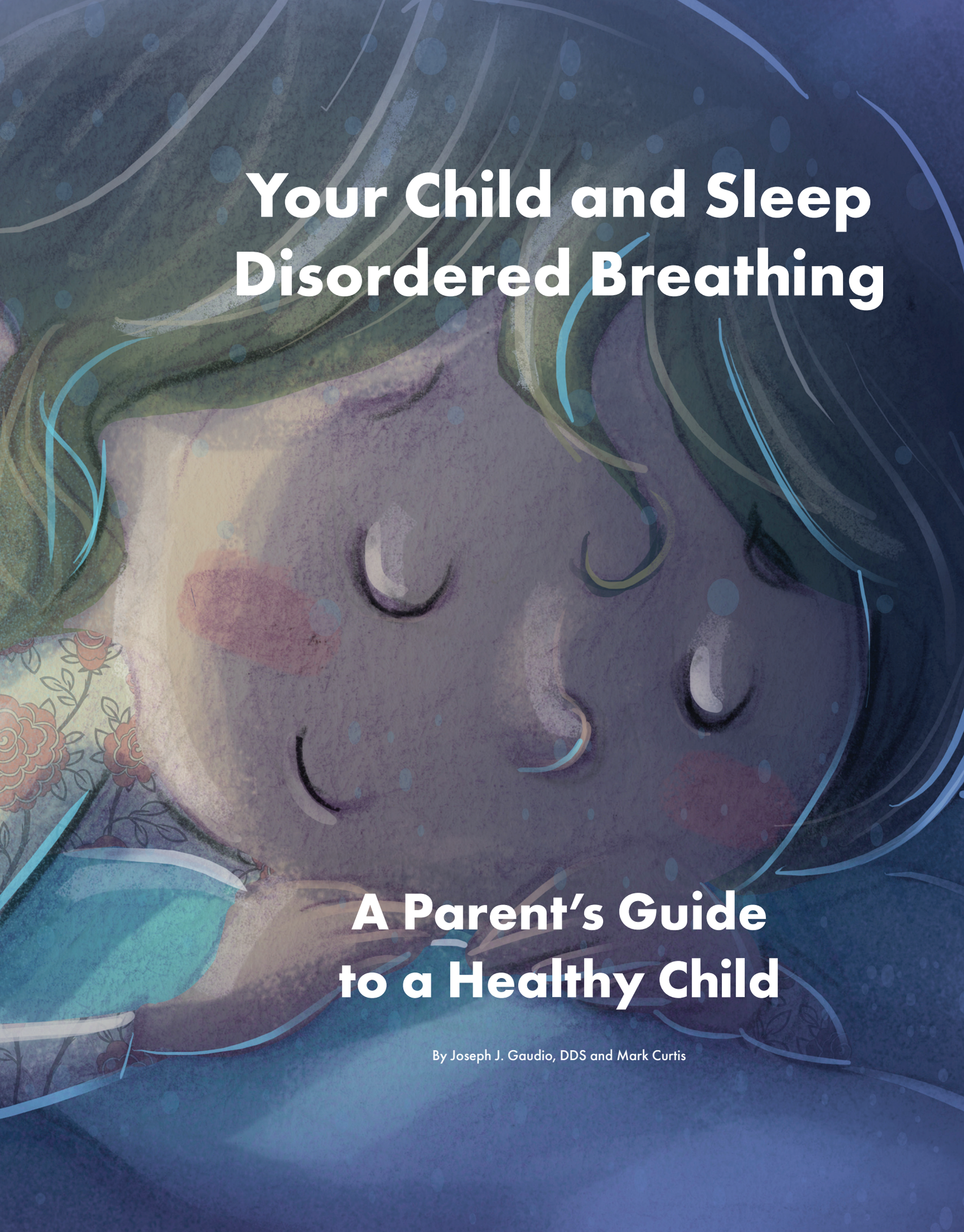


Your Child and Sleep Disordered Breathing

A Parent's Guide to a Healthy Child

By Joseph J. Gaudio, DDS and Mark Curtis

DANIEL MOHEBAN, DMD

Dr. Moheban (or Dr. Dan) received his undergraduate degree from Brandeis University in 1996. After college, Dr. Moheban spent three years conducting research at the Beth Israel Deaconess Medical Center and at the Dana Farber Cancer Institute. He then went on to attend Tufts University School of Dental Medicine where he earned his Doctorate in Dental Medicine in 2003. During that time, Dr. Moheban also worked at Colgate Oral Pharmaceuticals studying dental sealants. Dr. Moheban completed his post-doctoral training in pediatric dentistry at the University of Michigan in Ann Arbor and Mott Children's Health Center/Hurley Medical Center in Flint, MI in 2005. Most recently, in 2019, Dr. Moheban completed study in the Pediatric Dental Sleep Medicine mini-residency at Tufts University School of Dental Medicine.

Dr. Moheban has been practicing pediatric dentistry in the state of Massachusetts. Dr. Moheban has also taken numerous continuing education courses to stay current with the latest advances in dentistry. He has studied extensively in the areas of oral bacterial management and caries (cavity) prevention, laser dentistry, early orthodontic treatment, evaluation of lip and tongue ties, pediatric dental sleep medicine, and treatment of Temporomandibular Joint Disorders (TMD) in children, adolescents and young adults.

Dr. Moheban is board certified and is a diplomat of the American Board of Pediatric Dentistry. He is a member of the American Academy of Pediatric Dentistry, American Dental Association, Massachusetts Dental Society, Massachusetts Academy of Pediatric Dentistry, Academy of Laser Dentistry, Academy of Applied Myofunctional Sciences, American Academy of Dental Sleep Medicine and the American Association of Dental Research.

