# Comparison of Bio-Identical Signaling Therapy to Hyperbaric Chambers and Oxygen Therapy

## A Brief Overview of the Three Approaches with Wikipedia References

During an **oxygen therapy** treatment more oxygen is supplied to the lungs than 21% of the oxygen level we have in the air. The hemoglobin in the blood transports the oxygen into our body (see: http://en.wikipedia.org/wiki/Hemoglobin). The oxygen binding capacity of hemoglobin in red blood cells limit oxygen transport. Because the hemoglobin of the red blood cells is almost saturated with oxygen under atmospheric pressure, this route of transport cannot be exploited any further. Yet, even though normal people utilize only one quarter of the oxygen they inhale, transporting more oxygen to the cells does not necessarily improve oxygen utilization by the cells.

During a **hyperbaric chamber therapy** not only is the oxygen supply higher than natural levels found in the air, but the oxygen is also pressed into the blood. Oxygen transport by plasma is significantly increased. However, breathing high-pressure oxygen for long periods has been shown to cause oxygen toxicity (see: http://en.wikipedia.org/wiki/Hyperbaric_Oxygen_Therapy).

Both hyperbaric chambers and oxygen therapy increase the oxygen outside of the cell respiration chain. Simply supplying additional oxygen to cells does not increase the cells' ability to utilize more oxygen.

To increase cells' ability to utilize oxygen, the inner cell respiration chain has to be improved, thus enhancing oxygen metabolism in the cells. During oxygen metabolism, three main processes are taking place:

- ATP (cell energy) production - which is the main energy source for all cell metabolism processes (see: http://en.wikipedia.org/wiki/Electron_transfer_chain).
- ROS (reactive oxygen species) production can form free radicals - which after accumulation of excessive amounts lead to both age-related disorders and mitochondrial disorders (see: http://en.wikipedia.org/wiki/Free_radicals).
- ROS production can form second messengers that trigger the oxidative response - through signaling, the second messengers trigger coenzymes and other substances to prevent and repair free radical damage (see: http://en.wikipedia.org/wiki/Reactive_oxygen_species).

Today it is understood that activation of the oxidative response is initiated by the emitted energy from excited oxygen molecules within the watery cell environment (see: http://en.wikipedia.org/wiki/Oxygen and http://en.wikipedia.org/wiki/Singlet_oxygen). An optimized oxidative response leads to better free radical defense, higher ATP production, and overall improved cell metabolism (see: http://en.wikipedia.org/wiki/Cell_metabolism).

During **bio-identical signaling therapy** you inhale the natural 21% level of oxygen combined with water molecules that transfer the NanoVi™ device's bio-identical signal. This signal is equivalent to the cell's own biological signal. The bio-identical signal assists the body's oxidative response that improves cell metabolism and leads to improved oxygen utilization by the cells, more cell energy production (ATP), and better free radical protection (see: http://en.wikipedia.org/wiki/Fluorescence_resonance_energy_transfer).

After bio-identical signaling therapy, up to 10% less oxygen is exhaled unused. Because oxygen is metabolized only on the cellular level, bio-identical signaling therapy is distinct from oxygen therapy and hyperbaric chamber therapy, which only provide more oxygen to the system. Rather, it enables the system to utilize the oxygen better.

Bio-identical signaling therapy is usually a stand-alone therapy. However, when used in conjunction with hyperbaric chambers or oxygen therapy, it will not only improve the results of those treatments, it will also help protect the user from the free radical damage caused by excessive oxygen input.

*Additional Resource: Eng3 White Paper - Comparison of Activated Air and Oxygen Therapy*