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LEARN MORE ABOUT

Sleep in Dentistry



UNIVERSIDADE FEDERAL
DO RIO DE JANEIRO

UFMG

UNIVERSIDADE FEDERAL
DE MINAS GERAIS



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What is SLEEP?



“

Sleep is a fundamental **biological process** for the **survival** and **continuation** of the **human and animal species**.

It is a complex **neurobehavioral** state, maintained through an **organized interaction** between **neurons and the neural circuits** of the central nervous system.

”

“

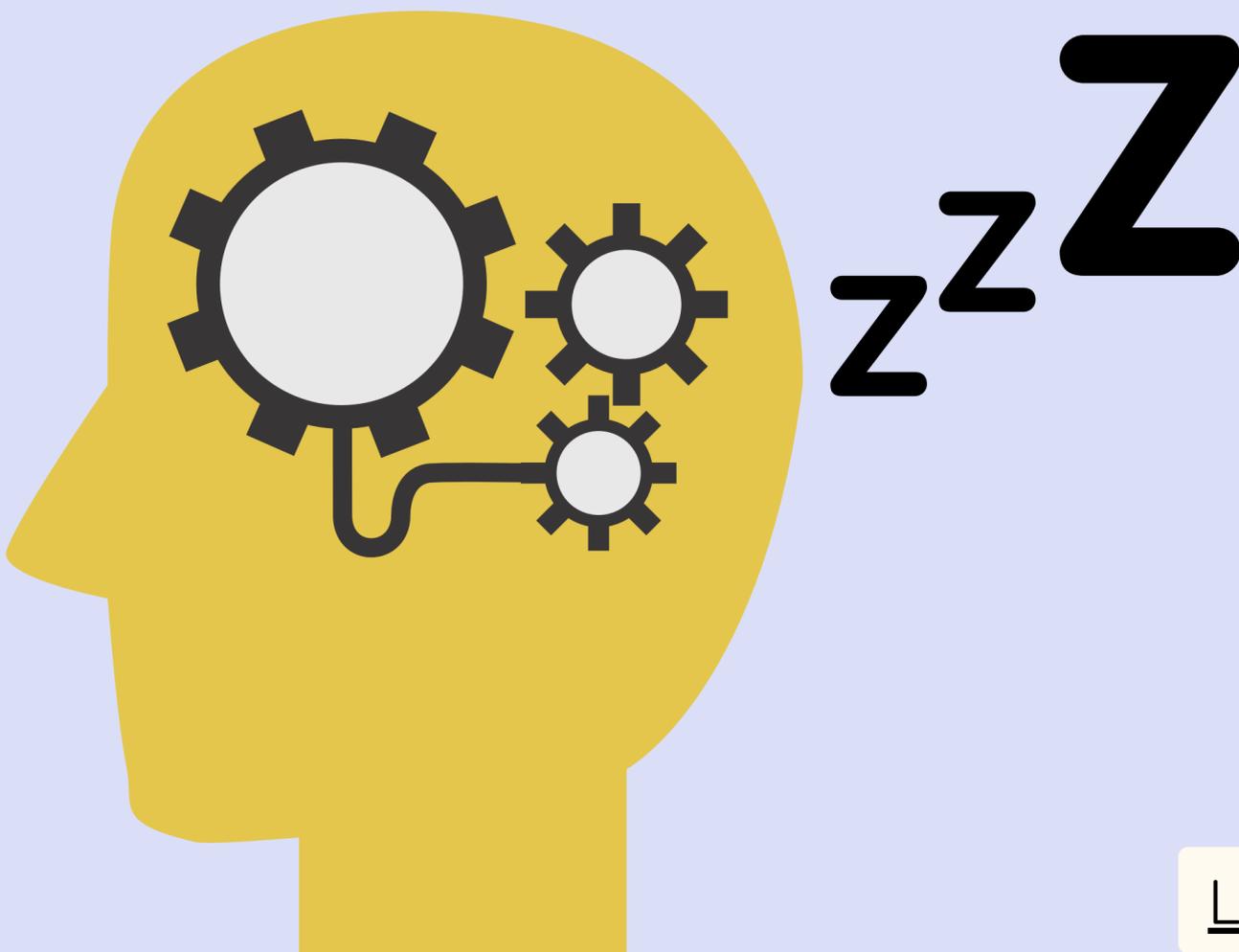
The **sleep** is not a result of a decreased brain activity, it is a **different state of consciousness.**

There is an **increase in brain activities** that are **important** for the processes of **memory and learning**, in addition to **brain repair and psychological recovery.**

A **good night of sleep** is important for a **therapeutic** and **restorative function** for the **body** and **brain.**

It is up to us to provide ideal conditions for our brain to work well!

”



Sleep health

Sleep health is a pattern that promotes physical and mental well-being adapted to individual, social and environmental needs.