Dr. Dan enjoys spending time with his wife and two boys. He likes being active in the outdoors of New England hiking, biking and going to the beach in the summer. In the winter he enjoys snow shoeing and making snowmen with his kids followed by delicious cups of hot cocoa.

A Parent's Guide to a Healthy Child

Welcome

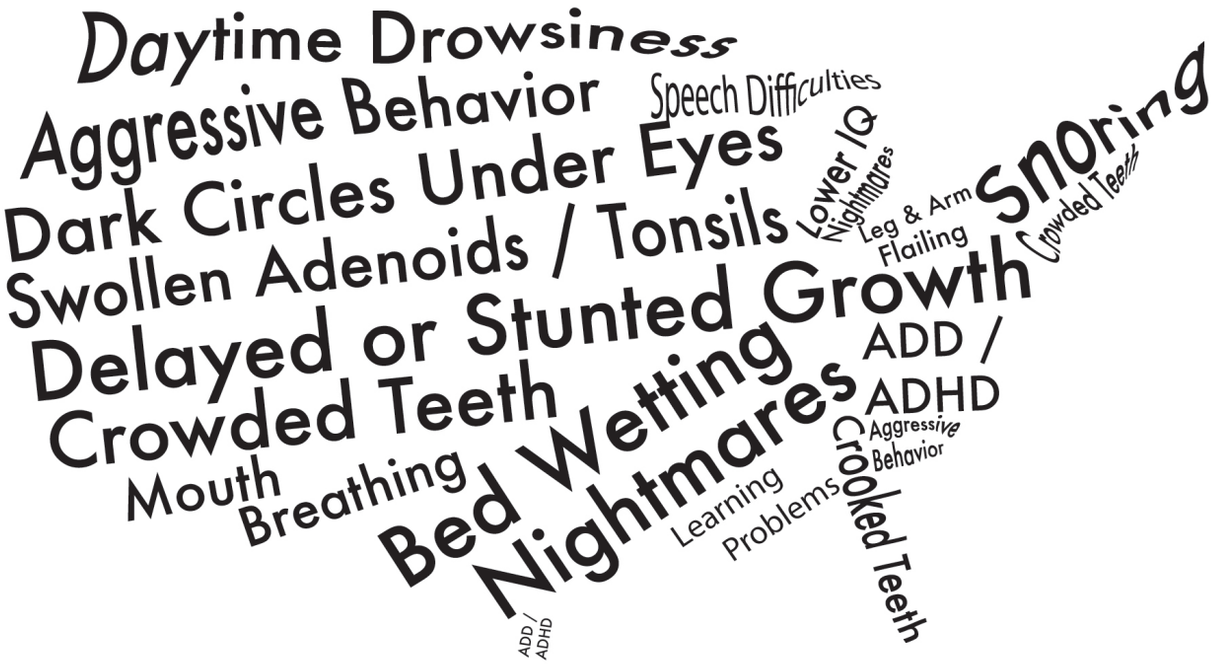
While childhood sleep disordered breathing is, at this time, an often-overlooked diagnosis, Pulmonologists, ENT's, Sleep-Focused Dentists and Respiratory Therapists across the country are working together to bring this debilitating disease into the spotlight.

How a child grows and develops is directly related to the quality of their sleep. Quality of sleep is affected by how well a child can breathe through their nose, which is related to the upper and lower jaws growing to their full potential.

Poor sleep can result in a myriad of symptoms that children and parents struggle with daily. Until now our society has been focused on treating the symptoms.

The key to helping an unhealthy child is to treat them early. This book is an excellent resource to help parents and the community understand childhood sleep disordered breathing.

Children's Health Epidemic



Two proud grandparents were talking in the reception area the other day. I heard one say to the other, "What is happening to kids these days? It seems like every one of them has behavioral problems, allergies, ADHD or something. I feel like kids are taking more and more medications every day."

The scary thing is, she is right. Research shows that nearly 90% of children in the United States suffer from one or more of the debilitating conditions featured on the map above.

On the next page, you'll find a list of side effects (symptoms) associated with Children's Sleep Disordered Breathing. Does your child exhibit any of these problems? Take heart! There is help to be had.

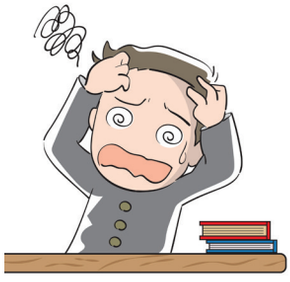
Common Symptoms of Sleep Disordered Breathing

Allergies
Asthma

Nightmares
Night Terrors

Stunted
Growth

Mouth-Open
Eating



Learning
Difficulties

Butt-Up
Sleeping

ADD
ADHD

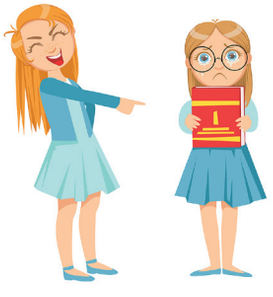
Bed
Wetting

Night
Sweats

Delayed
Speech

Daytime
Sleepiness

Aggression
Defiance



Bullying
Others

Frequent
Colds

Anxiety
Attacks

Restless
Legs

Traditional Treatments

Traditionally, physicians have offered parents of children with these issues many options to assist their children such as:

- Psychotropic Drugs
- Psychiatric Testing
- Surgery
- Tooth Extractions
- Sleep Studies
- Special Education
- Braces
- Amphetamines
- Counseling/Therapy
- Sleep Aids
- HGH Injections
- Allergy Testing
- Tutoring
- Behavior Modification

Commonality?

What do all of these commonly prescribed treatments have in common with each other?

Band Aids

They tend to be short term Band-Aids and address the symptoms but NOT the cause.

