TRAINING GUIDE

Your Guide to Injury Prevention

Everything you need to know to stay fit and pain-free

RUNNING IS ONE OF the best possible things you can do for your body. It builds up your muscles, bones, brain power, endurance, and overall strength. But if you're not careful, running can also break you down—which is when injuries happen. In this guide, you'll find everything you need to treat injuries, and prevent them from happening in the first place. We include training and lifestyle strategies to help you stay healthy, strength moves that lower your injury risk, plus great cross-training options and coping tips if you do get injured.

THE 6 LAWS OF STAYING HEALTHY

Follow these principles and you'll spend more time on the roads—and less time in rehab

1 KNOW YOUR LIMITS
Muscles and joints need time to recover and handle more training demands. Build your weekly mileage by no more than 10 percent per week.

2 LISTEN TO YOUR BODY
Most injuries don't come out of nowhere. First you'll feel persistent aches and soreness. At the first sign of pain (or discomfort that worsens during or after a run), take three days off. On the fourth day, run half your normal easy-day amount at a much slower pace. Then build back up.

3 SHORTEN YOUR STRIDE
Overstriding is a common mistake that can lead to injury. Shorten your stride, and you'll land "softer" with each footfall. Time yourself for 60 seconds and count each time your right (or left) foot hits the ground, then multiply by two. Aim for 170 to 180 steps per minute.

4 STRENGTH TRAIN
Muscles keep your body properly aligned while you're running down the road. Emphasize core, hip, and lower-leg strength training to keep your pelvis and lower joints positioned.

5 RUN ON A LEVEL SURFACE
Try to do some of your training runs on a level surface like a bike path or dirt trail. The local track also provides a firm, flat surface, as does the treadmill.

6 DON'T RUN FAST TOO OFTEN
Give yourself plenty of recovery time after races and hard workouts. Even Olympic gold medalists only do five to 10 percent of their training at 5-K race pace and faster.

MORE TIPS INSIDE

Safe Keepers

Exercises you should do to prevent the five most common injuries

WHEN RUNNERS GET HURT, plantar fasciitis, Achilles tendinitis, iliotibial-band syndrome (ITBS), shinsplints, or runner's knee is usually the diagnosis. Below is a quick, easy-to-do exercise routine developed by New York City–based physical therapist Allison Lind that will make you less vulnerable to these pesky injuries. For maximum benefit, do this session before two or three of your runs each week. Important note: If you know you're susceptible to one of these injuries, zero in on the exercise that protects against that problem—and do it every day.

CALF DROPS

Prevent Achilles tendinitis by strengthening the calf muscles. Stand barefoot with the balls of your feet on the edge of a step. Rise up on your toes with both feet. Shift your weight to one foot, then lower down on that foot. Rise up on both, lower on one foot. Do three sets of 10 on each side.

HALF-SQUATS ON A DOWNWARD SLOPE

Prevent runner's knee by strengthening the quads to keep the kneecap aligned. Stand facing down a hill or on a decline board. Squat halfway between the start position (straight leg) and a full squat (90 degrees). Do three sets of 10. Too easy? Try single-leg squats (below).

ARCH RAISERS

Prevent plantar fasciitis by strengthening your foot muscles. Stand barefoot on one leg. Imagine your foot is a tripod and place even pressure on your big toe, pinkie toe, and heel. Ground these three points as you "scrunch up" your arch. Hold this position for 30 seconds; repeat this three times.

HEEL WALKING AND BIG-TOE RAISERS

Prevent shinsplints by strengthening the muscles that attach to the shinbone. Do three sets of each.
A Walk in place barefoot for one minute with your forefeet off the ground. Do three sets.
B Lift the big toe of one foot, lower, and repeat 10 times.

SIDE-LEG RAISERS

Prevent ITBS by strengthening the gluteus medius muscle near the hip. When it's weak, another upper-leg muscle overcompensates and pulls on the ITB, causing pain along the outside of the leg, down to the knee. Lie on your side with your hips and legs stacked. Lift your top leg up, but point your toes inward and toward the ground to isolate the gluteus medius. Hold for 30 seconds, then release. Do three sets on each leg, working up to one minute per set.

