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RUNNING

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INTRODUCTION

Running can be daunting, whether you are just beginning or hoping to nail a personal best marathon time. But it doesn't have to be. With the right knowledge and a solid training program, anything is possible. Here you'll find everything you'll need to lace up and conquer your goals -- whatever they might be. You'll also find a collection of articles that cover a broad range of topics, from strengthening your glutes to proper form. Together, they'll help make you a better runner, and by building your know-how, they'll also help you enjoy running more. Whether you are starting out or a season vet, getting to the finish line will be a lot easier.

CONTRIBUTORS

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Reid Coolsaet
Reid Coolsaet is a top-ranked marathoner in Canada. At the 2010 Scotiabank Toronto Waterfront Marathon his time was 2:11:23 – the fastest by a Canadian in 24 years.

CANADA'S TOP 25 RUNS

The race calendar in Canada now boasts such a range of events that there's really no excuse for only signing up for the same run every year. Perhaps you're just starting and want to nail a very fast 10k. Or perhaps you want to try obstacle races. Or perhaps you really, really want a challenge and are looking for a 100-miler to tackle. Or perhaps you want to get on a plane to participate in something really far off. If you want it, it's out there.

MOST SCENIC

The Banff Marathon, set in Canada's first national park, has nothing but inspiring vistas for runners looking for natural wonders.
www.banffmarathon.com

The Yukon River Trail Marathon offers up the full beauty of White Horse's natural landscape.
www.yukonmarathon.com

For those who like more city in their scenery, nothing beats the cobbled roads of the SSQ Quebec City Marathan/Marathon des Deux Rives.
www.couriraquebec.com

BEST INTRODUCTION TO OBSTACLE RACING

The Spartan Race 5k is an ideal way for those who are curious about obstacle racing to get their feet wet (and muddy).
www.spartanrace.com

For those who are part of a group or want to make obstacle racing more of a team effort, Tough Mudder is the way to go, with many of challenges designed to be harder to complete as an individual.
www.toughmudder.com

MOST HARDCORE

No other race in Canada will test your mettle like this 125 km long course that has 5,000 metres of elevation change and no sympathy.
www.canadiandeathrace.com

The Western States 100-mile endurance run, in California, is the most prestigious ultra-marathon in the world. You read that right: 100-miles.
www.wser.org

MOST PUMP UP MUSIC

The Rock 'n' Roll Oasis Montreal Marathon, the only Canadian event in the largest marathon series in the world, boasts an average of one band for every mile of the course. There's also a post-race concert.
ca.competitor.com/montreal

BIGGEST TRAIL RUN

The Run for the Toad in Cambridge, Ont., is massive – this year it is capped at 1,250 runners, making it an experience unlike any other.
www.runforthetoad.com

MOST FUN AFTER DARK

Strap on your LED headlight – provided by race organizers – and trot along with hundreds of other runners in a moving light show. The 10km run or 5km run/walk is offered in seven Canadian cities throughout the year.
www.nightrace.ca

For families, the Trek or Treat Night Trail run in Oakville and Collingwood, Ontario, is a Halloween-themed 5k walk/run and one mile walk that is plenty fun for young runners.
www.trekortreat.ca

BEST INDOORS
Don't want weather to affect your time? Take it indoors. JOGX Indoor Marathons holds events in Montreal, Quebec City and Sherbrooke.
www.indoor-marathons.com

FASTEST 10K
Score a PB and help support a camp for children with cancer at the Sporting Life 10k in Toronto, which boasts a course that is almost all downhill.
www.sportinglife10k.ca

BIGGEST 10K FUN RUN
The Vancouver Sun Run attracts more than 50,000 runners each year.
www.vancouversun.com

BEST FANDEMONIUM
The Ottawa Marathon is the biggest running event in the country, and it attracts a similarly massive cheering section of upwards of 100,000 spectators.
www.runottawa.ca

BEST BOSTON QUALIFIER
The Road2Hope Hamilton Marathon ranked seventh last year on MarathonGuide.com's list of races where runners are most likely to qualify for Boston – a sure sign of a fast course. The Hamilton race was the only Canadian event to make the top 30, with just over 26 per cent of runners qualifying.
www.hamiltonmarathon.com

OTHER GREAT BOSTON QUALIFIERS
The Ottawa Race Weekend sees many runners move on to Boston.
www.bmovanmarathon.com

The Toronto Waterfront Marathon is also a great course to qualifier, with it and the BMO Vancouver Marathon regularly making the list of top 30 events that send the most qualifiers on to Beantown.
www.torontowaterfrontmarathon.com

BEST PARRRRRTY

Arrrr ya ready to have fun, matey? The pirate-themed Maritime Race Weekend takes runners through Eastern Passage and Cow Bay, N.S. and promises plenty of good times.
www.maritmeraceweekend.com

MOST HISTORIC

The Around the Bay 30k Road Race in Hamilton, Ontario, was first run in 1894. It is the oldest long distance road race on the continent, and tree years older than the Boston Marathon.
www.aroundthebayroadrace.com

The Scotiabank Calgary Marathon, celebrating its 50th year in 2014, is the longest-running marathon in Canada. The best part is runners finish in front of the Stampede Grandstand.
www.calgarymarathon.com

BEST DESTINATION MARATHONS

No event is a greater escape from Canada's winters than the Honolulu Marathon, in December.
www.honolulumarathon.org

The Beijing Marathon starts at Tiananmen Square and runners cross the finish line at the National Olympic Sports Centre stadium.
www.beijing-marathon.com/cn/index.html

The Virgin Money London Marathon boasts and huge field and is famous for costumed runners, making it one of the most amusing international races.
www.virginmoneylondonmarathon.com

BEST BRAGGING RIGHTS

The Boston Marathon is still the most prestigious event of its kind. Have you qualified yet?
www.baa.org/races/boston-marathon.com

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WEEK 1

WEEK ONE
The Running Tune Up for Week One

Feeling a little rusty after those cold, dark months of not running as far or as often as you'd like? It's time to start feeling efficient again, running your favourite trails and routes with a body that's ready to go. Let's set some new goals and get you back on track.

The first step is to evaluate your current state of health. If in doubt, you might need to consult your physician. You can't just pick up where you left off; this is especially harder as you age, unfortunately. You'll need to create a new foundation of running prior to beginning any challenging workouts.

Before we dive in and tell you what to do next, we need to ensure you understand the various training zones.

- **Zone 1** is a relaxed or recovery run, known as RR. This is a continuous running zone and the range in which you can comfortably maintain a conversation and is your warm-up and warm-down pace.
- **Zone 2** is steady state at marathon pace that still allows you to maintain a conversation.
- **Zone 3** is max steady state and is faster and at the level of a half-marathon or up to 10K-race pace. An example of this training would require one minute of zone 1 for each five minutes of zone 3 effort. Breathing is still controlled but becoming more difficult as the run progresses.
- The final zone is **Zone 4** or interval pace. This would be running at 5-km-race pace or faster and up to maximum heart rate. This zone would involve running intervals of equal time of faster running zone 4 and easy zone 1.

Your initial training program should start in zone 1 and zone 2 to establish a base. This is not the time to be comparing former times or checking your watch. You should be gauging your effort on your breathing and comfort level. Your volume per day and week will depend on your current running levels. For example, if you have been physically active over the winter, then beginning with three to five runs a week for a minimum of 30 minutes each session will get you started.

Each run should start and finish with five to 10 minutes in zone 1 and be comfortable, but can include zone-2 running in the middle. If you are already doing five runs a week, then two of those runs should be completely in zone 1.

Listen to your body and be sure to address any nagging pains. If a pain persists for more than three days, reduce your training and see a physician. It's like a car, if you don't fix the weird sounds or if you push it more than it's capable ... it'll break.

Stay motivated, be disciplined and listen to your body and your former racing form will come back to you.

THE PROGRAM

Brent Fougner and Trish Fougner's Running Zone Legend

As you get started, it's important to keep these training zones in mind:

Zone 1

The "relaxed recovery" zone, for warming up and cooling down.

Zone 2

The "steady" state: running at marathon pace, but still able to talk.

Zone 3

The "max steady" state: a faster speed, up to a 10K-race pace, while keeping the breathing under control.

Zone 4

The "interval pace": running at a 5-km-race pace or faster, up to maximum heart rate.

NUTRITION

Runners' top diet blunders – and how to avoid them

Whether you're training for your first 5K race or your umpteenth half-marathon, or if you're simply wanting to shed that winter weight, it's important to develop an eating strategy that will help you run your best.

Poor eating habits – even seemingly small mistakes – can sabotage your running and undermine your diet, too. To get into peak running form, it's important to watch for – and avoid – these common diet blunders.

Running on empty

Muscle glycogen (carbohydrate) stores are crucial to running performance, especially in half and full marathons. The only way to fill your glycogen stores is to eat carbohydrate-rich foods like whole grain breads and cereals, pasta, brown rice, sweet potato, legumes, fruits and low fat dairy products each day.

If your typical weekday scenario is one of haphazard eating – e.g. you skip breakfast and/or lunch and miss snacks – your muscles won't get the fuel they need for exercise.

An everyday diet for runners should sustain energy and blood sugar (glucose) levels all day long. That means eating three balanced meals with a mix of carbohydrate, protein and fat, and two small snacks.

Skipping the pre-run snack

Plan your snacks around your runs to ward off hunger and prevent early fatigue caused by your blood sugar dropping too low. If you run at lunch, you'll need a late morning snack one or two hours before you head out the door. If you run after work, a late afternoon snack is in order.

Pre-run carbohydrate-rich snacks include fig bars, whole grain cereal bars, dried fruit, yogurt and berries, smoothies and energy bars (look for energy bars made with whole foods like fruit, nuts and oats).

If you're a morning runner, your distance will determine whether you need a snack. If you're running for less than an hour, you don't need any pre-workout fuel. But if you don't like to run on an empty stomach, eat something small like a banana or yogurt.

For longer runs, eat a snack that's easy to digest. Try fruit and yogurt, a fruit smoothie, toast with jam, or a small bowl of low-fibre cereal with milk (no more than 2 grams fibre per serving).

Drinking too little

Being properly hydrated is essential to peak running performance. If you don't drink much during the day – except your morning coffee – you're more likely to fatigue early during your run.

Drink water during the day even if you don't feel thirsty. Runners should consume at least 9 to 12 cups (2.2 to 3 litres) of fluid each day. During a run, drink 125 to 175 ml of water every 10 to 15 minutes.

For runs longer than one hour, hydrate with a sports drink, which replenishes water, electrolytes lost through sweat and carbohydrates burned by your muscles.

Justifying extra calories

It's so easy to do – turn a blind eye to a cookie here or an extra helping there because you're running four days a week. Surely you're burning those calories off. So why isn't the needle on the bathroom scale budging?

If you've taken up running to shed a few pounds, justifying a few extra calories each day will only help you hold your weight steady. Truth is, running by itself won't help you lose much weight. To drop excess pounds, you need to combine running with a lower calorie diet.

Skimping on calories

Cutting a few hundred calories every day can help runners trim down. But cutting too many calories and increasing your mileage simultaneously is counterproductive.

If you deprive your body of the calories it needs to fuel normal bodily functions and exercise, it will break down muscle for fuel. The result: Weight loss will slow or come to a halt. What's more, your running performance will suffer.

Active women wanting to lose weight should consume no fewer than 1,400 to 1,600 calories per day; active men not less than 1,800 to 2,000 calories per day.

Overloading on carbs the night before

To boost muscle glycogen stores, runners "carbohydrate load" before a long run. But a huge pasta feast the night before can leave you feeling bloated during your run. Not to mention prompt the need for frequent bathroom stops.

To load your muscles with carbs effectively, moderately increase your intake of foods like pasta, rice, oatmeal, whole grains, sweet potato and fruit

for three days before the long run. Super-sized portions the night before aren't necessary.

Don't wait for the big event to increase carbohydrates. Practice this before each long training run.

Not fuelling long runs

If you're gearing up for a half or full marathon, you need to consume carbohydrates during your long runs to help maintain your blood sugar level at a time when muscle glycogen stores are dwindling.

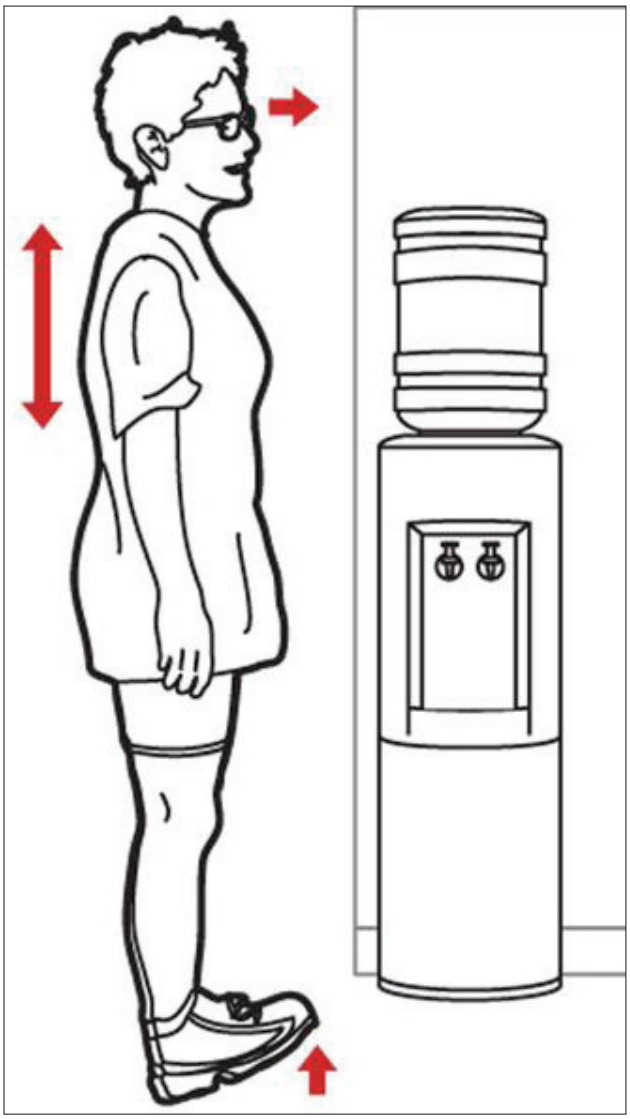
If you neglect to do so, you're more likely to "hit the wall"; you'll no longer have enough glucose in your blood and brain to function properly.

For runs longer than 75 minutes, consume 30 to 60 grams of carbohydrate per hour of running using a combination of sports drinks, energy bars, dried fruit, gummy bears or energy gels.

EXERCISE

How to work it (your legs) while you walk

This is a great workplace exercise for runners. It strengthens the front of your legs (which are often weak in runners) and also stretches the back of them (which often become tight)



1 Start standing, looking straight ahead. Engage your core. Lift your toes off the ground so that you balance on your heels.

2 Walk forward for 10 to 12 steps. Make sure to maintain proper posture: Don't look at your feet and don't drop your toes!

RESEARCH

Runners, it's time to rethink your shoes

It's been a dirty word among runners for decades, but it turns out that pronation - the inward roll of your foot as it hits the ground - may not be such a bad thing after all, according to a new study in the British Journal of Sports Medicine.

As interest in barefoot, minimalist and other unconventional running styles has grown, researchers have taken a harder look at running-shoe technologies such as soft cushioning, an elevated heel and "motion-control" designs that limit excessive pronation. The latest study, by researchers at Aarhus University in Denmark, takes aim at the idea that runners should be fitted with different types of shoes based on the degree of pronation in their feet.