The Real Culprit

Children's Sleep Disordered Breathing is a silent thief who steals away your child's oxygen at night.

More technically, SDB is a physical deformity that lowers a child's oxygen levels during sleep.

Children's Sleep Disordered Breathing also prevents children from getting good, restorative sleep.

Over time, that could contribute towards behavioral problems like ADHD, Anxiety, Bullying and Bed Wetting.

The lowered oxygen level may also trigger physical problems like Delayed Speech, Crooked Teeth, Chronic Fatigue and Sleep Apnea.

Sometimes SDB frustratingly mimics the symptoms of more serious diseases.

Where Did SDB Come From?

Anthropologist Dr. Robert Corruccini spent 30 years traveling around the world studying indigenous populations. He arrived at a definitive conclusion: Children's Sleep Disordered Breathing was nowhere to be found in the children of these cultures.

In fact, kids' oral and facial structures are very healthy and functional in cultures where:

- Breastfeeding begins at birth and continues into the third year of life.
- Children are weaned onto intact raw vegetables, tubers and fruit.

In "advanced" cultures we often:

- Never start breastfeeding or we move to a bottle within months of birth.
- Feed baby food that has been cooked and puréed into a soft mush.
- Use pacifiers to keep children "soothed".

The result?

By choosing technology and convenience over tradition, we "manufactured" SDB and many of the side effects that come with it in our children.

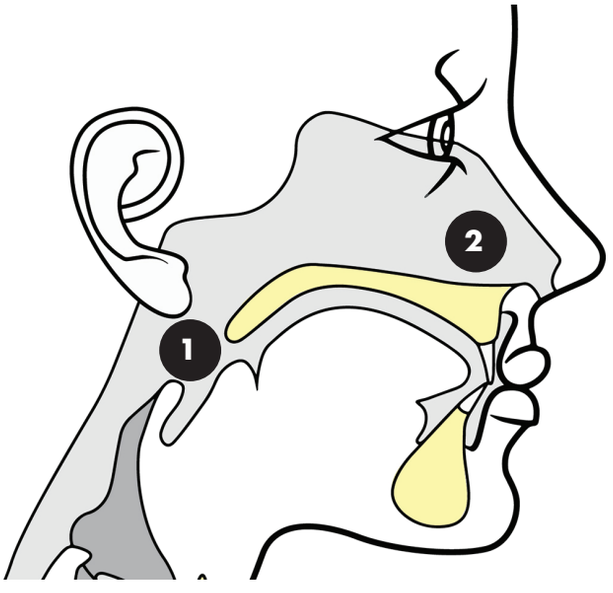
It's All About The Tongue

The tongue has a lot to accomplish in the first 10 years of its life. It will learn to twist itself into all kinds of shapes to form sounds as we begin the long task of developing speech to communicate. It will become adept at licking an ice cream cone and may learn what it takes to whistle. These are the milestones that make childhood wonderful. But, it's what the tongue does behind the scenes in those first few years that could mean the difference between going through life happy and healthy or living a life of misery.

Remember the list of symptoms related to SDB that we presented a few pages ago? Turns out the tongue can be implicated in all of those conditions and behaviors.

"How can the tongue have any connection with anxiety or learning difficulties?" you may be asking. It's a simple answer: OXYGEN!

Children naturally hold their breath under water. When they surface, everything goes back to normal. However, significantly restricting a child's flow of oxygen over their first few years can result in the mind and body going haywire.



Two Types of Children's Sleep Disordered Breathing

Type 1 SDB constricts the airway in a child's throat.

Type 2 SDB constricts the child's nasal airway.

Type 1 Sleep Disordered Breathing

"Workout" Food for the Mouth

In indigenous cultures, hard foods are introduced for the child to chew on, even while breastfeeding continues, thereby strengthening the tongue, oral muscles and lower jaw. It also places pressure on the erupting teeth.

To understand the dynamics behind this "Use it or lose it" situation, consider a boy with a broken leg. Once the leg is casted, the leg bones and muscles begin to shrink. Because the leg can't move, it "thinks" it's not needed. So, as soon as possible, doctors will have that boy using a walking cast. The vertical pressure stresses the leg bones and they respond by growing and getting stronger.

In "advanced" countries, parents often unwittingly weaken their children's tongues and jaw bones by feeding soft baby foods as the next step from bottle or breastfeeding.

The Case of the Useless Lower Jaw and Tongue

Soft baby foods put little stress on the facial bones and jawbone, whereas "real" foods require the tongue to precisely position food so the teeth can slice, bite and grind it for swallowing.

But mashed potatoes, strained peas, apple sauce and the like are "pre-chewed" for the child. The tongue simply mushes the food and swallows.

This tricks the tongue and jaw bone into "thinking" they are not needed. The tongue becomes weak and lazy.

The child's growing body only has so many nutrients to pass around so it's not going to waste precious protein, vitamins and minerals on a tongue and jawbone that aren't doing anything but laying around on the couch.

The jaw and tongue don't grow and may, in fact, even shrink. The rest of the head continues growing and developing as it usually would.

The child starts to develop a receding chin.

"What Qualifies as a Receding Chin?"

There isn't enough space in this book to fully discuss the exact measurements and ratios of facial structure that determine if a child has a clinically receding chin. However, there is a simple test that you can do at home to evaluate your child's chin.

Simply take a profile photo of your child and get it printed out on paper. Then, taking a ruler, draw a line from your child's brow down through the point where the upper lip meets the bottom of the nose. Then, continue on down to the chin. It doesn't matter if the child's face is perfectly level.

If the child's chin sticks out beyond the line or is at least touching the line, that is a positive sign. Of course, if your child is showing other symptoms such as snoring or sleep apnea episodes, do not rely on this at-home test as conclusive. It is not meant to replace a qualified doctor's clinical diagnosis.