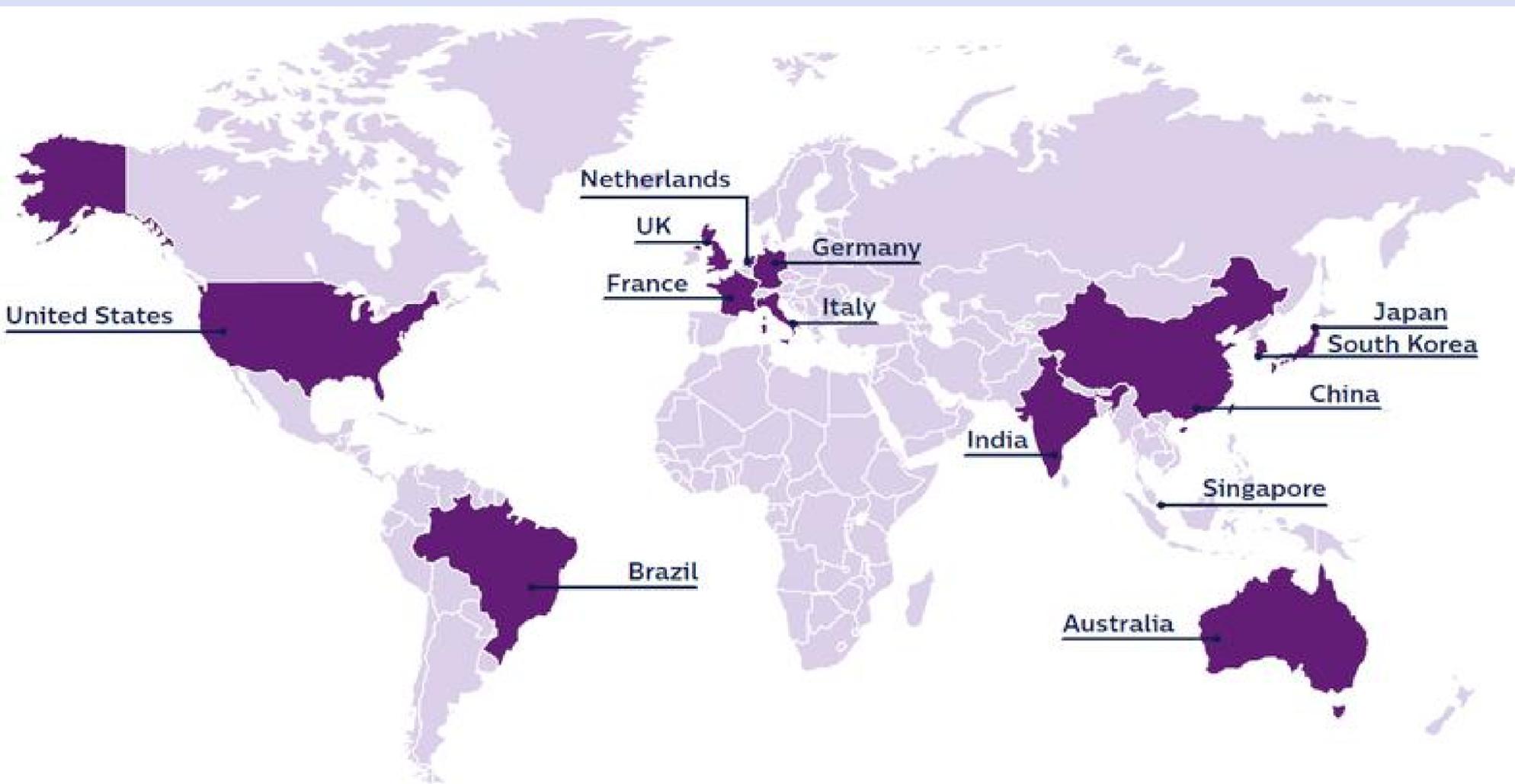
A good sleep health includes:

- 1 Satisfaction;
- 2 Appropriate time;
- 3 Adequate duration;
- 4 High efficiency;
- 5 Stay alert during awake time.

