children to consume a particular food increases their dislike for that food (reviewed in Birch and Dietz, 2008). Kids instinctively resist persuasion. If parents want to get their kids to eat vegetables and other healthy foods because the kids *like* them, then parents will have to employ different strategies – increasing accessibility and exposure, minimizing the competition, modeling, vowing to *not say anything* when a child refuses a food, and helping make food taste good, for starters. In short, the most successful parents of healthy eaters opt to skip the food fights.

Natalie Digate Muth, M.D., M.P.H., R.D., is a pediatrics resident at UCLA Mattel Children's Hospital. She practices these strategies everyday with her one-and-half-year-old son who she anticipates will soon enjoy eating his vegetables rather than throwing them on the floor.

References

American Dietetic Association. (2006). What's a mom to do? Healthy eating tips for families. Nutrition Fact Sheet.

Birch L & Dietz W (2008). *Eating Behaviors of the Young Child: Prenatal and Postnatal Influences on Healthy Eating*. Elk Grove Village, IL: American Academy of Pediatrics

Birch et al (1987). "Clean up your plate: effects of child feeding practices on the conditioning of meal size. *Learning and Motivation*, 18, 301-317.

Cook L (2007). The importance of exposure for healthy eating in childhood: A review. *Journal of Human Nutrition and Diet*, 20, 4, 294-301.

Gillman MW, et al (2000). Family dinner and diet quality among older children and adolescents. *Archives of Family Medicine*, 9, 235-240.

Hendy HM & Raudenbush B (2000). Effectiveness of teacher modeling to encourage food acceptance in preschool children. *Appetite*, 34, 61-76.

Orlet Fiser J, Rolls BJ, Birch LL (2003). Children's bite size and intake of an entrée are greater with large portions than with age-appropriate or self-selected portions. *The American Journal of Clinical Nutrition*, 77, 1164-1170.

Robert S & Heyman MB (1999). *Feeding Your Child for Lifelong Health: Birth Through Age Six*. New York, NY: Bantam Books

Sullivan SA & Birch LL (1990). Pass the sugar, pass the salt: experience dictates preference. *Developmental Psychology*, 26, 546-551.

Young, et al. (2004). Associations between perceived parent behaviors and middle school student fruit and vegetable consumption. *Journal of Nutrition Education and Behavior*, 36, 2-8.

World Health Organization (2003). Joint WHO/FAO Expert Consultation on Diet, Nutrition, and the Prevention of Chronic Disease. Geneva, Switzerland: World Health Organization.

Two New Athletic Shoes: Gimmick or Great Idea?

Vibram FiveFingers Classic ($75)
www.vibramfivefingers.com

Vibram has been one of the driving forces behind the growing popularity of barefoot running. Believing that barefoot exercise is more natural and comfortable, many exercisers are opting for a minimalist shoe that mimics the feel of barefoot exercise while also protecting the foot from abrasions or other injuries.

The Vibram FiveFingers Classic is one of several designs Vibram offers that adhere to this basic principle. This shoe features a sculpted, non-marking sole that wraps around the bottom and sides of the foot and a stretch polyamide fabric that envelopes the toes and top of the foot. An elastic band that fastens at the heel allows users to adjust the coverage and fit. Like gloves, each toe has its own "slot."

Needless to say, these shoes take some getting used to and will not appeal to everyone. They provide surprisingly good arch support and the sole is thick enough to minimize the feel of rocks or pebbles underfoot. (It also looks durable enough to withstand glass, but we did not try to confirm this.) Water-resistant and machine washable, the Vibram FiveFingers is ideal for walking along rocky shorelines or climbing over boulders. And, for those who are convinced of the benefits, they provide adequate coverage for running long distances. Although the manufacturer recommends this shoe for yoga and Pilates, most people will still prefer to perform these activities in bare feet.

One of the challenges we encountered with the Vibram FiveFingers is that its molded shape makes it difficult to fit those who don't have "standard" shaped feet. For example, individuals with a longer second toe or a predominant big toe may find the shoes don't fit correctly or feel uncomfortable. Likewise, the high heel tab may irritate those with heel spurs or other issues.

Reebok EasyTone Inspire Walking Shoe ($98)
www.reebok.com

Reebok introduced the EasyTone walking shoe in 2009 with a provocative marketing campaign that claimed these shoes helped wearers increase muscle tone in the leg and buttock muscles. According to Reebok's Web site: "While wearing EasyTone shoes, a person will experience increased muscle activation in her glutes (28%) and in key muscles in her hamstrings (11%) and calves (11%)." (Based on tests comparing EasyTone Go Outside to a typical Reebok foam-based walking shoe). What Reebok failed to mention is that their study involved just five subjects walking on a treadmill for 500 steps.

However, while Reebok's study may not have been large or completely unbiased, there is no doubt that creating a degree of instability when you walk will alter the way the muscles respond to an activity like walking. The question then becomes whether or not that change is beneficial, benign, or possibly harmful.

The "balance pods" at the toe and heel of the Reebok EasyTone Inspire are purported to make the user feel as though they are walking on sand. This is a bit of an exaggeration, although they do require the user to work a little harder with each step. According to our reviewers, a five-mile walk in the EasyTone shoes was not noticeably more challenging than a five-mile walk wearing traditional athletic shoes. However, some users noticed a slight degree of muscle soreness on the days following their walking workouts.

