Metabolic Analysis: The Key to Health and Fitness

Holt Davis
(Forge Fitness Management)

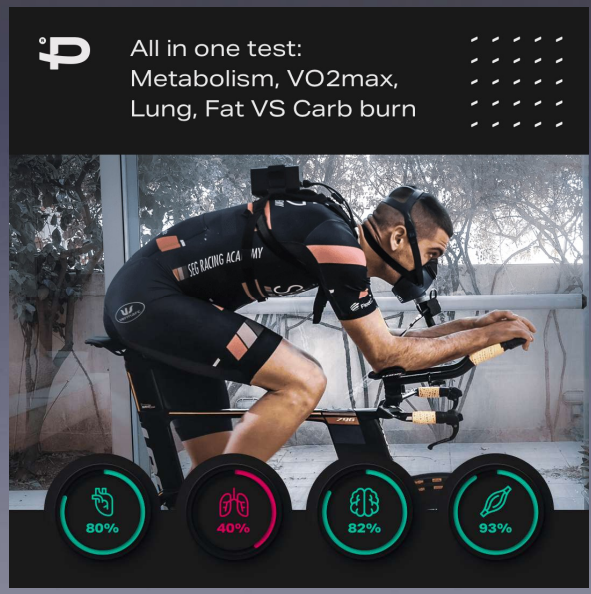
Discussion

- What is Metabolic Analysis?
- The PNOE Way.
- How and why it works.
- The Solution to your health and fitness.
- When and Where to test.
- How to learn more or set up a consult.

Metabolic Analysis

In a nutshell, Metabolic Analysis is the measurement of an individual's caloric burn at rest (RMR), and the measurement of their VO2 Max during exercise (Oxygen Utilization during Exercise).

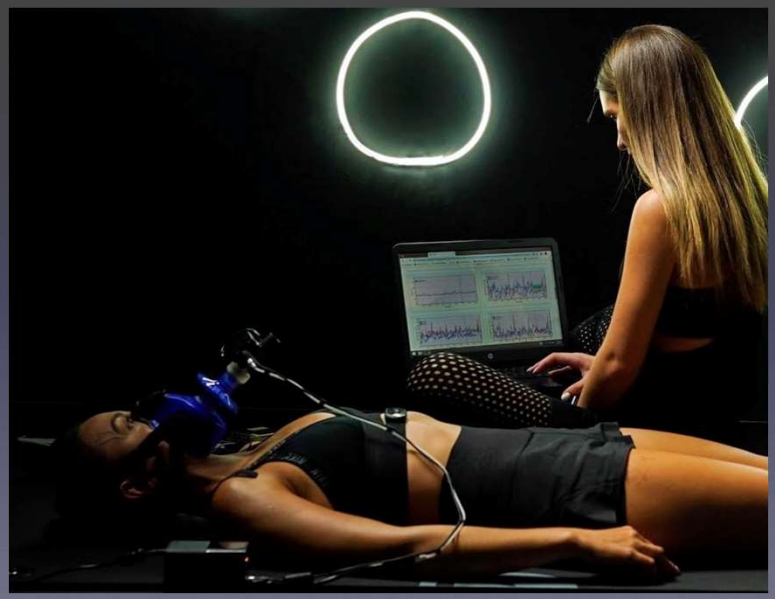
By analyzing a person's metabolism, we can create personalized nutrition plans and exercise programs to help them hit their goals.



Metabolic Analysis also gives us insight into a person's cardiovascular health.

