ISHP

BIO-PERFORMX

Endurance

MORAN

October 04, 2025

TABLE OF CONTENTS

Overview

Metabolic

Resting Metabolic Rate	Active Metabolic Rate
Fat/Carbohydrate Ratio	Metabolic Efficiency Low Intensity
Metabolism	Metabolic Efficiency High Intensity
Breathing Frequency	
Breath Volume	
Heart Rate	

Respiratory

Lung Function
Lung Capacity
Lung Capability
Breathing Frequency Zones

Cardiovascular

Active Metabolic Rate
Aerobic Health (VO2 Max)
Training Zones
Metabolic Efficiency (VO2 Pulse)

Strength

Strength - High Intensity
CO2/O2 (RER)
Heart Rate
Breath Frequency
Muscle Efficiency

Recovery

Active Metabolic Rate	
Heart Rate	44
Metabolic (CO2)	
Muscle Oxygen	
Breath Frequency	

Nutrition Guidelines

Ultrasound & Body Composition Assessment

Designed to track and optimize exercise and diet. Its proven technology can accurately measure tissue structure and body composition.

Body Composition

Body Fat Percentage - %

Nutrition Guidelines

Resting Metabolic Rate Assessment

The resting metabolic rate assessment determines the number of calories that you burn at rest, and metabolic health. It is also an indicator of overall health and well-being.

Caloric Intake

kCals Resting Metabolic	+	**kCals** NEAT	-	**kCals** to lose lbs per week	=	**~kCals**

Weekly Meal Plan Breakdown

Caloric Deficit Example

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1725KCals	**1725KCals**	**1725KCals**	**1725KCals**	**1725KCals**	**1725KCals**	**1725KCals**
120g Protein	120g Protein	120g Protein	120g Protein	120g Protein	120g Protein	120g Protein
155g Carbs	155g Carbs	155g Carbs	155g Carbs	155g Carbs	155g Carbs	155g Carbs
69g Fat	69g Fat	69g Fat	69g Fat	69g Fat	69g Fat	69g Fat
25g Fibre	25g Fibre	25g Fibre	25g Fibre	25g Fibre	25g Fibre	25g Fibre

Caloric Deficit with Maintenance/Refeed Example

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1615KCals	**1615KCals**	**1615KCals**	**1615KCals**	**1615KCals**	**2000KCals**	**2000KCals**
120g Protein	120g Protein	120g Protein	120g Protein	120g Protein	120g Protein	120g Protein
142g Carbs	142g Carbs	142g Carbs	142g Carbs	142g Carbs	190g Carbs	190g Carbs
63g Fat	63g Fat	63g Fat	63g Fat	63g Fat	84g Fat	84g Fat
24g Fibre	24g Fibre	24g Fibre	24g Fibre	24g Fibre	30g Fibre	30g Fibre

Macronutrients Recommendations

28%
Protein

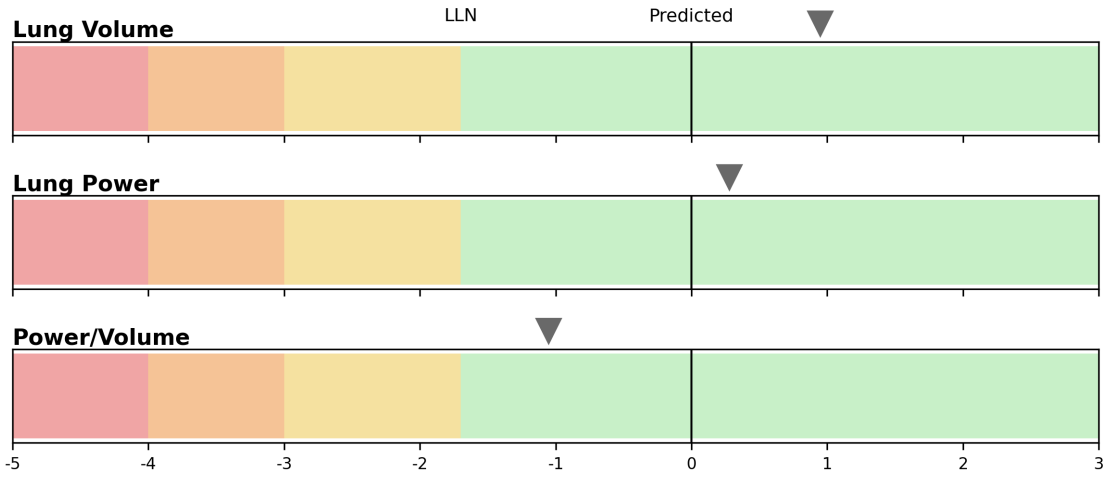
36%
Carbs

36%
Fats

Lung Analysis

Spirometry Assessment

Spirometry is a diagnostic device that assesses how well a person breathes and how their lungs are functioning. Lung function is crucial for oxygen delivery during physical activity. Comparing results to expected/normal values can highlight potential limitations that would require additional lung training to improve overall physical activity.



