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Dentistry's Great Awakening

Throughout the history of dentistry, there have been many important breakthroughs, such as: the breakthrough in understanding and treating periodontal disease; the breakthrough in integrating titanium implants with alveolar bone; and the breakthrough in computer technology guiding all phases of orthodontic and prosthetic therapy. It is my observation that we are currently experiencing another important breakthrough that will once again change dentistry forever.

“Dentistry's Great Awakening” refers to the sudden appreciation of the central role of a compromised airway influencing breathing disruption, adverse craniofacial growth and development, dental malocclusions, sleep disturbances, temporomandibular disorder (TMD)-like symptoms, cognitive impairment in all ages, autonomic dysregulation, and a general compromise in overall health.

Breathing is the most essential bodily function for survival

Every cell in the body depends on oxygen from the air we breathe to help metabolize the nutrients released from food for energy. Without oxygen, we can only survive for a matter of minutes. Air that enters the body through the nose is humidified and warmed as it swirls through the scroll-like turbinates. It passes over respiratory mucous membranes, which contain innumerable tiny hair-like cells to collect impurities and is sterilized by the powerful antimicrobial effects of nitric oxide, produced in the paranasal sinuses. Nitric oxide also dilates the nasal passages and airway, and it relaxes smooth muscle cells, resulting in bronchodilation and arterial vasodilation throughout the body [1–3].

Researcher and clinician Patrick McKeown, in his book, *The Oxygen Advantage* [4], describes multiple physiologic advantages of nasal breathing:

- Controls hyperventilation.
- Increased CO₂ in the blood, releasing more O₂ into tissues.
- Increased red blood cell production, improving O₂ delivery to tissues.
- Filtering of airborne pathogens.
- Unblocks nasal congestion.
- Improves overall breathing and lung function, including asthma.
- Improves VO₂ in the lungs, improving athletic performance.

What are some of the factors involved in an airway becoming compromised?

Think of the airway as a “garden hose,” from the tip of the nose to the lungs. It can be compromised by any change that obstructs the passageway, including a congenitally deviated nasal septum; trauma at birth or following, producing nasal stenosis; turbinate hypertrophy from allergies, inflammation and infection; nasal wall collapse on inspiration; and sinusitis. When breathing through the nose, the lymphoid tissues of the adenoids (nasopharyngeal tonsils) and tonsils (palatine and lingual), act as secondary lines of defense against bacteria and viruses. Swelling of these tissues, due to hypertrophy from increased lymphocytic activity, inflammation and infection, can compromise the normal airway.

What are some of the possible influences of a compromised airway?

Nasal breathing provides all the benefits of the body's “air filtration system.” When the nasal airway (upper airway) is compromised, it can disrupt ideal physiologic breathing. Upper airway constrictions will often convert nasal to mouth breathing. Several consequences may follow, including:

- Low tongue posture and dysfunctional swallowing patterns disrupt cranio-facial-respiratory growth and development, resulting in narrow maxillary arches, longer faces, tongue thrusts, and crowded malocclusions [5]. Furthermore, mouth breathing bypasses the nose, so that the tonsils and adenoids become the first line of defense against incoming bacteria, viruses, pollens, allergens, and pollutants. This “dirty air” can lead to enlargement of these lymphoid tissues, compromising the posterior airway.
- Labored breathing symptoms related to upper airway resistance syndrome (UARS), also associated with micro-arousals during sleep. UARS can produce classic TMD-like symptoms, such as chronic fatigue, non-refreshing sleep, disrupted sleep, bruxism, morning headaches, and daytime performance impairment [6–8].
- Oxygen desaturations, related to obstructive sleep apnea (OSA), can produce significant systemic repercussions.
- In children, UARS and OSA are common and frequently misdiagnosed as ADHD [9].

- In young and middle-aged adults, UARS and OSA are common and frequently diagnosed coincident with TMD [10].
- In middle aged adults, OSA can take a toll on brain function, producing signs and symptoms of dementia, poor concentration, difficulty with memory, decision-making, depression, and neurotransmitter dysregulation [11].
- OSA appears to activate both the systemic sympathetic/adrenomedullary and the hypothalamic–pituitary–adrenal (HPA) axis limbs of the stress system [12]. Nocturnal awakenings and micro-arousals are associated with chronic episodic cortisol release.
- OSA is associated with obesity, insulin resistance/diabetes, systemic inflammation, and a general compromise of overall health [13].

Dentistry's great awakening!

In 2016, Drs. Suzanne Karan and Yehuda Ginosar [14] wrote an editorial for the *International Journal of Obstetric Anesthesia*, entitled, “Gestational Sleep Apnea: Have we been caught napping?” Let us not get caught napping, but rather share in the “Great Awakening,” to the strong body of evidence pointing out the central role of airway and breathing disorders in the comprehensive care of dental medicine, including the evaluation, diagnosis, and treatment of craniomandibular disorders.

Dr. Tom Colquitt [15], illustrious Past-President of the American Academy of Restorative Dentistry (AARD), said it best, in his exhortation at the 2016 AARD Annual Session,

Our new priorities, other than emergency care, the FIRST procedure performed by every Dentist, for EVERY patient, of ANY AGE should be a proper airway examination and evaluation of breathing function. The primary duty of every Dentist is to promote proper nasodiaphragmatic breathing for every patient. The teeth are of secondary importance.

Welcome to Dentistry's Great Awakening, the next big breakthrough!

CRANIO: The Journal of Craniomandibular & Sleep Practice, is the ideal forum to awaken Dentists and all health professionals to the dawning of a new era emphasizing *airway health*. A special tribute to *CRANIO* Founder and Editor in Chief, Dr. Riley Lunn, who for 36 years has carried the torch, tirelessly dedicated to enlightening our professional community to many wonderful breakthroughs.

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