PNOE Analytics

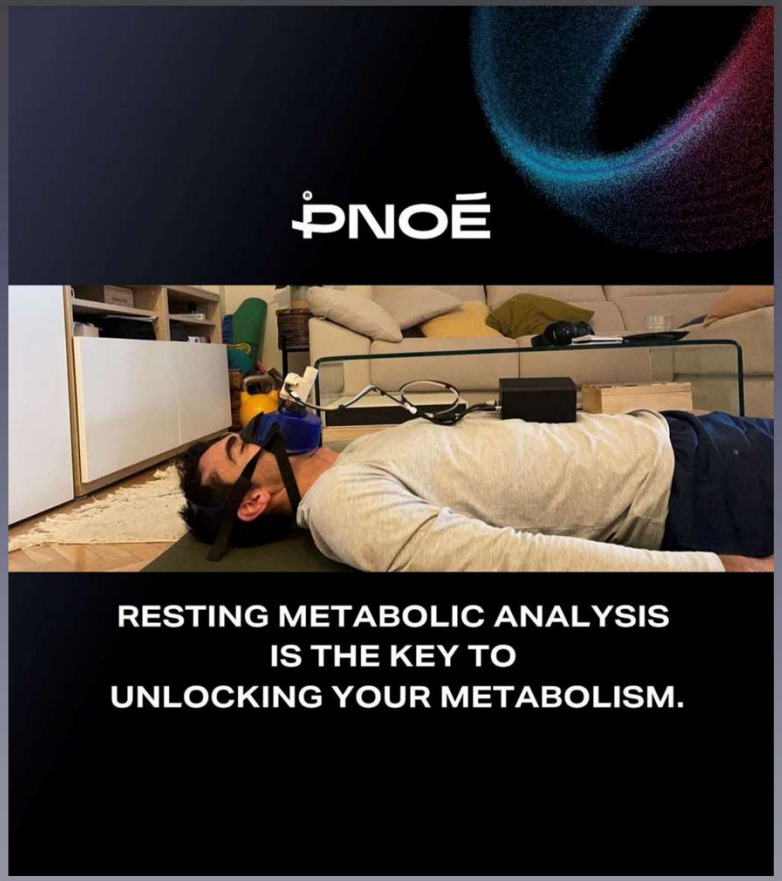
- PNOE Analytics has made Metabolic Analysis more accessible than ever before. By partnering with PNOE, we now have the ability to test individuals anywhere.
- The PNOE Metabolic Analyzer measures the exchange of gas per breath. This measurement gives us the information needed to gauge a person's overall health in several categories.
- VO2 (Oxygen during the inhale), VCO2 (carbon dioxide during the exhale) and VE (Ventilation or total volume of air exchanged) combine to give us the parameters needed to assess a person's health and fitness.

