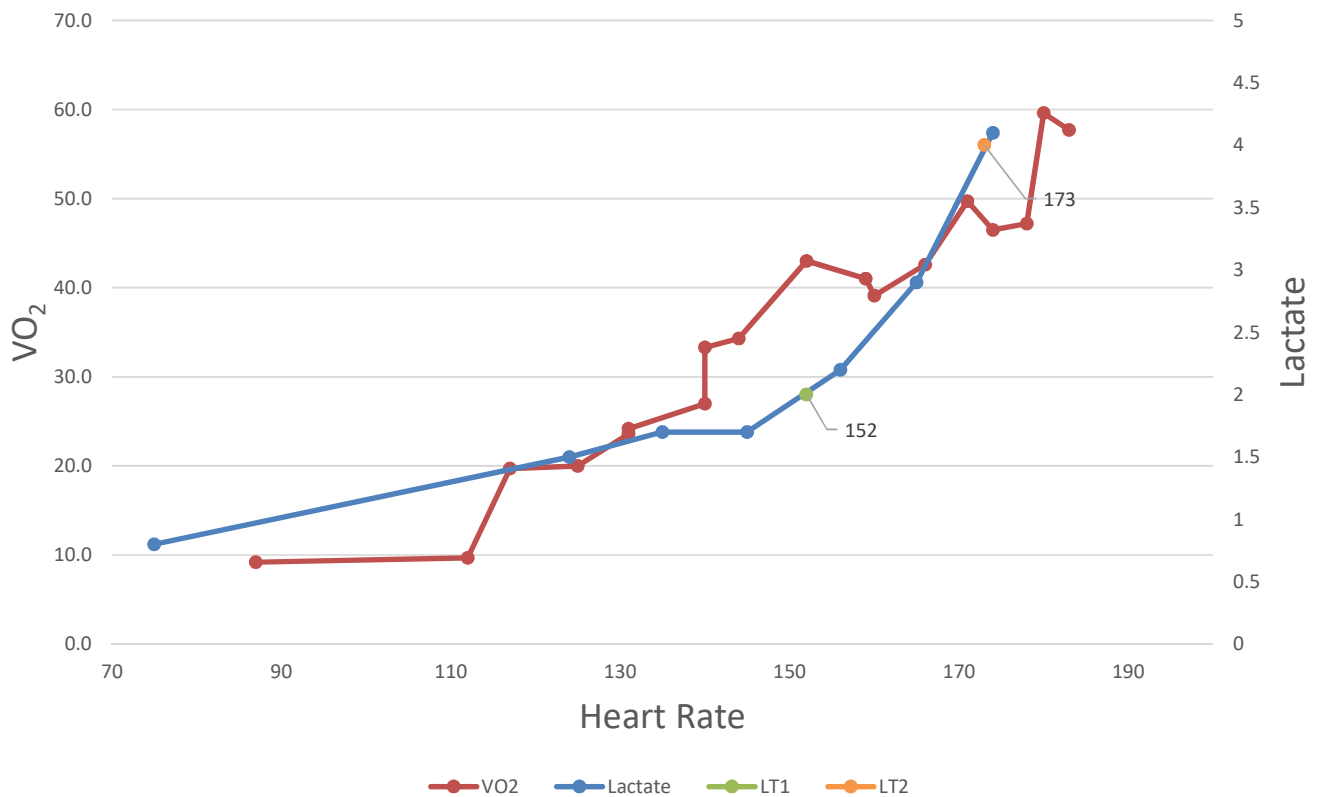




Name: Steve Rogers		Sex: Male		Date: 5/12/2023			
Physical Characteristics							
Age (yr)		33					
Height (in)		68.8					
Mass (lb)		164.5					
Maximal Data							
VO _{2max} (l/min)		4.46					
VO _{2max} (ml/kg/min)		59.6					
Heart Rate (bpm)		183					
Submaximal Data				Heart Rate (bpm)		Power Output (Watts)	
Lactate Threshold 1		152		150			
Lactate Threshold 2		173		200			
Aerobic Base		123		100			
Anaerobic Threshold		174		200			
Training Zones							
Zone		Heart Rates (bpm)		Calories/min		Power (watts)	
1		87	123	3.3	7.1	50	100
2		124	142	7.3	12.2	100	140
3		143	174	12.7	18.8	140	200
4		175	180	19.5	21.2	200	220
5		181	183	22.3		220+	
VO2 Max Norms for Men (ml/kg/min)*							
Percentile	Classification	20-29	30-39	40-49	50-59	60-69	
95	Superior	≥ 58.5	≥ 44.7	≥ 41.9	≥ 37.4	≥ 32.4	
90	Excellent	55.5	41.7	37.1	34	29.9	
85		53.9	38.1	34.9	32.1	27.8	
80		51.4	36.2	34.2	30.7	26.7	
75	Good	49.5	35	31.8	29.3	25.5	
70		47.9	33.9	30.4	28.2	24.5	
65		46	31.8	29.3	27.1	24	
60		44.5	31.1	28.6	26.3	23.2	
55	Fair	43.1	30.7	28	25.7	22.9	
50		41.9	30.1	27.1	24.8	22.4	
45		40.2	29.4	26.2	24.2	21.9	
40		38.3	28.1	25.4	23.6	21.4	
35	Poor	37.6	27.5	24.9	23	21	
30		36.2	26.9	24	22.6	20.2	
25		34.7	26.2	22.9	22.1	19.7	
20		33.2	25.4	22.2	21.5	19	
15	Very Poor	31.8	23.9	21.6	20.8	18.4	
10		29.5	21.8	20.6	20.4	17.3	
5		≤ 25.5	≤ 19.3	≤ 18.9	≤ 18.1	≤ 15.3	

