ONWARD
PHYSICAL THERAPY

16 WEEK MARATHON TRAINING SCHEDULE

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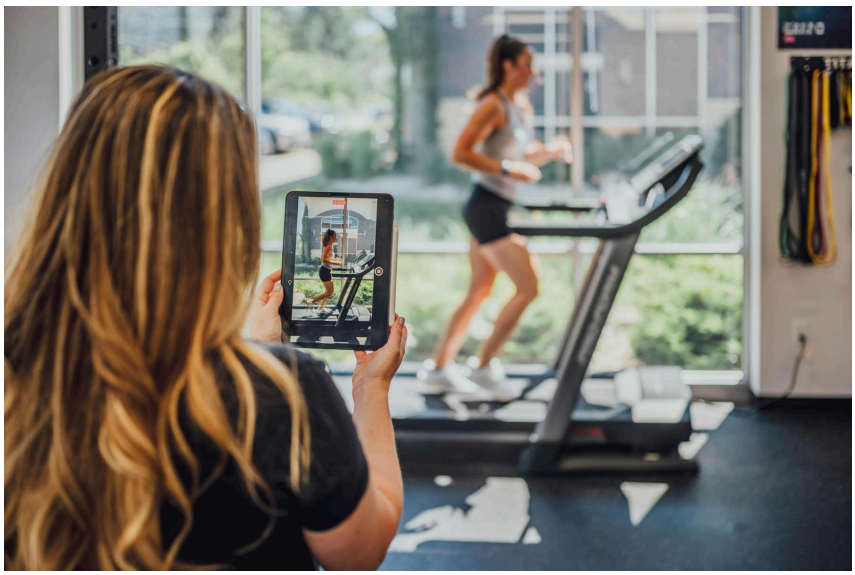
	VO2 MAX	TEMPO & STRENGTH	STRENGTH	LACTATE THRESHOLD	STRENGTH OR REST	LONG AEROBIC	STRENGTH OR REST
Heart Rate Zone	5	3	3-4	4	0-4	2	0-4
RPE	9-10	5-6	6-8	7-8	0-8	3-4	0-8
WEEK	**MONDAY**	**TUESDAY**	**WEDNESDAY**	**THURSDAY**	**FRIDAY**	**SATURDAY**	**SUNDAY**
1	VO2 max Workout #1	45 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #1	Resistance Training or Rest	8 miles	Resistance Training or Rest
2	VO2 max Workout #2	50 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #2	Resistance Training or Rest	10 miles	Resistance Training or Rest
3	VO2 max Workout #3	55 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #3	Resistance Training or Rest	12 miles	Resistance Training or Rest
4	Light Cross Training	65 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #4	Resistance Training or Rest	9 miles	Resistance Training or Rest
5	VO2 max Workout #4	50 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #5	Resistance Training or Rest	12 miles	Resistance Training or Rest
6	VO2 max Workout #5	65 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #6	Resistance Training or Rest	10 miles	Resistance Training or Rest
7	VO2 max Workout #6	75 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #7	Resistance Training or Rest	15 miles	Resistance Training or Rest
8	Light Cross Training	45 min run + Lower Body Resistance Training	Upper Body Resistance Training	Light Cross Training	Resistance Training or Rest	9 miles	Resistance Training or Rest
9	VO2 max Workout #7	60 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #5	Resistance Training or Rest	18 miles	Resistance Training or Rest
10	VO2 max Workout #8	75 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #4	Resistance Training or Rest	13 miles	Resistance Training or Rest
11	VO2 max Workout #9	60 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #3	Resistance Training or Rest	20 miles	Resistance Training or Rest
12	Light Cross Training	75 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #2	Resistance Training or Rest	12 miles	Resistance Training or Rest
13	VO2 max Workout #8	90 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #1	Resistance Training or Rest	22 miles	Resistance Training or Rest
14	VO2 max Workout #4	60 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #1	Resistance Training or Rest	12 miles	Resistance Training or Rest
15	VO2 max Workout #3	45 min run + Lower Body Resistance Training	Upper Body Resistance Training	Lactate Threshold Workout #6	Resistance Training or Rest	8 miles	Resistance Training or Rest
16	VO2 max Workout #2	30 min run	Light Resistance Training	Lactate Threshold Workout #7	Rest	**RACE DAY!!!!**	

Welcome To Your 16 Week Marathon Training Plan!

You've signed up and marked your calendar. Now it's time to start hitting the road and get physically prepared for your marathon! Our 16-week free marathon training plan has you covered to be ready for race day! Below you'll find the full plan and detailed explanations of each workout, plus strength workouts to do alongside your running to help optimize your performance and stay ahead of injuries.

We highly recommend combining this free marathon training plan with a Comprehensive Running Evaluation at one of our nationwide performance physical therapy clinics. This assessment will help identify running technical issues, mobility deficits, and strength needs that will hold back your performance during this training plan.