Genetics vs. Soft Foods

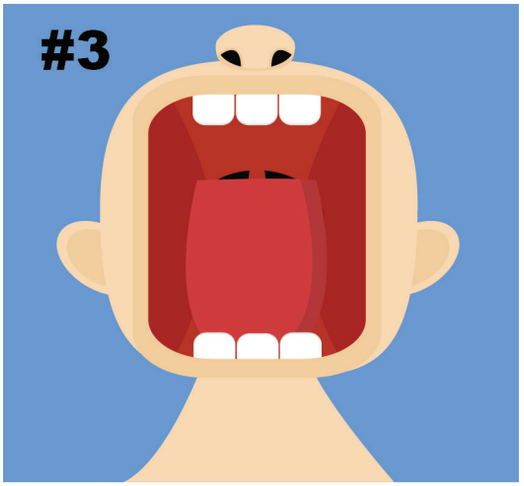
Some people may argue that whether or not a child will have a receding chin is purely due to the parents' chin shapes, but research does not bear that out.

Here is a photo of a dad and son where dad has a normally developed chin and the child's chin is stunted. Notice how his chin is actually pointed downward rather than forward.

"All Kids Have Receding Chins!"

Other people may claim that receding chins are a part of childhood and that the child will grow out of that phase eventually and have a normal chin.

Again, research does not back that statement up. In fact, only about 8%-10% of children have a receding chin. Both this little girl and her mom have perfectly normal chins.



"My Child Has a Receding Chin. Now What?"

If you have come to the conclusion that your child does, indeed, have a receding chin, now what do you do?

In our society, we refer to chins as "strong", "weak", "noble", "masculine" or "feminine". The problem is that these are all words related to a chin's appearance as we judge it.

But in this book we are talking about chins that did not develop properly and are STUNTED. A stunted chin indicates that the child's tongue and lower jaw failed to grow forward and are now constricting the airway in the throat.

And, when the child grows up, they will be very likely to snore and have sleep apnea. They will also be more at risk for heart disease and Chronic Obstructive Pulmonary Disease (COPD).

You may wonder, "How severely obstructed is my child's airway?" Well, let's find out.

At-Home Airway Assessment

To the left are four diagrams showing a child's throat and the severity of the constricted airway. This is actually a quick and simple test used in hospitals every day. If you've ever had surgery, the anesthesiologist probably asked you to open your mouth and say "Aaaaah".

He or she was checking to see how difficult it would be to place a breathing tube in your airway if needed. You can do the same test on your child at home.

Have your child face you straight on and look you in the eyes. Then have them place the tip of their tongue on the tip of their lower front teeth (just like in the diagrams).

Compare your child's airway to these diagrams and choose the one that best matches your child. If you choose #2, #3 or #4, you should be concerned and speak with a qualified sleep medicine dentist.

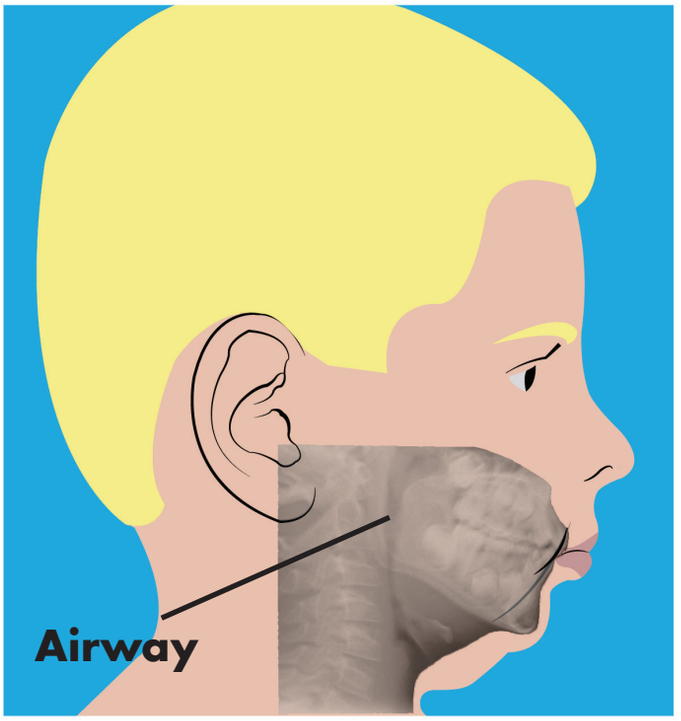
Fixing Type 1 Sleep Disordered Breathing

Narrow Airway

Even if the bones of the jaw stop growing, the rest of the head and face continue to grow around them. This continues to compress the child's airway in the throat. Worse yet, the tongue is being pushed back into the throat, further constricting the airways.

Finally, because the tongue is weak, it may fall backward into the throat during sleep and potentially cause sleep apnea episodes.

What does it feel like to have Type 1 SDB?
With your thumb and forefinger, push your chin in and down into your neck as far as you can without causing pain. Now breathe through your mouth. Fun, isn't it?