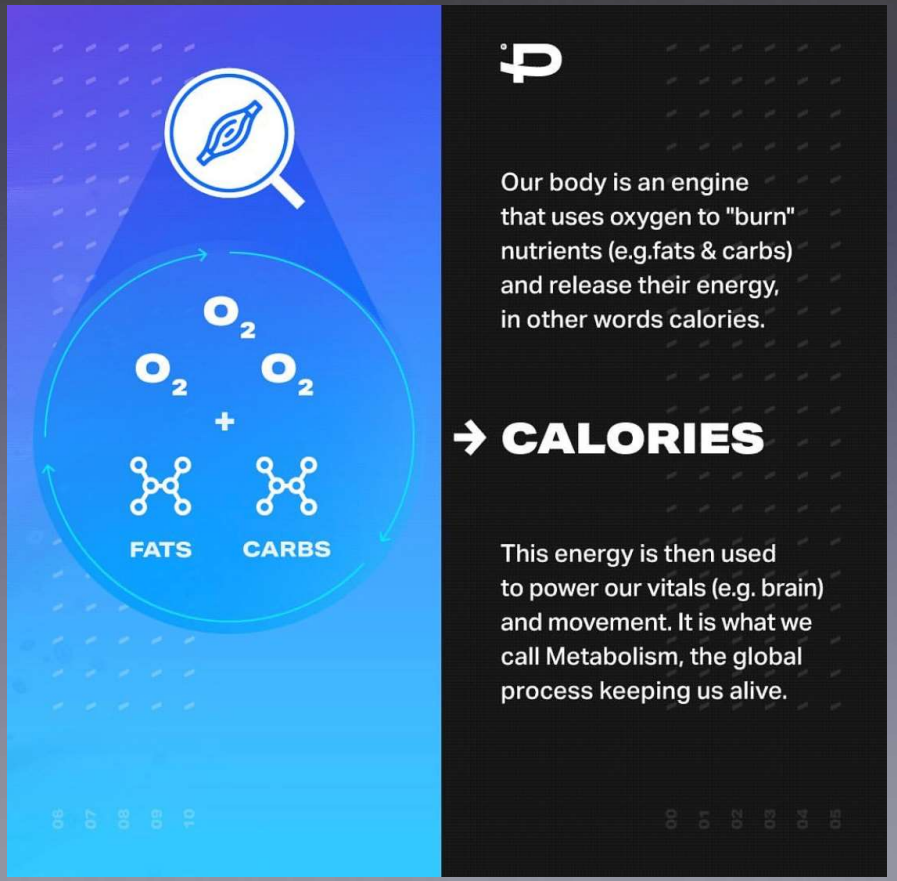


PNOE Analytics utilizes a Resting Metabolic Rate (RMR) and Ergometry (Stress Testing) to evaluate:

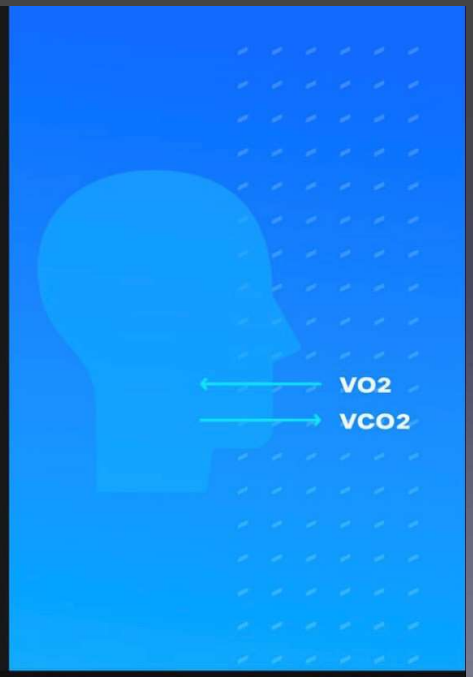
Cardiovascular health (i.e.Heart Rate, blood vessels and blood)
Energy consumption (i.e. kcal burned over time)
Cellular fuel source utilization (i.e. fats and carbohydrates).

A More Detailed Look





$$RQ = \frac{VCO2}{VO2}$$



Respiratory Exchange Ration (RER), AKA Respiratory Quotient (RQ) is the ratio of produced CO2 (VCO2) over consumed O2 (VO2) in one breath cycle

Our cells burn the main fuel sources of our body, fats & carbohydrates, to release their energy, AKA calories

These calories are used to power our vitals (e.g. heart function) and our body movement

This process also creates CO2

Burning Carbs

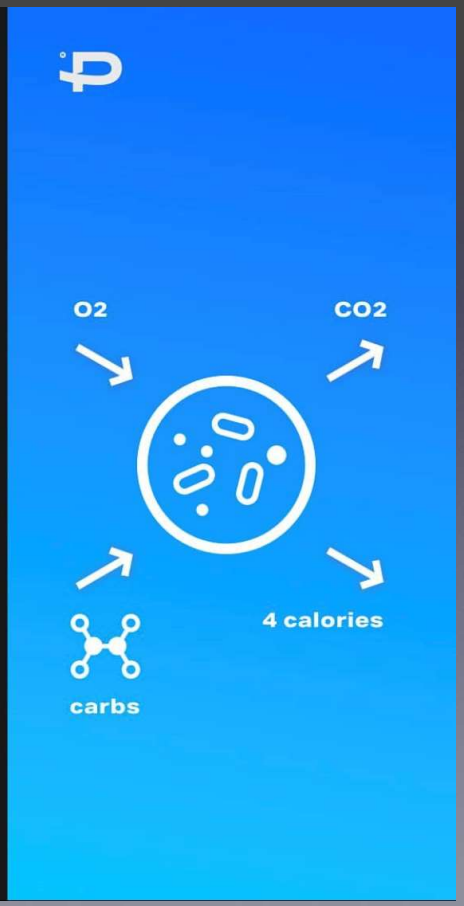
Burning 1 carbohydrate molecule requires the same amount of O2 as the amount of CO2 it produces