 Illustration by Stuart Bradford; Photographs by Beth Bischoff

Good Grief

Injuries can be devastating. Here's how to cope with emotions so you can heal faster

THE KEY TO COMING back from an injury is to take a purposeful approach and have a grieving strategy, says Diane Wiese-Bjornstal, Ph.D., a leading researcher of injury psychology and associate professor at the University of Minnesota. If you can recognize each state of mourning and work actively to move through each one, you'll heal faster, mentally and physically. And that means you'll be back on the road sooner. Here are the five stages of (injury) mourning, and what to do in each one.

DENIAL

WHAT TO DO "By denying you're injured, you can exacerbate the injury," says Jim Taylor, Ph.D., a sports psychologist in San Francisco. So listen to your body. At the first sign of a potential injury, back off. A few days off the roads are better than months of physical therapy.

ANGER

WHAT TO DO A positive outlook may be your greatest weapon. Research reports that athletes who use positive self-talk and set goals for their rehab experience "exceptional recovery." So be angry for a few days, then look forward. Set rehab goals so you can celebrate small successes.

BARGAINING

WHAT TO DO Taking action to fix your problem is good, but don't go overboard. "You can't microwave healing," Taylor says. "You have to slow bake it." Obey your rehab plan the same way you would a training program.

DEPRESSION

WHAT TO DO Fill your downtime with other activities. Stay connected to the running community: Cycle alongside friends on their long runs; invite your running buddies to a yoga class you've started taking; volunteer at a race.

ACCEPTANCE

WHAT TO DO Stick with your rehab plan and see the progress, Taylor says. This is critical. Anxiety and stress can cause muscle tension and suppress immune function, which can delay recovery.

THINK AGAIN

Sports psychologist Jim Taylor, Ph.D., offers ways to reframe doomsday thinking,

"I've always identified myself as a runner. Now who am I?"

VOICE OF REASON → "Running is one part of who you are," Taylor says. "Focus on the other interests and people that define you. Also, realize this is probably just a temporary break."

"Without running, I'm going to be fat and miserable."

VOICE OF REASON → "Ask your doctor about activities that are safe," Taylor says. "Find a cross-training option that burns calories and produces endorphins."

"I don't know what I'll do if I don't run a personal record."

VOICE OF REASON → "Adjust your goals," Taylor says. "Either stick with the race and do it slow, or pick a different race that will give you time to heal and rebuild."

Mistaken Identity

Proper rehab is tricky when your injury is hard to pinpoint. Here's help for some of the common maladies runners face

RUNNING INJURIES ARE notoriously tricky to diagnose, says Charlie Merrill, a physical therapist in Boulder, Colorado. Most injuries result from overuse, rather than sudden trauma, and without a single, obvious trigger, it can prove difficult to correctly pinpoint the pain's source. "Many running injuries stem from a different area than where they hurt," Merrill says. Runners who don't seek medical care may misdiagnose their injuries. These common runners' maladies may—or may not—be what they seem.

Shins

YOU THINK Shinsplints
BUT IT COULD BE A stress fracture
THE DIFFERENCE The pain strikes the same lower-leg area. However, shinsplints pain lessens as you warm up, while stress-fracture pain continues through the end of a run, says John DiFiori, M.D., team physician at UCLA. Stress-fracture pain often feels deep and radiates over a wide area, and weight-bearing activities increase the discomfort, says Clint Verran, a 2:14 marathoner and physical therapist. "If you're unsure, or if symptoms don't go away in three weeks, get a bone scan to rule out a stress fracture," Verran says.

Knees

YOU THINK Runner's knee
BUT IT COULD BE Iliotibial-band syndrome
THE DIFFERENCE The iliotibial band (ITB) is connective tissue that runs from your hip to your knee. "A tight IT band can cause friction along the outside of your knee, which is why it feels like a knee problem," Verran says. If it's ITB syndrome, then running downhill, lengthening your stride, and keeping your knee in a bent position for extended periods will worsen your symptoms. Stretching to loosen the band can help resolve the problem.

Lower back

YOU THINK Back injury
BUT IT COULD BE A piriformis strain
THE DIFFERENCE "The piriformis muscle is deep in the hip region, next to the sciatic nerve," Verran says. "If it becomes strained and goes into spasm, it can mimic a lower-back injury." Often piriformis strains happen when you're putting in a lot of mileage on hard surfaces. The pain usually centers around the gluteal region and gets worse with prolonged sitting. A doctor can differentiate between sciatica and piriformis syndrome with range-of-motion tests.