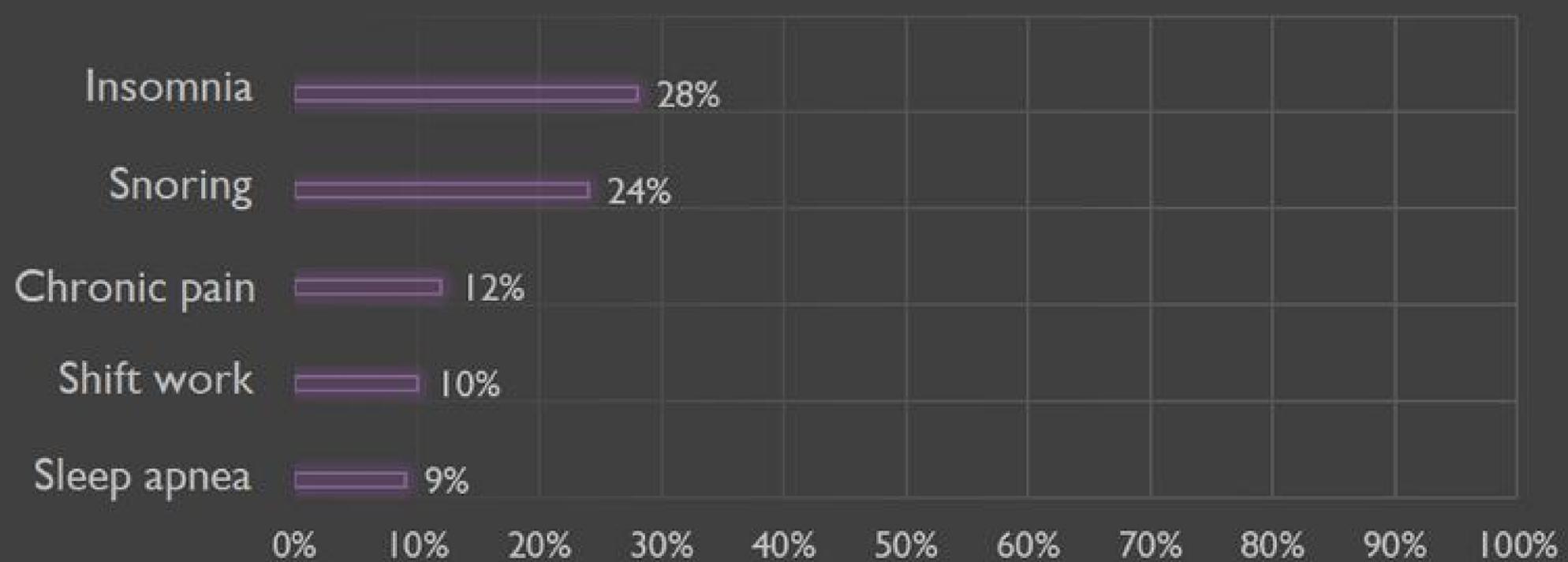
Sleep problems generate **medical and social concerns** since they represent a global phenomenon in modern society, which can affect all age groups, **influencing the quality of life and productivity** of individuals.



A survey conducted in 2020 showed that only **49%** of adults in the countries below were satisfied with their sleep:



The main reasons reported by the respondents that could disturb their sleep were:



A healthy sleep helps:

zzZ Cell and tissue repair;

zzZ Development of immunity and defense mechanisms;

zzZ Regulation of inflammatory functions;

zzZ Memory consolidation;

zzZ Cognitive and neurobehavioral skills;

zzZ Hormonal secretion;

zzZ Energy metabolism.

The absence of a healthy sleep may cause:

- ✘ Disturbances of concentration, alertness, and performance;
- ✘ Susceptibility to chronic diseases such as hypertension, diabetes, depression and obesity;
- ✘ Cardiovascular and intestinal diseases;
- ✘ Pregnancy complications;
- ✘ Increased risk of involvement in traffic accidents;
- ✘ Increased fatigue, irritability and anxiety;
- ✘ Mood changes;
- ✘ Increased sensitivity to pain.

ATTENTION!

While the amount of time that a person sleeps is important, **reaching the deepest stages of sleep is essential** to obtain optimal health benefits.

Sleep quality is considered **GOOD**, when a person is able to **fall asleep, go through the various stages of sleep and stay in each of those stages for its entire duration.**



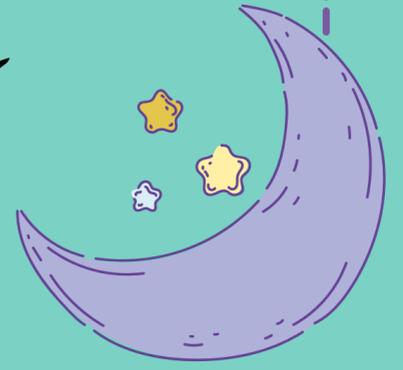
Is your sleep deep?

Sleep is divided into two stages:

- 1 Stage of Non-Rapid Eye Movement (NREM)**
- 2 Stage of Rapid Eye Movement (REM)**

On a normal night there are 3 to 5 alternating cycles of the NREM and REM phases, where each cycle lasts approximately 90 to 120 minutes.