The study design was simple: 927 beginners who were interested in starting a running program were issued with identical shoes and GPS watches, and divided into five groups from least pronated to most pronated based on their "foot-posture index," a measure of foot angle when standing still. They were given no instructions on how much to run or how often; over the following year, their running distance and injuries were carefully tracked.

The current advice from shoe companies is that runners with the most pronation should opt for motion-control shoes, those with the least pronation should wear "neutral" shoes and those somewhere in the middle need "stability" shoes. In this case, the shoe issued to all the runners was a neutral one (provided to the study at reduced cost by Adidas) - a recipe for disaster for subjects with severe pronation, you might think.

By the end of the year, 252 of the participants had sustained running-related injuries - but when the results were broken down by pronation group, there were no significant differences in injury rates. If anything the "pronated" group suffered fewer injuries per kilometre run than the "neutral" group, despite the lack of pronation control in their shoes.

The study has several strengths that are unusual in running research, such as the large number of subjects, the long follow-up period and the fact that clinicians assessing the injuries were blinded to their patients' pronation score, says Blaise Dubois, a physiotherapist at the Running Clinic in Quebec City.

"We need more of this type of study," says Dubois, who is currently planning his own large-prospective trial on the links between shoe choice

and running injuries, in affiliation with Laval University. “It’s important to reconsider the ‘old dogmas.’”

On the other hand, anyone using orthotics was excluded from the study, Dubois points out. This may have eliminated precisely those subjects most likely to suffer injuries when running without pronation control. Also, the subjects had no running injuries to begin with. In runners who are injured or have previously been hurt, it’s possible that assessing foot posture and reducing (or in some cases increasing) pronation could help eliminate the imbalances contributing to the injury, says the study’s lead author, Rasmus Ostergaard Nielsen.

Still, the results offer the strongest evidence yet that pronation shouldn’t be the determining factor in how you choose your shoes. This is consistent with a 2011 University of British Columbia study, in which runners were randomly assigned to one of the three main shoe types. In that study, those who happened to get the “correct” shoe for their foot type were no less likely to get injured than those in the “incorrect” shoe.

All of which leaves runners with little to go on when they choose their shoes - except one obvious factor. Research by Dr. Benno Nigg at the University of Calgary has offered preliminary evidence that the feeling of comfort when you try on a pair of shoes relates to how well the shoe is suited to your foot, and ultimately to your injury risk.

Though it sounds simple, this approach integrates your body’s feedback about how much your foot is pronating, how it strikes the ground and how well the shoe fits your particular foot type. (Note that comfort needs to be assessed while actually running in the shoes.)

And there’s also a more general message, Nielsen and his colleagues point out: When you get injured, you can’t always blame the shoes. The underlying cause of most injuries, whatever you have on your feet, is simply “too much, too soon.”

ADVICE

I'm much slower than my running buddy. What can I do?

I have started running with a friend. I am really happy she asked me to run with her because it makes me run, but my friend is faster than I am and I feel guilty holding her up

The question

I have started running with a friend. I am really happy she asked me to run with her because it makes me run, but my friend is faster than I am and I feel guilty holding her up.

The answer

Most of my favourite running memories happened with friends. So, my biggest piece of advice is that if you found a buddy, don't talk yourself out of running with her because you feel guilty.

Your friend is an adult. Don't second guess her invitation. Just enjoy the run. That being said, when she wants to do a faster run on her own, don't take it personally. Respect that decision as well.

From personal experience, I know that running with a friend, whether you are the faster or slower buddy, can be an awesome experience. I have experienced both. My personal-best half-marathon time is because a friend (who is a faster runner) paced me. I will be eternally grateful to him. In other races I have paced slower friends so that they could get a personal best. Those were equally rewarding experiences. It is always wonderful to see someone succeed.

In training runs, I like running with a slower friend during a recovery run. They are so important, but I find it hard to make myself do them. Relaxing is not one of my strong suits. I am always grateful to my buddy for helping me slow down and smell the roses.

The main takeaway is stop feeling guilty. Your friend most likely enjoys running with you because it allows her to be social, recover and enjoy the process of running, not just the final result! Plus, when it comes to exercises, running included, guilt is counterproductive. Feelings of guilt (for example, from skipping a workout) often just make us embrace an unhealthy habit like eating junk food. In your case, feeling guilty has made you contemplate not embarking on a great fitness journey with a friend.

Trainer's tip

Run with your friend, but don't abandon solo runs altogether. Running solo allows you to run at your own pace (so you don't over-train), and will teach you how to pace and motivate yourself. Plus, I really enjoy solo runs because they allow me time to reflect.

ADDITIONAL STORIES

How to work it (your legs) while you walk

tgam.ca/EBth

Why a 'do over year' can help your running

tgam.ca/EBti

WEEK 2

WEEK TWO
Reaching the next level

To get faster and stronger it's essential to establish an end goal. You need something to work toward. If your goal is to run a 5-kilometre or 10-km road race you will need an eight to 12-week training program to prepare properly for it. If your goals are more intrinsic and you are looking to improve you overall fitness and just enjoy your running this season then you should see improvements within a few weeks.

For some of you, staying at zones 1 and 2 might be necessary for another week or two but for others who feel they are ready to take the next step, you can start to move into zone 3 once or twice a week for a maximum of 10 to 15 minutes during a full workout. For example, after a proper 10 minute warm-up, this workout would include three five-minute intervals in zone 3 with one minute of relaxed running (zone 1) after each interval, followed by a cool down (zone 1) of 10 minutes.

It's very important during this increased activity and intensity that you gauge how your body is reacting to the training and how it is recovering.

Focus your attention on how you are breathing while you're running. Is it in control? Are you still able to carry on a conversation? Begin to know what your levels are by how your body is reacting. You should be able to comfortably complete three intervals of this higher intensity.

Here's a sample week for the more advanced runner ready to move into zone 3 training:

Monday
Day Off

Tuesday
10 minute warm-up then three five-minute runs in zone 3 with one minute relaxed recovery (zone 1), followed by a cool down of 10 minutes in zone 1

Wednesday
Easy run in zone 1 - minimum 30 minutes

Thursday
Day off

Friday
Repeat of Tuesday workout

Saturday
Easy run in zone 1 - minimum 30 minutes

Sunday
A longer run including some running in zone 2

A good way to monitor how your body is recovering is to take your resting heart rate every morning before you get out of bed. If your resting heart rate starts to get higher over time, this can be an indication that you are not fully recovering.

Consider taking an easy recovery day or a day off from training. It will only make your next run even better.

NUTRITION

How effective are sports drinks and coconut water?

With sports drinks reigning supreme – and coconut water all the rage – it helps to know when plain old-fashioned water works best

It used to be that water was the beverage of choice for athletes. But ever since 1966, when scientists from the University of Florida tested a special formula on the school's football team – the Gators – sports drinks have become a popular workout drink.

This original concoction of sugar, salt and water was appropriately named Gatorade. Over the past few decades sports drinks have come a long way with refinements in amounts of sugar and sodium, and the addition of minerals.

Recently coconut water – touted as "nature's sports drink" – has become all the rage with many celebrities and professional athletes for its hydrating properties.

But depending on your sport, these beverages might not give you a competitive edge. Before you shell out two to three dollars per 500 millilitres, you need to determine if plain water will do just as well hydrating your body.

Hydration is critical to athletic performance. In fact, dehydration is one of the most common reasons for early fatigue during exercise. All it takes is losing as little as 2 per cent of your body weight for the performance-robbing effects of dehydration to kick in.

Sweating is the body's way of releasing heat from working muscles. If you don't drink enough during exercise and you lose too much fluid from sweat, body temperature rises and performance can suffer.

The addition of sodium to sports drinks helps prevent low blood sodium (hyponatremia) in prolonged exercise. Sodium, lost along with sweat, is needed for transmitting nerve impulses and proper muscle function. Even a slight drop in blood sodium can cause problems.

Many sports drinks are made up of 6 to 9 per cent carbohydrates, in the form of liquid sugar and/or high fructose corn syrup to provide energy for working muscles. (Soft drinks and fruit juice contain 10 to 15 per cent carbohydrates.) Numerous studies have shown that the fluid, electrolytes and carbohydrates in sports drinks delay fatigue, enhance physical performance and speed recovery in athletes.

Low sugar sports drinks such as G2 Perform are popular with marathoners

who get their carbohydrates from energy gels or bars during long runs and want only the fluid and electrolytes from a sports drink.

But not everyone needs to use sports drinks. If you're working out for less than an hour, water will do just fine. Sports drinks benefit people who engage in longer bouts of exercise like running, cycling and sport tournaments.

Studies also show that sports drinks can enhance the physical and mental performance of individuals who engage in team sports that are played for a short duration, but intensely.

If you're not hitting the gym, water is best to quench your thirst. Sugar-sweetened sports drinks contain calories – about 130 calories per 500 ml – that add up if you're not burning them off. And most of us don't need the extra sodium and refined sugar.

What about coconut water? Compared with most sports drinks, it's lower in calories (45 to 60 calories per 250 ml), carbohydrates and sodium, and higher in potassium, another mineral that gets sweated out during exercise. Coconut water, the juice of young green coconuts, also contains magnesium and calcium.

Coconut water shouldn't be confused with coconut milk, a high fat liquid that comes from grated coconut meat.

But coconut water fails as a good sports drink for people who engage in vigorous exercise that produces a lot of sweating, according to a report presented this past week in Philadelphia at the annual meeting of the American Chemical Society,

Coconut water's claim to fame is its high potassium content, a mineral many people don't get enough of because they don't eat enough fruits and vegetables. But during prolonged exercise, we lose much more sodium than potassium. The report concluded that coconut water alone can't replace the sodium lost during strenuous exercise.

Lighter exercisers, however, will do fine to rehydrate with coconut water or plain water.

Tennis player John Isner, who played the longest tennis match in history at Wimbledon in 2010, credits his endurance on the court to coconut water mixed with sea salt. (He mixes it with protein powder postmatch.)

Whether you hydrate with water, a sports drink, or coconut water the key is to drink enough fluids before, during and after exercise. This might sound like an easy task, yet research indicates that many athletes fall short.

Two hours before exercise, drink 500 ml of cool fluid. During exercise, keep a water bottle handy and drink 125 to 250 ml every 15 to 20 minutes.

Drink even if you don't feel thirsty. When exercising longer than one hour, a sports drink is recommended. Use the alarm on your wristwatch to remind you when it is time to take a drink.

After exercise, replenish the fluid you lose through sweat. Learn how much sweat you lose during exercise by weighing yourself before and after a workout. For every pound of weight you lose during exercise, drink roughly 500 ml of fluid to rehydrate. It's also important to replenish your muscles with carbohydrates and proteins from foods or a sports recovery drink.

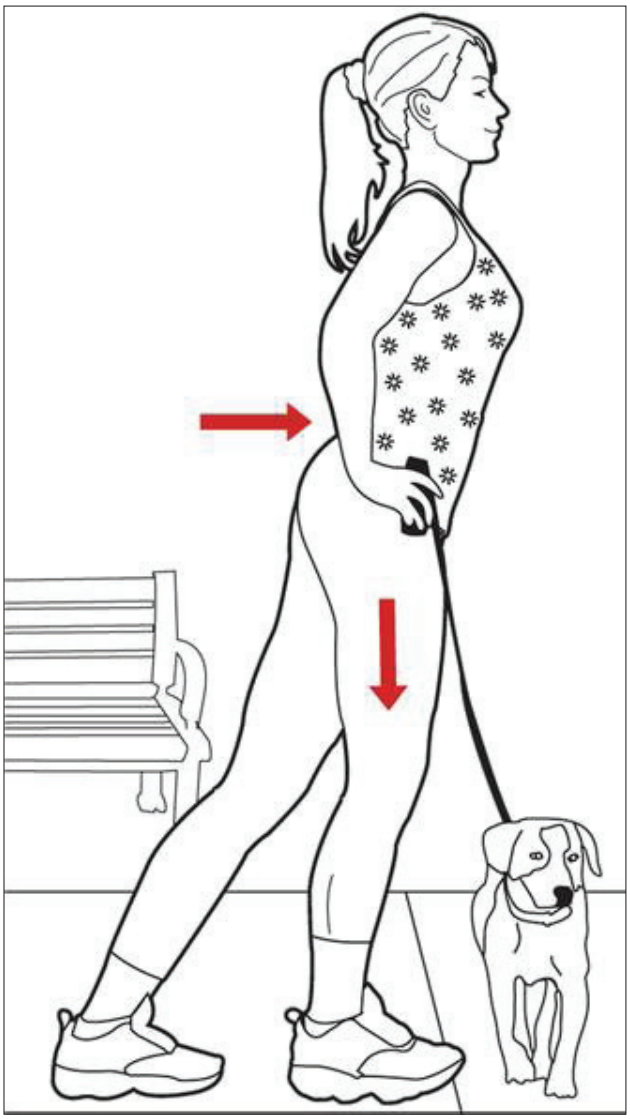
If you're physically active outdoors in hot, humid weather your fluid requirements will be markedly increased.

If you're a non-exerciser, stick with plain water and save sports drinks for the purpose they were intended – hydration during and after exercise.

EXERCISE

Stretch and strengthen with the tin man

Stretching your hamstrings, calves and glutes, strengthening your core and challenging your balance – all in a minute's walk)



1 Stand flatly with your right foot in front of your left, about one-foot distance apart. Keep your legs straight, hips forward and chest out as you hinge your upper body forward at your hips. Hold briefly.

2 Then bend your left knee so your hips sit backward. Keep your right leg straight as you flex your right foot to bring your toes toward your chest. Hold briefly. Alternate sides until you (slowly) reach your destination.

RESEARCH

Can positivity make you a better runner?

Spring is here - chirping birds, snow-free trails and the annual debate about whether you run with the "right" technique. But before you start grappling with knee angles and foot-strike positions, consider the following curious result.

Researchers at the University of Nevada, Las Vegas, put two groups of volunteers through a test of running economy, a measure of how much energy it takes to travel a given distance, much like the gas mileage of a car. One group received no feedback, while the other received positive (but totally fake) feedback every two minutes, such as, "You look relaxed. You are a very efficient runner."

Bafflingly, the second group became more efficient when they started receiving positive feedback - confirmation, the researchers wrote in the Journal of Sports Sciences, of the "social-cognitive-affective-motor nature of motor performance." In other words, traits that we consider purely physical actually depend on what we think and how we feel - a finding with interesting implications for how we coach sports and learn to exercise.

There's plenty of evidence that positive feedback helps people learn tasks such as throwing or golf-putting more quickly and effectively. It's usually assumed that encouraging words boost confidence and motivation. But the improvement in running economy is harder to explain: You can't just "decide" to run more efficiently, no matter how hard you try.

Instead, Dr. Gabriele Wulf, the senior author of the UNLV study, points to the detrimental role of "self-regulatory processes" in the mind. The more you worry about whether you're doing things right, the less fluid and efficient your movements become; positive feedback helps to quiet these ever-present doubts, while negative feedback makes them worse.

Similarly, Wulf has explored the difference between "internal" and "external" focus of attention in motor learning. Basketball players told to focus on the motion of their wrist (an internal focus) will hit fewer shots than those told to focus on the rim of the basket (an external focus). The same is true for a long list of other activities, from dart-throwing to balancing on a beam to kicking a football.