Sinuses, neck, random body parts

YOU THINK A persistent cold
BUT IT COULD BE Overtraining syndrome
THE DIFFERENCE Push your body beyond its ability to recover, and it will start to break down. This is overtraining syndrome. Every runner's body has its own breaking point, and warning signs are easy to brush aside. Look for a cascading effect, says Kristen Dieffenbach, Ph.D., an exercise scientist at West Virginia University. "You had one thing, and now it's two and then three." Overtraining results from too little recovery, which can happen even at low mileage. Symptoms include moodiness, depression, a dip in performance, trouble sleeping, and persistent fatigue. The cure: rest and recovery.

The Pill Problem

The right drug can relieve pain and discomfort—or put you in a world of hurt

WHEN USED PROPERLY, over-the-counter pain medications can be a godsend. Acetaminophen (Tylenol) can tame many pains. And nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, aspirin, and naproxen, can reduce pain and swelling following an injury like an ankle sprain. The trouble comes, doctors say, when people misuse these drugs. Here's how to use the right drug at the right time.

"I twisted my ankle on a run, and now it's swollen."

→ **PILL TO POP** Ibuprofen (Advil) or naproxen (Aleve)
→ **MED SENSE** For injuries with swelling, ibuprofen or naproxen are best bets. Take up to 3,200 milligrams of ibuprofen per day for no more than four days, or take 200 to 400 milligrams of naproxen every 12 hours up to four days.
→ **WARNING LABEL** NSAIDs should never be combined, so take either ibuprofen or naproxen.

"I inherited my dad's bum knee and his heart disease."

→ **PILL TO POP** Naproxen
→ **MED SENSE** Naproxen does not seem to increase the risk of heart problems like other NSAIDs do. Take 200 to 400 milligrams every 12 hours for up to four days
→ **WARNING LABEL** Avoid if you have kidney problems or high blood pressure. It can cause GI bleeding.

"My back is killing me!"

→ **PILL TO POP** Aspirin (Bayer, Excedrin)
→ **MED SENSE** Aspirin is the least expensive option for swelling and pain associated with a new injury. Take up to 650 milligrams every four hours as needed, for up to four days.
→ **WARNING LABEL** If you're prone to ulcers or heartburn, aspirin can cause intestinal bleeding.

"My Achilles hurts one day, but is fine the next."

→ **PILL TO POP** Acetaminophen (Tylenol)
→ **MED SENSE** Does not impair healing process. Take 325 to 1,000 milligrams, twice a day. Never exceed 2,000 milligrams in 12 hours.
→ **WARNING LABEL** Don't use if you're drinking. Alcohol increases acetaminophen's liver toxicity.

COLD CALL

Icing an injury can speed up recovery—if you do it right

IT'S THE MEDICAL recommendation runners get most often. Injured knee? Ice it. Sore shin? Ice it. Good advice. Ice can decrease pain and inflammation and enhance healing. But if you do it wrong, you could damage surrounding muscle tissues, says Joseph Dykstra, M.A., assistant athletic trainer at Calvin College in Grand Rapids, Michigan. So here's a guide that will make icing crystal clear.

DO	DON'T	WHY
Leave it on for 10–15 minutes	Leave it on for more than 20 minutes	Ice for more than 20 minutes and you'll risk frostbite. If your skin looks red, it's a warning sign. Remove the ice once you feel numbness.
Ice five times a day with at least 45 minutes in between	Call it quits after one day	An injury benefits from ice in the days following the trauma. Icing five times a day keeps tissue temperature low to minimize inflammation.
Apply ice ASAP after running	Ice before you run	When applied right after a run, ice decreases swelling and starts the healing process. Icing before a run could numb a body part and block signals to your brain to back off. This may cause you to alter your gait, increasing injury risk.

Quality Care

When you're hurt, you can speed your recovery by finding the best specialist to treat your injury

MAKE THE CALL
Sports-Medicine Doctor
→ Physicians with added training in sports medicine are often the best place to start. Sports docs can give you a comprehensive evaluation that includes diagnostic tests, from blood counts to bone scans to MRIs. They'll help you resolve medical issues, such as vitamin deficiencies, and may refer you to a specialist to rehab injuries like plantar fasciitis or runner's knee.
BEST FOR Mystery ailments, fatigue, and health issues affecting your running
NOT FOR Therapy for an already-diagnosed muscle or joint injury

MAKE THE CALL
Orthopedist
→ Orthopedists are trained to treat issues affecting the bones, muscles, tendons, and ligaments. Seeing an orthopedist is a smart choice if you have an ongoing ache or pain that acts up during or after a run. Ideally, you'd see an orthopedist with a sports-medicine specialty who has plenty of experience working with athletes. Look for one who is rehabilitation-oriented and operates as a last resort.
BEST FOR All types of running injuries—muscle strains and pulls, joint pains and sprains, stress fractures
NOT FOR General health problems (fatigue, anemia, etc.)