Stages of sleep

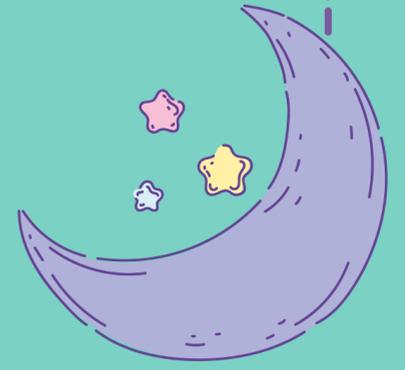


The distribution of sleep stages during the night can be altered by several factors, such as age, biological clock, room temperature, drug ingestion or particular pathologies.

Normally **NREM** sleep is concentrated in the **first part** of the night, while **REM** sleep predominates in the **second part**.

As sleep progresses, the person spends **more time** in **REM** sleep and **less time** in the **NREM** stages.

Stages of sleep



NREM

Characterized by muscle relaxation and it is divided into 3 stages: N1 and N2, which are the lightest stages of sleep; and N3, also called stages 3 and 4, in which the individual enters a deeper sleep, characterized by slow wave brain activity.

Each stage has a specific function to calm the body and brain, decrease body temperature and heart rate, preparing the body for maintenance and repair.

REM

Known as paradoxical sleep, where all skeletal muscles are in a hypotonic state, as if the body were paralyzed, also, involves high activity in the central and autonomic nervous systems.

It is the most restorative phase of sleep and allows the mind to transfer new memories and lessons to long-term memory, rationalize emotions and it is vital to the repair and maturation of the brain.

Sleep cycle



STAGE N1 (NREM)

Mind and body begin to relax; easy to wake up; aware of what happens around. Breathing and heart rate are regular.



STAGE N2 (NREM)

Relaxed; harder to wake up; not aware of what happens around. Body temperature drops; upper airway relaxation; snoring can begin; brain activities related to memory formation.



REM

Very active brain; dreams happen; almost complete paralysis of skeletal muscles. Processing of emotional memory; supplies energy to the brain and body; support for daytime performance.