Actual Patient X-Ray at 8-Years of Age

Before Guided Growth

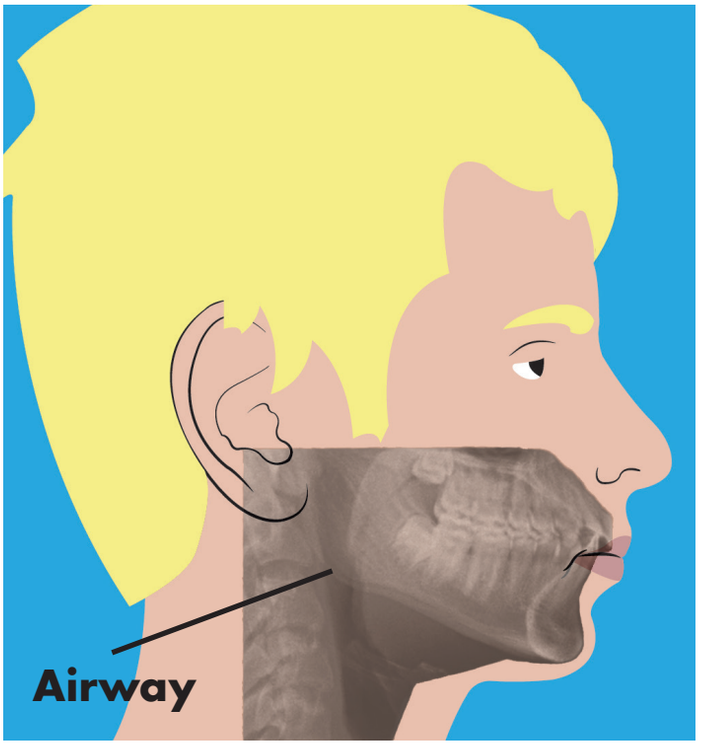
Guided Growth

Fortunately, qualified dentists offer a program that can reverse the effects of irregular facial development.

Guided Growth:
- Promotes growth of the middle head
- Promotes growth of the jaw
- Opens the airway
- Promotes proper body growth
- Reduces levels of stress hormones
- Releases more HGH during sleep
- Corrects orthodontic problems
- Creates an ideal overbite and overjet
- Creates proper bite
- Brings all 28 teeth into place

Using Guided Growth, most children can be treated and cured of a compromised airway.

Additional benefits include:
- Training the tongue
- Promoting proper swallowing
- Improving speaking skills
- Eliminating thumb sucking
- Eliminating tongue thrusting



Actual Patient X-Ray at 13-Years of Age

After Guided Growth

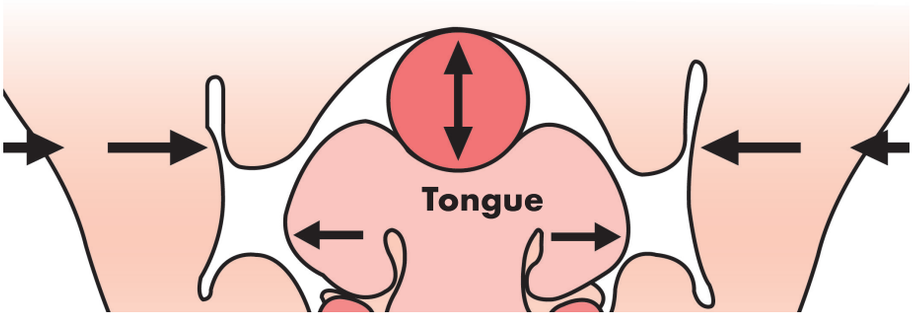
Type 2 Children's Sleep Disordered Breathing

"Pacifiers, Bottles and Thumbs, Oh My!"

In America, parents often feel like breastfeeding is a hassle and there isn't enough time in the day. Add to that that it's usually difficult to bring the baby to work for breastfeeding and it's easy to understand why bottle feeding is so popular here.

So, we stop breastfeeding after a couple of months and put a bottle in our babies' mouths. When they are finished with the bottle, we stick a pacifier in their mouths. If there is no pacifier available, they suck on their thumbs.

It's been estimated that 18-month old babies spend as much as 85% of their waking hours sucking on something.



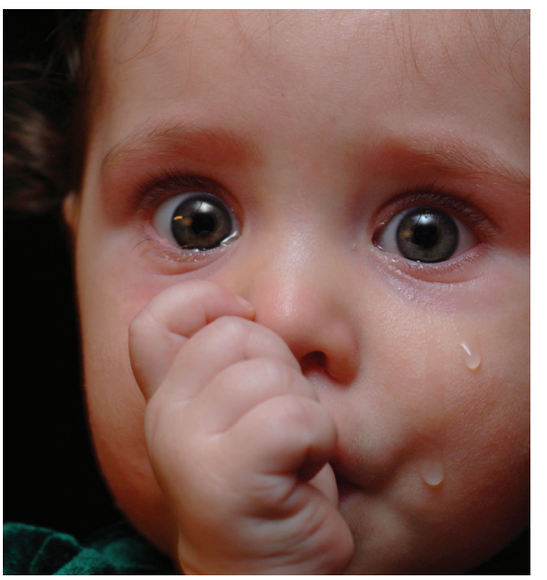
The Daily Damage of Sucking on Objects

Imagine the red circle above is a thumb, pacifier or bottle nipple. When the child sucks on it, the cheeks and lips are drawn in, forcing the upper gums and teeth inward and the roof of the mouth upward.

The tongue generates vertical force, pushing upwards on the midpoint of the roof of the mouth. This pushes the palate into the nasal airways.

Meanwhile, the tongue is also being forced outward against the lower gums and teeth, thereby multiplying the negative effects of habitual sucking.

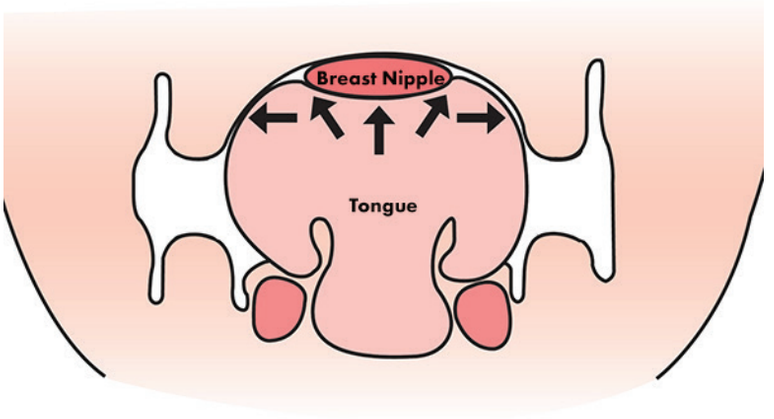
When the child's adult teeth come in, if the lower jaw has been widened and the upper jaw has been narrowed, the teeth will not mesh properly.