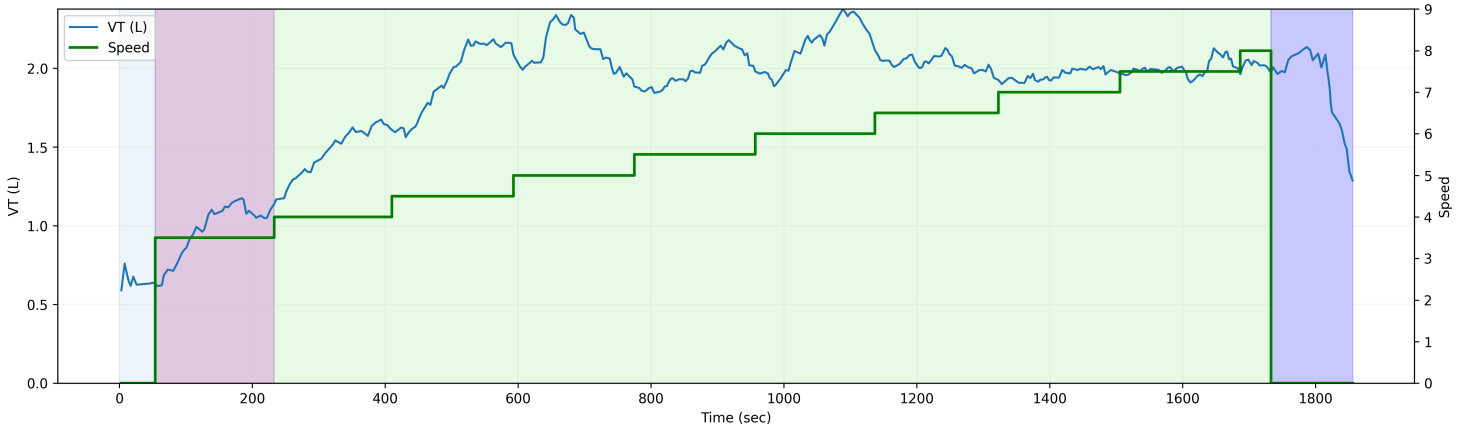
FVC
4.24L → 112.0%
of predicted

FEV1
3.26L → 103.3%
of predicted

FEV1/FVC
76.90% → 91.8%
of predicted

Indications

Respiratory



Peak VT

2.38 L/Breath which occurs at 171 bpm (Zone)
56.1% of FEV1

Cardio Metrics

Active Metabolic Rate Assessment

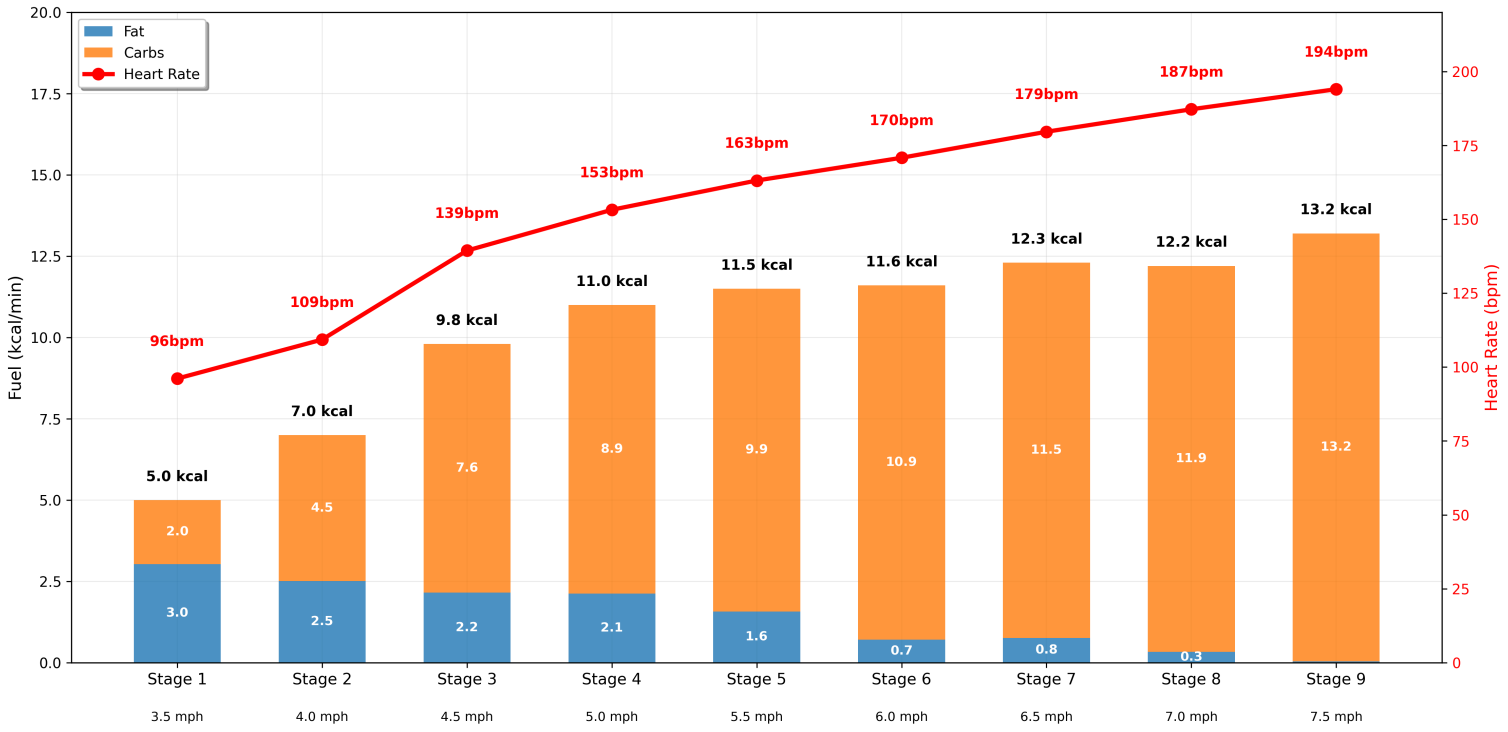
The active metabolic rate assessment is a key measure of aerobic fitness. It helps determine your specific heart rate zones and how well your body uses carbohydrates and fats as fuel while you exercise. It is also an indicator of overall health and wellbeing.

VO2 Max - 47.9 (100th percentile)

Age (F)	Very Poor	Poor	Fair	Good	Excellent	Superior
30-39	19.0-24.1	24.1-28.2	28.2-32.2	32.2-35.7	35.7-45.8	**45.8+**

Personalized Heart Rate Zones

Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Improves health and recovery capacity	**Improves endurance and fat burning**	**Improves Aerobic fitness**	**Improves maximum performance capacity**	**Develops maximum performance and speed**