MAKE THE CALL
Podiatrist
→ Podiatrists spend four years of training specializing in feet. They'll check the wear patterns of your running shoes and watch you walk and run to look for biomechanical issues.
BEST FOR Foot and ankle-related problems; chronic injuries that often result from poor foot mechanics (runner's knee, iliotibial-band syndrome)
NOT FOR Acute nonfoot injuries

MAKE THE CALL
Physical Therapist
→ PTs are trained to watch people move and figure out what's going wrong. A good PT will spend up to an hour on your initial evaluation. Often, PTs work with physicians and orthopedists to diagnose problems. They devise rehab plans and prescribe exercises to keep you healthy.
BEST FOR Rehabbing known injuries
NOT FOR General health problems (fatigue, anemia) or if you suspect you have a fracture

MAKE THE CALL
Chiropractor
→ Chiropractors can be a valuable part of your medical team. Most will watch you walk or run to identify risk areas that can lead to injuries. Some will also recommend stretches and strengthening exercises to correct gait imbalances.
BEST FOR Back pain; injuries that may not be responding to other methods
NOT FOR Traumatic injuries like fractures or torn ligaments

ASK THE DOC

A checklist for determining whether you're seeing the best person to treat your injury

Do you have a specialty in sports medicine?
You should look for someone who has done a sports-medicine fellowship or other sports-related training in their discipline.

Do you run?
While it's not necessary, it definitely helps. At the very least, the doctor should have experience getting runners back out on the roads again. Even better, ask the doctor for a reference from another runner.

What should I bring to the appointment?
The answer should include your training log and running shoes.

How much time will you spend with me?
Expect at least a 30-minute visit.

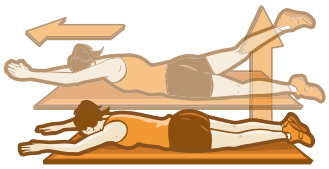
Will you refer to me to a specialist if necessary?
Good providers recognize the limits of their expertise and aren't afraid to send you to a colleague for additional tests.

Beyond Crunches

If you want to get faster, fitter, and stronger, you need to train your core like a runner

DESIGNED BY GREG MCMILLAN, a running coach and exercise scientist, this simple but effective core workout can improve your running and strengthen the specific muscles you need to stay injury-free. Try doing two sets of these moves right before or after your run, three times a week.

SUPERMAN



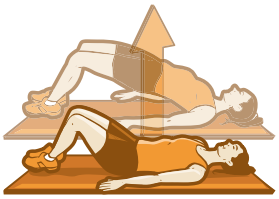
What it hits transversus abdominis (deep abs) and erector spinae (lower back)

Start facedown on the floor, with your arms and legs extended out front. Raise your head, left arm, and right leg five inches off the floor. Hold for three counts, then lower. Do up to 10 reps on each side.

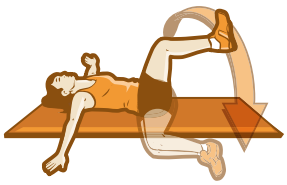
BRIDGE

What it hits glutes and hamstrings

Lie faceup on the floor, with your knees bent 90 degrees, your feet on the floor. Lift your hips and back off the floor until your body forms a straight line from your shoulders to your knees. Hold for five to 10 seconds. Lower to the floor and repeat 10 to 12 times.



METRONOME



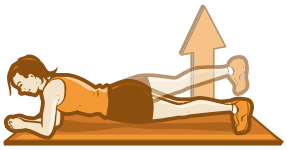
What it hits obliques

Lie faceup with your knees bent and raised over your hips, with your ankles parallel to the ground, your feet lifted, and your arms extended outward. Rotate your legs to the left side, bringing your knees close to the floor without touching it. Return to the center. Do 10 to 12 reps on each side.

PLANK LIFT

What it hits transversus abdominis and lower back

Begin facedown, propped up on your forearms, knees and feet together. With your elbows under your shoulders, lift your torso, and hips in a straight line from head to heels. Hold for 10 seconds. Raise your right leg, keeping the rest of the body still.