"But, Isn't Breastfeeding Sucking As Well?"

Actually, it's not. Instead, the tongue pushes the breast nipple up against the roof of the mouth causing the mother's milk to be pressed out rather than sucked out.

As the baby continues to apply pressure over and over, the tongue pushes outwards. With this repetitive motion, the tongue counteracts the constant inward pressure of the child's cheeks and lips and protects the nasal airways.



"What Do You Mean, Protects the Nasal Airways?"

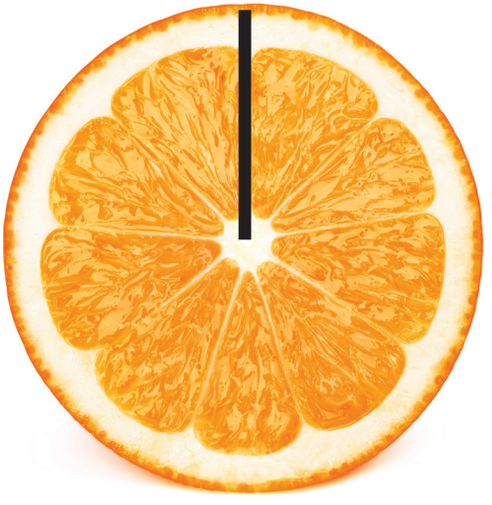
The roof of the child's mouth (upper palate) sits right underneath the airways coming in through the nose and leading down into the lungs. If the roof of the mouth gets pushed up, it will push into the nasal airways. When that happens, the nasal airways get squeezed and it becomes more and more difficult to breathe through the nose.

"How Can the Roof of the Mouth Get Pushed Up Into the Nasal Airways?"

The cheeks and lips are powerful muscles and they are constantly squeezing inward on the upper gums. It doesn't seem like much pressure, however, long ago orthodontists discovered they could move entire sets of teeth around with tiny rubber bands if they kept the pressure of those rubber bands on 24/7.

The two black lines on the oranges below are exactly the same height. As you can see, the squeezed orange is taller than the other orange. That's what happens to the child's palate.

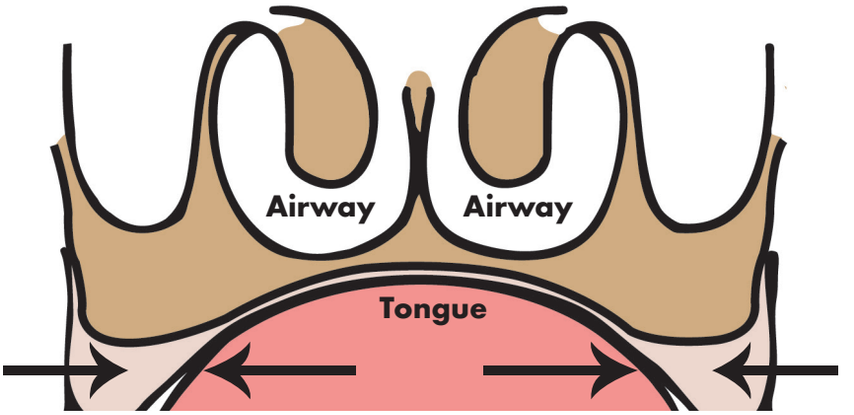
The tongue fights that inward pressure.



Protected Airways / Expanded Palate

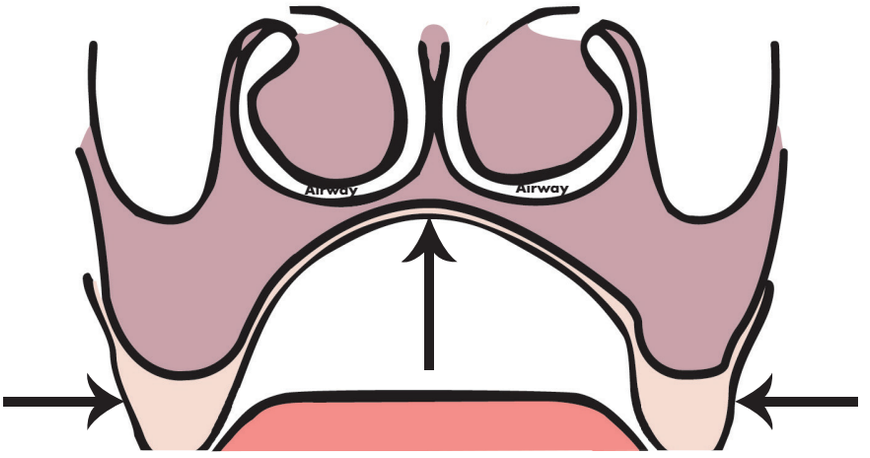
When the tongue lives in the roof of the mouth, it pushes outward every time the cheeks and lips squeeze inward.

And, in fact, it pushes a little harder and a little more often so that as the child's head grows, the upper palate is expanded. That's important because once the permanent teeth start to come in, the upper and lower jaw need to be aligned so the upper and lower teeth mesh beautifully.



Absentee Tongue

If the tongue is not living in the roof of the mouth, there is no counteracting force to stop the cheeks and lips from squeezing the palate together and driving the roof of the mouth up and into the nasal airways.



