

EWOT - Exercise with Oxygen Therapy

The cardiovascular system's response to exercise is aimed at guaranteeing adequate oxygen delivery to the working tissues. This is done by increases in the heart rate and lesser increases in the stroke volume. The heart rate increases almost linearly with the increases work rate, with the peak value depending primarily on age and the state of physical fitness.

The relationship between stroke volume and exercise is non-linear, reaching a plateau at about 50% of maximum exercise. The end result on both changes is an increase in cardiac output from 4-6 L/min at rest, to 20-30% L/min at peak exercise. The increase on blood flow is not uniformly distributed; rather, blood is hunted from non-exercising organs (gut), to most active ones (legs, arms, heart, respiratory muscles). The blood pressure increases during exercise, due primarily to increases in systolic pressure without major changes in the diastolic component. This increased pressure is easily accommodated in normal persons, but may have dire consequences in people who already have increased baseline pressure as a function of underlying hypoxemia and lung disease.

With progressive exercise, minute ventilation (VE) increases from resting values of 6-8 L/min to reach values of 100-200 L/min, depending on the individual persons physical fitness. The increase in VE is linear with work rates up to 50-90% of maximum work, when it disproportionately increases. This observed increase is best explained by the onset of anaerobic metabolism (termed anaerobic threshold(AT)). The occurrence of AT is related to the increased energy need of the working cells. As the cells energy production rate exceeds the utilization (availability) of O₂, a shift from the oxydative pathway is made to the pyruvate-lactate mechanism which, though less in energy production, allows for exercise to continue. This metabolic change results in increased lactic acid production (metabolic acedosis), which further stimulates ventilation (thereby explaining the faster rate in VE). Local accumulation of lactic acid may help explain the pain and fatigue that individuals feel when performing intense exercise or the frequently reported pain in the ricage in people with severe ventilator loads.

When O₂ is given to exercising subjects without their knowledge, the onset of lactic acidosis is delayed. Exercise results in significant cardiovascular and respiratory changes that are aimed and maintaining adequate oxygen tissue supply, and elimination of the products of metabolism (CO₂ and organic acids). Whether the limitation to acute exercise is due to cardiac or respiratory reasons depends on the physiological state of the person exercising. The crucial role played by oxygen in the genesis of the energy needed to perform a task by any of the working pumps may be the success of EWOT or Oxygen Therapy.

Increased oxygen supply should theoretically improve exercise by decreasing the onset of lactic acid. Oxygen has been proven to prolong exercise when given to normal individuals.

Effects on the Cardiovascular System

The administration of oxygen to healthy individuals at rest results in a decrease in heart rate and minimal drop in cardiac output and pulmonary artery pressure. When oxygen is administered to normal people during exercise, there is less increase in heart rate.

Effects on the Respiratory System

Administration of supplemental oxygen to normal individuals results in a 30-40% increase in tissue endurance.

FAQ's

Q: What is Oxygen?

A: Oxygen is one of the five basic elements of all life (Oxygen, Nitrogen, Sulphur, Hydrogen and Carbon). There are several forms of Oxygen, however the most common and stable form of Oxygen is "O₂" or Diatomic Oxygen.

Q: How much oxygen is in our air today?

A: Our breathable air used to contain more than 50% oxygen. Today it contains only 21% oxygen

Q: Why do I need Oxygen?

A: Our bodies need to produce energy. 80% of the aerobic metabolic energy required by our bodies comes from aerobic metabolism directly linked to oxygen intake. Only about 10% of our produced energy comes from food. In simpler terms, with Oxygen Enriched Air (OEA), the body will metabolize food more efficiently, generate more energy and create a healthier body.

Q: How much Oxygen do I need?

A: More oxygen than you're getting today. As mentioned before the Earth's oxygen levels have dropped considerably over the years. That issue combined with our breathing techniques contribute greatly to our lack of proper oxygen intake. When taking Oxygen Enriched Air (OEA) through a cannula or mask you will breathe normal air with it. The combination of both OEA and normal air will produce the equivalent of approximately 55%-65% Oxygen Enriched Air consumed.

Q: What happens if my body does not get enough oxygen?

A: The lack of oxygen in your breathable air will contribute to insufficient biological energy, which may greatly contribute to anything from mild fatigue to life threatening diseases such as cancer. The Medical Society has confirmed the relationship between insufficient oxygen intake and disease.

Q: Can I breath in too much Pure Oxygen?

A: Yes, because too much pure oxygen can be toxic to the human body. It has been proven, and medically confirmed, that high concentrations of pure oxygen or high concentrations of pure oxygen at high pressure can cause oxygen toxicity, which may result in lung damage or convulsions.

Q: Will Oxygen Enriched Air improve my athletics?

A: Yes, Athletes and athletics require tremendous amounts of oxygen to convert carbohydrates, sugars, fats and proteins into heat and energy required for their high activity level. This conversion process is known as Oxidation and what is Oxidized (or burned) for the body's energy are carbohydrates, sugars, fats and proteins. However, Oxygen is the "Fuel" required to Oxidize all or any of these foods. Without the presences of Oxygen, these foods would Oxidize (burn) very poorly resulting in a poor cellular reproduction and function, which would cause inadequate production of energy.

Q: Will Oxygen Enriched Air improve my weight management?

A: Yes; Oxygen is the main Fuel required to Oxidize (convert) carbohydrates, sugars, fats and proteins into energy. A lack of oxygen will promote an inadequate Oxidation process (poor burning of foods), which will result in a lower percentage of your foods being converted into energy and high percentage of your foods turning into fat.

Q: What are symptoms of Oxygen Deficiencies?