SIDE PLANK

What it hits obliques, transversus abdominis, hips, and glutes

Lie on your right side, supporting your upper body on your right forearm, with your left arm at your left. Lift your hips and, keeping your body supported on the forearm and the right foot, extend your left arm above your shoulder for 10 to 30 seconds. Switch sides.

HARD CORE, HEALTHY RUNNER

Prehab your problem areas to run injury-free

LOWER BACK

→ As your legs pound the pavement, your vertebrae absorb much of the force. That shock worsens if your core is weak, which will produce lower-back pain. Build those muscles with moves like the superman.

HAMSTRINGS

→ When your core isn't stable, your hamstrings have to work extra hard. The added work can leave them tighter and more vulnerable to injury. To strengthen them and your glutes, try bridges, lunges, and squats.

KNEES

→ Without a stable core, you can't control the movement of your torso, and you risk putting excess force on your joints. This can lead to patellar tendinitis and iliotibial-band tendinitis. Plank and side plank can steady the core.

 Photograph by Sarah A. Friedman; Illustrations by Supercorn

The Backup Plan

You may be down. But you don't have to be out. Here's how to stay fit until you can run again

INJURED AND CAN'T RUN? Try these alternative workouts designed by Tom McGlynn, founder of Focus-N-Fly, an online coaching service. While swimming is an ideal activity, because you have to be proficient in the sport to get the aerobic benefits, stick with other cross-training activities, unless you are experienced in the pool.

BIKING

Hit the roads if you're experienced. If not, ride a stationary bike or take a Spin class.
Intervals—45 to 60 minutes: 1- to 3-minute climbs; recovery 50 percent as long. Maintain heart rate above 80 percent during intervals.
Endurance workout—60 to 120 minutes: Warm up; 10 minutes hard/2 minutes easy; cool down.

POOL RUNNING

Pump your arms; lift your knees
Intervals—45 to 60 minutes: Warm up; 3 to 5 cycles of 10 x 50 seconds all-out/10 seconds easy. After each cycle, do 2 minutes easy. Cool down. Maintain heart rate above 80 percent.
Endurance workout—60 to 120 minutes: Warm up; 10 minutes hard/2 minutes easy; cool down.

ELLIPTICAL

Intervals—45 to 60 minutes: 5-minute warmup; 8 to 14 x 2 minutes hard/2 minutes easy; 5-minute cooldown. Maintain a heart rate above 80 percent during intervals.
Endurance workout—60 to 120 minutes: Warm up; alternate 7 minutes hard/3 minutes easy; 10-minute cooldown.

WEEK	S	M	T	W	T	F	S
1	Off	No workout, light stretching or yoga (see runnersworld.com/yoga)	Physical therapy—strength and flexibility work	30–60 minutes of cross-training (65% effort)	Pool-running intervals (80% effort for 30 minutes of total workout)	30–60 minutes of cross-training (65% effort)	Use the elliptical for the same length of time as a normal long run
2	Off	Pool-running intervals (80% effort for 30 minutes of total workout)	30–60 minutes of cross-training (65% effort)	Spin class (80% effort for 30 minutes of total workout)	30–60 minutes of cross-training (65% effort)	Pool-running intervals (80% effort for 30 minutes of total workout)	Bike for the same length of time as a normal long run
3-5	Off	Elliptical intervals (80% effort for 30 minutes of total workout)	Pool-running intervals (80% effort for 30 minutes of total workout)	Spin class (80% effort for 30 minutes of total workout)	30–60 minutes of cross-training (65% effort)	Elliptical intervals (80% effort for 30 minutes of total workout)	Bike for the same length of time as a normal long run
6	Off	Elliptical intervals (80% effort for 30 minutes of total workout) followed by a 10-minute run—1 minute running/1 minute walking	Pool-running intervals (80% effort for 30 minutes of total workout)	Spin class (80% effort for 30 minutes of total workout) followed by a 10-minute run—1 minute running/1 minute walking	30–60 minutes of cross-training (65% effort)	Elliptical intervals (80% effort for 30 minutes of total workout) followed by a 10-minute run—1 minute running/1 minute walking	Pool run for the same length of time as a normal long run
7	Off	Elliptical intervals (80% effort for 30 minutes of total workout) followed by a 12-minute run: 2 minutes running/1 minute walking	Pool-running intervals (80% effort for 30 minutes of total workout)	Spin class (80% effort for 30 minutes of total workout) followed by a 12-minute run: 2 minutes running/1 minute walking	30–60 minutes of cross-training (65% effort)	Elliptical intervals (80% effort for 30 minutes of total workout) followed by a 12-minute run: 2 minutes running/1 minute walking	Bike for the same length of time as a normal long run
8	Off	Elliptical intervals (80% effort for 30 minutes of total workout) followed by a 15-minute run—4 minutes running/1 minute walking	Pool-running intervals (80% effort for 30 minutes of total workout)	Spin class (80% effort for 30 minutes of total workout) followed by a 15-minute run—4 minutes running/1 minute walking	30-60 minutes of cross-training (65% effort)	Elliptical intervals (80% effort for 30 minutes of total workout) followed by a 15-minute run—4 minutes running/1 minute walking	Pool run for the same length of time as a normal long run