A German study in 2009, also published in the Journal of Sports Sciences, found this pattern also holds true for runners. When subjects were told to focus on their breathing or their running form, they ran less efficiently and

burned more energy at a given pace than when they were simply told to focus on their surroundings. These two factors can be stacked together for greater effect. A new study by Wulf and her colleagues, recently accepted for publication, compared the effects of positive feedback and external focus in learning to throwing a tennis ball with the non-dominant arm. Both together produced better results than either one alone, which in turn was better than neither.

All of this seems to add up to a depressingly nihilistic view of skill development, in which any attempt to identify or correct errors in your technique actually makes you worse by triggering negative internal focus. But not all efforts to improve your running form are doomed, Wulf says.

"It is possible that corrective feedback might initially cause a decrease in efficiency," she acknowledges. "But hopefully the 'right' feedback - external and positive - would minimize that, and perhaps lead to greater efficiency relatively soon."

For runners, the challenge is to think of ways to promote better running form using external positive cues, rather than fixating on what the knees and ankles might be doing wrong.

Wulf points to research at Southern Illinois University, where runners are instructed to think about "clawing the ground" with their feet; researchers at the University of Delaware and Harvard have also investigated the effects of telling runners to focus on "running quietly" - a positive message, rather than the equivalent negative message, "Stop making so much noise when your feet land!"

The message also applies beyond the world of sports coaching. For example, studies have found that instructions with external focus improve learning and function in people with motor impairments from strokes and Parkinson's disease.

Of course, efficiency isn't the only goal for those seeking better running form. Many people would gladly accept worse efficiency in exchange for a reduced risk of injury. If you're struck down by shin splints every time you lace up your running shoes, then it may well be worth trying to identify and correct problems with your running style.

But don't lose sight of the ultimate goal of any gait retraining, which is to eventually be able to head out the door and clear your mind, forgetting all about stride length and trunk posture, and simply enjoy the spring. It's not just more efficient - it's more fun.

Running Cues

Researchers have found that focusing on cues outside your body produces the best results when learning motor tasks. Try the following tips to improve your running:

Run quietly

Make each step as noiseless as possible, avoiding a loud slapping noise when your feet hit the ground.

Claw the ground

Instead of extending your front leg as far forward as possible, begin to bring it back before it hits the ground, as if you're clawing a carpet toward you.

Hot tin roof

Minimize the time your feet stay in contact with the ground by taking quick, short steps.

ADVICE

Does stretching beforehand help or hurt my run?

The question I always stretch before I run, but recently I was told I shouldn't. Why? I feel stiff and want to loosen up. Am I setting myself up for injury?

The answer There are different types of stretching. I do dynamic flexibility exercises before my runs to mobilize my chronically tight hips and calves. If you also do dynamic flexibility exercises, you are not setting yourself up for injury and should keep doing them. If you are doing static stretches (my guess is you are, since static stretching tends to be more common) save them until after your run.

With static stretching, you are passively holding positions for a sustained period. With dynamic flexibility exercises, you are actively moving your muscles through their range of motion.

Both static and dynamic flexibility exercises will help you feel looser, but dynamic flexibility exercises lubricate your joints, increase blood flow and generally prime you for motion. Static stretches calm you down, which is perfect postrun.

For example, if you currently do a static standing quad stretch (by pulling your ankle to your bum) replace it with bum kicks, the dynamic version of the same exercise: Walk or jog while kicking your heel to you bum 20 to 30 times.

Or, if you do the standing hamstring stretch (by placing your foot on a stable object and bending forward), replace it with Frankensteins: Stand tall and move forward by kicking your legs straight out in front of you so you stretch your hamstrings and mobilize your hip joint.

Switching your stretching routine might be an adjustment – not to mention you might feel silly doing the dynamic flexibility exercises – but it is worth it. I feel peppier and lighter on my feet since I have retrained myself to save static stretches for after my workout.

Trainer's tip Try doing dynamic mobility exercises when you're waiting at a red light. Here's how to do hip swings: Stand perpendicular to a stable object like a parking metre, fingers lightly touching it. Swing one leg forward and back 20 times. Try and keep the leg that is swinging straight and your core tight. Swing the leg from your hip, not your knee.

ADDITIONAL STORIES

Stretch and strengthen with the tin man

tgam.ca/EBtkj

Rookie runners, gather your gear slowly

tgam.ca/EBtk

WEEK 3

WEEK THREE
What to eat

If you are training your body for a 10K race then you should be fuelling your body the same way. What you eat should be just as important as your physical training. It's not dieting, per se, but behaviour modification for healthier eating.

Start by reducing the amount of sugar you consume on a daily basis. This can be as simple as replacing table sugar with a natural substitute like blue agave syrup, which is low on the glycemic index. By reducing your glycemic levels, you will help stabilize your blood sugar levels and reduce the urge to eat more then you need. It will also allow for a better workout and enable recovery. A significant drop in blood sugar levels at the wrong time can have a negative impact on your race, workout or even your workday.

To recover from workouts or to prepare for a run, when you eat is just as important as what you eat. Start your day with a meal that includes some form of protein to sustain you till lunchtime. If you plan to run within an hour after breakfast or have an early race, try a protein powder-based smoothie. Experiment with different ingredients to see what agrees with your stomach. Substituting milk with rice, soy or almond milk may help with digestion. Flavour the smoothie with a low-glycemic fruit juice and add a protein powder, such as whey. Following your run, eating a good meal that also includes protein within 30 minutes is ideal.

A balanced diet of protein, complex carbohydrates and fats is key to keeping the body well fuelled. Consume fats that lean more to the plant oils, nuts and fish. Monitor the amount of processed food you eat a day. Many of these items are high in sodium and consist of simple carbohydrates that have no nutritional value.

This week's training suggestions - increase overall volume by a maximum of 10 per cent.

Monday
Day off

Tuesday
10-minute warm-up, then 1 x 10 minutes in Zone 3 with 2-minute relaxed recovery (Zone 1), 2 x 5 minutes (Zone 3) with 1 minute (Zone 1) recovery between. Finish with a cool down of 10-minutes in Zone 1.

Wednesday
Easy run in Zone 1 - minimum 35 minutes

Thursday
Day off

Friday
Repeat of Tuesday workout

Saturday
Easy run in Zone 1 - minimum 35 minutes

Sunday
Longer run with some running in Zone 2 (increase it by 10 per cent)

NUTRITION

Fuel up right for your run

Taking on carbs before, during and after a run is a key strategy for fast recovery

A diet for runners should derive most of its calories – 55 to 60 per cent – from carbohydrates. Carbs are a good source of glucose, the form of sugar that your brain, nerves and muscles needs to function properly. The majority of glucose is stored as glycogen in your muscles and liver. When you deplete your stores, your muscles and brain run out of fuel, leaving you feeling physically and mentally fatigued.

To prevent bonking – hitting the wall – during a run, everyday meals and snacks should emphasize such carbohydrate-rich foods as pasta, rice, whole-grain breads and cereals, legumes, fruits and low-fat dairy products. The following nutrition strategies will help you feel your best during a run, and recover faster afterward:

Eat beforehand

For runs 60 minutes or less you can rely on your glycogen stores to get you through – providing, of course, your daily meals and snacks contain carbohydrates. If you're running longer, eat a carbohydrate-rich snack at least 45 minutes before to supply glucose to your bloodstream. Pre-run snacks include fig bars, whole-grain cereal bars, energy bars, dried fruit, yogurt and berries, smoothies, even a small bowl of cereal with milk. These snacks are easily digested and won't leave you feeling full. Foods high in protein, fat or fibre take longer to empty from your stomach and are likely to cause digestive upset while running.

Load the carbs

If you're gearing up for a half or a full marathon, you'll need to top off your muscle glycogen stores the night before a long run and, for many long-distance runners, several nights before. Focus your evening meal on carbs such as pasta, rice, bread, thick-crust pizza and potatoes rather than protein-rich foods like meat. But don't overdo it. Consuming huge portions can lead to digestive issues – and unwanted bathroom stops – during your long run. Experiment well before race day to determine what works best for you. Eat a low-fat, high-carb snack before bed such as yogurt and fruit or toast with jam.

Take fuel along

If you're running longer than 75 minutes, you'll need to refuel on the run. Consume 30 to 60 grams of carbohydrate per hour of running, using a combination of sports drinks and energy bars, dried fruit, gummy bears or energy gels. Energy gels are packets of concentrated fruit-flavoured carbs. Use one to two gels for every hour of running (the harder you run, the more you'll need), starting 45 to 60 minutes into a long run. Chase gels, energy bars and dried fruit with plenty of water to avoid stomach cramps and indigestion.

Stay hydrated

Water is fine for runs of less than an hour. But if you're out longer, hydrate with a sports drink that replenishes water and electrolytes lost through sweat and carbohydrates burned by your muscles. In general, aim to drink 150 to 375 ml (5 to 12 ounces) of fluid every 15 to 20 minutes.

Refuel afterward

After your run, eat a recovery snack within 30 to 60 minutes, the window of glycogen recovery. Research shows that a combination of carbohydrate and protein (in a 3-to-1 ratio) is best for speeding glycogen replacement. Try low-fat chocolate milk, a blender smoothie made with milk and banana, an energy bar with fruit, half a bagel and yogurt, or half a tuna sandwich and an orange. These post-run snacks also replace potassium that you lose in sweat. Rehydrate with water, sports drinks and/or juice.

Boost your iron

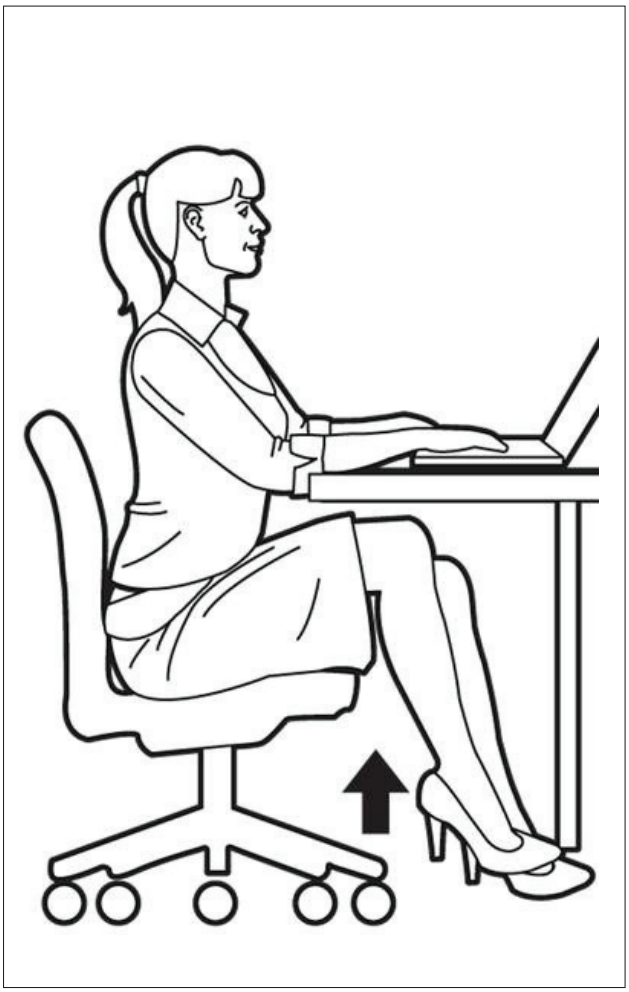
This mineral helps power your run by making hemoglobin, the pigment that carries oxygen to working muscles. Without enough iron, your aerobic capacity is reduced and you'll fatigue early. Runners are thought to be vulnerable to low iron stores since it's lost through sweat and a small amount may also be lost through footstrike (the action of your foot hitting the ground), which can damage red blood cells in the feet.

Female runners who have higher daily iron needs due to menstruation have an even greater risk of deficiency. Iron-rich foods include beef, dark turkey meat, oysters, tuna, halibut, ready-to-eat breakfast cereals, legumes, cooked spinach, raisins and prune juice. To ensure you're getting enough, consider taking a multivitamin and mineral. Look for a product that contains 5 to 10 milligrams of iron (for men and postmenopausal women) or 10 to 18 milligrams of iron (premenopausal women).

EXERCISE

We dare you to lift your foot (it's not as easy as it looks)

Stretching your hamstrings, calves and glutes, strengthening your core and challenging your balance – all in a minute's walk)



1 Sit tall, with your knees bent and your shoulders over your hips and level from side to side.

2 Engage your abs to hover one foot off the floor for as long as you can. Switch feet and repeat. It's vital you don't move your pelvis, shoulders or head. This exercise is too easy if the rest of your body isn't as still as a statue. If done right, co-workers looking at you won't even notice that your leg is hovering off the ground.

RESEARCH

How long can I go before refuelling with carbs?

The question

How long can I go before I need to "refuel" with carbs, and how much do I really need?

The answer

If you're spending nine hours doing an Ironman triathlon, you definitely need fuel. Samantha McGlone, the 2007 World Championship silver medalist, downs five sports drinks during the bike ride, and adds one or two energy gels an hour to her drinks during the run.

"But I have done Olympic-distance races [which take about two hours] on water," says the Montreal native, who represented Canada in triathlon at the 2004 Olympics. "Maybe not the best, but back in the day …"

Researchers have been arguing for years about whether carbohydrates make any difference during exercise lasting an hour or two and, if so, how much you need. Recent experiments suggest that during shorter workouts, carbs are for the brain rather than the muscles, and that during longer workouts, not all carbs are created equal.

The traditional advice has been you should ingest carbs – from a sports drink or energy bar to simple food such as a banana – during exercise lasting longer than about two hours, according to Asker Jeukendrup, a sports nutrition researcher at the University of Birmingham in Britain. For shorter exercise, it's commonly believed you should have enough carbs stored in your body. A typical 150-pound male, for example, can store about 2,000 calories of carbohydrate in his leg muscles alone; running a half-marathon requires only 1,500 calories.

But that's not what scientists have observed. In placebo-controlled studies, drinking a high-carbohydrate sports drink seemed to sometimes – but not always – offer a performance boost even in 60-minute exercise bouts.

Last year, researchers from Loughborough University in England published a study in the Journal of Sports Sciences that, combined with earlier results, explains this riddle. They found that runners could go farther in a 60-minute treadmill test if they drank a sports drink containing 6.4-per-cent carbohydrate – but only if they had fasted overnight. If they ate a meal three hours before the test, the sports drink didn't help.

It seems simple: Sports drinks only help during one-hour workouts if

you're depleted at the start. But there's another wrinkle. Researchers get exactly the same results during a 60-minute treadmill test if the runners simply swish the sports drink in their mouth then spit it out, without swallowing: The subjects get a performance boost from the drink if they've been fasting, but none if they've had a meal. "This shows that it has nothing to do with energy absorption," Dr. Jeukendrup says. "It's in the brain."

While this research is still new, brain-scanning studies by Ed Chambers, a colleague of Dr. Jeukendrup's in Birmingham, suggest that previously undiscovered carbohydrate sensors in the mouth send signals directly to the brain announcing the impending arrival of more fuel. (The sensors work even if the subjects can't taste the drink.) The brain then signals that you can go faster, even if the carbs never reach your muscles.

At the other end of the spectrum, your muscles really do need more carbohydrate during exercise lasting longer than two hours. Even the most quickly absorbed carbohydrates (glucose and maltodextrin) can only pass from your intestine into your blood stream at a rate of about 60 grams (a little more than 200 calories) an hour – not enough to keep up with demand during intense exercise.