It therefore has an RQ of 1,

since VCO2 = VO2

$$RQ = \frac{VCO2}{VO2} = 1$$

It also releases 4 calories of energy to be used by your body



Burning Fats

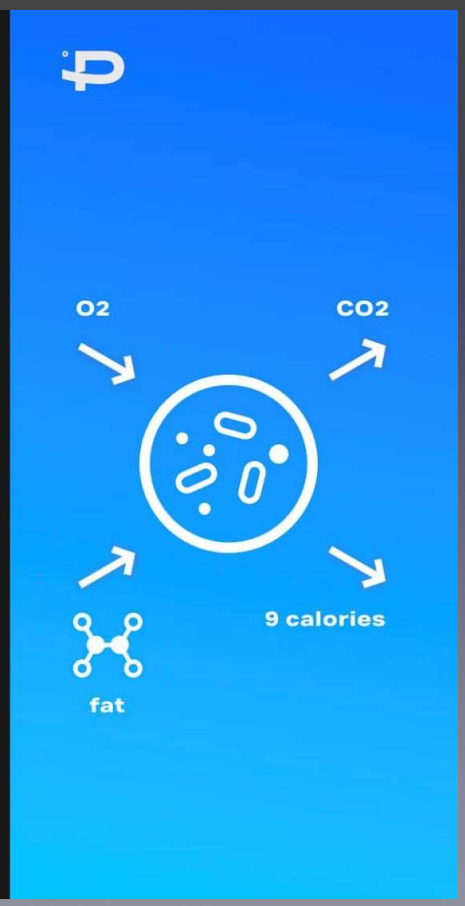
Burning 1 fat molecule requires ~40% MORE O2 compared to CO2 it produces