55-65% of Max Heart Rate	**65-75% of Max Heart Rate**	**80-85% of Max Heart Rate**	**85-88% of Max Heart Rate**	**90% of Max Heart Rate**
81-96bpm	**96-63bpm**	**63-179bpm**	**179-199bpm**	**199+bpm**
3.5mph 2% Incline	**3.5-4.0mph** 2% Incline	**4.0-6.5mph** 2% Incline	**6.5-7.0mph** 2% Incline	**7.0-8.0mph** 2% Incline
10:39min/km Pace	10:39-9:19min/km Pace	9:19-5:44min/km Pace	5:44-5:20min/km Pace	5:20-4:40min/km Pace
Avg: **4.4kcals/minute**	Avg: **5.9kcals/minute**	Avg: **9.4kcals/minute**	Avg: **12.5kcals/minute**	Avg: **12.8kcals/minute**
Avg: 0.4g/min Carb Utilization	Avg: 0.6g/min Carb Utilization	Avg: 1.9g/min Carb Utilization	Avg: 2.9g/min Carb Utilization	Avg: 3.1g/min Carb Utilization
Avg: 27 breaths *Ideal Range: 15-20 breaths*	**Avg: 28 breaths** *Ideal Range: 20-25 breaths*	**Avg: 31 breaths** *Ideal Range: 25-30 breaths*	**Avg: 42 breaths** *Ideal Range: 30-35 breaths*	**Avg: 51 breaths** *Ideal Range: 40+ breaths*