To get around this limit, Dr. Jeukendrup realized he could mix different carbohydrates that are absorbed from the intestine through separate mechanisms. While fructose is only absorbed at 30 grams an hour, it doesn't interfere with glucose absorption. That means glucose and fructose mixed in a 2:1 ratio can be absorbed as quickly as 90 grams an hour.

This formula has been incorporated in drinks, bars and gels by PowerBar, which funds some of Dr. Jeukendrup's research (the funding only started after the initial results were published, he points out). Other companies are following suit by introducing products with rapidly absorbed carbohydrate blends.

For Ironman athletes such as Ms. McGlone, the ability to absorb up to 90 grams an hour of carbohydrate is crucial, though it takes practice to tolerate such a high intake without stomach upset. More generally, Dr. Jeukendrup says, the glucose-fructose mix is important only for sustained exercise lasting more than about three hours. But if you're trying to avoid bonking during a marathon or long bike ride, it could be the key.

Drinks, gels or bars?

Taking in carbs only helps if you can keep them down – not always an easy task if you're exercising intensely. Marathon fans still remember Bob Kempainen at the 1996 U.S. Olympic trials, vomiting up a stream

of fluorescent green Gatorade as he pulled away from his bewildered competitors to win. Typically, drinks containing less than about 8-per-cent carbohydrate (80 grams a litre) are easiest to absorb.

Depending on your sport and your preferences, you can also take in solid food. In November, Asker Jeukendrup and his colleagues published a pair of papers in Medicine & Science in Sports & Exercise comparing sports drinks, gels and bars. The result: Subjects were able to absorb and burn carbohydrates in all three forms at exactly the same rate. “Cyclists tend to eat more real food than runners, because of the amount of jostling in running,” triathlete Samantha McGlone notes. “If I’m riding hard for more than five hours, I can stop at the store for Snickers and a Red Bull.”

ADDITIONAL STORIES

Why is running making me fat?
tgam.ca/EBtl

We dare you to lift your foot (it’s not as easy as it looks)
tgam.ca/EBtm

ADVICE

How can I strengthen my glutes for running?

When the buttocks muscles aren't firing properly, the body compensates by overusing the lower back. To avoid this pattern, try bridges and side leg lifts

The question

While training for a marathon I developed some back pain. My doctor told me my glutes are not strong and I need to strengthen them. The pain is because my back is compensating. Can you suggest some exercises?

The answer

When running, the glutes (bum) should be the muscle group primarily responsible for pulling the leg backward. When the glutes pull the leg back behind the body, the motion is called "hip extension."

If the glutes are not firing properly, the body has to find a compensation pattern. Often extension ends up occurring through the lower back instead of the hip. This can cause an overuse injury of the lower back.

Unfortunately, this is a somewhat common problem for runners. I suggest all runners incorporate glute-strengthening exercises into their routine to help prevent this problem.

To get the glutes to fire, try these exercises:

Bridges

Lie on your back with your legs bent, feet placed hip distance apart on the ground. Engage your bum muscles to lift your hips off of the ground. Try not to lift with your hamstrings (back of legs) or lower back. Repeat 10 times.

Side leg lifts Lie on your right side. Lift your left leg up to hip height. Imagine your leg weighs 100 pounds and that you have to use your bum muscles (the ones located just behind the side seam of your pants) to lift the leg up. Repeat 10 times and switch sides.

Note: If you have undiagnosed back pain, meet with a physiotherapist or sports doctor before you incorporate any new exercises into your routine.

Trainer's Tip

Make sure you stretch your hip flexors, because if they are tight they can inhibit your bum muscles from working. Stand in a lunge position. Bend your back knee and tuck your pelvis so your hip bones come toward your ribs. Reach the arm on the same side of your back leg up toward the ceiling. Hold for 30 seconds.

WEEK 4

WEEK FOUR
Increasing intensity

It's midpoint in our series, and by now you may have set a goal and have followed the prescribed workouts. It's time to take the intensity of these workouts to the next level.

In the past three weeks we have introduced training zones one through three. These zones, when balanced throughout the week, have prepared you for this next step. If you are able to include zone 3 training twice a week for 20 minutes, you're ready for zone 4.

Remember that zone 3 training is based on "feeling" this pace by your breathing rate (your breathing should be controlled and you should still be able to talk). If you have a GPS watch or heart rate monitor, begin to equate this new pace to kilometres per hour and heart rate. (If you don't, continue to monitor your pace by how you are breathing and how you feel.)

A very fit runner can identify zone 3 as a pace they could hold steady for an hour or at the level of half marathon pace. It is slightly slower then your 10K pace and is the zone of training just below what is called your anaerobic threshold. It trains the circulatory system and lungs to become very efficient at transporting oxygen to the muscles. As this system becomes more efficient, our threshold pace improves, which means we can run faster within the same system.

Zone 4 training will take you to 5K pace or faster and will approach maximum heart rate. It is important that you have had clearance from your physician.

The first zone 4 training is called lactate shuttle training. In this workout, you mix zone 3 running with surges into zone 4. Because you need to return to zone 3 throughout the workout, it is important to understand the differences between these two levels.

The other type of zone 4 training is interval training, wherein there is a one-to-one ratio of work to rest. Usually the length of these intervals ranges between one and four minutes but can become longer as you get stronger. The overall volume of the workout will depend on the pace you are running. Take your heart rate immediately after some of your intervals to use later as we start to establish more precise training intensities.

Suggested training this week

Monday
Day Off

Tuesday
Workout day - 10-minute warm-up, then two 10-minute segments in zone 3, with zone 4 surges every fourth minute. Between the 10-minute segments, include two minutes of zone 1 running. Finish off the session with a warm down of 10 minutes in zone 1

Wednesday
Easy run in zone 1, a minimum of 35 minutes

Thursday
Day off

Friday
Repeat Tuesday, or do a 10-minute warm-up plus five minutes of running in zone 2 or 3, followed by five to 10 one-minute intervals at a zone 4 pace (start with 5K effort). In between each interval, run at a zone 1 pace for one minute, and finish with a warm-down of 10 minutes in zone 1

Saturday
Easy run in zone 1, minimum of 35 minutes

Sunday
Longer run but not more then 25 per cent of weekly volume. If you are feeling good, include some running in zones 2 and 3

NUTRITION

Embrace carbs to fuel athletic performance

Knowing what to eat – and when to eat it – will help you maximize your workouts and stay strong and lean

For me, the close of the 2010 Winter Olympics means less time on the couch glued to the television and more time devoted to my fitness routine.

As I watched the athletes compete, I was in awe of their incredible physical condition. No doubt the amazing displays of strength, power and endurance we witnessed in Vancouver have inspired many Canadians to kick-start spring training.

Whether your fitness regimen includes lifting weights at the gym, training for a marathon or taking yoga classes, you need to eat right if you want to maximize your workouts and get (or maintain) a lean, strong body.

If you don't fuel your muscles properly, you won't get the results you want. Knowing what to eat – and when to eat it – can enhance physical performance during training and competition.

The foundation of any athlete's diet is carbohydrate from starchy foods (e.g. cereal, bread, rice and pasta), fruit and legumes. Even milk, yogurt and soy beverages supply carbohydrate. Once digested, carbohydrate-rich foods are absorbed into the bloodstream as glucose (a.k.a. blood sugar). Glucose that's not used immediately for energy is stored in muscles and the liver as glycogen, which is used to fuel all types of exercise.

Including carbohydrate-rich foods at all meals and snacks is critical to keep your glycogen stores topped up. And the more vigorous your workout, or the longer your workout, the more carbohydrate you need. Having low glycogen stores will result in early fatigue and less effective training.

Carbohydrate is also an essential fuel for the brain and nervous system, and plays a vital role in sports that require precision, dexterity and hand-eye co-ordination.

While protein-rich foods such as meat, poultry, fish and eggs don't provide energy to working muscles, they serve an important role in a fitness-friendly diet. The building blocks of protein, called amino acids, are used to repair and build muscles tissues that break down

during exercise. Replacing valuable muscle protein helps you recover faster and train harder. An adequate intake of protein also helps maintain the body's immune system.

Protein needs increase with exercise, but not as much as you may think. Gone are the days when athletes devoured precompetition meals of steak and eggs. While sedentary folks require 0.8 grams of protein for each kilogram of body weight a day, endurance athletes need 1.2 grams of protein per kilogram of body weight per day and strength athletes need to consume 1.3 to 1.7 grams of protein per kilogram body weight per day.

Most active people get the protein they need from diet alone. For example, a 180-pound (82-kilogram) man who lifts weights at the gym three times a week needs about 106 grams of protein each day. Three servings of dairy and two six-ounce servings of chicken, fish or meat a day delivers 108 grams.

Keep in mind that consuming more than the recommended amount of protein does not lead to further increases in muscle size or strength since there's a limit to the rate at which protein can be synthesized into muscle.

Water is also an essential nutrient for peak performance. Dehydration, even in small amounts, can cause early fatigue during exercise. Athletes should consume at least nine to 12 cups of fluid each day. During exercise, drink half to three-quarters of a cup of water every 10 to 15 minutes.

Sports drinks are recommended during exercise that lasts longer than one hour to replenish lost fluid and electrolytes (sodium potassium, chloride). Most sports drinks also contain 6- to 9-per-cent carbohydrate, which provides energy for working muscles.

Timing is everything when it comes to fuelling and recovering from exercise. Your goal: to allow enough time to digest food so you have readily available energy for your muscles. In general, the closer you get to your workout start time, the fewer calories you should eat. Allow three to four hours for a large meal to digest (e.g. chicken, rice and vegetables), two to three hours for a smaller meal (e.g. a sandwich), and one to two hours for a snack (e.g. an energy bar or smoothie).

The closer to exercise, limit the protein, fibre and fat content of your meal or snack since these nutrients take longer to empty from your stomach than carbohydrate.

To aid recovery, a carbohydrate-rich snack that also delivers protein (e.g. chocolate milk, a banana and yogurt, a protein shake made with milk or fruit) will help replenish muscle glycogen and repair muscle tissue. Recovery foods should be eaten within 30 to 60 minutes after stopping exercise since this is when glycogen- and protein-building enzymes are most active.

ADDITIONAL STORIES

Follow these simple steps for a quick core workout

tgam.ca/EBto

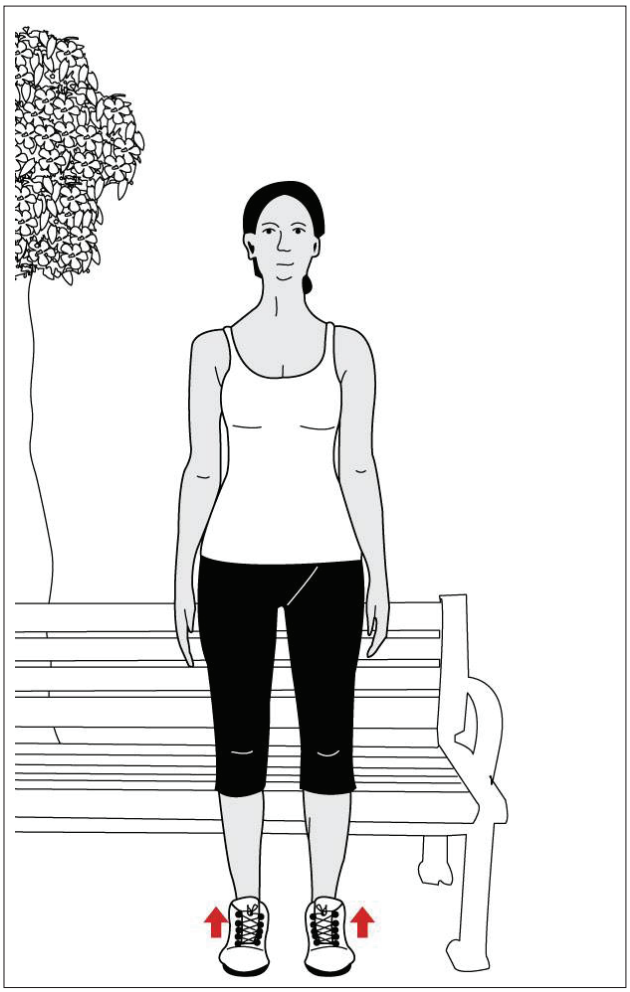
Training secrets of Kenyan runners

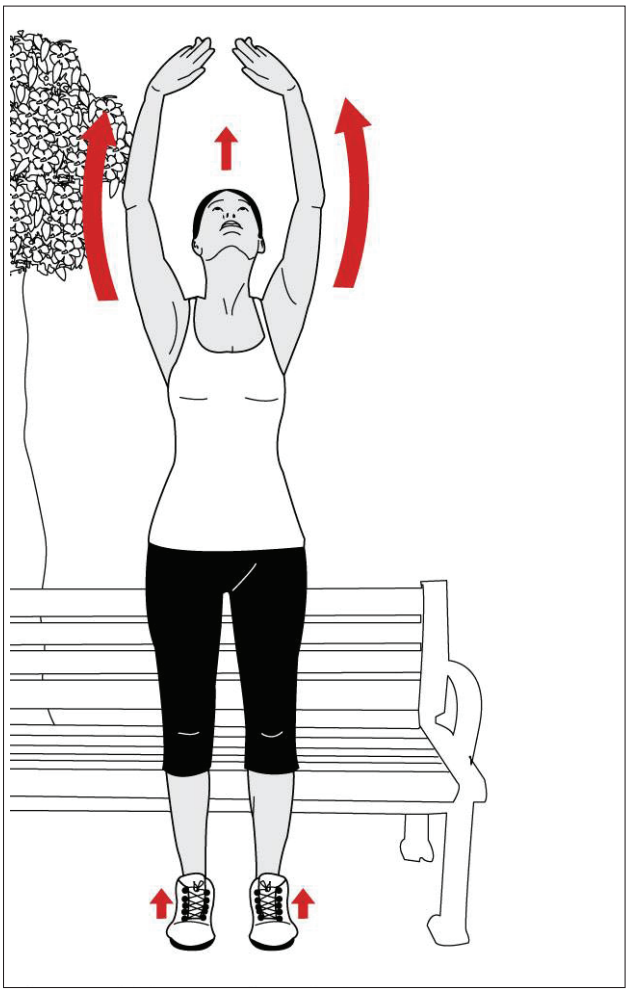
tgam.ca/EBtp

EXERCISE

Follow these simple steps for a quick core workout

Hey you! Don't just stand there. Follow these simple steps and you'll have pulled a leg and core workout from thin air





1 Stay standing. Lift your heels off the ground to balance on your toes.

2 Hold this position while you arc your arms backward like you are swimming backstroke. Turn your head upward so you can see your hands. Hold for a few seconds, then drop your arms back down. Don't fall over! Repeat 10 to 20 times.

RESEARCH

Strength Training

Recent studies have confirmed what many coaches have long suspected about the links between strength training and running economy

The training secret that propels top distance runners like Cam Levins of Campbell River, B.C., is very simple: They run a lot. Levins, for example, earned a spot at last summer's Olympics (and cult-hero status among running fans) by running three times a day, up to 300 kilometres a week, during his collegiate career at Southern Utah University.

With an extreme regimen like that, other forms of supplementary training tend to take a back seat.

"I didn't do much weight training in college," Levins, 24, explained in an interview. "Just not enough time in the day to do much of it, and I would do mileage instead."