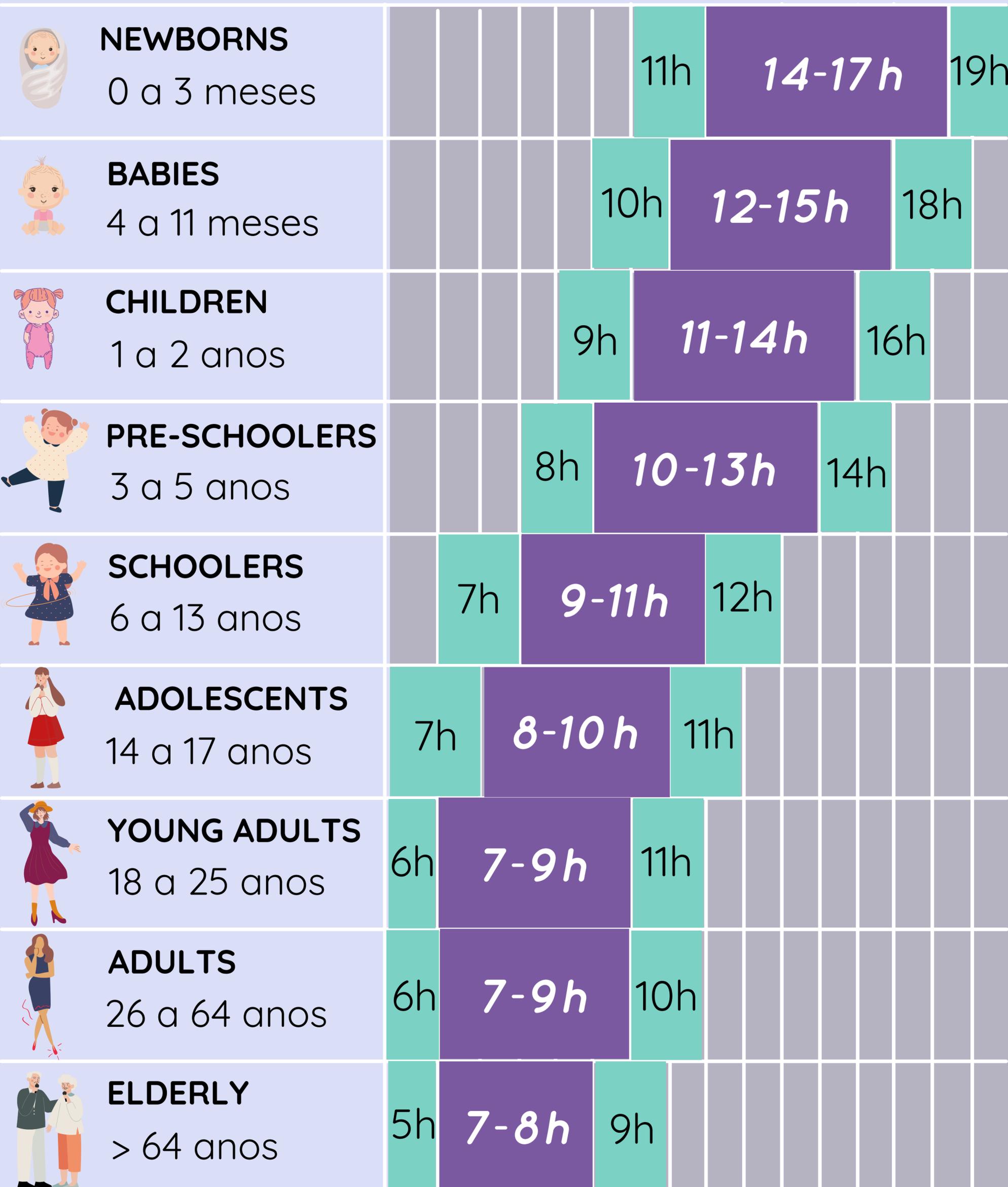


STAGE N3 (NREM)

Deep sleep; skeletal muscles relax; difficult to wake up. Drop in blood pressure; slower breathing; increases the blood supply in the muscles; collapse of the upper airways is possible; tissue growth and repair; restored energy; hormonal regulation; insulin secretion..



Ideal sleep time



Recommended
 May be appropriate

Where does *dentistry* come into this subject?



Dental sleep medicine is a rapidly **growing** field that is in direct interaction with sleep medicine and comprises many aspects of human health. It is a branch of dentistry that studies the **oral and maxillofacial causes and consequences of sleep-related problems.**

The American Dental Association (ADA) has adopted a formal policy statement that states that **dentists** must include **screening for sleep-related breathing disorders** during all **oral examinations.**



Oral health professionals are in the optimal position to **detect problems related to the quality of sleep**, as they often reflect in the orofacial region.

Therefore, **dental histories** must include questions about **sleep quality, sleep quantity, and previous diagnosis of a sleep condition**, such as insomnia or Obstructive Sleep Apnea Syndrome (OSAS).

A partir daí, devem tratar ou encaminhar o paciente para outro profissional para determinar o melhor curso de ação.

How to identify sleep problems in clinical practice?

- Signs of mouth breathing: recessed chin, short upper lip, open lip posture;
- Dark circles under the eyes, tired look;
- Bruxism: worn teeth;
- Dental caries;
- Gingival and periodontal problems: poor plaque control;
- Chronically dry or excessively wet lips, xerostomia (dry mouth), dry food in the corner of the mouth;
- Snoring: personal report.

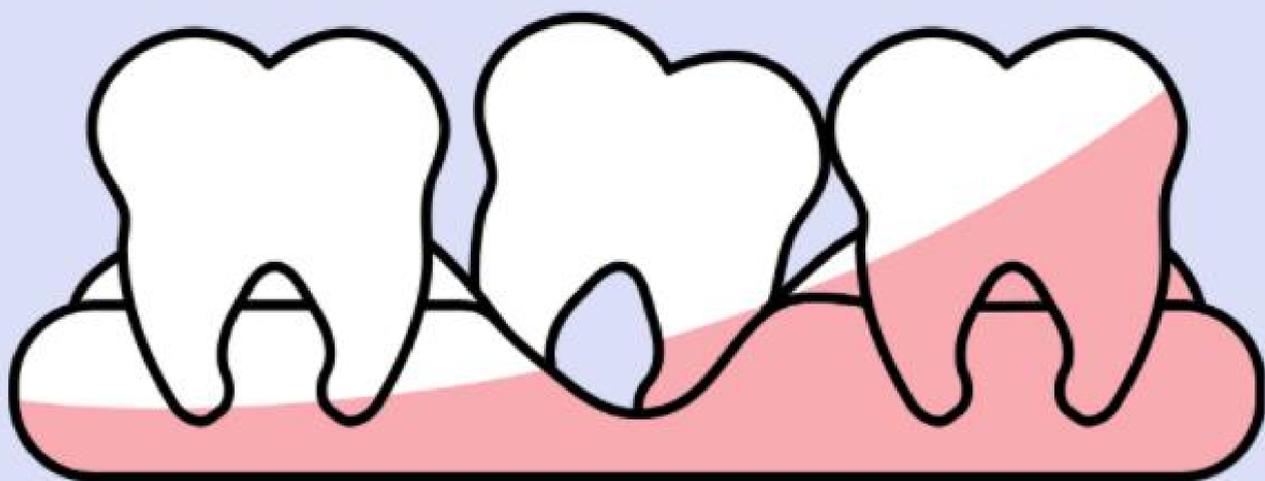


Sleep and Dentistry

Periodontal disease

Periodontal disease or periodontitis is a chronic dysbiotic inflammatory disease that compromises the integrity of tooth support tissues, which can lead to tooth loss.