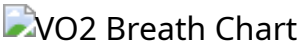
Client: Keirstyn Moran | Assessment Date: July 29 2025

VO2 Pulse

Begins to drop at 180 bpm (Zone 4)

VO2 Breath

Begins to drop at 173 bpm (Zone 3)



Fat Metabolism

Fat Max

**Optimal 10-12Kcals/minute*

3.8Kcals/min

49% of Max Heart Rate
97 bpm

Carbs and Fat Crossover

100bpm

51% of Max Heart Rate

100bpm at a speed of 4.0mph and incline of 2%

Fat Metabolism Chart

Recovery

Cardiac Recovery

(1 minute)

33%

Metabolic (CO2) Recovery

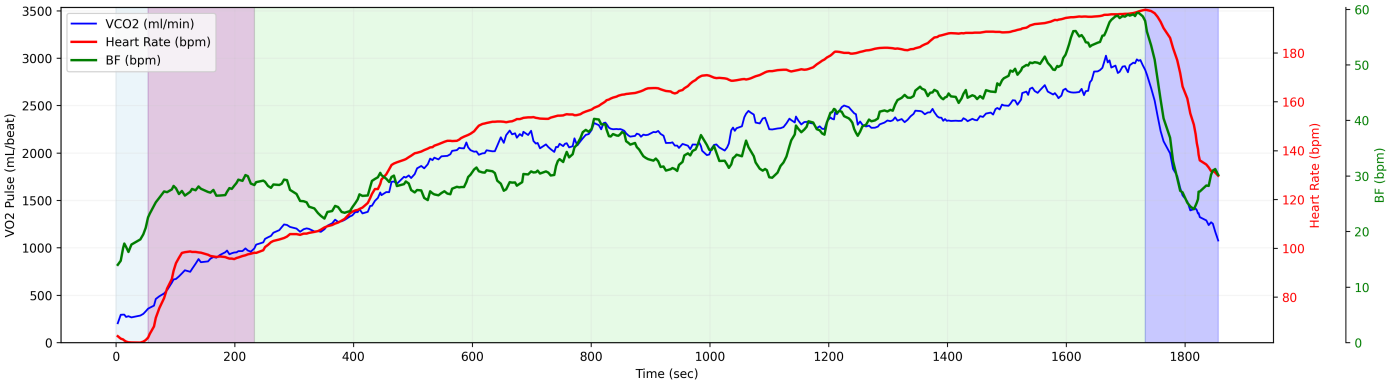
(2 minute)

65%

Breath Frequency Recovery

(2.5 minute)

76%



Resting Heart Rate - 53bpm

Age (F)	Poor	Below Average	Average	Above Average	Good	Excellent	Athlete
26-35	82bpm +	75-81bpm	71-74bpm	66-70bpm	62-65bpm	55-61bpm	**44-54bpm**

Local Muscle Activity

Muscle Oxygenation Assessment

SMO2 testing (Skeletal Muscle Oxygen Saturation) is an analysis of how effectively oxygen is being used at a particular muscle. It helps determine limitations on if the muscle is effectively using oxygen when exercising.

Indications - Right Leg

Surplus
Supply > Demand at a heart rate and speed of:
n/a

Supply Threshold
Demand outstrips supply at a heart rate of:
154bpm @ 5.0mph

Recovery
"Optimal >100%"
n/a

Indications - Left Leg

Surplus
Supply > Demand at a heart rate and speed of:
n/a

Supply Threshold
Demand outstrips supply at a heart rate of:
165 bpm @ 5.5mph

Recovery
"Optimal >100%"
n/a

Training Recommendations

Zone 2 3-4x/week:

- 40+ minutes of Steady State Cardio (HR ____ bpm)
- ____ mph at 2% Incline

Zone 3 1-2x/week:

- 10-20 minutes in zone 3 (HR ____ bpm)
- ____mph + at 2% Incline
- Slow down cadence until HR reaches ___ bpm
- ____mph at 2% Incline
- Maintain HR in zone 1 (____bpm) for 4-8 minutes
- Repeat 2-3 times