"Where is the Tongue?"

It's lying on the floor of the mouth. Sometimes that's because the tongue has been weakened by being fed soft baby foods after being bottle fed or breastfed.

Or, it may be because the tongue has learned to stay out of the way of the needed oxygen coming in through the mouth. In that case, the child has become a "mouth breather."

Mouth Breathing While Sleeping

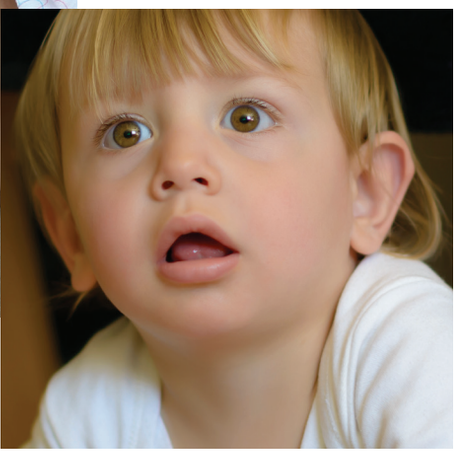
Mouth Breathing

Q. Why does the child mouth breathe?
A. Because they can't get enough air through their noses.

Q. Why can't they get enough air through their noses?
A. Because the tongue wasn't in the roof of the mouth to protect the nasal airways.

Q. Why wasn't the tongue protecting the nasal airways?
A. Because it was on the floor of the mouth out of the way of incoming needed air when the child mouth breathed.

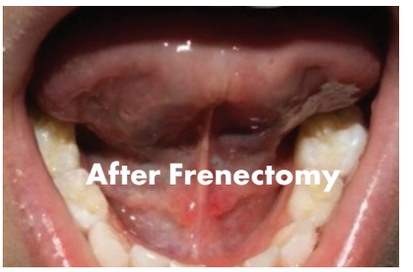
(See Mouth Breathing Vicious Cycle on next page)



Mouth Breathing 24/7

Tied-Down Tongue Deemed "Blameless"

When a child is tongue-tied, the frenulum (little flap of skin that holds the tongue in place), is too constrictive and the tongue is physically prevented from living in the roof of the mouth to protect the nasal airways. A qualified dentist can remove that extra tissue and free the tongue.



The Mouth Breathing Vicious Cycle

Sometimes the tongue gets trapped in an endless cycle of mouth breathing. This situation keeps the tongue lying on the floor of the mouth rather than living in the roof of the mouth where it can do its job of protecting the nasal airways, expanding the palate and aligning the bite.

Mouth Breathing Event

Oftentimes the Type 2 SDB cycle begins with a genesis mouth breathing event.

For example, a child who has been a consistent user of both bottle feeding and pacifiers catches a cold. Before she can recover from that cold virus, another one hits her. Over the course of the next six weeks, she develops a sinus infection which eventually takes nine weeks to get rid of.

She has had a stuffy nose for months and adopts a mouth breathing sleeping style. Her nasal airways were already narrowed from sucking on bottle nipples and pacifiers.

But now, the damage accelerates.

Acceleration and Aggravation

Her nighttime mouth breathing has disrupted her sleep and she gets more and more tired during the day. The mouth doesn't moisten the incoming air like the nose does, so she has a sore throat from breathing dry air all night. She gets pretty cranky.

Her mother soothes her by putting a pacifier in her mouth most of the time. She also gives her extra bottles to keep her hydrated.

When she sleeps, which is now more often, her mother puts a pacifier in her mouth to help her sleep. She spits it out so she can keep her mouth open for breathing. Her mother puts it back in every time she checks on the girl.

Her mother doesn't realize that she is making the girl's problems worse with the pacifier and extra bottles.

The Cycle Continues

As the nasal airways keep shrinking, she keeps breathing through her mouth. Bacteria, viruses and allergens don't get filtered in the nasal passages. They head down into the lungs unimpeded. She gets sick asgain and develops a stuffy nose. She continues to breathe through her mouth. That lets the cheeks and lips squeeze the palate without resistance. The palate gets pushed up and narrows the nasal airways further.

The cycle goes around again. And again.

The Tongue Lies Low

The tongue is now well trained to stay low and out of the way of the incoming air. Even if the child's nasal airways eventually open up when she gets over her illness, the tongue continues to stay locked to the floor of the mouth.

However, because the tongue is not doing its job as Official Protector of the Palate, the nasal airways continue to narrow even further.

Chronic Mouth Breathing: 24/7

Eventually, the child "forgets" how to breathe through the nose. The mouth begins to hang open throughout the day.

The tongue tries to help the body get as much air as possible. It does this by lying on the floor of the mouth where it won't be in the way of incoming air.

Fixing Type 2 Sleep Disordered Breathing

Expanding the Palate

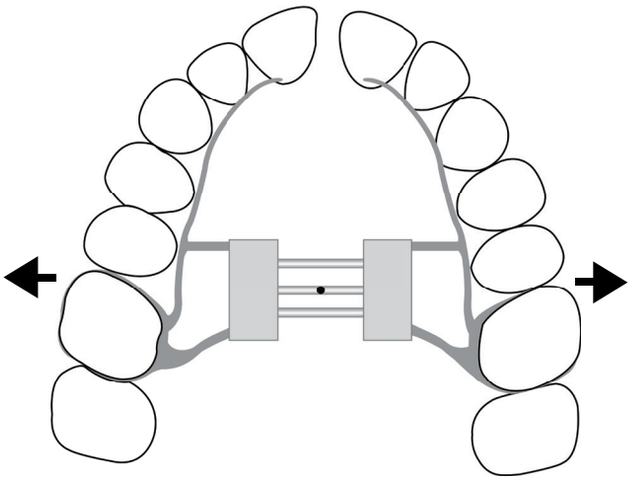
By using orthodontic appliances, a qualified sleep dentist can artificially expand the palate. When the width of the palate is expanded, the upper jaw and facial structure are expanded as well which, in turn, expands the child's nasal airways.