In addition, severe untreated periodontitis can also affect systemic health, increasing the risk of cardiovascular disease.



Sleep and Dentistry

Periodontal disease

Altered and low-quality sleep can produce hyperglycemia that creates glucose intolerance, which increases gingival and systemic inflammation and tissue damage that may precede periodontitis.

In addition, systemic inflammation caused by periodontitis can have a potential effect on the duration and quality of sleep. This situation can become a vicious circle.



Sleep and Dentistry

Bruxism

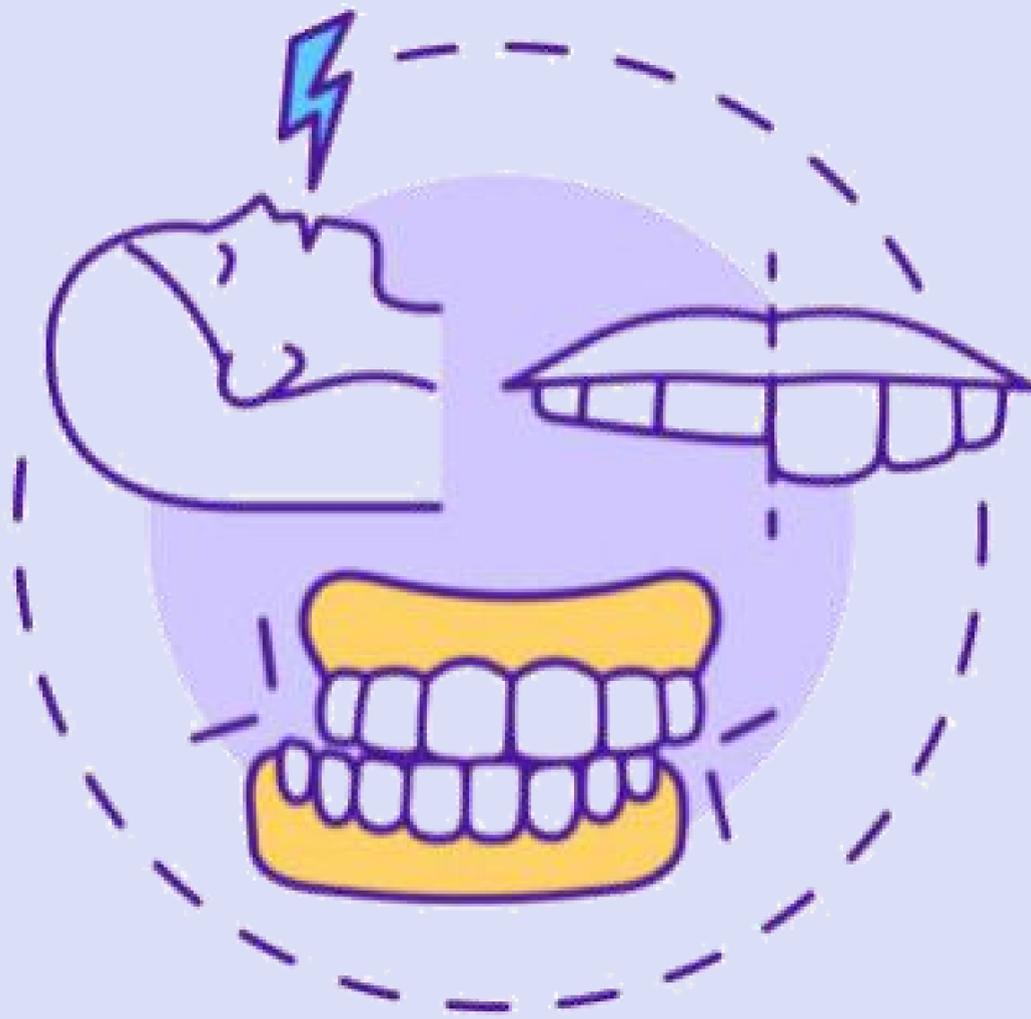
Bruxism is a masticatory muscle activity that can occur during sleep (sleep bruxism) or during the day (awake bruxism), characterized by repetitive clenching or grinding of the teeth or sustained tooth contact and/or by bracing or thrusting of the mandible.



The current literature suggests that certain behaviors that occur during sleep are risk factors associated with bruxism such as snoring, mouth breathing, restless sleep, stomach position during sleep, nightmares, talking in sleep (somniloquy), lack of sleep, among others.

Sleep and Dentistry

Bruxism



Bruxism is the source of many dental and neuromuscular problems, including dental wear, tooth chipping, periodontal disease, hypertrophy of the masticatory muscles, exacerbation of facial pain, headaches, and temporomandibular disorders; in addition to a grinding noise that has a disturbing effect on the sleep of the bed partners, which makes the patients seek the dental clinic.