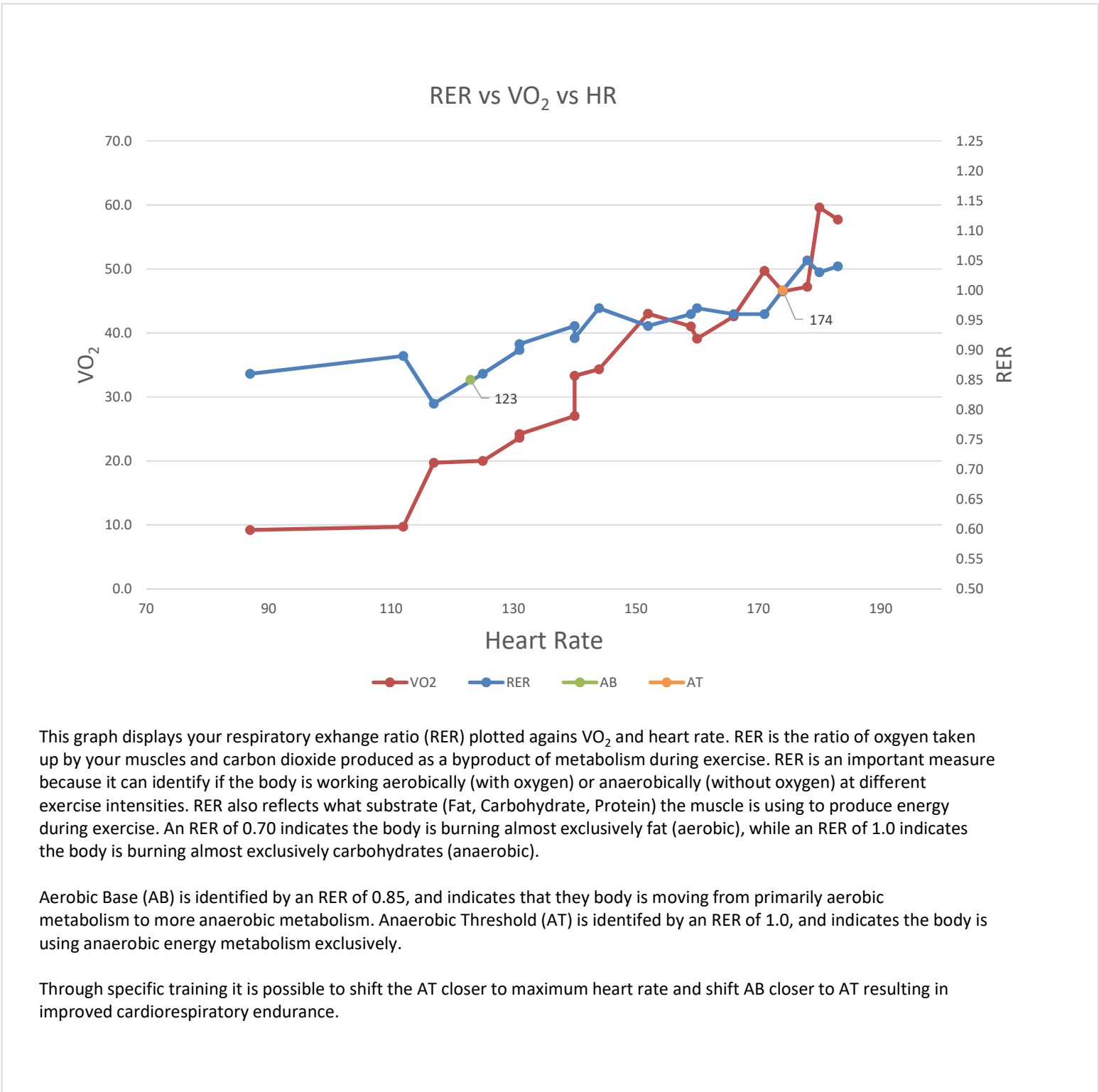
*American College of Sports Medicine, 2022