Therefore,

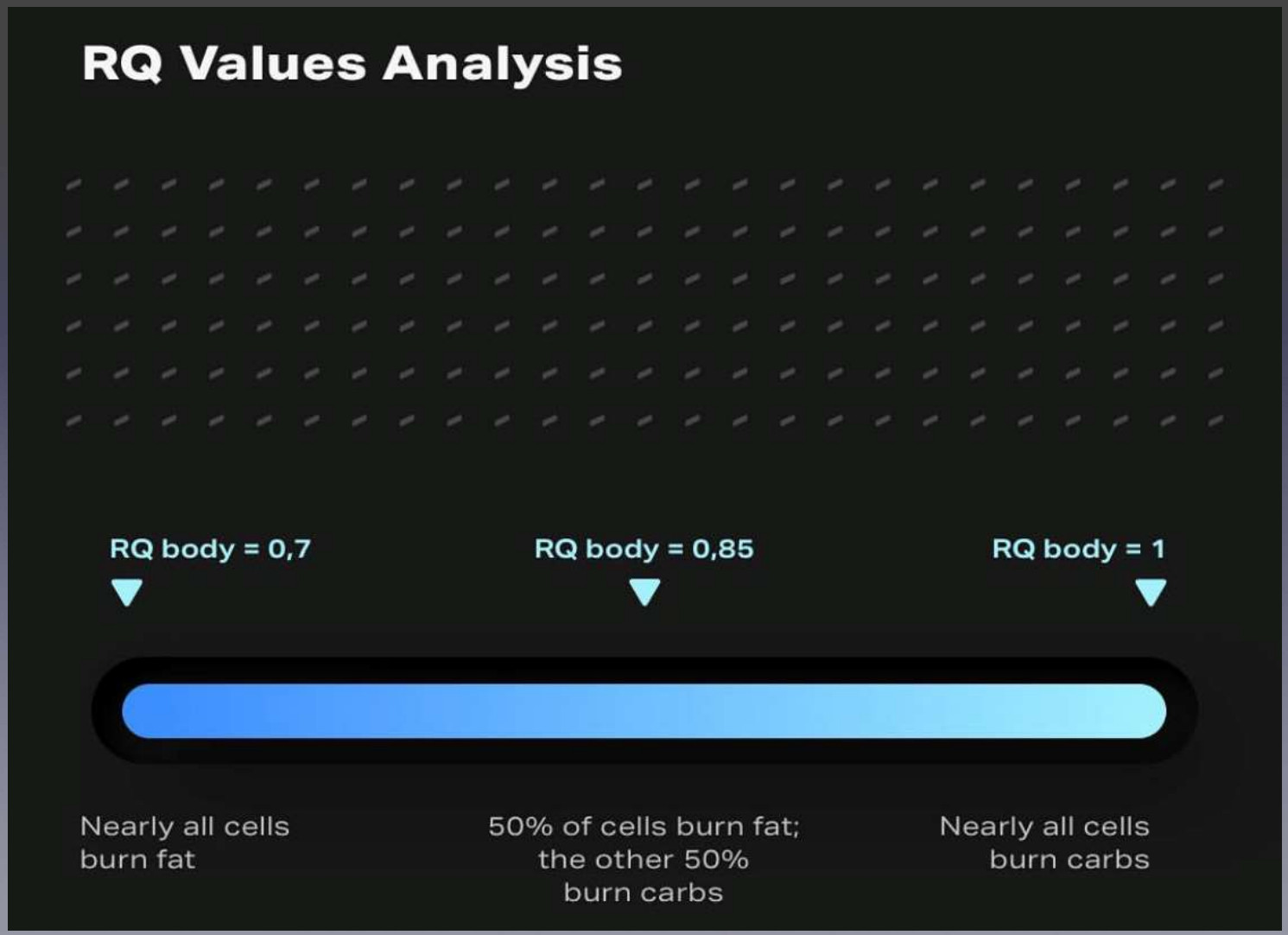
since 1.4 x VCO2 = VO2

$$RQ = \frac{VCO2}{VO2} = 0,7$$

It also releases 9 calories of energy to be used by your body



RQ Values Analysis



Reports

The PNOË Resting Metabolic Rate (RMR) assessment provides information on:

- The fuel sources your body uses during daily activities
- Your metabolic health
- Your nutrition requirements based on your metabolic rate and fitness goal

Fuel Sources

Your body uses a mixture of carbs and fats to produce the energy needed to sustain life and power daily activities. High reliance on fat as a fuel source is one of the most reliable indicator of cellular health and is strongly associated with low likelihood of weight gain or weight re-gain.

0 25 50 75 100

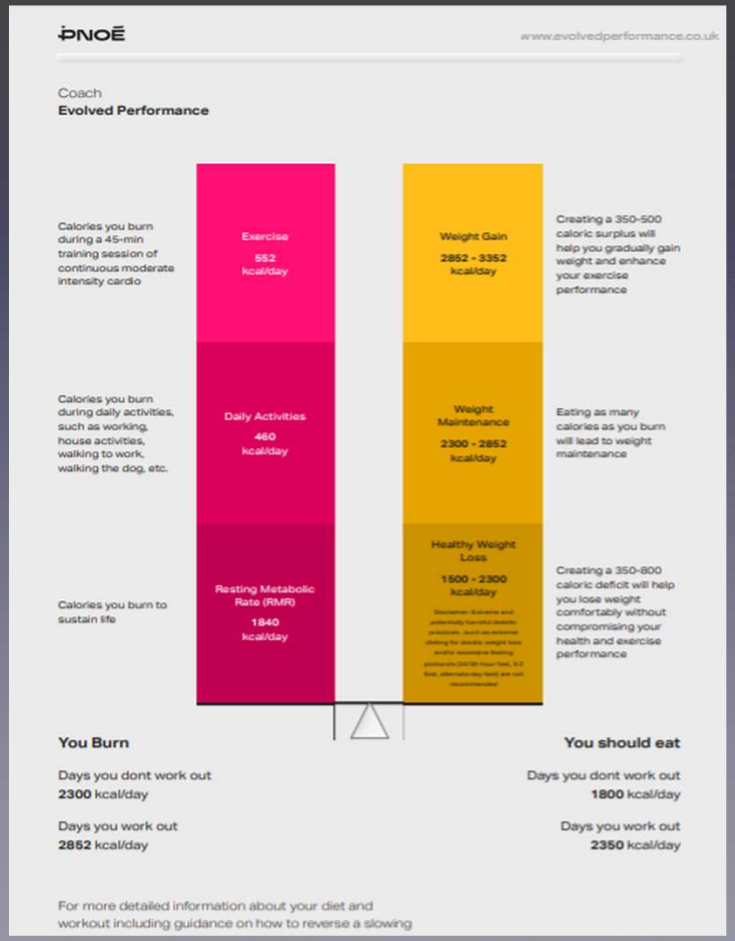
Fats
Carbohydrates

Your metabolism uses an energy mix of 46% fats and 54% carbohydrates to produce energy

