EARLY TREATMENT

For some people, early orthodontic treatment means that a child simply has braces placed on the teeth at a young age. While that concept may be somewhat true, early orthodontic treatment embodies considerably more than moving the teeth. Early treatment philosophy includes a basic understanding that the body has an innate ability to heal itself. When faced with structural problems such as orthodontic problems, it helps to understand that most of these problems are due to structural or functional deficiencies, and that the body needs a little help to "outgrow" these problems.

First Phase Treatment: Your foundation for a lifetime of beautiful teeth

The primary goals of the first phase of treatment are to develop the jaw size in order to accommodate all the permanent teeth and to relate the upper and lower jaws to each other. Children will typically exhibit early signs of jaw problems as they grow and develop. An upper and lower jaw that is growing too much or not enough can be recognized at an early age. If children after age 6 are found to have this jaw discrepancy, they are ideal candidates for early orthodontic treatment. This phase typically is accomplished over a 16-18 month period of time before a resting phase is recommended to periodically monitor development until which time all remaining permanent teeth erupt.

Resting Period and Periodic Observation

In this phase, the remaining permanent teeth are allowed to erupt while retaining the accomplishments of the initial phase. The retainers are adjusted in such a manner to retain the dental alignment but not interfere with growth and development. A successful first phase will have created and maintained room for the remaining permanent teeth to find an eruption path in as close to an ideal position as possible.

It is important to understand that by the end of the initial phase of treatment, the teeth are not in their final positions. Once all the remaining permanent teeth erupt, decisions can be made regarding the treatment options available to achieve functional and esthetic stability.

Two-phase orthodontic treatment is a very specialized process that encompasses orthopedic influence on the developing facial bones and alignment of key teeth as a means of maintaining all permanent teeth for the most optimal functional and esthetic result with proven long-term stability.
Planning now can save your smile later

Because they are growing rapidly, children can benefit enormously from an early phase of orthodontic treatment utilizing appliances that direct the growth relationship of the upper and lower jaws and help them outgrow the problem. Thus, a good foundation can be established, providing adequate room for the eruption of all permanent teeth. This early correction typically will prevent later removal of permanent teeth to correct overcrowding and/or surgical procedures to align the upper and lower jaws. Leaving such a condition untreated until all permanent teeth erupt could result in a jaw discrepancy too severe to achieve an optimal result with braces alone and can strongly predispose one to jaw joint problems later in life. In other words, delay will also potentially cause unnecessary damage to the jaw joints. This is the best opportunity to take advantage of the principle of FORM and FUNCTION, which will be discussed later.

Second Phase Treatment: Stay healthy and look attractive

The goal of the second phase is to make sure each tooth has an exact location in the mouth where it is in harmony with the lips, cheeks, tongue, other teeth, and the jaw joints. When this equilibrium is established, the teeth will function together properly with the best likelihood for long-term stability.

Movement & Retention

At the beginning of the first phase, orthodontic records were made and a diagnosis and treatment plan established. Certain types of appliances were used in the first phase, as dictated by the problem. The second phase is initiated when all permanent teeth have erupted, and usually requires braces on all the teeth for an average of 18-24 months. Retainers are worn after this phase to ensure you retain your beautiful smile.

So……what about this idea called Form and Function?

FORM <-> FUNCTION

The reason one needs to consider treating a child when younger is to capture the assistance of growth and development. This approach establishes a considerably better foundation for long-term stability. We saw this for ourselves in East Germany in 1979 when our research team was able to evaluate the orthopedic/orthodontic stability after 10-15 years after treatment was completed. Personally, what I saw was considerably better than what we were achieving in the United States. We all know someone who had orthodontic treatment previously and still look like they need orthodontic treatment. What was the major difference here?

