The Troublesome Connection Between TMJ Health and Airway Health

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Disclosures
I have no financial connection with anything mentioned in this talk

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TMD - Discovery

Chief Complaint
Jaw Movements During Sleep

Masticatory Muscle Activity With Contact = Sleep Bruxism

Parafunction Link to OSA

Arousals Cause SB

Tooth Contact, or Sleep Bruxism

- RMMA
- Two big breaths
- Suprhyoid muscle tone increases
- Tachycardia
- Brain EEG activity levels increase.
- decrease in parasympathetic dominance
- rise in autonomic cardiac sympathetic dominance

-1.0 to -0.8 sec

-4.0 sec

-4.0 min
You Do Ask

...about heart disease
....about diabetes
...about chronic pain
....about TMD

...about Airway

Airway Health

Do You Snore?

Have you been diagnosed with OSA?

I don’t snore
They tested me: No OSA

“My Doctor Doesn’t Have an Answer”

What do Dentists Do?

We Own TMD

We’re Comprehensive
We Got

This
Help?  ✔️
Fix?  ❌

“I hate this splint”

We  Got
more of
This

What do you need more of?
CURiOsiTY
Your Patient is Sleepy

But Not Old or Fat

Sleep Hygiene

noun

habits and practices that are conducive to sleeping well on a regular basis

What does Dr. G say?

Flow Limitation

Negative Pressure
The Data Say

Esophageal Pressure  -33cm H2O

3 second alpha intrusion arousals on EEG

Body responds before Oxygen drops

PSG Diagnosis

No Apnea

No Hypopnea

No Desats

Your Patient isn’t Healthy
What Else Do We Know?

**UARS**
- Male: 50 - 50
- Female: 50 - 50

**OSAS**
- Male: 20 - 80
- Female: 20 - 80

**ODI**
- Unremarkable
- Significant

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**Insomnia**

Patients with primary insomnia have increased high-frequency EEG activation, abnormal hormone secretion, increased whole body and brain metabolic activation, and elevated heart rate and sympathetic nervous system activation during sleep.

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**Functional Somatic Syndrome**

Medically Unexplained
- Migraine headache/tension headache syndrome
- Irritable bowel syndrome (IBS)
- Temporomandibular joint (TMJ) syndrome
- Fibromyalgia

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**Somatic Syndrome - Anxiety - Insomnia**

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**Homeostasis**
Maintaining Stability through achieving constancy of the internal environment

**Allostasis**
Maintaining Stability through changes.
Enables the organism to deal with increased demands

**Allostatic Challenge**
Emotional, Psychological or Physical Stressors
Testing Allostasis Capacity

**Allostatic Challenge**

- **Challenge**
- **Response**
- **Reset**

**Acute Allostatic Challenge**

- **Exercise Overheating**
- **Response Sweating**
- **Return to Normal**
Chronic Allostatic Challenge

- Challenge
- Adaptation
- Conditioning

Perpetuating Allostatic Challenge

- UARS
- HPA Axis Activation

Functional Somatic Syndrome

- Medically Unexplained
  - migraine headache/tension headache syndrome
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  - fibromyalgia

Somatic Syndrome - Anxiety - Insomnia

What’s the Mechanism?

- Odorants attach to Main Olfactory Epithelium
- Electrical Signals are Generated to the Cortex
Olfactory Nerve - CN I
Mechanoreceptors in the Olfactory Bulb Send Pulses to the Limbic System with Airflow Pressure Changes

Stimulation of electro-olfactogram responses in the main olfactory epithelia by airflow depends on the type 3 adenylyl cyclase.
Chen X1, Xia Z, Storm DR.

Mechanoreceptors in the Olfactory Bulb Send Pulses to the Limbic System with Airflow Pressure Changes

Limbic System
Emotion
ANS Regulation
Endocrine Systems

Neural Sensitization Paradigm
Acute Allostatic Challenge creates a response
Perpetuating Allostatic Challenge sensitizes the Limbic System

Perpetuating Allostatic Challenge
UARS
HPA Axis Activation
Functional Somatic Syndrome
SDB
- Increased Airflow
- Lower Pressure
- Triggers Signals to Limbic System

UARS vs. OSAS

High Upper Airway Resistance:
- **Sustained** pharyngeal narrowing during inspiration causing obstructive alveolar hypoventilation

Obstructive Sleep Apnea:
- **Recurrent** pharyngeal occlusion causing transient respiratory events
UARS

Sustained low pressure / high airflow
sends repeated signals to Limbic System
Perpetuates the Allostatic Challenge

Perpetuating Allostatic Challenge

UARS
HPA Axis Activation

Functional Somatic Syndrome

Functional Somatic Syndrome
Chronically Irritated
Hypothalamic Regulation

Circadian Disturbances

Hypothalamus

Blood Pressure
Thermoregulation
Appetite
Growth Hormone

Memory Function
Thyroid Function
Wakefulness
Cortisol

Dopamine
GI Stimulation
Sleep Regulation
UARS patients tend to have more neurotic and sensitive personalities than patients with OSAS, which may be a cause of the clinical features of UARS.

TMJ patients tend to have more neurotic and sensitive personalities than patients with TMJ which may be a cause of the clinical features of UARS.

What Can You Do?

Expand Your History

Look for Somatic Pain Syndromes
Airway Diagnosis

Medical + Risk

Likely Outcome

OSA

Likely Outcome

CPAP

PSG Diagnosis

No Apnea

No Hypopnea

No Desats
Airway Diagnosis

No + Medical Risk

Treat the Symptoms

Do What You Can to Verify

Cardiopulmonary Coupling

SNS Activation
Simple Airway Testing
Nasal Breathing
Nutrition
PCP Collaboration

7. Dentists should test patients using OAT for effectiveness, including use of home sleep apnea monitors to obtain interim results for the purpose of OA titration
8. Surgery may be necessary
9. Dentists should continually update their knowledge and training
10. Dentists should maintain regular communication with patient’s other medical providers
11. Follow-up testing by physicians should be done to confirm treatment efficacy

Dentists are the only health care provider with the knowledge and expertise to provide OAT.

TMD?
Lower Sleep Efficiency
More Frequent Awakenings
Responds to Melatonin

American Dental Association
Policy Statement on the Role of Dentistry in the Treatment of Sleep-Related Breathing Disorders

1. Dentists are encouraged to screen for SRBD and refer for diagnosis
2. Screening includes children, although referral and treatments differ from adults
3. Oral appliance therapy is appropriate
4. Physicians prescribe OAT but dentists are responsible for evaluation, choosing, and providing the service
5. Informed consent is required
6. Dentists treating SRBD with OAT should be capable of recognizing and managing side effects

TMD: Temporomandibular Disorder
Melatonin: A hormone that regulates sleep and wake cycles

TMDs and melatonin: A study published in the Journal of Clinical Sleep Medicine (2014) and the Journal of Pain Symptom Management (2013) explored the relationship between melatonin and TMD, demonstrating that melatonin can help alleviate symptoms associated with TMD.
It’s Both
People's beliefs about health problems, perceived benefits of action and barriers to action, and self-efficacy explain engagement (or lack of engagement) in health-promoting behavior.


Curiosity + Action = Clinical Wisdom

Learn What They Believe

Treat What They Value
You Can Expand
Their Possibilities

You Can Change
Their Life

Sound Familiar?

Know Your Work
Know Your Patient
Know Yourself
Apply Your Knowledge

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