Since graduating last year, though, Levins has shifted his priorities to make time for strength training – for good reason. Recent studies have confirmed what many coaches have long suspected about the links between strength training and running economy, a measure of how much energy it takes to run at a given speed. Pumping iron will never replace the benefits of pounding the pavement, but a modest dose of the right kind of strength training can pay big dividends.

The traditional approach to strength training for endurance athletes has been to focus on a high number of repetitions with relatively light weights – three sets of 10 to 15 reps for each exercise, for example. The idea is to build strength without packing on too much muscle, a "problem" that is purely hypothetical for the vast majority of people.

Instead, it turns out that the exact opposite approach may produce better results. Training with heavy weights or explosive motions, such as leaping, seems to have less in common with the demands of running, but these techniques are extremely effective at improving the communication between your brain and your muscles.

Such "neuromuscular" adaptations allow you to recruit more muscle fibres with each contraction, and ultimately translate into more efficient running.

Researchers at the University of Rome tested this idea in a study

published in this month's issue of The Journal of Strength and Conditioning Research. They recruited 16 runners, with an average age of 44 who were preparing for a marathon, and divided them into three groups. In addition to their regular running, one group added a six-week, twice-weekly traditional strength-training program consisting of three sets of 10 reps of a variety of upper- and lower-body exercises, using a weight equal to about 70 per cent of their one-rep max. The second group did a heavy-weight protocol, doing four sets of three to four reps with 85 to 90 per cent of one-rep max. The third group did no weights.

After six weeks, only the heavy-weights group had made any improvements: 16 per cent in their one-rep max on the leg-press machine and 6 per cent in running economy. Interestingly, these gains came without any significant increase in muscle mass, supporting the hypothesis that the primary benefits were neuromuscular.

Another study, due to be published later this year in the same journal, found that runners can also benefit from "plyometric" training, which uses explosive leaps and jumps to stimulate neuromuscular pathways. Researchers in Chile and Spain assigned 36 runners to either a six-week plyometric training program (60 drop jumps twice a week) or a control group; by the end of the study, the plyometric group had improved their time in a 2.4-kilometre run by 3.9 per cent, while also improving sprint and jump performance.

While plyometrics are usually considered an advanced form of training, there's no reason that recreational runners can't use them too, as long as they build up gradually, says Dr. Mikel Izquierdo of the Public University of Navarra in Spain, the lead author of the study.

In fact, recreational runners may have even more to gain since they're likely weaker to start, he says.

There's still no getting away from the fact that the best way to get better at running is to run more. But these results suggest that even a short, six-week bout of strength training, inserted a few times a year leading up to a goal race, can give your running a significant jolt. It's also a great way to build resistance to injuries and fight off the muscle loss associated with aging – and it's a lot easier than running 300 kilometres a week.

A six-week strength-training routine

Dr. Maria Francesca Piacentini and her colleagues at the University of Rome used the following strength-training routine to boost running economy among master marathon runners: Lift twice-weekly for six weeks. Do four sets of three to four reps of each exercise: half-squat with arm weights, leg press, lunges with arm weights, bench press, lat pulldown (lift 85 to 90 per cent of your estimated one-rep max). Rest three to four minutes between reps.

ADVICE

How can I build my running endurance?

The question

I want to run a 5K in the fall, but every time I run I get exhausted after one kilometre. How can I extend this?

The answer

Instead of trying to run for five km and getting discouraged when you can only run for one, alternate one minute of running with four minutes of walking for 20 to 30 minutes. Gradually increase the duration of the running intervals, and decrease the walking intervals.

Sample five-kilometre running program

Each week do two full-body strength workouts as well as the corresponding week's running program. Run two or three days per week, on non-consecutive days.

Run at a speed that you can maintain throughout all the running intervals.

Week One

Warm up with five minutes of speed walking.

- Alternate one minute of running with four minutes of walking for 30 minutes.
- Cool down with a five-minute walk.

Week Two

Warm up with five minutes of speed walking.

- Alternate two minutes of running with three minutes of walking for 30 minutes.
- Cool down with a five-minute walk.

Week Three

Warm up with five minutes of speed walking.

- Run for one minute. Walk for four minutes.
- Run for two minutes. Walk for three minutes.
- Run for three minutes. Walk for two minutes.
- Repeat the last set. In subsequent sets, decrease your running time and increase your walking time by one minute each, until you arrive at one minute of running and four minutes of walking.
- Cool down with a five-minute walk.

Week Four

Warm up with five minutes of walking.

- Alternate running for three minutes and walking for two minutes for thirty minutes.
- Cool down with a five-minute walk.

To progress, slowly increase the duration of your running intervals until you can alternate running for 10 minutes with one minute of walking.

Trainer's tip

On race day, don't get overwhelmed by thinking you have to run the entire five km. Even during a race it can be useful to walk for a minute in between every 10 minutes of running. Just remember, whether you run the entire distance, or include walking breaks, the race will be a huge accomplishment.

WEEK 5

WEEK FIVE
Injury prevention

When is the right time to take an easy day? It's not a sign of weakness if you take an easy day to recover or a complete day off of any kind of exercise. In fact, it's integral to your training - that's when improvements can happen and the body repairs itself. It also helps keep you injury-free.

Depending on your situation, there are several different types of recovery you can try. If you have ongoing fatigue or soreness that doesn't disappear after a few days, you may need to consider cross-training. This can include anything that uses the large muscle groups and increases your heart rate, such as cycling, swimming and pool running. You can use cross-training in place of a recovery day or a workout to limit the impact on the body. If you have any persistent pain you should seek medical advice.

Another sign to watch for is the inability of your muscles to feel recovered after increasing the intensity or distance. You will feel slight stiffness initially. If this continues over several days, it's time to consider easing back.

Your actions immediately following your workout are important components of recovery. This starts with a proper warm-down of easy running for at least 10 minutes. Eating a healthy snack right after your workout and drinking fluids is the next step. A full meal should be enjoyed within two hours to start to refuel the body. Next you should start to flush out any by-product that has accumulated in the muscle tissue, such as lactic acid. Sitting in a cold water bath for at least 10 to 15 minutes (add ice in the summer) works well. Or you can alternate between hot and cold showers (one minute cold, three minutes hot) for the same amount of time, making sure you

direct the water onto the legs.

Now it's time to work the muscles with stretches and a foam roller. Start with smaller muscle groups and then move onto the larger muscles. Stretches should be held for three to five minutes, allowing the muscle and the surrounding fascia to relax to a normal state.

Finally, don't underestimate the influence that stress can play in affecting your level of recovery. Simply chilling and achieving a level of relaxation through meditation, yoga or elimination of outside distractions - such as TVs, cell phones and computers - will go far in helping the body recover.

This week's suggested training:

Monday
Day off

Tuesday
Workout day - 10 minute warm-up, then two to three 10-minute intervals in zone 3, with zone 4 surges every fourth minute. Between the 10-minute segments include two minutes of zone 1 running. Finish off the session with a warm-down of 10 minutes in zone 1.

Wednesday
Easy run in zone 1, minimum of 35 minutes

Thursday
Day off

Friday
Repeat Tuesday's workout

Saturday
Easy run in zone 1, minimum 35 minutes

Sunday
Longer run, but not more then 25 per cent of weekly volume. Include some running in zones 2 and 3 if you are feeling good.

Option: Substitute an easy day with some cross-training.

NUTRITION

Not just quinoa: Strawberries and kiwi also boost peak performance

Protein and carbs help endurance and muscle building but vitamins C and D also found to play a role, particularly for young women

There's more to eating for sports than loading up on carbs and downing protein shakes, especially for recently inspired young athletes.

According to new study findings, teenagers will perform better on tests of cardiovascular fitness and muscle strength if they get enough iron, vitamin D and antioxidants in their diet.

We know that carbohydrate-rich foods such as pasta, rice and energy bars fuel athletes through endurance sports like running, swimming and cycling. And that protein-packed meat, dairy and egg whites help power athletes though sports that require muscle power and strength.

The current study, published this month in the Journal of Applied Physiology, is the first to link blood levels of certain nutrients to sports performance in healthy teenagers.

Researchers took blood samples from 1,089 boys and girls, aged 12 to 17, to measure levels of vitamins, minerals and antioxidants. The kids were then put through fitness tests to measure muscular and cardiovascular fitness. A standing jump test was used to measure lower body strength and a 20-metre shuttle run tested cardiovascular fitness through maximal oxygen consumption. (Maximal oxygen uptake, or VO2 max, is considered the best measure of aerobic endurance. The more oxygen you can use during high-level exercise, the more energy your muscles can produce.)

For cardiovascular and muscle fitness, blood levels of hemoglobin – an indicator of iron stores – and vitamins A, C and E were tied to better performance in boys. Vitamin D and beta-carotene levels were more predictive of improved performance in girls.

The researchers accounted for factors that can affect the blood levels of nutrients, such as age, body weight, season, latitude and physical activity.

The findings suggest a connection between your intake of vitamins and minerals and sports performance, but they don't prove cause and effect. That said, there's certainly reason to think these nutrients are

ADDITIONAL STORIES

How correcting muscle imbalances can heal injuries and make you a better runner

tgam.ca/EBtp

important.

Iron is used to make hemoglobin, a protein in red blood cells that shuttles oxygen to muscles. Low iron levels can reduce VO2 max and impair peak performance. Vitamin C helps hasten recovery from exercise by repairing collagen – the main protein in tendons and ligaments – and boosting immunity.

Vitamin D allows muscle and bones to develop properly and helps maintain a healthy immune system. Previous research in teenage athletes suggests that low vitamin D levels impair muscle power and contribute to sports injuries.

Athletes eat special, often surprising foods, to power their game. The world's fastest man, Usain Bolt, for example, eats chicken nuggets and plenty of yams. Others chase back massive bowls of oatmeal with protein shakes.

The following strategies can help aspiring Olympians and recreational athletes to excel.

Focus on carbs

Include carbohydrate-rich foods at all meals and snacks to keep muscle glycogen (energy) stores topped up. Healthy carbs include oatmeal, 100 per cent whole grain bread, brown rice, quinoa, millet, pasta, legumes, sweet potatoes and fruit. Milk, yogurt and soy beverages supply some carbohydrate.

The more vigorous or longer your workout, the more carbohydrate you need. Low glycogen stores cause early fatigue and less effective training.

Power with protein

Athletes have higher protein requirements to repair muscle damage that occurs during exercise and to support muscle building.

Studies suggest endurance athletes need to consume 1.2 grams of protein per kilogram of body weight per day. Resistance exercise like weight lifting increases protein needs to 1.6 to 1.7 grams of protein per kilogram body weight per day.

(Sedentary folks require 0.8 grams per kilogram body weight per day.)

Most athletes can meet their daily protein quota from a mixed diet that includes lean meat, poultry, fish, eggs, legumes, dairy, soy and legumes. Some may benefit from protein supplements.

Get enough iron

An iron deficiency, even without full-blown anemia, can cause fatigue, difficulty concentrating and poor sports performance.

Iron-rich foods include beef, oysters, clams, turkey, chicken, tuna, pork loin and halibut, ready-to-eat breakfast cereal, soybeans, lentils, baked beans, black beans, firm tofu, cooked spinach, raisins and prune juice.

Boost vitamin C

This antioxidant nutrient helps repair collagen, enhances immunity and fends off reactive oxygen molecules (free radicals) that damage cells. The best food sources include strawberries, citrus fruit, kiwi, bell peppers, broccoli, Brussels sprouts and mango.

Take vitamin D

Children, teens and adults to age 70 require 600 IU, or international units, of vitamin D each day. Older adults need 800 IU daily. Some people may need a higher dose to maintain a sufficient blood level of the nutrient.

Since very few foods contain vitamin D naturally, and we can't rely on sun exposure during our fall and winter to produce vitamin D in our skin, a vitamin D supplement is recommended. Milk and fortified plant beverages supply 100 IU of vitamin D per 1 cup.

Time it right

Allow enough time to digest food so you have readily available energy for muscles. The closer to exercise start time, the fewer the calories. Allow three to four hours for a large meal to digest, two to three hours for a smaller meal, and one to two hours for a snack.

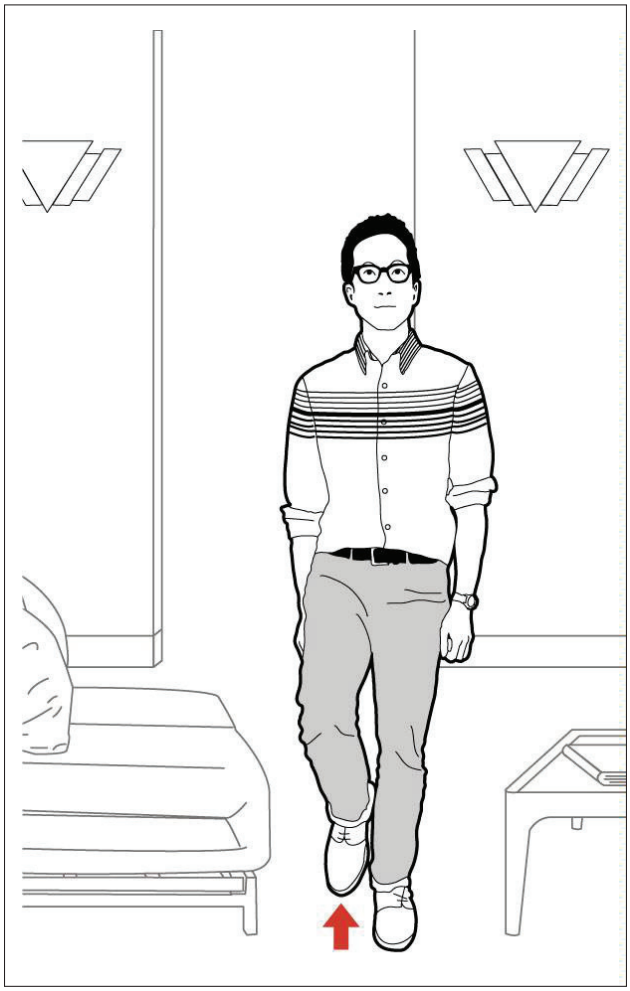
Hydrate before, during, after

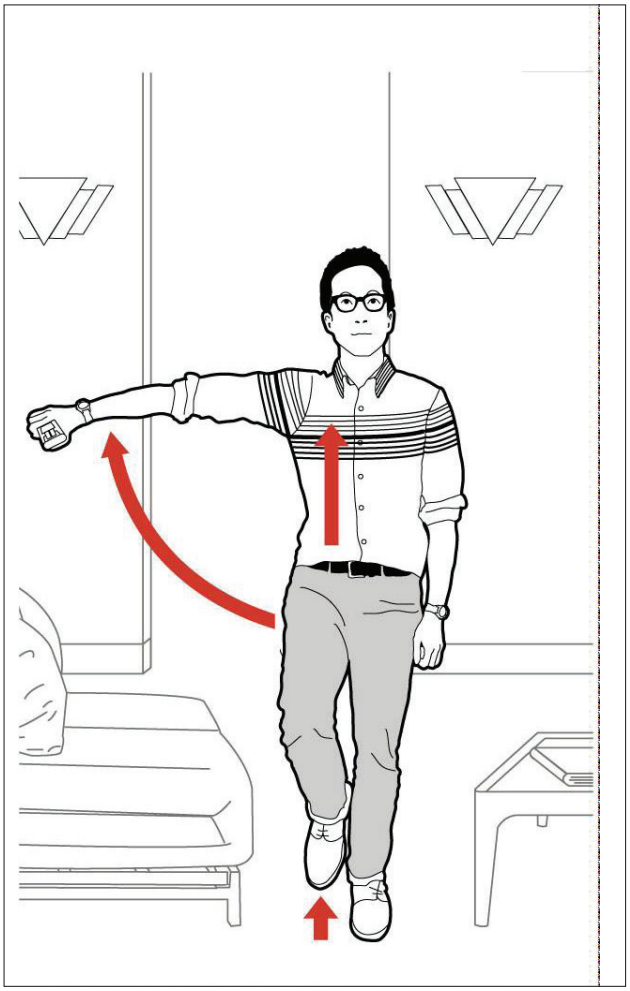
Dehydration can cause early fatigue during exercise. Consume at least 9 to 12 cups of fluid each day. During exercise, drink ½ to ¾ cup of water every 10 to 15 minutes.