Sleep and Dentistry

Dental caries

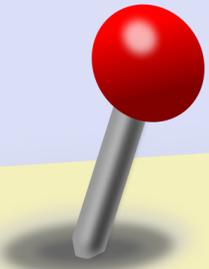
Changes in the sleep cycle can increase the risk of caries, due to the abnormal reduction in the salivary flow caused by the alteration in the salivary gland, and the susceptibility to infection, by the reduction of the secretion of antibodies (IgA) and, consequently, of the immune function. Considering that saliva has protective properties against the formation of dental plaque - for example, neutralizing the acidic intraoral pH - a decrease in the amount or flow of saliva can cause an increase in caries.



Sleep and Dentistry

Dental caries

Children who are more nocturnal, who sleep later and wake up later, are also more susceptible to caries. Staying up late at night usually leads to night exposure to light and meals. In this way, tooth decay arises when oral resistance to cariogenic microbes is low (for example, at night, when the salivary flow decreases).

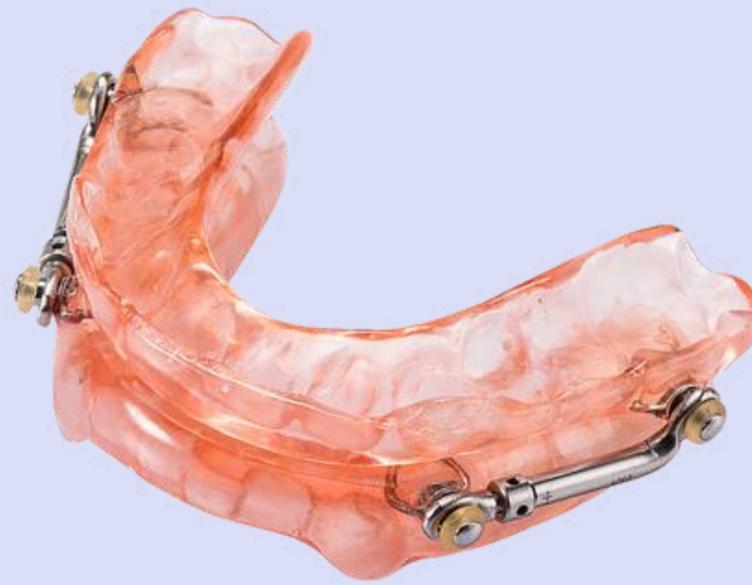


SHORT SLEEP IS ASSOCIATED WITH HIGH LEVELS OF STREPTOCOCCUS MUTANS COLONY, ONE OF THE BACTERIA INVOLVED IN THE CARIES PROCESS.

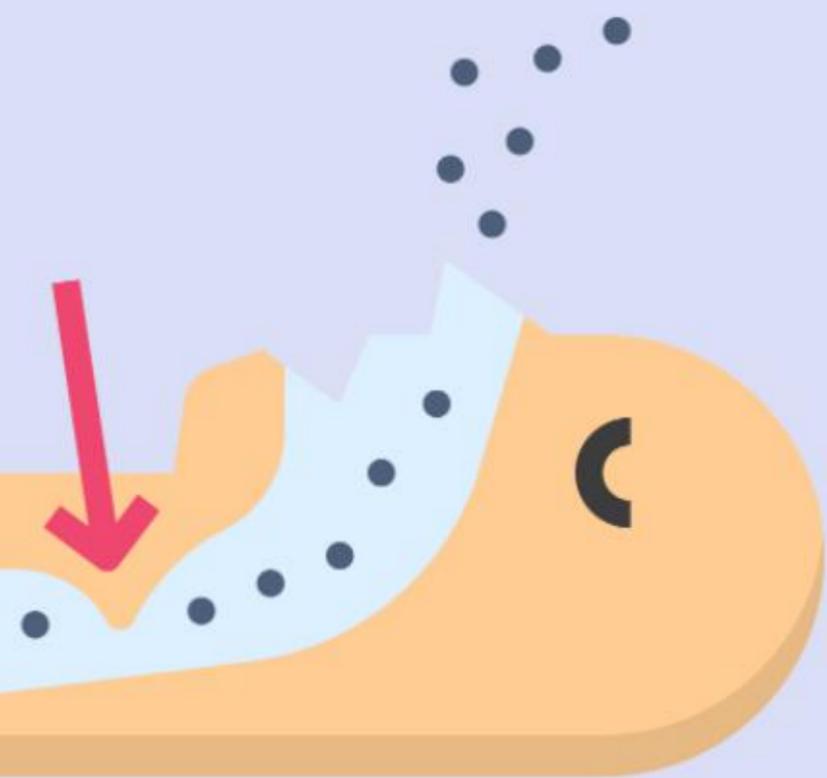
Sleep and Dentistry

OSAS

Obstructive Sleep Apnea Syndrome (OSAS) is a medical condition which dentists have become increasingly involved with in the past 10 years, as it has been demonstrated that some patients with OSAS or snoring could be helped with oral appliances or by means of oral surgery.