Type	Sets	Effort Duration	Zone	RPE	Recovery Duration
Short	8-10	10-30 seconds	5	10	20-60 seconds
Medium	6-8	30-90 seconds	4	8-9	30-90 seconds
Long	4-6	5-10 minutes	3/4	7-8	2.5-5 minutes
Tempo	2-3	10-20 minutes	3	6-7	4-8 minutes
Cardio	1	>40 minutes	2	4-5	N/A

Training Week Example with Progression

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Zone 2 45 mins	Zone 2 45 mins	Zone 3 10mins On 8mins Rest x2		Zone 2 45 mins		

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Zone 2 50 mins	Zone 2 50 mins	Zone 3 10mins On 6mins Rest x2		Zone 2 50 mins		

Training Week

(To be filled out by your trainer)

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Training Week Guidelines

Zone 1

- Zone 1 training is low intensity, for active recovery.
- It can be done daily or even consecutively, depending on fitness, volume, and health.

Zone 2

- Zone 2 training can be done on consecutive or daily basis with moderate sessions.
- Can be steady state or interval sessions.

Zone 3

- Zone 3 training can be done 1-5 times per week.
- Wait 24 to 48 hours between sessions for adequate recovery.

Zone 4

- Zone 4 training: 1-4 times per week.
- Wait 24 to 48 hours between intense sessions for recovery.

Zone 5

- Zone 5 training: 1-2 times per week.
- Wait 48 hours between sessions for recovery.
- Zone 5 increases VO2 max and endurance at VO2 max.

Zone 3, 4, 5 can be combined with Zone 1 or 2 - the higher zone should be done first!

Next Steps:

Calorie Tracking

- Download and create an account with My Fitness Pal (or preferred nutrition tracker)
- Fill out the "My Profile" section with your goals (ie: height, weight, target weight)
  - Input your Macros
  - Click the three dots on the bottom right corner
  - Click "Goals"
  - Click "Calorie, Carbs, Protein and Fat Goals" under the Nutrition Goals
  - Set the Calories, Carbs, Protein, and Fat to the recommended macro outlined above.
- Once completed fill out your food intake from each meal on the main page

It's highly recommended to purchase a weight and food scale for more accurate results.

Daily Tasks

- Weigh yourself in the morning, after your first bowel movement, and naked
- Log your weight into your my fitness pal app
- Track calories in grams - FOLLOW YOUR PERSONAL RECOMMENDATIONS.
- Log in a diary:
  - Log any additional prescribed recommendation (i.e breath work)
  - Complete the prescribed training recommendations (i.e Zone 2 Training)
  - Log additional physical activity (i.e Monday - Strength Training 1 hour)

Two weeks after Appointment

- Should you find the macronutrient breakdown difficult to follow, reach out to us to discuss a change within your caloric parameters

Should you have any questions or concerns please contact us!

Recommended Next Testing Date: October 2025

Glossary

Body Fat Percentage:

The percentage of your overall body weight that is composed of fat cells. Body fat percentage can be reduced by either losing weight from fat mass, while maintaining lean mass, or maintaining fat mass while increasing lean mass.

Metabolic Rate:

Metabolic Rate measures the number of calories your body burns for basic functions and movement, based on factors like weight, age, gender, and height. A higher metabolic rate helps prevent weight gain and supports weight loss by ensuring you burn enough calories. Tracking metabolic rate is key for managing weight and preventing conditions linked to metabolic dysfunction. Positive influences include resistance exercise, proper sleep, and adequate protein, while negative factors include extreme dieting, yo-yo dieting, and excessive cardio. Improving it involves resistance training and optimal nutrition.

Fuel Source:

Fat-burning efficiency measures your cells' ability to use fat as fuel, reflecting mitochondrial and cellular health. It indicates how well your body balances fat and carbohydrate usage to support energy needs, assessed by analyzing oxygen and carbon dioxide in your breath. High fat-burning efficiency suggests strong metabolic and mitochondrial function, linked to better weight management and longevity.

To improve fat-burning efficiency, focus on Zone 2 endurance training and potentially intermittent fasting to enhance oxygen absorption and cellular function. Zone 5 interval training will also help improve fat burning mitochondrial density and capillarization. Factors that reduce fat burning ability include diets high in processed foods, alcohol, and large meals before bed. Conditions related to metabolic stress also hinder fat burning abilities.

