

Vail Valley

WINTER 2016



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LOOKING THROUGH A WINDOW

A glimpse of greater health at a higher altitude

by Dr. Doug

'Back to the Future' or H.G. Wells Classic of the Time machine to predict the future maybe in front of us after all. Altitude at 8,200-11,000 feet not only may present a Rocky Mountain high from the standpoint of hypoxia, but the euphoria from unparalleled beauty of the views and landscape that nature provides.

The ability for individuals to look through a vast picture window into their medical health future may seem to be a fantasy or science fiction. However, the challenges placed on the human body in the extremes of atmospheric conditions, presents an opportunity to fast forward on a timeline to diagnose or reveal latent disease or clinical conditions, which are unbeknownst to many individuals. Active lifestyles may be more suitable at sea level, where stress is reduced due to higher oxygen content and lower atmospheric pressure.

The medical community that practices in the mountains of Colorado and other ski resorts and towns in the U.S. has been able to care for and treat patients in a preventative manner for many medical conditions. Altitude and the associated lower oxygen content plays a role in almost all clinical conditions and the ability to heal or recover at times will follow what is known as the Frank Starling law at which point it may become a situation of 'falling off the curve/cliff' on a graph relationship. These can include experimental chemotherapy for certain tumors, the autoimmune diseases, cardiopulmonary conditions, undiagnosed cardiac conditions, borderline hypertension, gastrointestinal disorders, ENT, endocrine, and CNS correlations. There also is a paucity of data and prior research on the ability to heal and its associated correlation at various altitudes. There is some data generated and discussion taking the opposite side of the theory, that addition of oxygen to patients who are having an acute myocardial infarction may actually be detrimental in its effect on these patients. These positions are based for the most part on studies and outcomes generated on the patients being at or near sea level. At these atmospheric conditions, the accepted pulse oximetry (SpO2) is at least 95%. In the Vail Valley, and at this elevation a factor decrease of 5% is a general ballpark guideline for an adequate level before hypoxia is technically defined for 8200 ft elevation. Being part of the human

experience comes with the understanding that we are all unique, and cannot be boxed neatly into categories for the sake of insurance, decision-making, and for governmental parameters.

The windows into the future have changed many patients' lives in the past and their visits to the Vail Valley. One example is of a person, we'll call "Saint," who will be forever grateful. Saint travels to the valley a couple of times a year for several years. In the past, the altitude affects her for a day or two until she is able to acclimate. This visit she is affected by the altitude more so with headaches, lassitude and nausea/ vomiting to a greater degree than in the past. Recent significant social stressors warranted a vacation to further complicate her clinical condition. With treatment of anti-nausea meds and oxygen she improved and her headache abated. However, the next day, symptoms returned and a more extensive work up was warranted due to the severity of her headache. An outpatient MRI of

the brain exhibited a Chiari malformation at the base of the brain. There was some crowding of the foramen magnum (which is the opening to the base of the skull, and the entry of all the vital components that support the brain). This tumor was picked up substantially sooner, at altitude, than it would have been at sea level. This also was done prior to any seizure activity, deleterious effects of increased intracranial pressure and any long-term damage. The over perfusion syndrome that can occur at altitude is related to the lower oxygen concentration in the blood and the carotid body sensing mechanism that increases the blood flow to the brain. With the skull being a closed space, this frequently leads to headaches experienced at altitude and thus the appropriate terminology for the process. Once home, Saint was able to proactively have an extensive further workup and elective surgery performed, rather than an "emergent operation" that is substantially more risky, to remove this tumor. Today, Saint is clinically cured and lives a robust healthy life.

Altitude can provide the picture window that we all hope for in our futures... representative of this beauty of nature and its gift to always be one of the beautiful snow covered ski slopes, mountains, running streams, aspen leaves turning and forever green forests.... at least for today. [VVmag](#)



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