Sports drinks are recommended during exercise that lasts longer than one hour to replenish lost fluid and electrolytes (sodium potassium, chloride).

EXERCISE

Work your core and shoulders with the get up, stand up





1 Grab a stapler or another light object with your right hand. Lift your right foot off the floor and balance on your left leg.

2 Use your left bum muscle and your core to stay stable as you raise your right arm out to shoulder height 10 times. Switch and repeat on youropposite leg and arm.

3 Hold this position while you arc your arms backward like you are swimming backstroke. Turn your head upward so you can see your hands. Hold for a few seconds, then drop your arms back down. Don't fall over! Repeat 10 to 20 times.

RESEARCH

What's wrong with your form? The devil's in the details.

For runners, the definition of folly is repeating exactly the same motion 10,000 times an hour and expecting not to get injured.

That's the thinking behind standard advice to vary the terrain you run on, alternate between different pairs of shoes and mix different forms of cross-training into your routine. The more you mix it up, the less likely any given body part will break down.

But as high-tech gait analysis systems reveal increasingly subtle details about how we run, a more complicated picture is emerging. For some injured runners, too much stride-to-stride variability may be the problem. They may have muscle weaknesses or imbalances that allow their hips, knees and ankles to wobble in slightly different directions with each stride - and the solution is rehab exercises that produce a more consistent stride.

In this case, the goal is "a more predictable movement pattern," explains Dr. Reed Ferber, a top biomechanics researcher and head of the University of Calgary's Running Injury Clinic. "The body knows what to expect for the upcoming footfall, and the muscles can adjust accordingly."

Ferber's research relies on a sophisticated 3-D gait analysis system that uses multiple video cameras to capture and analyze every detail of a subject's running motion. The system is now deployed at more than two-dozen labs and clinics around the world (for a list, see runninginjuryclinic.com), and Ferber has a database of thousands of runners to compare results with.

He initially expected that the database would reveal simple relationships between stride abnormalities and running injuries - knee pain might result from too much hip rotation, for example. But no matter how much data he collected, these links remained elusive.

Instead, the biggest difference he noted was that, in healthy runners, the data from each stride looked almost exactly like the data from the previous stride. In injured runners, on the other hand, the joint angles and motions were slightly different with each stride, though these variations were invisible to the naked eye.

This suggests that you can't diagnose running problems simply by watching someone run. Ferber recalls a patient who had a distinctly

knock-kneed gait - "you could see her coming from miles away along the running paths" - and was perennially injured despite having spent years trying to correct this problem. Ferber's analysis showed that her stride was also highly variable; a program of hip-strengthening exercises gave her a more consistent stride and cleared up her injury problems, even though the knock-kneed stride persisted.

While the evidence so far is suggestive, more research will be required to determine whether stride variability might be as much a consequence as a cause of injury. That, too, would explain why injured runners display greater variability that diminishes once they get healthy again.

"Good treatment that addresses the pain may end up changing the variability," notes Greg Lehman, a physiotherapist and chiropractor who oversees the use of one of Ferber's 3-D gait analysis systems at Toronto's Medcan Clinic.

In addition to the gait analysis, Lehman gives patients a series of running-related functional tests such as one-legged squats, to look for physical characteristics that might affect their running. Even without 3-D motion analysis, these simple tests can help therapists identify potential problem areas.

"If I can identify a limitation in basic function, like ankle dorsiflexion, it might help me understand why someone runs a certain way," he says. "On the other hand, if they have something structural like bowleggedness, then I know I can't correct this and shouldn't try."

Variability isn't all bad, both Ferber and Lehman stress. In healthy runners, mixing up different running routes, surfaces, paces, shoes and so on is a great way to apply "daily positive stress" that strengthens the very muscles needed to maintain a consistent stride, Ferber says.

But injured runners have different needs.

"During rehab, we ask our patients to limit variability," he says.

"Stick to one route, on one surface, with one set of shoes, and so on. Once they're injury-free, the focus can shift back to training and varying the program," Ferber adds.

Try the following three tests, recommended by Toronto chiropractor and physiotherapist Greg Lehman, to check for functional limitations that may be affecting your running stride.

1 Ankle dorsiflexion: Stand facing a wall, with the front of your foot 10 centimetres from the wall. With one leg at a time, bend the knee forward keeping your heel on the ground. If you can touch the wall with your knee, you have adequate ankle mobility.

2 Single-leg squat: Squat down and back on one leg, with the other leg behind you. Aim to bend your knee to 45 degrees with minimal side-to-side knee and hip motion. If your kneecap ends up pointing inward rather than forward, that indicates a muscle imbalance.

3 Push-up: Assume standard push-up position, lying on your stomach with hands shoulder-width apart. Push up while keeping your back and hips straight. A back that sags (or an inability to get off the ground) points to functional weakness.

ADVICE

Weak ankles? Seven easy exercises

The question

My ankles are not strong. I always roll them when I run and play sports. They feel wobbly. Can you give me some strength exercises for them?

The answer

Absolutely! A close friend of mine struggles with a similar problem, so I understand how frustrating unstable ankles can be.

Do exercises that appropriately challenge your balance. For example, try standing on one leg. Once that gets easy, close your eyes. Balancing improves proprioception. Proprioception is the body's ability to know where it is in time and space – a neurological ability vital for athletes, since no one can or should be consciously aware of their bodies positioning at all times.

To strengthen the muscles in your lower leg and foot, you should also try these exercises:

Standing calf raises: Lift yourself up on your toes for 15 reps. To increase the challenge, stand on one leg or hold weights.

Heel walks: Lift the front of your foot off the floor. Balance on your heels and walk across the room.

Hand-Foot War: Put your right hand against the outside of your right foot. Push your hand into your foot. Resist the push with your foot. Next, place your hand on the inside of your right foot and repeat the push-resist sequence. Switch and repeat with your left foot.

Towel pulls: Place one bare foot on a towel. Grab the towel with your toes. Lift your heel, pull the towel taut, then repeat the toe grabs. Continue for the length of the towel.

When your ankle feels strong enough, incorporate lateral and other sport-specific exercises. Simulating the athletic movements needed for your sport in a controlled environment is a great way to safely prepare your body.

For example, try lateral leaps: Start standing on your left leg. Propel yourself to the right with your left bum muscles, land on your right leg in an athletic stance, then jump back to the left.

Hopping exercises can also be useful: Stand on your right leg. Hop forward, sideways and backward for 10 to 30 repetitions. Then switch and repeat on left foot.

Trainer's tip: Your weak link may be your ankles, but the stronger your entire lower body and core is, the more support your ankles will have. Make sure you are doing lower-body and core exercises such as squats, dead lifts and planks.

WEEK 6

WEEK SIX
Warm Ups

Proper preparation before a training session is just as important as the recovery after the session. Because the central nervous system needs to be triggered to perform the right sequence of movements as we run you need to get the body activated and warmed up.

Neglecting this routine will result in muscle groups shutting off and creating an imbalance in running efficiency, which can lead to overcompensation by other muscle groups and potential injury.

Before we head out on any big run or workout, we start our preparation with some light soft-tissue work.

This can be done on a foam roller, or with a tennis or golf ball. Roll out such areas as the hamstrings, calves and arches of the foot.

This increases blood flow and helps prepare these muscles for exercise.

Next, activate key muscles by performing your favourite stretches and holding them for just three to five seconds. One of the most important muscle groups used in trunk stability is the glutes. To activate the glutes, lie on your back with knees bent and feet flat on the ground as close to your butt as is comfortable. With arms at your side, lift one leg off the ground and bring the knee toward your chest.

Next, lift your hips up, balancing on your shoulders with the foot still on the ground.

This is called the single leg glut bridge. Hold for three to five seconds performing three on each leg. This preparation should take about 10 to 15 minutes.

If you are doing a workout, it's time to head out for a warm-up run of 10 to 20 minutes of easy zone 1 to 2 running.

You should include two to three minutes near the end of your

warm-up run in zone 3 to get your breathing rate up, to activate the muscles around the lungs and maximize your lung volume.

We can now get into the dynamic part of the warm-up with some mobility and specific running exercises.

Start with leg swings, high knee marching, arm swings and even some backward running to increase mobility around the major joints (ankles, knees, hips and shoulders).

This series of movement patterns uses multiple muscle groups required to run efficiently. You are now ready to move into your workout fully warmed up.

This week's training includes some 10K and 5K pace work.

Establishing your goal pace can be done by reviewing past races and setting new goals (be conservative at first). Remember that zone 4 training for a fit person is the pace they can hold for one hour, so you can adjust this pace to determine your 10k time.

You can use an online pace converter and get a 5K pace to use in training. Again, please be conservative initially.

Monday
Day Off

Tuesday
Workout day - full warm-up, then 4-6 x 5 minutes at 10K pace with 3 minutes of zone 1-2 running between the 5-minute segments. Finish off the session with a warm down of 10 minutes in zone 1

Wednesday
Easy run in zone 1, minimum 35 minutes

Thursday
Day off

Friday
Full warm-up, including 5 minutes running in zone 3, 5-10 x 2 minute zone 4 (establish a 5k goal pace for this workout) with 2-minute zone 1 in between, followed by a warm down of 10 minutes in zone 1

Saturday
Easy run in zone 1, minimum 35 minutes

Sunday: Longer run but not more then 25 per cent of weekly volume, include some running in zones 2 and 3 if you are feeling good. **Option**: Substitute an easy day with some cross-training.

NUTRITION

What's the best snack to eat before a workout?

What to eat before you exercise depends on the type of workout you will be doing. If you're doing a strength workout (e.g. weights, circuit training, boot camp) your snack should provide carbohydrate to fuel your muscles during exercise and protein to help your muscle tissue recover after exercise.

Snack options to eat 45 to 60 minutes before a strength workout include an energy bar (look for 20 to 25 grams of carbohydrate and 10 to 18 grams of protein), a smoothie made with fruit and milk or soy milk, yogurt and berries, a hard-boiled egg and an apple, or half a turkey sandwich.

If your cardio workout (e.g. power walk, run, elliptical trainer) is less than an hour, you don't necessarily have to eat a preworkout snack. Providing your meals include carbohydrate-rich foods such as whole grains, legumes and fruit, you can rely on your muscle glycogen (energy) stores to get you through. If you exercise in the morning and you're trying to lose weight, research suggests eating breakfast after - rather than before - a cardio workout allows you to burn more fat.

If your cardio workout is an hour or longer, eat a carbohydrate-rich snack at least 45 minutes before to supply glucose to your bloodstream. Your snack should be 100 to 200 calories; larger snacks take longer to digest. Easily digested snacks include a smoothie, a banana, three-quarters of a cup of yogurt, an energy bar, a whole grain cereal bar and a small serving of oatmeal. Foods high in protein, fat or fibre take longer to empty from your stomach and are likely to cause digestive upset while you are working out.

Post-workout snacks are important, too. After a cardio workout, eat a carbohydrate-rich snack if your next meal will be more than an hour away. Carbohydrates replenish the glycogen your muscles burned during exercise.

After a strength workout, you need carbs as well as 10 to 20 grams of protein to help repair and rebuild muscles tissue. Protein shakes (made with milk and/or fruit), energy bars, three-quarters of a cup of Greek yogurt and fruit, even a sandwich with lean protein all work well.

And of course, be sure to drink water before, during and after

exercise to help stay hydrated. Water is fine for workouts less than an hour. But if you're exercising longer, hydrate with a sports drink, which replenishes water and electrolytes (sodium, potassium, chloride) lost through sweat. Aim to drink five to 12 ounces of fluid every 15 to 20 minutes.

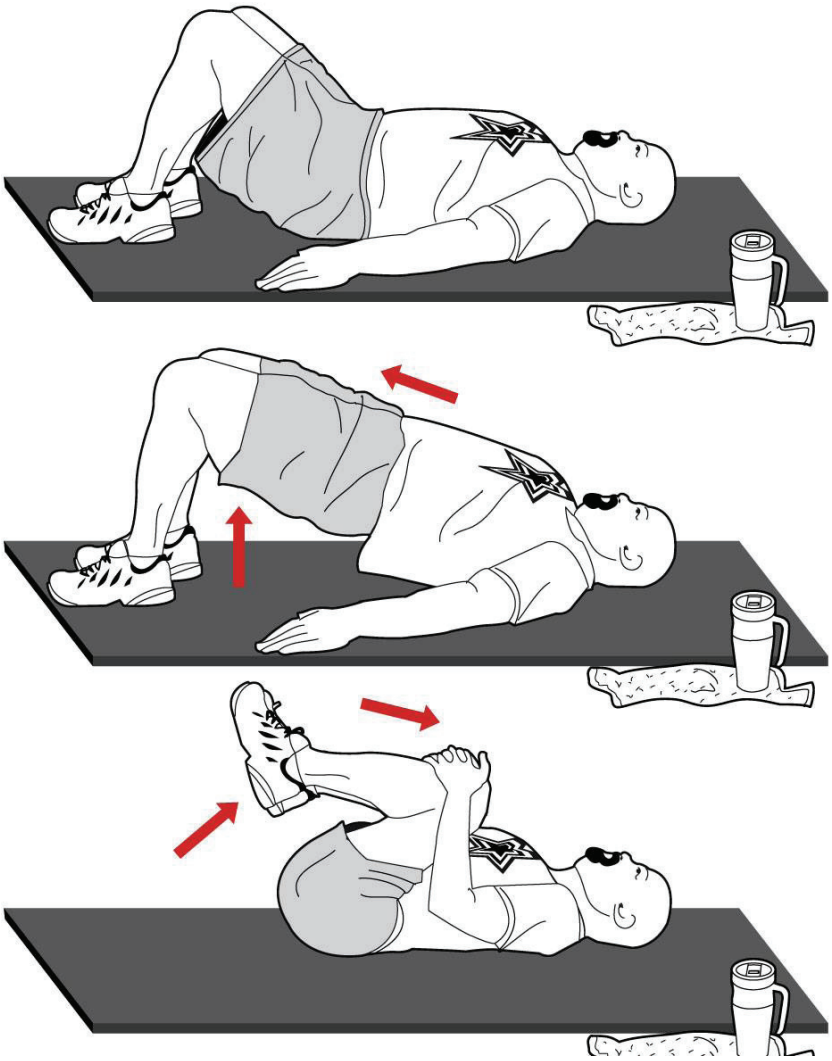
ADDITIONAL STORIES

Why sprinting is good in the long run

tgam.ca/EBts

EXERCISE

The business traveller



1 Place your feet hip-distance apart and parallel on the floor. Engage your bum and core to lift your hips up. Keep your kneecaps in line with your middle toes. Repeat 10 to 15 times.