NEAT (Non-Exercise Activity Thermogenesis)

refers to the energy expended for all activities that are not deliberate exercise or structured physical activity. This includes daily movements such as walking, fidgeting, standing, cleaning, typing, and even simple tasks like cooking or shopping. NEAT contributes significantly to the total caloric expenditure and plays a key role in maintaining body weight and overall energy balance. It varies widely among individuals, depending on lifestyle, occupation, and habits.

Spirometry:

Spirometry is a diagnostic device used to provide objective measurements of lung volumes and capacities. Lung function is crucial for oxygen delivery during physical activity, and comparing spirometry results to expected values can highlight any potential limitations to performance.

"From a Performance standpoint, it is essential in making informed training recommendations related to respiratory health to optimize endurance performance and metabolic health."

- **FEV1:** Forced Expiratory Volume - the total amount of air expelled in the first second.
- **FVC:** Forced Vital Capacity - the maximum amount of air exhaled in one breath after a maximum inhalation
- **FEV1/FVC:** Calculated ratio used in the diagnosis of obstructive & restrictive lung disease.

By comparing these measurements to expected values based on age, gender, height and ethnicity, healthcare professionals can diagnose a range of lung conditions such as asthma, COPD, restrictive lung diseases, and more.

VO2 max:

VO2 Max, or maximal oxygen consumption serves as a valuable indicator of overall fitness, cardiovascular health, and endurance capacity. VO2 max reflects the efficiency of your heart lung system in pumping oxygen-rich blood to working muscles. A higher VO2 max indicates a stronger cardiovascular system, which is associated with a reduced risk of heart disease and other cardiovascular issues.

Understanding and training to increase your VO2 max can contribute to enhanced physical performance, longevity and well-being.

Glossary

Peak VT:
Peak Volume of air moved throughout the test.

Respiratory Capability Limitations that can be found include:

- **Endurance:** Normal capacity, but cannot maintain their VT over time.
- **Strength/Power:** Normal capacity, but peak VT is not 75-85% of their FEV1 despite FEV1 being normal
- **Coordination (Hyper/Hypo-Ventilation):** Normal capacity, but uses low volumes +/- high BFs at lower intensities. A breathing coordination limitation can also be identified by the loss of volume at higher intensities, which are then recovered upon recovery/stop of activity.

VO2 Pulse:
VO2 Pulse refers to the relationship between oxygen consumption (VO2) and heart rate (HR) during exercise. This measure gives insight into how efficiently the body is using oxygen in relation to the heart's output. A higher VO2 Pulse suggests that an individual is able to deliver oxygen more efficiently to the muscles with each heartbeat.

VO2 Breath:
VO2 Breath refers to the amount of oxygen consumed per breath during exercise, which indicates how effectively the body delivers oxygen to the bloodstream through the lungs with each breath. A more efficient VO2 Breath means the body requires less effort to obtain the same amount of oxygen, indicating better respiratory efficiency and oxygen utilization.

Carb & Fat Crossover:
The point during exercise at which the body shifts its predominant fuel source from fats to carbohydrates. This transition typically occurs as exercise intensity increases, and marks the transition from Zone 2 into Zone 3. As exercise intensity increases, the body starts to rely more on carbohydrates because they provide faster energy.

Endurance training (e.g., long, steady-state cardio within Zones 1 & 2) increases the body's ability to burn fat efficiently at higher intensities, shifting the crossover point to a faster speed, or higher heart rate/intensity. Because fat stores are much larger and can provide a steady stream of energy for prolonged periods, a higher CHO/FAT crossover can help delay fatigue, which is especially beneficial in longer-duration events, where carbohydrate depletion can lead to a significant drop in performance.

Cardiovascular Recovery:
The percentage your heart rate drops within the first minute of the inactive recovery phase in relation to the lowest heart rate recorded prior to the start of the test.

Metabolic (CO2) Recovery:
The percentage that your VCO2 levels (amount of CO2 you are exhaling) drop within the first 1.5 minutes of the inactive recovery phase in relation to the lowest VCO2 recorded prior to the start of the test.

refers to the rate at which the body clears carbon dioxide (CO2) after exercise, reflecting the efficiency of the cardiovascular and respiratory systems in returning CO2 levels to baseline. A faster VCO2 recovery indicates effective management of metabolic byproducts, signaling a healthier metabolic system and lower risk of metabolic disorders.

