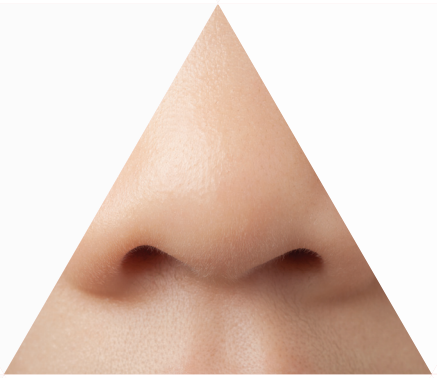

The Oxygen Advantage

Addressing dysfunctional breathing patterns for sleep disordered breathing and dentofacial development

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Although breathing is an involuntary function, the manner in which we breathe has an enormous effect on our health. The way we breathe influences how much oxygen is released from the lungs to the blood, and from the blood to the tissues and cells. It also influences our blood circulation, affecting the dilation or constriction of blood vessels which supply the organs with oxygen. Healthy breathing should be quiet, calm, and almost undetectable. Unhealthy breathing, on the other hand, involves breathing through the mouth to produce loud, noticeable, heavy breathing. In order to help prevent and address a number of conditions including obstructive sleep apnea, it is necessary to have a basic understanding about the way we breathe and the importance of reducing breathing volume toward normal.

Mouth-breathing, movements from the upper chest, and audible breaths are all clear signs that an individual is breathing in excess of their body's needs. For example, these over-breathing habits are consistently seen in heart attack patients, closely linking excessive breathing volume with a greater risk of cardiovascular disease. A research study of an intensive coronary unit in a Minneapolis hospital found that of 153 heart attack victims, 100% breathed predominantly using their upper chest, 75% were chronic mouth-breathers, and 70% demonstrated open mouthed breathing during sleep.[1]

Nasal breathing, on the other hand, performs at least thirty functions on behalf of the body.[2] Along with providing a sense of smell, the nose is nature's way of preparing air before it enters the lungs. As the nostrils are much smaller than the mouth, they create approximately 50% more resistance in comparison to mouth breathing, resulting in a 10-20% greater oxygen uptake in the blood.[2] Breathing optimally through the nose not only increases blood oxygenation, but also increases the amount of oxygen delivered to tissues and organs.[2]

In 1991, nitric oxide was discovered within exhaled air and research revealed that production of the gas takes place both inside the blood vessels and also in the paranasal sinuses.[3] As we breathe in through the nose, large amounts of NO are released within the nasal airways.[4] Nitric oxide then follows airflow to the lungs where it helps to increase oxygen uptake in the blood.[4]

Breathing through the nose during sleep in a quiet and gentle manner will also help reduce snoring and obstructive sleep apnea. Snoring occurs due to a large volume of air passing through a narrowed space which causes turbulence in the soft palate, nose or back of the throat. There are two factors here; the first is that the individual is breathing too noisily during sleep. The second is that their nose may be congested causing narrowing of the upper airways. For many decades the Buteyko Method has been successfully used to help with snoring and sleep apnea. Simply by unblocking the nose, switching to nasal breathing and calming breathing towards normal, snoring and sleep apnea greatly reduces. This is not a coincidence given the number of studies highlighting the relationship between nasal obstruction, mouth breathing and snoring/ sleep apnea. Upper airway resistance is much higher while breathing orally than nasally during sleep, with obstructive apneas and hypopneas profoundly more frequent when breathing orally, (apnoea-hypopnoea index 43+/-6) than nasally (1.5+/-0.5).5 In another paper published in the Journal of Clinical Sleep Medicine, the wearing of a chin strap alone to prevent

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mouth breathing improved severe obstructive sleep apnea as well as or better than the use of CPAP.[6] This is an extraordinary result given that a large number of people are unable to wear a CPAP due to the inconvenience and side effects of wearing a mask over the face during sleep.

The good news is that sleep experts are increasingly becoming concerned of the impact of open mouth breathing during sleep and especially among children. Among these is Stanford University based, Dr. Christian Guilleminault who is a leading figure in the field of sleep medicine. According to Dr. Guilleminault, "the case against mouth breathing is growing, and given its negative consequences, we feel that restoration of the nasal breathing route as early as possible is critical." Furthermore, "restoration of nasal breathing during wake and sleep may be the only valid 'complete' correction of pediatric sleep disordered breathing."[7]

Concurring with Dr. Yosh Jefferson, it is important for general and pediatric dentists to screen and diagnose for mouth breathing in adults and in children as young as 5 years of age. If mouth breathing is treated early, its negative effect on facial and dental development and the medical and social problems associated with it can be reduced or averted.[8]

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