Lactate vs VO₂ vs HR

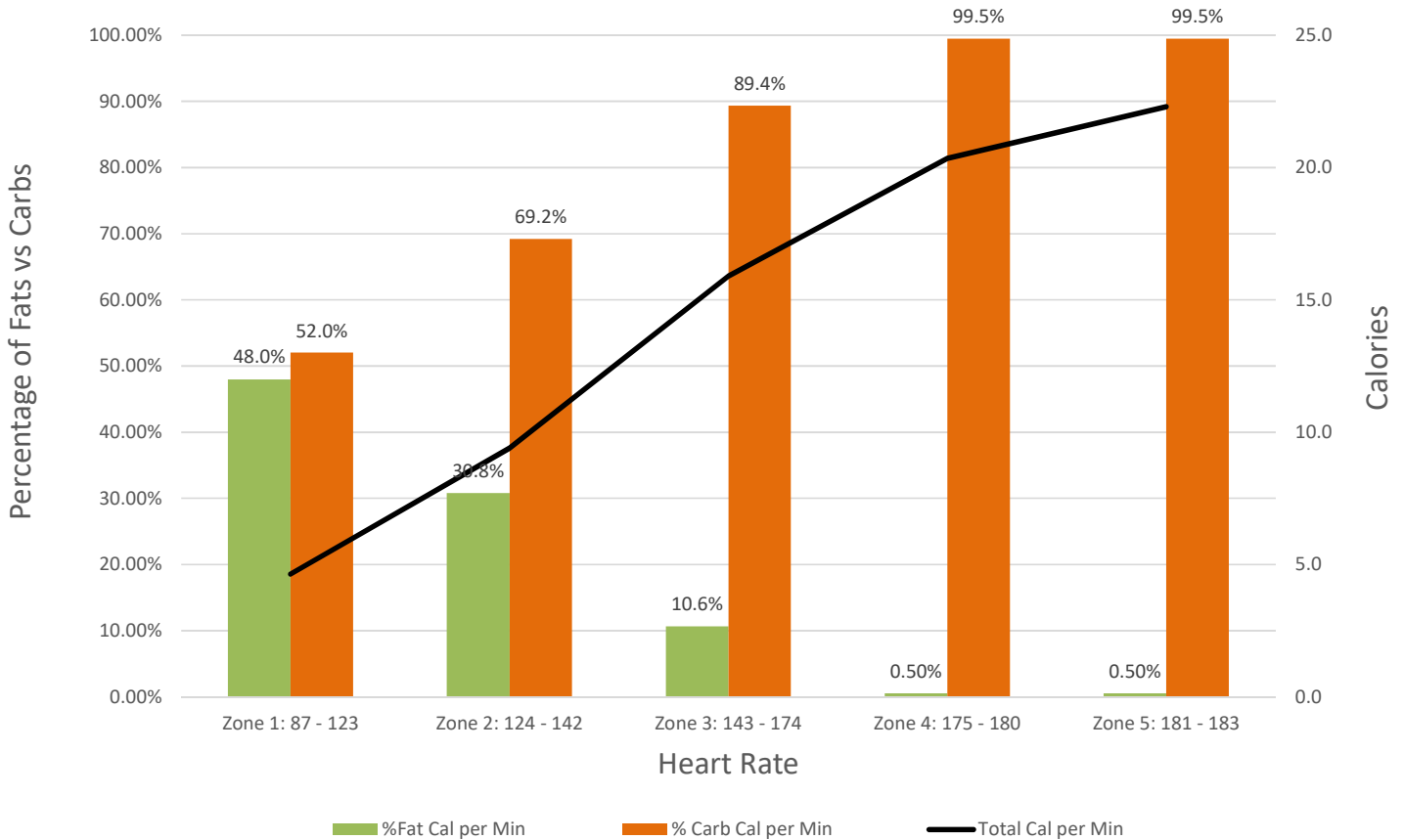


Lactate is a by-product of metabolism and serves as an indirect marker of muscular fatigue during exercise. The lactate that is produced during normal and exercise metabolism is generally removed from the blood under low-intensity activities. As the intensity and duration of the activity increases, the rate of lactate production begins to exceed the rate of lactate removal from the blood, and it is this increased concentration of blood lactate that can lead to fatigue.

This test measured the concentration of lactate in the blood to be able to determine your Lactate Threshold 1 (LT1) and your Lactate Threshold 2 (LT2). LT1 is often defined as the lowest intensity where there is a sustained increase in blood lactate concentration above resting levels. LT1 is often identified when blood lactate concentration reaches 2.0 mmol/L. This is also commonly referred to as your aerobic threshold (AeT) and is an exercise intensity that can be maintained for 60 minutes or more. LT2 is often identified when blood lactate concentration reaches 4 mmol/L. This is commonly referred to as your anaerobic threshold (AT) and is when blood lactate concentration will continue to rise rapidly. Exercise intensities above LT2 cannot be sustained for very long.



Energy Expenditure and Utilization



This graph displays how your body "burns" calories at different heart rate ranges. During exercise, as your heart rate increases the total number of calories expended also increases. However, the percentage of calories expended from fat decreases.

The myth of the "fat burning zone": As you can see here, the body generally burns a higher percentage of calories from fat at very low intensities. This is what is commonly referred to as the fat burning zone. Although a higher percentage of calories expended may be coming from fat, the total number of calories burned is very low. Additionally, exercising at very low intensities will decrease overall exercise capacity, or VO_{2MAX} decreasing the body's ability to burn calories and fat.

Through proper cardiorespiratory training, it is possible to increase the percentage of fat calories burned at higher exercise intensities that will result in improved endurance and body composition.