This guide is tailored for runners who already have a solid running base and are looking to improve their marathon performance. Before using this as your training guide, you should be able to run 6-8 miles without much discomfort. If not, give yourself some time to build up to that level gradually, or you may risk injury. Remember, this is only a guide, so feel free to make minor modifications to suit your personal schedule.

The Marathon Workouts

VO_2 Max Workout:
After warming up, run hard, then rest, repeating several times.

A VO_2 max workout involves high-intensity intervals aimed at improving your maximum oxygen uptake. They typically consist of shorter intervals (2-5 minutes) at a high intensity, near your maximum effort level. These intervals challenge your cardiovascular system, helping you become more efficient at utilizing oxygen during intense exercise. VO_2 max workouts improve your aerobic capacity, enabling you to sustain a faster pace for longer periods. They are challenging and help build mental resilience, preparing you for the physical and mental demands of racing.

Anaerobic/Lactate Threshold Workout:
Shift from a slow, easy aerobic jog where you primarily use oxygen as your source of energy, to a higher intensity anaerobic pace that you can sustain for 15-20 minutes (or 5-10 minutes if you're just starting out). During this pace, you will primarily utilize carbohydrates for energy, and lactate is produced as a byproduct.

- Definition: The lactate threshold is the intensity of exercise at which lactate begins to accumulate in the blood faster than it can be cleared. It is often expressed as a percentage of VO_2 max. The increased acidity of the blood inhibits the use of fatty acids for energy production through aerobic metabolism and thus increases the body's reliance on carbohydrate and glycolysis for energy. As blood lactate levels continue to rise and carbohydrate stores become depleted, the muscles begin to fatigue and performance is diminished.
- Benefit: By raising your lactate threshold, you can run at a higher intensity for longer periods before fatigue sets in. This is crucial for marathon running, where maintaining a strong, steady pace is essential.

Cross Training:
Running, especially long distance running, puts repetitive stress on specific muscle groups and joints. Cross training activities that raise your heart rate, such as cycling, rowing, or swimming, improve your aerobic capacity without the repetitive impact of running. What cross training you select depends on your personal preference. Incorporate a variety of cross training activities to build a more resilient and efficient body, and ultimately improve your marathon performance.

Resistance Training (RT) Workouts:
Resistance training in your marathon preparation is essential for improving overall strength, endurance, and injury prevention. During this training, though, running should be your main focus while lifting plays a supporting role - you don't want to be too sore to get in your miles. The amount of time you spend lifting will depend on your previous strength training experience, your specific goals, and any particular injuries you may be dealing with or trying to prevent. As a general rule, aim for resistance training 2 days per week, or half the number of days that you run each week. Examples of different types of resistance training workouts:

- Lower Body Strength Training:
    - Exercise examples: Squats, lunges, deadlifts, calf raises, side steps, and step-ups.
    - Benefits: These exercises strengthen the primary muscles used in running, including the quadriceps, hip abductors, hamstrings, glutes, and calves. Stronger legs help improve running efficiency, power, and endurance.
- Core Strengthening:
    - Exercise examples: Planks, Russian twists, leg raises, mountain climbers, and bicycle crunches.
    - Benefits: A strong core stabilizes your torso, improves posture, and enhances running form, reducing the risk of lower back and hip injuries.
- Upper Body Strength Training:
    - Exercise examples: Push-ups, pull-ups, dumbbell rows, shoulder presses, and chest presses.
    - Benefits: While the upper body is less involved in running, it still plays a crucial role in maintaining balance and form. Strong arms and shoulders help drive your running motion and improve overall stability.
- Plyometric Training:
    - Exercise examples: Box jumps, jump squats, bounding, and burpees.
    - Benefits: Plyometrics enhance explosive power, speed, and neuromuscular efficiency. They help improve running economy and the ability to generate force quickly, which is useful for sprinting and hill running.
- Stability and Balance Training:
    - Exercise examples: Single-leg squats, single-leg deadlifts, lateral step downs, Bosu ball exercises, and stability ball exercises.
    - Benefits: These exercises improve proprioception, balance, and coordination, reducing the risk of falls and injuries. They also strengthen the stabilizing muscles around your joints. Running is a single-leg sport—every stride is a one-legged stance—so training with single-leg exercises is key to building strength, balance, and injury resilience.

By incorporating resistance training workouts into your marathon training plan, you'll build a stronger, more resilient body capable of handling the demands of long-distance running, ultimately leading to better performance and reduced injury risk. With multiple runs and strength training sessions each week, you'll likely need to double up and do both on the same day. When lifting and running on the same day, run first if your training calls for a long run, tempo run, or interval workout (VO2 max or

Lactate Threshold) so your legs are fresh for your run. On easy running days, lift first so you can give more energy to your strength training. It's okay if your legs are tired on an easy run day—in fact, this might encourage you to keep your heart rate low and not push the pace, and it trains your body to run with some degree of fatigue, which you'll definitely be feeling in the later miles of the marathon.