HOW TO GAUGE INTENSITY → 60 to 75% effort Like an easy, conversational run. **80 to 85% effort** Harder to chat, but sustainable for longer times. **More than 85% effort** Like a 5-K; no talking in complete sentences.

Runner's Rehab

Exercises to help you make the most of your downtime

YOU HAVE TO prepare your body for the activity you want to get back to," says Annie O'Connor, a physical therapist in Chicago. "These simple exercises build leg, core, and rotational strength—crucial components of good running form." Check with your doctor to make sure these are safe for you.

1 POWER RUNNER

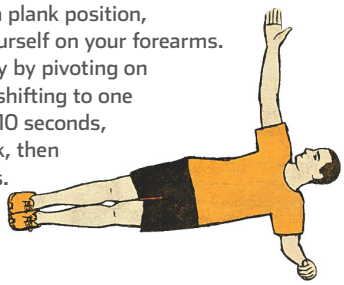
Stand with hands behind your head. Lift your left knee and bring your right elbow forward. Return to the starting position, tap your left toe on the ground, and power back up. Repeat for 15 seconds (progress to a minute) and switch sides. Vary speeds—slow one day, fast the next.

2 REVERSE LUNGE WITH A TWIST

Take a step back with your left leg, lunging down while turning your torso right. Return to the starting position. Repeat on the other side. Do five on each side. Gradually build reps (and then add weights) as you feel stronger.

3 PLANK TO SIDE BRIDGE

Start in a plank position, supporting yourself on your forearms. Turn your body by pivoting on your feet and shifting to one arm. Hold for 10 seconds, return to plank, then alternate sides. Repeat six to 10 times.



4 HIGH-KNEE SKIPPING

Find an open space and start skipping, thrusting your arms and knees upward. Do this for 15 seconds, progressing to one-minute intervals. (Note: This exercise is for people who are far along in their healing process and are preparing to resume running.)

BACK AT IT

When it's time to return to running, follow these strategies, courtesy of Ed Eyestone

START SLOWLY

Runners returning to action often carry extra weight, which puts more stress on the body. To avoid injury caused by that stress, run no more than 20 consecutive minutes for several weeks. Short walk breaks are good!

JOIN A GROUP

Athletes respond best when they return to a team setting. For my runners, their teammates may be running longer and faster, but many have made their own comebacks. Even spending the first few minutes of the workout with the group helps returning runners realize that they, too, will eventually regain their fitness.

GO AEROBIC

Think of aerobic easy running as the foundation of your ultimate fitness. The more fit you want to be, the greater the foundation you must build. Just as Rome was not built in a day, re-establishing your base after a long break can take months. As you advance from 20 minutes a day, increase your runs by no more than one mile per workout.

RECOVER WELL

Run every other day for the first few weeks. Rest days reduce the risk of injuries.

CROSS-TRAIN

After a month, gradually change your recovery days from rest only to cross-training days. It will help build your aerobic development without increasing your injury risk. For 30 to 60 minutes ride a bicycle, use an elliptical, or do pool running in deep water.

RACE SPARINGLY

And only when the result will be encouraging. You don't have to be ready to run a new PR, but you don't want to end up discouraged by your performance, either. Avoid comparing your results with those from before your layoff. Say: "That's the fastest I've run since I made my comeback!"

With contributions by Adam Bean, Jen Van Allen, Amby Burfoot, Alyssa Shaffer, Mackenzie Lobby, Christie Aschwanden, Liz Plosser, Erin Strout, Ed Eyestone, Meghan Rabbitt