2 Looking for a challenge? Do a second set with a pillow between your knees to strengthen your inner thighs. Finish by drawing your knees into your chest and hold for 30 seconds.

RESEARCH

The best way to run hills

The question

What's the best way to run hills? Push hard and get them over with, or keep it relaxed?

The answer

Running uphill is tough on the lungs, and running back down is tough on the legs. Either one can derail an otherwise pleasant run – but if moving to Saskatchewan isn't an option, you'll need to develop strategies to deal with this challenge.

Fortunately, a group of Australian researchers used the latest technology to investigate this question, sending a group of runners out on a hilly 10-kilometre course while wired with a portable gas analyzer to measure oxygen consumption, a GPS receiver to measure speed and acceleration, a heart-rate monitor and an "activity monitor" to measure stride rate and stride length. The results, published this year in Medicine & Science in Sports & Exercise, suggest that most runners make two key mistakes: They try to run too fast uphill and don't run fast enough downhill.

When you're running on flat terrain, your speed is generally limited by the ability of your heart and lungs to transport oxygen to the muscles in your legs. If you try to maintain the same speed while hauling your body up a hill, you'll quickly notice that you're breathing harder because you're consuming more oxygen.

The problem with this approach is that, once you get to the top of the hill, you'll need time to recover from this extra effort. In the study, runners took an extra 78 seconds on average to regain their initial speed after cresting a hill – a delay that wipes out the benefit of pushing hard up the hill, according to lead researcher Andrew Townshend of the Queensland University of Technology.

"Based on our results, we suggested that a small decrease in speed on the uphill may be more than compensated for by a quicker return to faster running speeds on the subsequent level section," he says.

Dr. Townshend and his colleagues have put this strategy to the test – "with some success," he says – in a follow-up study that is currently being prepared for publication.

Surprisingly, the opposite was true on downhill sections. Because

of the jarring impact involved in running downhill, most of us simply can't run fast enough in that direction to be limited by oxygen. The practical tip: When you get to the bottom of a hill, focus on maintaining your momentum (and higher speed) until your breathing forces you to slow down again.

The downhill results were much less consistent among subjects than the uphill and level sections of the experiment. Some people were able to run far closer to their aerobic limits than others, gaining valuable time without becoming significantly more tired. This suggests that downhill running is a skill worth practising.

Of course, there's a reason we tend to back off going downhill: It's hard on the legs and it raises the risk of injury. For that reason, it's best to limit downhill training to short sprints on a fairly gentle grade. A 2008 study from Marquette University in Wisconsin found that a 10-per-cent grade (5.7 degrees) was ideal to maximize your speed in 40-yard sprints.

While these simple tips – slow down on the ascent, speed up on the descent – should help you distribute your effort more evenly during runs, you'll need to try them out to find the right balance for yourself.

"The best I can suggest is that runners should practise varying their degree of effort on hills that they frequently use in training, to determine how much they should slow down to reap an overall time benefit," Dr. Townshend says.

ADVICE

How do I minimize pronation when I run?

The question

My feet pronate when I run. What can I do?

The answer

The ankle should primarily be a hinge joint that brings your toes toward and then away from your shin.

During pronation, the foot points out to the side, and the inner arch rolls in.

If you pronate while running, the muscles of the knee, hip and back have to alter their recruitment patterns to compensate for the pronation, and over time this can cause injury.

To help retrain the muscles of the foot and ankle, try this exercise to help with your foot alignment.

1. Sit in a chair with your feet bare, parallel and shoulder width apart. Equally distribute your weight on your big toe and both sides of your heel. Lift up your arch and create space between it and the floor. Imagine you are forming a dome with your arch. Hold for five seconds. Repeat five-10 times.

2. Stand on your right leg in front of a mirror so you can watch your form.

First, make sure your weight is evenly distributed on your big toe and both sides of your heel. "Dome" the foot while standing.

Watch for two things in the mirror: Don't let your knee cave inward; keep your knee cap in line with your middle toe.

Watch your pelvis, and make sure both hip bones are level.

Aim to hold perfect alignment for five seconds. Work up to holding for 30 seconds. Repeat on left leg.

Trainer's tip

If you pronate, most likely your peroneal muscles (which run lengthwise up the outside of your lower legs) are tight. You can use a foam roller to help release them. Lie on the floor on your side, legs stacked together, with a foam roller tucked perpendicularly under the bottom leg. Use your arms to prop up your upper body (like a plank position) and then propel yourself in a head-to-toes motion. The roller will move up and down your leg, massaging the muscles. Flip over and repeat for the other leg.

WEEK 7

WEEK SEVEN
Rested, relaxed and ready for race day

Once you have your race date confirmed, it's time to start planning to have an optimal race.

As you head into your pre-race week, it's important to be on the start line with absolutely no fatigue in the legs. Cutting back or tapering your training in this final week is crucial. Reduce the volume of your runs to about 70 per cent of a typical week. It's important to maintain some zone 3 running in this last week, but cut back on the distance. If possible, run part of race course (or at least bike or drive it) so you can check for elevation changes, changes in running surface, corners and any other potential challenges. It's also valuable to identify certain landmarks throughout the course, which will help you visualize and plan out your race strategy and pace.

Prior to race day, assemble a timeline for your race-day preparation. The day before, start by laying out your running gear, race number, pins and other essentials. That way there is no last-minute panic over missing items, and you don't get to the race and realize you forgot to pack your timing chip!

If your race is early in the morning, eating a meal that you will digest in time may be difficult. At this point, you will have experimented with different foods. Stay with what's familiar and don't try something different.

Arrive at the race with plenty of time to do a full warm-up. You can do the soft tissue and activation stretches at home but make sure you have a thorough warm-up run prior to the race.

Remember, in any road race, going out too fast will have a detrimental effect on your final time. Get into your own rhythm at the start and ignore those around you who are pushing the pace off

the start line. So what is your pace? If you are racing a 5K, then try to calculate a pace based off your zone 4 workouts. Be conservative, allowing yourself some room to speed up in the second half. In a 10K, start out at your zone 3 pace for half the race. In both cases you should be able to have what is called a negative split, meaning the last half of your race is faster than the first half. Remember: Plan ahead and run your own race. Good luck!

ADDITIONAL STORIES

How to work your core before even getting out of bed
tgam.ca/EBtt

It's race day: how to get rested and ready
tgam.ca/EBtu

NUTRITION

What to eat before the big performance

Our guide won't make you an Olympian, but it will help maximize your athletic performance.

What to eat
The following guide won't make you an Olympian, but it will help maximize your athletic performance.

30- to 60-minute cardio workout (power walk, run, elliptical, cycle)

Before: a carbohydrate-rich snack, 100 to 200 calories. Try a blender smoothie made with skim or soy milk and frozen fruit, ¾ cup of yogurt, a banana or a whole-grain cereal bar.
After: a carb-rich snack, 100 to 200 calories, if your next meal is more than an hour away. Water to rehydrate.

45- to 60-minute strength workout (weight training, circuit training)

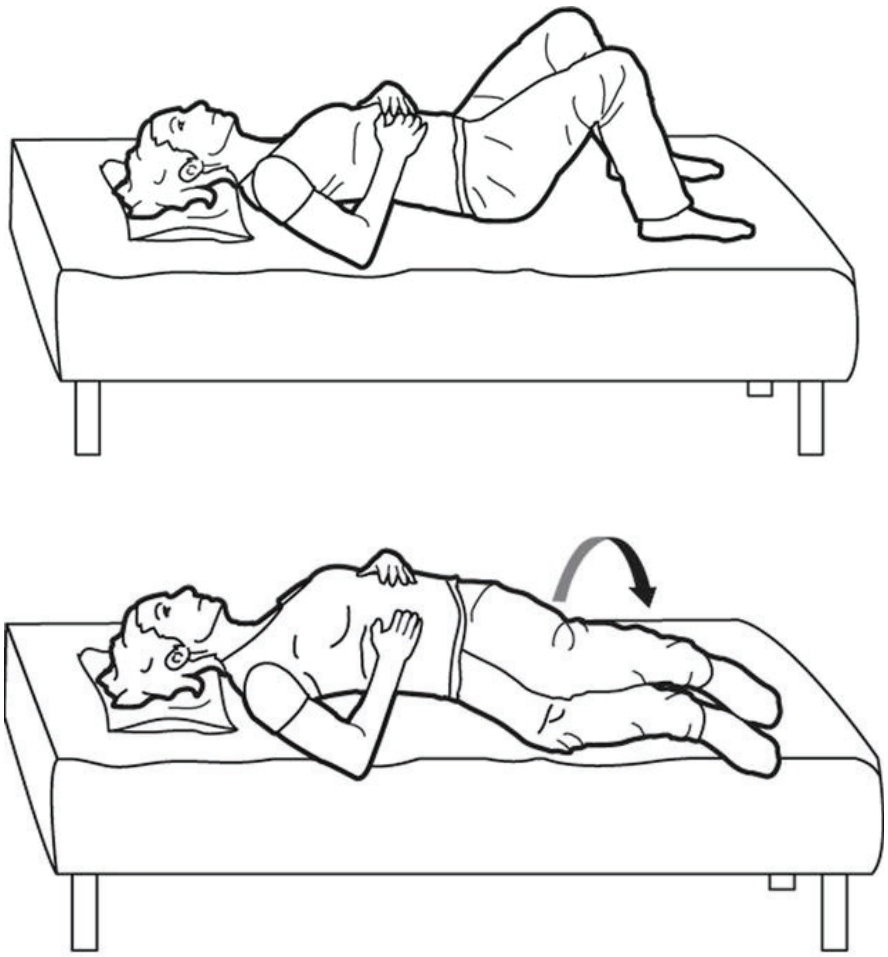
Before: a carb-rich snack with at least six grams of protein to enhance muscle repair, 200 to 250 calories. Try an energy bar, half a turkey sandwich, yogurt and berries, or a hard-boiled egg and an apple.
After: a carb-rich snack that contains 10 to 20 grams of protein. Try a protein shake and a banana, 1½ to two cups of chocolate milk, 45 grams cheese and whole-grain crackers, or a bowl of fruit salad with 200 grams of yogurt. Water to rehydrate.

Half-day cross-country ski or snow shoe

The night before: a high-carb meal such as pasta or a stir-fry with rice. **Before:** a high-carb breakfast such as oatmeal and toast or whole-grain pancakes and fruit. **During**: carbohydrate-rich snacks every two hours. Try dried fruit and nuts, granola bars or energy bars. Drink water or a sports drink. **After:** a carb-rich snack if your next meal is more than an hour away. Water or a sports drink to rehydrate.

EXERCISE

How to work your core before even getting out of bed



1 Lie on your back. Bend your knees and place your feet wider than hip-width apart on your bed.

2 Let your knees fall gently to the right. Pause, then use the left side of your waist to pull your knees back to their starting position.

RESEARCH

Why are elite athletes able to speed up when they see the finish line?

Studies have shown that what limits endurance is all in your head

After five days and almost 250 kilometres of running through the shifting sands and hair-dryer heat of the Sahara Desert, Simon Donato had reached the limits of his physical endurance. The 37-year-old from Canmore, Alta., who travels the world competing in the most gruelling ultra-endurance races as co-host of the TV adventure series Boundless, knew he had to cover another 30 km to reach the finish line, but he could barely put one foot in front of the other.

Then, as he staggered on, a strange thing happened: He began to speed up. He gained strength as he felt the finish line draw nearer, he says, "and the final five kilometres were probably my fastest of the entire day."

Donato's experience is hardly unusual. We've all experienced the surge of energy that comes with realizing we're almost finished a difficult task. And the same phenomenon will be on display in Sochi, where events such as the 50-km cross-country ski race will last for over two hours but still be decided by fractions of a second in a furious final sprint. (Just ask Devon Kershaw, the Canadian who finished fifth at the last Games, 1.6 seconds behind the winner.)

But it's also puzzling. If tired muscles and depleted energy stores are what slow you down during prolonged exercise, then how are you able to speed up at the end, when you should be most tired and depleted? Over the past decade, this puzzle has forced physiologists to reconsider what limits endurance. Their conclusion is that, to a much greater degree than suspected, the limits are in your head.

"Top-level athletes get closer and closer to their real physiological maximum," says Dr. Samuele Marcora, a fatigue researcher at the University of Kent in Britain. But they never quite reach it: The brain applies the brakes before the heart, lungs or muscles fail.

Marcora points to a classic study by French researcher Dr. Michel Cabanac, published in 1986. He asked volunteers to "sit" against a wall with their knees bent but no chair for support, and offered them a monetary reward, ranging from a few cents to a few dollars, for every 20-second interval they endured. The more money he offered, the longer the subjects lasted – again, an obvious result. But it illustrated

that the timing of their collapse depended on factors in their brain, not their muscles.

Marcora believes our limits are dictated by an ever-changing balance between perceived effort and motivation. Fatigued muscles affect how hard your effort feels, but so too do many other seemingly unrelated factors, like how mentally fatigued you are or how confident you are. He and his colleagues published a study last fall showing that two training sessions in "motivational self-talk" reduced the perception of effort during a cycling test and allowed subjects to last 18-per-cent longer before reaching exhaustion.

So does this mean the secret to physical success is simply mind over muscle? Not quite. "The sense of effort is generated by the brain, but it's still your reality," Marcora says. "You can't just ignore it."

That reality can be tweaked, though, by researchers who deceive their volunteers into achieving otherwise impossible feats. One study showed that cyclists lasted longer in a ride to exhaustion when the clock was secretly adjusted to run 10-per-cent slower than normal; another found that cyclists performed better in hot conditions when the thermometers were rigged to display artificially low temperatures.

Knowing how much longer you have to go also affects how hard your effort feels, an effect known as teleoanticipation. That's why athletes like Donato are able to speed up as they approach the end of a race: Even though their bodies are more tired than ever, their brains interpret the signals differently. In the lab, tricking subjects by making them continue for shorter or longer times than expected produces sudden changes in their perception of how tired they are.

All these studies demonstrate the power of the mind, but they don't offer much useful insight on how to push harder, since it's difficult to deceive yourself. For practical applications, one promising approach comes from neuroscientists at the University of California, San Diego, who have been studying the brain patterns of elite adventure racers like Donato in fMRI scanners.

The experiments involve completing cognitive tests while enduring the unpleasant sensation of having the oxygen flow through their breathing mask temporarily restricted. Compared to non-athlete controls, the adventure racers have a heightened anticipatory response in their insular cortex, which monitors incoming signals from the rest of their body; they're then able to remain calm and perform well during the period of restricted breathing.

The difference, explains Dr. Martin Paulus, the lead researcher, is that the athletes have thousands of hours of training that has taught them to accept discomfort without panicking. “Through repeated exposure, you learn to tolerate it,” he says.

Paulus and his colleagues then put a group of Navy Seal recruits through an eight-week mindfulness-training program, teaching them techniques rooted in Buddhist meditation. They saw changes in brain patterns after the mindfulness training that mimicked patterns seen in the elite adventure racers – an indication that it may be possible to directly train the brain to better handle adversity and physical discomfort.

This approach is hardly a simple shortcut, though. Whatever the form of the training, it takes time and effort to push the cautious limits imposed by your brain. And even experienced athletes like Donato still have to constantly remind themselves to believe in their ability to go just a bit farther.

“The races we choose for Boundless are some of the toughest out there, and regularly push me to redefine my personal limits,” Donato says. “This is a mental redefinition, though, not a physical one, because it’s the mind that needs to overcome the obstacles. Once this happens, the body will usually follow orders.”

