The High-Oxygen Strategy
"Vitamin O_2"

Though there is no single cause of fatigue/energy epidemic, all of the seemingly diverse contributors to this epidemic rob our cells of oxygen and rob our selves of energy.

It is now indisputable---though often overlooked---that physical and mental health are dependent upon, more than anything else, the optimum production, maintenance, and flow of biological energy. The crystal of that energy is a substance called adenosine triphosphate, or ATP. ATP is the basic currency of life. Without it, we are literally dead. Imbalance or interruption in the production and flow of this substance results in fatigue, disease, and disorder, including immune imbalance, cancer, heart disease, and all of the degenerative processes we associate with aging.

Without OXYGEN, there can be no ATP. Oxygen is the most vital component in the production of ATP within our cells. Thus the most logical way to try to optimize health is to make sure that we optimally oxygenate every cell in our bodies.

Driving the energy-production process in mitochondria is adenosine triphosphate (ATP), the universal energy source for all cells. At the organ level, the heart uses energy to pump blood, the kidneys use energy to filter wastes, and the lungs use energy to take in oxygen and expel carbon dioxide. Meanwhile, the master organ, the brain, uses massive amounts of energy to send nerve impulses throughout the body, orchestrating bodily functions like a conductor of a symphony. In terms of the whole body, energy is used to move, talk, work, drive, lift, and exercise.

ATP is considered the most important single substance in the biochemistry of life. When ATP is low, so is the body's energy level, and without ATP, there is no life. Every single cell must generate its own ATP from nutrients either provided by food in a complex conversion process or supplemented by certain ATP-generating substances (Kidd 1988).

"VITAMIN O" OXYGEN IS THE ELITIR OF LIFE.

The Biochemistry of Oxygen
Oxygen metabolism is the primary energy source in higher life forms. Because heat energy produced by oxygen reactions such as fire would damage tissue, metabolic pathways have evolved that safely capture small packets of reusable chemical energy. This energy is stored in molecules called adenosine triphosphate (ATP).

Figure F1 illustrates some features of ATP production during the breakdown of sugar at normal oxygen partial pressures. The biochemical processes known as glycolysis use no oxygen and produce relatively little ATP. The major product of glycolysis, pyruvic acid, enters the Krebs cycle which release carbon dioxide and supplies electrons needed to form ATP. Most ATP is produced in a series of electron transport reactions called the respiratory chain.

Oxygen usually does not enter the respiratory chain until the very end where it reacts with hydrogen to form water. Should oxygen enter the respiratory chain prematurely, molecules like the superoxide anion (02-) and hydrogen peroxide (H202) can form. These reactive species of oxygen are potentially toxic but are deactivated by protective enzymes such as superoxide dismutase and catalase.

When the oxygen partial pressure is raised with HBOT, Figure F2, the production of reactive oxygen species increases and may overwhelm the protective mechanisms. This can initiate biochemical and physiological changes that interfere with normal function and cause signs and symptoms we know as oxygen toxicity. Employing proper exposure times and depths as well as oral antioxidants easily and effectively neutralizes oxygen toxicity.

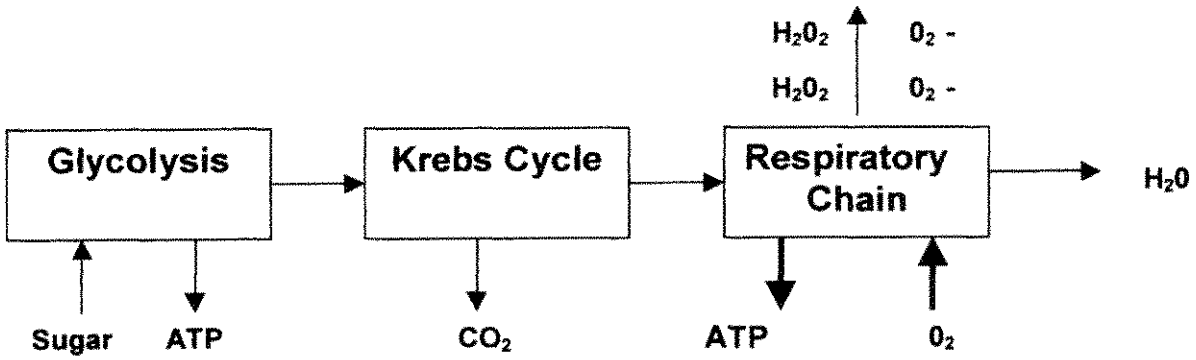

Figure F1: The production of ATP during the breakdown of sugar at normal (normoxic) oxygen partial pressures.

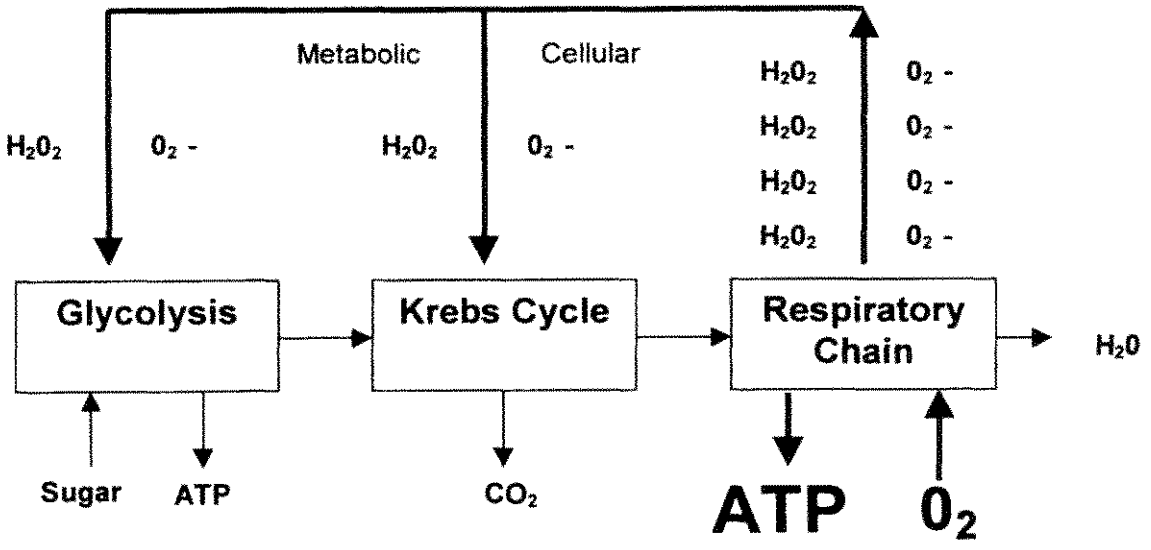

Figure F2: The production of ATP and reactive oxygen species during the breakdown of sugar at elevated (hyperoxic) oxygen partial pressures.