Slow VS Fast Metabolism

Slow or fast metabolism refers to whether your body burns less or more calories than normal. Long-lasting diets or excessive cardio can slow your metabolism down. Weight training or temporarily increasing the calories you eat can help your metabolism recover. Slow metabolism leads to less calories burnt during the day, and as a result, to difficulty in losing weight or maintaining weight loss.

25	40	55	70	85
Very slow	Slow	Average	Fast	Very Fast



PNOË www.evolvedperformance.co.uk

Coach
Evolved Performance

Calories you burn during a 45-min training session of continuous moderate intensity cardio

Exercise
552 kcal/day

Calories you burn during daily activities, such as working, house activities, walking to work, walking the dog, etc.

Daily Activities
460 kcal/day

Calories you burn to sustain life

Resting Metabolic Rate (RMR)
1840 kcal/day

Weight Gain
2852 - 3352 kcal/day

Creating a 350-500 caloric surplus will help you gradually gain weight and enhance your exercise performance

Weight Maintenance
2300 - 2852 kcal/day

Eating as many calories as you burn will lead to weight maintenance

Healthy Weight Loss
1500 - 2300 kcal/day

Creating a 350-800 caloric deficit will help you lose weight comfortably without compromising your health and exercise performance

You Burn

Days you dont work out
2300 kcal/day

Days you work out
2852 kcal/day

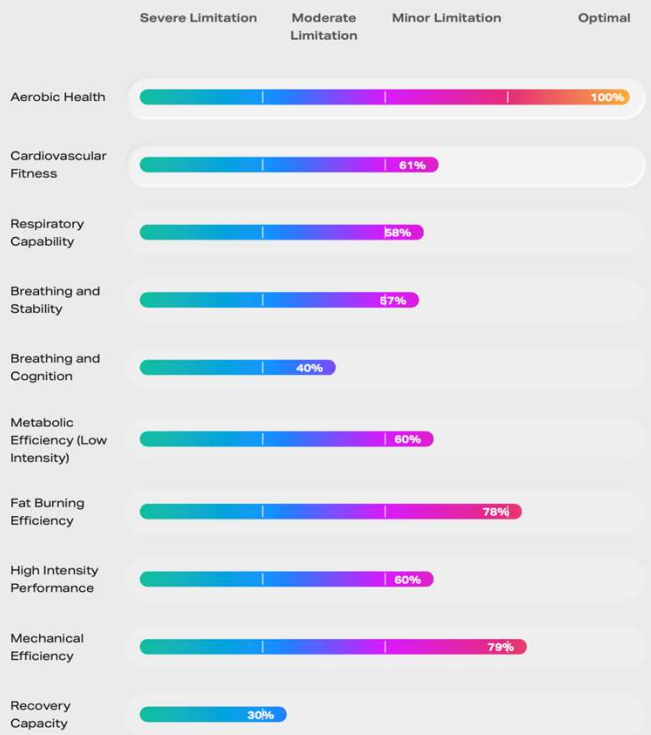
You should eat

Days you dont work out
1800 kcal/day

Days you work out
2350 kcal/day

For more detailed information about your diet and workout including guidance on how to reverse a slowing