ADVICE

I'm training for a half marathon but now have heel pain

Question

I have been training for a half marathon. I feel great, but have developed a pain in my right heel.

Answer

Heel pain is usually a result of plantar fasciitis, a condition that develops when the connective tissue that runs along the bottom of your foot acquires small tears and becomes irritated.

Make an appointment with a massage therapist, ART practitioner or physiotherapist to get manual therapy on your foot, as well as a concrete diagnosis. You don't want to treat yourself for plantar fasciitis only to discover in three months that something else was causing your pain.

The most common causes of plantar fasciitis is overuse, and faulty movement patterns.

The first step in the healing process is to stop the activity that is causing the irritation. In your case, I suggest a hiatus from running.

The second step is to address the acute symptoms, i.e., relieve the pain. Ice and massage your foot and stretch out your calves. Try rolling the bottom of your foot with a massage ball.

The third step is to figure out what caused the problem in the first place, so the problem does not resurface once you start running again.

For example, foot pronation during running causes the ankle to fall inwards and the toes to turn out slightly. This pulls on, and stresses, the plantar fascia, causing irritation and eventually, plantar fasciitis. If your feet pronate, you will need to strengthen your glutes and work on fixing your running gait.

Another possible cause is overuse – for instance, if you increased your mileage too quickly while training for the half marathon, or did not give yourself enough rest.

Try to use this injury as a learning opportunity so that when you return to training you are a smarter and stronger runner.

Trainer's tip

During your hiatus, try non-impact activities like rowing, pool running, swimming lengths and strength training to maintain your fitness. Just stay away from strength moves that involve balance, especially single-leg balance exercises. They could irritate your injury.

WEEK 8

WEEK EIGHT
How to be your own coach

Over the last two months we've outlined a basic training program to use on your way to training for a race. Now that you understand intensity levels, how to monitor your body through heart rate and mastered a variety of workouts, it's time to take your training to the next level.

The most important rule of any training program is to take ownership and adjust it to your schedule, running goals and recovery rate. Listening to your body is key. One of the best ways to track how you're feeling and performing is to keep a training log.

Training logs need to include details about any problems as well as your morning heart rate, your total mileage, intensity levels, stress levels and how you are feeling when you are running. For women, it's also helpful to record when you have your period, as it can have an impact on your training. The training log can help you assess when a rest day or week is necessary. Are you consistently feeling tired day after day? It may be time to take an easy week of training or a few days off. Many athletes work through a cycle of training hard for three weeks and then taking one week easier.

To keep your interest and muscles primed, it's important to add variety. Do a high-intensity session and include hills or, alternatively, go to the track and try doing a set of intervals to learn a sense of pace. Change your running routes often and meet up with different people for runs. Substitute cross-training or other types of exercise such as hiking or biking.

Besides defeating boredom with the same routine, there actually is a medical reason for a changeup. The nervous system will adapt to a variety of stimuli by building new muscle groups and pathways.

Over all, you'll be better prepared for any kind of change in your workouts and races.

When training on your own, it is important to be more conservative and cautious in your training. For your overall program, it's better to have succeeded in a series of weeks of consistent running than hammering two weeks of hard-core training and then sustaining an injury. Listen to your body.

ADDITIONAL STORIES

How to sneak in a last-minute core exercise

tgam.ca/EBtv

Why group running works

tgam.ca/EBtw

NUTRITION

Popeye was right: Spinach can make you stronger

Popeye was right, it seems. According to a study published last week in the journal Cell Metabolism, eating spinach can make your muscles stronger.

But it's not the iron in spinach that gives muscles a boost. It's nitrates - natural compounds abundant in vegetables - that appear responsible.

In the study, healthy people took nitrate supplements - the equivalent of 1.5 cups of cooked spinach - for three days. At the beginning and end of the experiment, participants rode an exercise bike while their oxygen intake was measured.

Taking nitrate supplements resulted in more efficient muscles - the amount of oxygen needed to fuel exercise was reduced by as much as five per cent.

It's thought that dietary nitrate helps the mitochondria - the power plant inside every cell - run more smoothly and effectively.

The researchers don't suggest you start popping nitrate supplements before a workout. Rather, they say, the results offer one explanation for the many well-known health benefits of leafy green vegetables.

Nitrates feed into a pathway that produces nitric oxide, a chemical that relaxes blood vessels, lowers blood pressure and improves circulation. In doing so, nitrate-rich leafy greens could increase the flow of oxygen and nutrients to working muscles.

While these findings are interesting, there are plenty of other reasons to eat leafy greens such as spinach, kale, Swiss chard and collards.

When it comes to vitamins, minerals and antioxidants, leafy green vegetables are hard to beat. They offer fibre, vitamins C, A and K, folate, calcium, magnesium, potassium and beta-carotene, and have been linked to a lower risk of heart disease, Type 2 diabetes and certain cancers.

Leafy greens are also an exceptional source of lutein and zeaxanthin, phytochemicals that guard against cataract and macular degeneration. Research also suggests a regular intake of leafy greens can keep your mind sharp as you age.

You'll get more calcium, magnesium, iron, beta-carotene and lutein if you eat your greens cooked rather than raw. That's because cooking breaks down cell walls, increasing the amount of minerals and antioxidants available to your body for absorption.

If you're new to leafy green vegetables, the following tips will help you add them to your diet - aim for one serving each day. (One serving is equivalent to a 1/2 cup cooked or 1 cup raw). These vegetables are readily available in grocery stores. Other leafy greens worth looking for include dandelion greens, beet greens, mustard greens and turnip greens.

Collard greens

To prepare, trim the roots and separate the leaves. Wash thoroughly. Remove the tough stems and ribs from the leaves. Coarsely chop the leaves. Collard greens are most flavourful when sautéed. But you can also add this green to soups and stir-fries.

» Drizzle sautéed collard greens with extra virgin olive oil and freshly squeezed lemon juice. Top with toasted pine nuts

» Add blanched collard greens to a chicken stir-fry. To blanch, bring water to boil in a large pot. Add greens to boiling water and cook for 1 to 5 minutes, or until greens have wilted. Remove from the heat and drain. Allow greens to cool then squeeze out moisture.

» Sauté collard greens with cubes of firm tofu, minced garlic and a hint of curry paste for a vegetarian meal.

Kale

Both leaves and stalks can be eaten, but most recipes call for leaves only. After washing, use a knife to remove the tough stems and ribs. Coarsely chop leaves. Kale leaves are sturdy and hold up well in soups and pasta sauces.

» Add chopped kale leaves to sautéed garlic and red chili flakes; sauté until tender, about 5 minutes. Drizzle with roasted sesame oil just before serving.

» Sauté kale leaves with chopped apple. Before serving, sprinkle with balsamic or apple cider vinegar.

» Add raw kale leaves to any soup and simmer until leaves are tender.

Rapini (broccoli raab)

You can cook and eat the leaves, stalk and flower heads of rapini just as you would regular broccoli. Rapini has a stronger flavour than broccoli. Some people prefer to blanch rapini for one to two minutes before cooking it in order to mellow the flavour. Discard bottom 1/4 inch of stalks.

» Sauté blanched rapini for 3 to 5 minutes with minced garlic. To serve, drizzle with fresh lemon juice and sprinkle with grated Romano or Parmesan cheese.

»Add chopped blanched rapini to a tomato-based pasta sauce with turkey sausage.

» Sauté rapini with minced garlic, red chili flakes and chick peas for a vegetarian dish.

Spinach

Savoy spinach has crisp, creased, curly leaves. Smooth-leaf spinach has flat, unwrinkled spade-shaped leaves. Baby spinach has a slightly sweeter taste and is great for adding to salads.

» Steam spinach and add a splash of raspberry vinegar just before serving.

» Add layers of steamed spinach to a lasagna recipe.

» Add chopped spinach or baby spinach to pasta sauce at the end of cooking.

Swiss chard

This tall leafy green vegetable has a thick, crunchy stalk that comes in white, red or yellow with fan-like green leaves. Discard bottom 1 inch of stems. Then chop the stems and leaves. The stalks will take longer to cook than the leaves; begin cooking them about 2 minutes before adding the leaves.

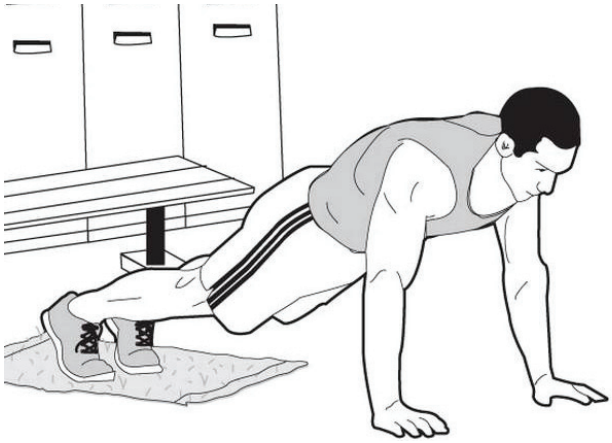
» Toss cooked Swiss chard with penne pasta, extra virgin olive oil, sautéed garlic, lemon juice, sun-dried tomatoes, chopped black olives and grated Parmesan cheese.

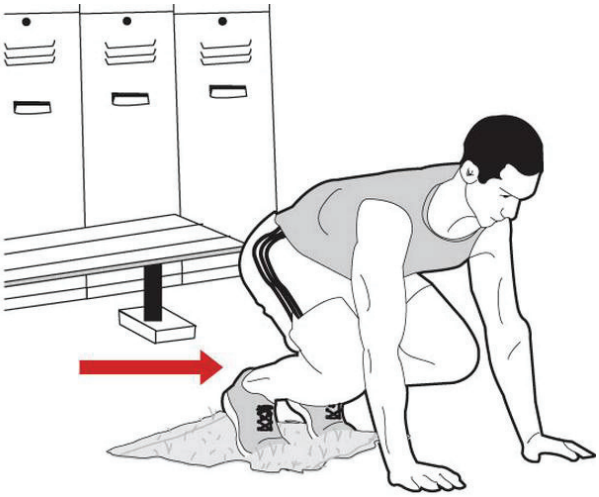
» Add steamed Swiss chard to omelettes, quiches and frittatas.

» For variety, use Swiss chard in place of spinach in recipes.

EXERCISE

How to sneak in a last-minute core exercise





1 Start in a plank position with your toes on the towel. Keep your arms straight and your hands directly under your shoulders.

2 Slide your feet forward along the floor so that your knees bend under your hips. Slowly return your feet to their original position. Keep your upper body and pelvis stable as your legs move. Repeat eight to 10 times.

RESEARCH

Even rec athletes can learn how to draft

Here's how Drafting isn't just for pro cyclists and runners: Sheltering behind someone can save a significant chunk of energy even at recreational speeds – so it's worth knowing how to slipstream effectively, and when it matters most

At last month's Scotiabank Toronto Waterfront Marathon, Reid Coolsaet returned a favour. For 25 kilometres, he served as a "rabbit" to set the pace and block the wind for Kenyan runner Stephen Chelimo, who had done the same for Coolsaet a year earlier to help him earn a spot on the Olympic team.

The power of the peloton reigns supreme in competitive cycling, where the effects of air resistance make it almost impossible for a single rider to outpace the pack. But drafting isn't just for pro cyclists: Sheltering behind someone can save a significant chunk of energy even at recreational speeds, and it can make a big difference to runners, too – so it's worth knowing how to slipstream effectively, and when it matters most.

The energy you expend to overcome air resistance depends on two factors: how fast you're moving forward, and how fast the wind is blowing against you. If you double your speed on a still day, you'll spend eight times more energy fighting air resistance. That's why drafting will always be more important to cyclists than to slower-moving runners.

But no matter how fast you're going, if the wind speed doubles, then the energy you spend overcoming it will quadruple. For runners like Coolsaet, a Guelph, Ont.-based marathoner, and Chelimo, cruising at just over three minutes per km along the breezy shores of Lake Ontario, this can quickly add up to a significant drain on their efforts.

Positioning yourself to take advantage of someone else's wind-blocking is a skill that takes practice.

"I like to run right behind the rabbit unless there's a stiff wind coming from the side," Coolsaet says. "Then I'll go to the opposite shoulder of the wind direction."

You have to get close to maximize your benefits: Some cycling studies use a wheel-to-wheel distance of 30 centimetres to measure the effects of drafting – the gap in real-world situations can be much smaller. Runners can't get quite that close without getting kicked in

the shins, but years of running in track races with crowded packs has taught Coolsaet how to tuck in less than one metre behind other runners.

So does this really matter to most people? If you're just out to get some exercise, then air resistance is actually a bonus, forcing you to burn a few extra calories. But if you're trying to set a best time or cover a long distance that's near the edge of your abilities, sheltering from the wind could make a difference.

For cyclists, wind resistance becomes the dominant force slowing you down at speeds above about 25 km per hour. But even at lower speeds, there's still a significant benefit to drafting.

For runners, the bar is set a bit higher. Studies have found that you spend about 2 per cent of your energy fighting air resistance on a still day while running at the brisk clip of three minutes 20 seconds per km. That means that air resistance is negligible at typical jogging paces of five minutes per km or slower unless the wind is strong and in your face.

Still, a friendly rabbit can be helpful at any speed, Coolsaet points out: "I think the main benefit is mental unless it's a really windy day," he says.

Having someone else take on the cognitive burden of setting the right pace and choosing the best path along the route can conserve valuable mental energy, allowing you to save it until you really need it in the later stages of your run. That's why many large road races offer designated "pace bunnies" to lead other runners to specific finishing times.

And even if you don't have a hired rabbit to help you out, there's good news from cycling studies. A group of people sharing the wind-breaking duties, it turns out, can ride one to five km per hour faster than the individuals riding on their own. So if necessary, take your turn at the front before you tuck in out of the wind – that way, everyone wins.

ADVICE

What's a balanced exercise routine for runners?

The question

I really enjoy running five to seven kilometres, five days per week. I know I should be doing exercises other than running. I am not sure how to structure my exercise week so that it is balanced.

The answer

Since it sounds like you are not training for a specific running event, I would suggest you limit your runs to a maximum of three times per week to prevent injury and boredom, and that you add strength, core and flexibility training to your routine.

Try this sample week:

Running workout 1: easy run. For you, this would be your regular five to seven kilometres. Others should pick a distance they can run comfortably in roughly 30 minutes.

At the end of this run, do 20 to 30 minutes of core, foot and ankle work. See the exercise in the Trainer's Tip for a sample exercise.

Once or twice per month, replace this run with something different, for example a spinning class, a team sport or kayaking. Just challenge your body to do a workout it is not used to.

Running workout 2: speed work. Do a 10- or 15-minute warm up. Then do five to 10 sets of one-minute hard running followed by two minutes of moderate running. Finish with a 10- to 15-minute cool down.

Running workout 3: longer run. This run should be slightly longer than your easy run. Never increase the duration of this run by more than 10 per cent a week.

After your speed work and longer run, do 20-plus minutes of flexibility and/or yoga.

Workout 4 and 5: resistance training in the gym.

Trainer's Tip

Strengthen your ankles, knees and especially your glutes by doing a standing balance exercise after your run. Simply stand on one leg. Engage your glutes and look to see your knee is in line with your second toe, and your weight is equally distributed on your foot. Hold this position and close your eyes. Try to hold for 30 seconds on each leg.