Without further research, it is difficult to measure how well these shoes might live up to Reebok's claims. Overall, the shoe is comfortable and stylish, although it runs a full size smaller than expected and the toebox is very narrow (wide sizes are available). At $98, the Reebok EasyTone Inspire is not significantly more expensive than other walking shoes; however, the shoes should not be worn during other activities as they could increase the risk of turning an ankle or straining a ligament if the user were to run or move laterally.

ACE has commissioned a study by the researchers at the University of Wisconsin, La Crosse, to investigate the claims of the Reebok EasyTone and other "toning" walking shoes. The results of that study should be available some time in 2010.

Fitness Product Reviews

As your continued source for safe, reliable and effective fitness information, we're excited to announce the November launch of our new fitness product reviews available at www.acefitness.org/reviews. Read expert reviews like those featured in this column on products ranging from portable fitness equipment to books and DVDs to find out what we liked, what we didn't like, average price range and where to buy. Plus, provide your own ratings and share your thoughts and feedback on the products you've tried!

ACE FITNESSMATTERS CEC QUIZ

January/February 2010

To earn 0.1 continuing education credits (CECs), you must carefully read this issue of *ACE FitnessMatters,* answer the 10 questions below, achieve a passing score (a minimum of 70 percent), and complete and return the credit verification form below, confirming that you have read the materials and achieved a minimum passing score. In a hurry? Save money by taking the quiz online at www.acefitness.org/fmquiz for $15 and gain instant access to CECs.

Circle the single best answer for each of the following questions.

1. One of the most important actions adults can take to help children eat healthier is to _____.
   A. Avoid having any unhealthy food in the house
   B. Pretend to enjoy eating certain foods even when they don't like them
   C. Model healthy eating behaviors
   D. Reward healthy eating with treats.

2. During a 20-minute kettlebell workout, subjects' heart rate averaged between _____ of maximum heart rate.
   A. 50 and 59 percent
   B. 60 and 75 percent
   C. 76 and 85 percent
   D. 86 and 99 percent

3. Research suggests that a child may need to be exposed to a healthy food as many as _____ times before he or she will accept it.
   A. 3
   B. 5
   C. 10
   D. 15

4. Which of the following is NOT among the most common causes of running injuries?
   A. Running too much, too soon
   B. Being neuroanatomically abnormal
   C. Taking short, inefficient strides
   D. Running too fast, too soon

5. Several studies have shown that when a child is allowed to self-regulate food intake, _____.
   A. Total caloric intake and nutritional value differ minimally from day to day
   B. Total caloric intake and nutritional value differ widely from day to day
   C. He or she tends to consume excessive amounts of empty calories
   D. He or she avoids eating any fruits and vegetables

6. The ACE-sponsored research on kettlebells suggests that a 20-minute kettlebell workout burns as many calories as _____.
   A. Walking at a 4-mph pace
   B. Running at a 6-mph pace
   C. A cardio-kickboxing workout
   D. Cross-country skiing uphill at a fast pace

7. Which of the following behaviors has NOT been associated with increased television viewing?
   A. Poor school performance
   B. Childhood obesity
   C. Overall worse nutrition
   D. Reduced preference for advertised foods

8. The most accurate predictor of running-induced osteoarthritis is _____.
   A. A prior injury
   B. Being neuroanatomically abnormal
   C. High-mileage running
   D. Poor running mechanics

9. Research suggests that the more parents pressure their children to eat certain foods, _____.
   A. The less likely their children will be to develop a taste for those foods
   B. The less likely their children will be to avoid those foods
   C. The more likely their children will be to eat those foods
   D. The more likely their children will be to have a balanced diet

10. Experts suggest that recreational runners should increase the volume of their running by no more than _____ and restrict their longest run to no more than _____ of their weekly total of miles.
    A. 5 percent; 20 percent
    B. 10 percent, 25 percent
    C. 10 percent, 30 percent
    D. 15 percent, 30 percent

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FM

Kettlebells

Continued from page 7

As for heart-rate data, the average HR during the kettlebell snatch workout was between 86 percent and 99 percent of the kettlebell HR max for all subjects (Figure 1). "The average heart rate was 93 [percent], but some people averaged, for the 20-minute workout, 99 percent of heart rate max," says Porcari. "Anytime you're using that much muscle effort, it's going to be a vigorous workout."

As for the $\dot{V}O_2$max, the treadmill $\dot{V}O_2$max was 23 percent higher (38.9 ml/kg/min vs. 31.6 ml/kg/min) than the $\dot{V}O_2$max attained during the kettlebell $\dot{V}O_2$max test (Table 1).

The Bottom Line

Kettlebells can provide one heck of a workout. Based on comparisons with data from previous research on standard weight training, the HR and $\dot{V}O_2$ responses during the kettlebell snatch routine suggest it provides a much higher-intensity workout than standard weight-training routines. Furthermore, the kettlebell snatch workout easily meets industry recommendations for improving aerobic capacity. "This is good news for people who are looking for a very good resistance-training workout that will also help them lose weight," says Schnettler. "For people who might not have a lot of time, and need to get in a good workout as quickly as possible, kettlebells definitely provide that."

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