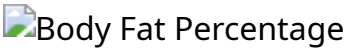
Breath Frequency Recovery:
Refers to the speed at which the body returns to a normal breathing rate after physical exertion. Faster breath frequency recovery indicates a well-conditioned cardiovascular and respiratory system, allowing the body to efficiently regulate oxygen and CO2 levels. It supports better endurance, faster recovery between intervals, and the ability to sustain higher performance during repeated efforts or prolonged activity. Additionally, a quick return to baseline signals that the autonomic nervous system is functioning well, reducing stress on the body and promoting more efficient recovery. This also reflects a healthier metabolic system, better management of metabolic byproducts like CO2, and a lower risk of chronic conditions.

Glossary

Local Muscle Activity/SMO2:

SmO2 testing is a valuable tool for understanding how muscles respond to various physiological stressors and how to fine-tune training, nutrition and hydration accordingly. Monitoring changes in tissue oxygen saturation and utilization helps identify an individual's optimal intensity to work at, as well as how well they recover between bouts of intensity. This can help optimize training to improve performance, prevent overtraining, and tailor strategies for better results.
During competitions, athletes can also use SmO2 data to pace themselves effectively. Adjusting intensity based on muscle oxygenation can help prevent premature fatigue and optimize race outcomes

Body Fat Percent Master Chart


Body Fat Percentage

Glossary

Resting Heart Rate

Age (M)	Poor	Below Average	Average	Above Average	Good	Excellent	Athlete
18-25	85bpm +	76-84bpm	74-78bpm	70-73bpm	66-69bpm	61-65bpm	60-60bpm
26-35	83bpm +	77-82bpm	73-76bpm	69-72bpm	65-68bpm	60-64bpm	55-59bpm
36-45	85bpm +	79-84bpm	74-78bpm	70-73bpm	65-69bpm	60-64bpm	55-59bpm
46-55	84bpm +	76-83bpm	73-77bpm	70-72bpm	66-69bpm	61-65bpm	56-60bpm
56-65	85bpm +	78-84bpm	74-77bpm	70-73bpm	65-69bpm	60-64bpm	50-59bpm
65+	84bpm +	77-83bpm	73-76bpm	70-73bpm	65-69bpm	60-64bpm	55-59bpm

Age (F)	Poor	Below Average	Average	Above Average	Good	Excellent	Athlete
18-25	81bpm +	74-81bpm	73-78bpm	66-69bpm	62-65bpm	56-61bpm	50-55bpm
26-35	82bpm +	75-81bpm	71-74bpm	66-70bpm	62-65bpm	55-61bpm	54-54bpm
36-45	83bpm +	76-82bpm	71-75bpm	67-70bpm	63-66bpm	57-62bpm	47-56bpm
46-55	84bpm +	77-83bpm	72-76bpm	68-71bpm	64-67bpm	58-63bpm	49-57bpm
56-65	82bpm +	76-81bpm	72-75bpm	68-71bpm	62-67bpm	57-61bpm	51-56bpm
65+	80bpm +	74-79bpm	70-73bpm	66-69bpm	62-65bpm	56-61bpm	52-55bpm

VO2 Master Chart

Age (M)	Very Poor	Poor	Fair	Good	Excellent	Superior
20-29	29.0-38.1	38.1-44.9	44.9-50.2	50.2-61.8	57.1-66.3	66.3+
30-39	27.2-34.1	34.1-39.6	39.6-45.2	45.2-51.6	51.6-59.8	59.8+
40-49	24.2-30.5	30.5-35.7	35.7-40.3	40.3-46.7	46.7-55.6	55.6+
50-59	20.9-26.1	26.1-30.7	30.7-35.1	35.1-41.2	41.2-50.7	50.7+
60-69	17.4-22.4	22.4-26.6	26.6-30.5	30.5-36.1	36.1-43.0	43.0+

Age (F)	Very Poor	Poor	Fair	Good	Excellent	Superior
20-29	21.7-28.6	28.6-34.6	34.6-40.6	40.6-46.5	46.5-56.0	56.0+
30-39	19.0-24.1	24.1-28.2	28.2-32.2	32.2-35.7	35.7-45.8	45.8+
40-49	17.0-21.3	21.3-24.9	24.9-28.7	28.7-34.0	34.0-41.7	41.7+
50-59	16.0-19.1	19.1-24.4	21.8-27.6	25.2-28.6	28.6-35.9	35.9+
60-69	13.4-16.5	16.5-18.9	18.9-21.2	21.2-24.6	24.6-29.4	29.4+