OSAS often includes the reduction and/or interruption of respiration due to partial or total obstruction of the upper airways, for repeated periods, causing lack of oxygen and frequent awakening of the patient.



Sleep and Dentistry

OSAS

Dry mouth is reported by 95% of patients with OSAS. It happens due to mouth breathing, causing the salivary flow to cease almost completely and the frequency of swallowing to decrease. Thus, it can cause an increase in dental caries, in the formation of dental plaque, and, consequently periodontitis.

Attention!

OSAS can cause the patient to wake up without rest, with excessive fatigue during the day, with cognitive impairment, reduced libido, development of hypertension and cardiovascular diseases, as well as a series of other health problems, some of them serious, including mortality.

Sleep and Dentistry

Traumatic dental injuries



Sleep quality influences cognitive functions, level of attention and motor skills, thus, it can be associated with falls, traffic accidents (e.g.,

sleeping on the wheel) and other events that can result in traumatic dental injuries.

In addition, a bad night of sleep generates tired individuals who are susceptible to mood changes, rule-challenging, exhibiting risky behavior and act impulsively. These factors can increase the risk of involvement in events that lead to dental injuries.

Sleep and Dentistry

Orofacial pain

Pain disrupts various aspects of physical and psychological life, including sleep. For example, orofacial problems, such as temporomandibular disorder, are often sources of chronic pain that can alter sleep patterns.

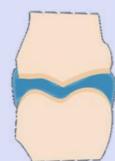


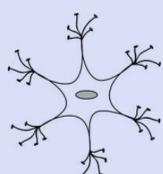
Sleep and Dentistry

Orofacial pain

There are several types of orofacial pain:

 dentoalveolar (teeth and the surrounding support tissue);

 musculoskeletal (muscle or joint problems);

 neuropathic (nervous tissue problems);

 headache.

50 - 90%

of patients with acute pain have poor sleep at night.

Patients with chronic pain have a cycle:

Poor sleep at night followed by pain on the next day.

High levels of pain during the day are followed by poor sleep at night.

Sleep and Dentistry

Orofacial pain

In addition, patients with chronic pain and other people who sleep poorly tend to have more fragmented sleep, with micro-awakenings, frequent awakenings, and body movements, in addition to changes in the sleep stage and thus present an unsatisfactory sleep. Some patients with Temporomandibular Disorders (TMD) and pain in the facial muscles also report waking up during sleep.



Other facial pain caused by inflammation of the dental pulp and other diseases, such as osteoarthritis of the Temporomandibular Joint (TMJ) and trigeminal neuralgia, can also delay the onset of sleep or interrupt the sleep in progress.

Sleep and Dentistry

Others situations



ORAL ULCER

A study suggested that sleep deprivation can worsen oral ulcers and delay its healing.

BAD BREATH

Insufficient sleep worsens bad breath. The decrease in the rate of salivary flow in the mouth during sleep can decrease the antibacterial and saliva cleaning effects. An unpleasant odor can occur because of food residues between the teeth and putrefaction of retained exfoliated oral epithelial cells, and this can increase the plaque accumulation on the teeth and tongue.



MYTHS AND TRUTHS *related to sleep and dentistry*

There are many myths related to sleep, and many that are passed on from generation to generation, but without scientific basis. Now that you have read this e-book, would you know how to answer which ones are **myths** and which ones are **truths**?

Can toothache make sleep difficult?

Truth! Most patients with acute pain report poor sleep at night. This can be explained by the fact that pain delays sleep and causes interruptions, causing it to be more fragmented, with micro-awakenings and frequent awakenings.

Can only a sleep doctor treat a person's snoring?

Myth! The dentist is also a competent professional to treat snoring. Treatment is performed with oral devices or oral surgery.

MYTHS AND TRUTHS *related to sleep and dentistry*

Does sleeping with an open mouth affect oral health?

Truth! The mouth breathing that causes individuals to “sleep with their mouth open” causes the salivary flow to stop almost completely and the frequency of swallowing to decrease, reducing the protective effects of saliva against dental plaque. In this way it can increase caries, plaque and inflammation in the gums.

Does sleeping badly at night and getting sleepy during the day increase the risk of falling, hitting your mouth and breaking your teeth?

Truth! A bad night's sleep generates tired individuals who are susceptible to mood changes, to rule challenges, and exhibit risky behavior, acting impulsively. These factors can increase the chances of getting involved in events that lead to dental injuries.

WE HOPE THAT THIS E-BOOK HAS HELPED
YOU TO UNDERSTAND A LITTLE MORE ABOUT
SLEEP AND DENTISTRY!

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