Resistance Training For Your Marathon			
Marathon Training Phase	**Running Goal**	**Strength Training Goal**	**Strength Training Focus**
Base (Weeks 1-8)	Aerobic Endurance	Stability and Balance	8-12 Reps, Unilateral Exercises, Mobility
Peak (Weeks 9-13)	Speed and Race-Specific Training	Strength and Power	4-6 Reps; Bilateral exercises, Plyometrics, Mobility
Taper (Weeks 14-16)	Recovery and Race Prep	Maintenance	Low Volume, Reduced Resistance, Mobility

Rate of Perceived Exertion (RPE) is a subjective measure of the intensity of exercise based on how hard you feel your body is working. It takes into account physical sensations such as increased heart rate, breathing rate, sweating, and muscle fatigue. The RPE scale is a valuable tool for monitoring and adjusting the intensity of your workouts, ensuring that you train at the appropriate level.

Heart Rate Zones are used to gauge exercise intensity based on your heart rate as a percentage of your maximum heart rate. Understanding these zones helps optimize training for specific fitness goals. For the average endurance athlete training for long distances such as half or full Ironman and/or Marathons, the percentage of time you should spend training in each zone is roughly as follows:

- Zone 1 and 2: 80-85%
- Zone 3: 15-20%
- Zone 4: 10-15%
- Zone 5: 2-5%

To use heart rate zones you need some device to measure your heart beats per minute. To measure your maximum heart rate, you can use an equation (Maximum heart rate (MHR) = 208–0.7(age)) or take a physical test.

Heart Rate Training Zones	RPE	Intensity	% Heart Rate Max	Heart Rate Example (i.e. max of 190 bpm)	Benefits	Physical Symptoms	Physiological Effects
Zone 1 Active Recovery	**1-2**	**Very light**	**50-60%**	**95-114 bpm**	**Beginning-level aerobic training, reduces stress**	**Relaxed, easy pace, rhythmic breathing, used for warm-ups and cool downs**	**Your body is burning primarily fat to produce energy, making it an optimal way to reduce or maintain body weight**
Zone 2 Aerobic	**3-4**	**Light**	**60-70%**	**114-133 bpm**	**Basic cardiovascular training, good recovery pace**	**Comfortable pace, slightly deeper breathing, and can carry a conversation - "Conversational zone"**	**Your body is still primarily burning fat for energy production.** **Zone 2 training decreases insulin resistance and increases your body's ability to transport oxygen to your muscles.**
Zone 3 Tempo	**5-6**	**Moderate**	**70-80%**	**133-152 bpm**	**Enhances your ventilatory threshold, improves aerobic fitness, and helps to build muscle strength**	**Moderate pace, more difficulty to hold a conversation**	**In Zone 3 and beyond, your body begins shifting toward burning more carbohydrates than fats in order to produce energy, in turn making Zones 3, 4, and 5 less optimal for weight loss and more tailored towards athletic improvement.**
Zone 4 Lactate Threshold	**7-8**	**Vigorous**	**80-90%**	**152-171 bpm**	**Improved anaerobic capacity, speed, and lactate threshold**	**Fast pace and a bit uncomfortable. Short of breath, can only speak a sentence.**	
Zone 5 Anaerobic	**9-10**	**Very hard to max effort**	**90-100 %**	**171-190 bpm**	**Improved anaerobic and muscular endurance, increased power**	**Sprinting pace, unsustainable for a long period of time, and labored breathing.**	

The Workouts

VO_2 Max Workouts

You should do these after an adequate warm up. If you want additional training, add 30 minutes of cross training.

1. 4 x 200m with 1 minute of recovery
2. 3 x 200m with 1 minute of recovery, then 3 x 400m with 2 minutes of recovery
3. 30/30 fartlek:
   Alternate running 30 seconds at VO_2 max pace and 30 seconds at half that pace.
   Continue until you can't sustain 30 seconds at VO_2 max pace.
4. 5 x 800m with 2 minutes of recovery
5. Pyramid set:
   200m
   1 minute of recovery
   400m
   2 minutes of recovery
   800m
   3 minutes of recovery
   400m
   2 minutes of recovery
   200m
6. 3 sets of 4 x 300/100m:
   Run 4 x 400m repeats. Run the first 300m at VO_2 max pace and the final 100m at all out sprint pace.
   Recover for 1 minute. Repeat 300/100 until you've done 4 rounds.
   Recover for 5 minutes.
   Repeat for 2 more times for a total of 3 sets.
7. 3 x 1600m fartlek:
   Run 1600m (1 mile) alternating between 200m at VO_2 max pace and 200m at 5k pace.
   Recover for 5 minutes.
   Repeat for 2 more times for a total of 3 sets.
8. 60/60 fartlek:
   Alternate running 60 seconds at VO_2 max pace and 60 seconds at half that pace.
   Continue until you can't sustain 60 seconds at VO_2 max pace.
9. 5 x 800m with 2 minutes of recovery

Lactate Threshold Workouts: You should do these after an adequate warm up. Once you've completed the lactate threshold workout, run at a mild-moderate pace until you've trained for a total of 60 minutes.