Overview



Training Zones

Zone	HR Range	Wattage Range	Speed Range	RPE	Benefits	Training Type
Zone 5	181 - 189 BPM	-	-	10/10 Feels impossible to continue, completely out of breath, unable to talk	Improves VO2peak, aerobic capacity and muscle metabolism	Short high intensity intervals
Zone 4	173 - 181 BPM	293 - 461 W	-	8-9/10 Difficult to maintain exercise intensity, hard to speak more than a single word	Improves anaerobic capacity through improvements in buffering capacity	Medium high intensity intervals
Zone 3	167 - 173 BPM	262 - 293 W	-	6-7/10 On the verge of becoming uncomfortable, short of breath, can speak a sentence	Improves VO2 and cardiorespiratory health through increases in cardiac strength and improvements in O2 dependent storage and lactate shuttle	Long medium intensity intervals/tempo
Zone 2	148 - 167 BPM	170 - 262 W	-	4-5/10 Feels like you can exercise for long periods of time, able to talk and hold short conversations	Improves aerobic capacity and muscle metabolism through increased mitochondrial density and capillarization	Low intensity cardio training
Zone 1	138 - 148 BPM	140 - 170 W	-	2-3/10 Feels like you can maintain this intensity for hours, easy to breath and carry on a conversation	Improves fat burning and increases oxygen delivery to the muscles without significant utilization leading to recovery	Recovery

	Units	04/28/2021
Fat-Max	at BPM	148
Ventilatory Threshold 1 (VT1)	at BPM	142
Ventilatory Threshold 2 (VT2)	at BPM	179
VO2 Peak	ml / min / kg	48

Fat Max

The exercise intensity where a person burns the most amount of fax and the least amount of carbohydrate.

Ventilatory Threshold 1 (VT1)

The exercise intensity at which physical activity starts to be considered a workout.

Ventilatory Threshold 2 (VT2)

The exercise intensity at which the body transitions into Zone 5 where anaerobic metabolism becomes a large part of the body's energy generation.

VO2 Peak

The maximum oxygen consumption in milliliters per kilogram per minute (ml/kg/min) of body weight achieved during the test.

Subject		Measurement	
Name	Holt Davis	Status	✔ Closed
Gender	Male (26)	Date	2/15/2021, 11:18:06 AM
Weight	91 kg	Duration	17' (221 breaths)
Height	193 cm	Protocol	Copy of New PNOE Flywheel Ramp Test (e.g. Assault Bike)(Holt Davis)
Exercise Frequency	5 times a week	Device	PNOE 2016-392
Exercise Goal	Muscle Gain		
Report Type	Ramp		

Request: Free Exercise Report | Advanced AMR Report (new) | Breathwork Report (new) | Whoop Calibration | Nutrition |

Benchmark

Warm Up - Fly… | Flywheel Test | Recovery - Fly…

MOV.AVG (BREATHS) | MOV.AVG (TIME) | BINS (TIME) | VIEW IN KG | 1

What Gets Measured:

- **VO2**: The amount of oxygen intake per breath
- **VCO2**: The amount of carbon dioxide exhaled per breath
- **FVC (Forced Vital Capacity)**: The maximum volume of air your can breath in in one second.
- **FEV1 (Forced Expiratory Volume)**: The maximum volume of air you can breath out in one second.
- **VT (Tidal Volume)**: The volume of air you exhale in every breath cycle.
- **BF (Breathing Frequency)**: The number of breaths you take every minute.
- **VO2 Peak**: The Maximum amount of oxygen your body can absorb.
- **And Much More!**

What It Tells Us

- **Metabolic Rate**: The rate at which your body burns calories.
- **Fat Burning Efficiency**: The body's ability to use fat as a fuel source.
- **Cardiovascular Health**: The ability for your heart, blood vessels and blood to pump oxygen rich blood throughout your body.
- **Aerobic Health**: The amount of oxygen your body can absorb.
- **Respiratory Capacity**: How big your lungs are.
- **Respiratory Capability**: The amount of your lung capacity you actually use.

The Solution

- Do you have trouble gaining/losing weight?
- Do you diet frequently without long lasting results?
- Have you tried limiting your carb intake or changing your macros and still nothing changes?
- Are you consistently in the gym but not seeing the results?
- Does your fitness feel like it’s at a standstill?

Testing is Mobile and Easy to Use

Testing can be conducted anywhere:

- Gym
- Home
- Office
- Clinic
- Outdoors

For More Information on PNOE Analytics or Testing

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