In addition, fun oral exercises and different food choices are encouraged. The Guided Growth program gives children and their parents a "Do-Over" opportunity. Both the parents and their child get to shout out, "Do Over!" and get a second chance for that child to be healthier, happier and rid of the social, behavioral and physical problems that we discussed at the beginning of this book.

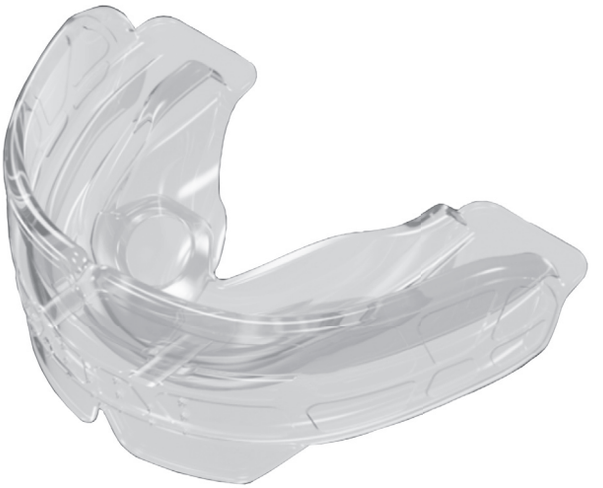
Rapid Palatal Expander

One solution is a Rapid Palatal Expander, which is attached to the upper molars either by bonding or the use of cemented bands.

The metal appliance is adjusted periodically.



Palatal Expander Widens Palate



Myo-Functional System

The Myo-Functional system consists of a series of intra-oral appliances that are worn 1-2 hours per day and while sleeping. These appliances expand the arch form by exerting light forces to align the teeth and jaws.

SDB Case #468

Shondra, at the age of five, was having trouble sleeping at night. She had just started kindergarten and was having some troubles in school.

Her pediatrician suspected Sleep Disordered Breathing and ordered a sleep test.

Shondra had a crossbite and a narrow, raised palate. She was a mouth breather, snored and sometimes choked during sleep.

Guided Growth Plus Expanded Palate Treatment

After being referred for Guided Growth and palate expansion, Shondra's lower face and jaw began to fill out and she found it easier to breathe through her nose. She began getting the restorative and rejuvenating sleep that her energetic body demanded.

Not only did her facial structure change, her behavior turned around as well. Being well-rested, she was no longer so anxious about little things and that made her a calmer, happier little girl.

As she matured, Shondra's permanent teeth came in just where they were supposed to and her face remained symmetrical and balanced.

Indicators of Sleep Disordered Breathing

You may ask, "How do I know if my child has Sleep Disordered Breathing?"

There are physical indicators or characteristics that have been shown to accompany Sleep Disordered Breathing in children. Of course, it's not a hard and fast rule that children with SDB will have these characteristics. However, when they are accompanied by one or more of the negative health and social symptoms discussed at the start of this book, you should consult with a qualified sleep medicine dentist.

Snoring/Sleep Apnea

If the child is snoring or having sleep apnea episodes, it might be from Type 1 SDB.

Crowded Teeth

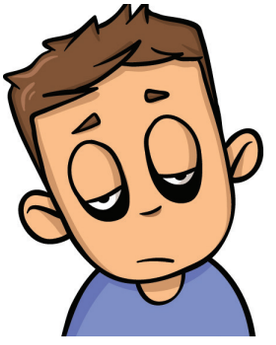
Children with Type 2 SDB often have overcrowding of the upper teeth.

Receding Chin

A receding chin is a classic sign of Type 1 SDB where the lower jaw and tongue are blocking the airway in the throat.

Dark Circles

Children who are not getting restful, restorative sleep at night develop distictive dark circles under their eyes. Their eyelids may sag and they look like an adult who has been out partying all night.



24/7 Mouth Breathing

Type 2 SDB blocks the airways in the nose so children get their oxygen through the mouth.

Dry and Swollen Tonsils

Type 2 SDB makes children breathe dry air through the mouth making the tonsils swollen and irritated.

Where Do We Go From Here?

The good news is that whether a child is just beginning to show signs of Sleep Disordered Breathing or has done so for years, dentistry can help.

In fact, in cases where the development of a compromised airway is caught early enough, a qualified dentist can most likely fix the problem, they can oftentimes reverse the damage and restore the child's ability to breathe freely through the night.

As for you, from now on, you'll always see children differently. Everywhere you go, you'll be aware of tired children standing in the background with dark circles under their eyes, stunted chins and crowded and/or crooked upper teeth.

Please share with other parents what you know about Sleep Disordered Breathing.

Go ahead and give them our contact information.

You might change a child's life.

It’s Hard To Imagine Now...

...but, just two years ago, one of them was a bed wetter. Another one was in danger of not passing into the next grade because defiant refusal to do one’s homework does not make for good grades.

The oldest one had no friends because of his bullying and the youngest had anxiety attacks that made going on a family vacation a nightmare for everyone involved. They weren’t “bad” kids but they had a problem.

They ALL had Sleep Disordered Breathing and were not getting a fully rejuvenating night of sleep. However, after completing a program of Guided Growth and Palate Expansion, their lives have improved significantly.

They’re no “Li’l Angels”, but they are much happier kids and have put their SDB symptoms behind them. Here, they’re having some fun displaying the smarter, stronger tongues they developed during the Guided Growth program.