1. 1 mile repeats:
   Run 3-4 x 1 mile repeats at lactate threshold pace with 2-4 minutes of recovery in between.
2. 800m repeats:
   10 x 800m repeats at lactate threshold pace with 1-2 minutes of recovery between each repeat.
3. 5 x 400/1200m compound sets:
   Run 400m at VO_2 max pace.
   Slow to lactate pace for 1200m (3/4 mile).
   Recover for 2 minutes between each compound set.
   Repeat 4 more times for a total of 5 compound sets.
4. 3 x 200/2000/200m compound sets:
   Start with the first 200m at VO_2 max pace.
   Slow to lactate pace for 2000m.
   Finish by kicking back up to VO_2 max pace for the last 200m.
   Recover for 3 minutes between each compound set.
   Repeat 2 more times for a total of 3 compound sets.
5. 2 x 400/800/1600/800/400m compound sets:
   Start with the first 400m at VO_2 max pace.
   Slow down to a pace half way between your VO_2 max pace and lactate threshold pace for the next 800m.
   Slow down to lactate threshold pace for the next 1600m.
   Speed back up to the pace half way between your VO_2 max pace and lactate threshold pace for the next 800m.
   Finally, finish with the last 400m at VO_2 max pace.
   Recover for 5 minutes between each compound set.
   Repeat 1 more time for a total of 2 compound sets.
6. 2 x 12 minutes with 4 minutes of recovery
7. 2 x 5 minutes with 5 minutes of recovery

10 Key points to remember during your training:

1. **Consistency**: Stick to your training schedule to build endurance and strength gradually.
2. **Proper Gear**: Invest in good running shoes and gear that fit well and provide adequate support. The best running shoe is the one that feels the most comfortable to you.
3. **Distance:** While hitting the distance on your marathon training plan is important for optimal preparation, it's equally important to listen to your body and adjust as needed. Prioritize long runs and quality sessions, but don't be afraid to modify the plan to prevent injury, manage fatigue, or accommodate life events. The goal is to arrive at the start line healthy, well-prepared, and confident in your ability to complete the marathon.
4. **Rest:** You can't train hard unless you are well-rested. The schedule includes rest days and easier runs throughout the training. These will help you rest before harder/longer workouts on other days. Rest is crucial in marathon training to allow your muscles to recover, repair, and grow stronger, reducing the risk of injury. It helps prevent overtraining, which can lead to burnout and decreased performance.
5. **Listen to your body**: Pay attention to signs of fatigue, pain, or injury, and adjust your training as needed.
6. **Warm-up:** Warming up is important, not only before the race itself, but before your speed workouts and pace workouts. Warm up before you run fast. A good warm-up is to jog a mile or two, dynamically stretch for 5-10 minutes, then perform running drills including strides or acceleration (100 meters at near race pace). Adjust your workout times accordingly as an adequate warm up may take up to 20 minutes.
7. **Nutrition:** Follow a balanced diet rich in carbohydrates, proteins, and healthy fats, and stay well-hydrated. Carbohydrates, or carbs for short, serve as the main source of energy for athletes. Endurance athletes need high amounts of carbs to help them stay as powerful and strong as long as possible by fueling Type II muscle fibers with readily available glucose. However, consuming too many carbohydrates at once can increase the risk of gastrointestinal distress. Experiment during training to find what works best for your body. Increase carbohydrate intake for glycogen loading in the days before the race, and avoid trying new foods on race day.
8. **Hydration:** Drink fluids and electrolyte-rich products consistently to prevent cramping, lightheadedness, and other complications. You can try sipping on Gatorade, using Nuun tablets, or eating pretzels to replenish electrolytes like sodium, potassium, magnesium, and chloride. If you're running in hot weather, you can also try a sports drink with 20–30 mEq of sodium and 2–5 mEq of potassium.
9. **Tapering:** The final three weeks before the race is the start of the taper. Tapering is a critical phase in marathon training that involves reducing your training volume to allow your body to recover and be in peak condition for race day.
10. **Race Strategy**: Plan your race day strategy, including pacing, hydration, and nutrition.

Remember, these are general guidelines; please consult a healthcare professional for personalized advice and recommendations.