A: Some symptoms of Oxygen Deficiency may include the following:

- Fatigue
- Circulation Problems
- Poor Digestion
- Depression
- Memory Loss
- Muscle aches and pains
- Headaches
- Hangovers
- Poor Concentration

Oxygen deprivation can, and is believed by the Medical Society to cause life-threatening diseases such as cancer. Bacteria, Viruses, and Diseases find it very difficult to live and survive in an Oxygen rich environment.

Q: Will Oxygen Enriched Air improve my concentration?

A: Yes, concentration is a combination of a practiced exercise and having the proper diet, which includes proper amounts of oxygenated air, to stimulate the brain's activity.

Q: Will Oxygen Enriched Air improve my relaxation ability?

A: Yes; because typically when people are having difficulty relaxing it's due to some type of either physical or mental stress, which may or may not be partially caused by the lack of oxygen in their system. Whatever the cause may be, an Oxygen Enriched Air source can ease the tensions within the body by providing the cells with the proper amount of fuel to create the ATP necessary to provide the body and mind with the energy to relax and calm it. A lack of oxygenated air can cause our bodies to hyperventilate and our hearts to beat faster than normal making it difficult to come to a calmed or relaxed state.

Oxygen and Disease

When there is a lack of Oxygen at the cellular level the life processes required for proper and adequate cell function and reproduction halts and the cell begins to die.

Typically what happens is when cells lack the required amount of oxygen the glucose (converted energy) within these cells starts a process of fermentation and a chain reaction is initiated. These cells start to live off of the fermentation of the stored glucose instead of the ATP (adenosine tri-phosphate) which is the pure energy created through a chemical reaction between oxygen and the cells stored glucose. This event creates a reversal in the cell's normal metabolic cycle. These damaged cells begin to multiply and will no longer function as designed or contribute to the body's normal functions. These unhealthy cells become either malignant or benign and typically are categorized as "tumors". The unhealthy cells themselves are considered "Cancerous"

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Oxygen Therapy

Oxygen Therapy or LTOT (long Term Oxygen Therapy) may benefit the following conditions:

- AIDS
- Lung Cancer
- Chronic Mountain Sickness
- High Altitude Sickness(HAPE)
- Interstitial Lung Disease
- Cystic Fibrosis
- Sequelae Tuberculosis
- Bronchiectasis
- Kyphoscoliosis
- Neuromuscular Diseases
- Sleep Apnea Syndromes
- Primary Hypoventilation Syndromes
- Pulmonary Hypertension

The beginning of oxygen as a known element began with Joseph Priestly, who obtained oxygen from mercuric oxide back in 1775. Thomas Beddoes used it for medical reasons in the 1800's. Alvan Barach was responsible for oxygen's proven ability to reverse hypoxemia and to be recognized as a therapeutic agent via portable oxygen therapy.

To understand the scientific rationale concerning oxygen's effect on exercising and its therapeutic indications, it is necessary to understand the physiology of gas exchange, transportation of oxygen to tissues, and the consequences of tissue hypoxemia.

Hypoxemia is defined as an abnormally low arterial oxygen tension (P_{aO_2}). The five physiological causes of hypoxemia include a low inspired partial pressure of oxygen, abnormal ventilation-perfusion relationship (V/Q mismatch), decreased diffusion capacity, alveolar hypoventilation, and right-to-left shunt. Supplemental oxygen increases its concentration in the inspired gas (F_{iO_2}) and is the primary treatment for hypoxemia resulting from the first three causes. The hypoxemia of alveolar hypoventilation is best treated by increased ventilation while a true shunt is by definition unresponsive to oxygen.

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Vitamins, Supplements, Protein Bars/Drinks, Recovery Drinks.....this is what you're consuming now, yet you're missing the key element that greatly affects the metabolism, utilization and delivery of these products, OXYGEN!

Oxygen is what keeps you alive, yet we overlook it as a supplement. Can our bodies and mind operate more effectively and efficiently with additional supplemental oxygen; absolutely! How? Why?

The blood and circulation system is probably our most overlooked elements of a healthy and stimulated body. The body's tissues get their nutrition from the blood which travels via the circulation system. If your blood is weak and your circulations system is inadequate then your tissues (muscles, organs, brain, etc.) will be fed an inadequate diet, lacking in both nutrients and oxygen.

Supplemental oxygen greatly helps stimulate your blood and circulation systems by ensuring they have adequate oxygen or more than adequate oxygenation to complete their assign duties effectively and efficiently. Adequate oxygen delivery at the cellular level enhances the tissue strength, recovery and resiliency. Are you getting enough oxygen? How do you know if you're getting enough oxygen? Unlike water or food, in which your body will typically alert you of thirst or hunger, oxygen deprivation is less obvious.....until it's too late! However, Altitude will alert you rather quickly of the effects of lack of oxygen and altitude can and will cause server illness to the point of death. This can occur in a 24 hour timeframe; lack of food will take several weeks to become fatal and lack of water will take several days to become fatal.....so what do you think is most critical to the body's optimum functionally? OXYGEN is the Answer!

Here are the documented affects of lack of oxygen at the cellular level:

- Development of cancerous cells which typically convert to cancer
- The development of disease more rapidly and more often
- Retention of toxins in the tissues
- Lack of tissue stimulation furthest from the heart
- Fatigue more often and for longer periods
- Weak mental focus and stimulation
- Poor digestion and food metabolism

Here are the documented effects of usage of supplemental oxygen:

- Recovery from physical activity increases by 5-10 fold
- Physical activity participation at a higher level
- Excellent relief from altitude sickness and symptoms
- Relief from stress (Stress causes shallow breathing which in effect limits oxygen consumption)
- An increase feeling in well-being
- More efficient metabolism
- Sleeping better
- Enhanced moods