In East Germany, the children received their first orthodontic evaluation by age 7. By American standards, this was considered too early; the old orthodontic thinking was to wait until all permanent came in. Waiting means that growth is not going to help create the best foundation for a stable outcome. There is a reciprocal relationship between FORM and FUNCTION. What this means is that structural discrepancies will determine function, which in turn determines form. In other words, the body will adapt or compensate for any imbalances in the system (structure or FORM), which in turn will determine FUNCTION and so the balancing act continues. Some of this adaptation will lead to functional disturbances and will alter how the facial bones develop (FORM).
Let’s use the example of breathing. If a child is a “mouth breather” at night (FUNCTION), the facial bones will develop differently (FORM) usually resulting in narrow jaw structure, and a facial height that is longer than normal. **One of the most important considerations for a growing child is to make sure that breathing dynamics are normal.** So the next question should be: why is my child “mouthbreathing?” Obstruction to the nasal airways involving enlarged adenoids and tonsils can be obstructive to normal nasal breathing. However, these potential airway conditions should illicit the following question: why are the adenoids and tonsils enlarged anyway? If a child as a history of allergies, then the next question should be: Why does he have allergies?” At times, it is important to consult with the pediatrician or an ENT specialist for an evaluation.

As our routine; however, we take a naturopathic approach to these issues and discuss matters of nutrition [see Nutrition Matters] and all other underlying causes behind the malocclusion and airway problem. As in all health matters, failure to identify and treat the underlying issues, will ultimately result in, you guessed it, failure. Did you know that the most common reasons for allergies and sinus issues are related to poor nutrition and unsuspecting sensitivities to the foods we commonly eat, which in turn can cause disturbances in our endocrine system? Genetics? I don’t believe so. The current scientific evidence, since the identification of the human genome in 2003, suggests that we can influence at least 70% of our genetic expression. The good news is that we can significantly influence our health outcomes. The bad news, is that we can significantly influence our health outcomes. Whoa!! I hate the words responsibility and accountability. More on nutrition later [Click on Nutrition Matters].

**Begin With An Accurate and Comprehensive Diagnosis**

**AIRWAY OR BREATHING DYNAMICS**

**What Does “Mouthbreathing” Look Like?**

As parents, more often than not, we just know if our child is breathing through the nose or mouth. Of concern is whether or not “mouthbreathing” is occurring at night or at rest. Perhaps the following pictures will help us recognize “mouthbreathing” if unsure:

![Confirmed mouthbreathing while sleeping. Dad?! This is embarrassing. This is my youngest son.](image)
The presence of an openbite is related to an unfavorable tongue position, which in turn is most often associated with “mouthbreathing.” Quite common in “mouthbreathers” is a lower lip that is at least twice as large as the upper lip.

“Mouthbreathing” while sleeping. Note the abnormal tongue position (low and forward), which can influence excessive development of the lower jaw, insufficient growth of the upper jaw, or failure of the teeth to come together or “mech.”

This photograph typifies the “adenoid face” look in a “mouthbreather.” Notice the area under the eyes; often referred to as “allergic shiners.” The lips’ have basically no “tonicity” or muscular contraction potential. Quite often, the openings to the nose remain quite small because they do not develop to normal size due to the absence of FUNCTION.
During the clinical evaluation, the well-trained specialist will assess the facial characteristics as well as the presence of enlarged tonsils, turbinates, adenoids, nasal cartilage, and tongue position.

A. “Mouthbreathing” due to an obstructive airway caused by enlarged adenoids.

B. The facial appearance after the obstruction was removed.

Adult patient who had previous orthodontic treatment involving tooth removal and upon a review of medical history, he denied that he was a “mouthbreather.” Well, we caught him in the act as he dozed off in the dental chair. You can also see how facial growth was altered causing a gummy smile line due to vertical over development of his upper jaw. Reason for failure: an undiagnosed breathing problem.

This is another example of a “mouthbreather.” In her case, she has somewhat of a “dull” appearance, insufficient development of the cheek bones, narrow nostrils, a flaccid lower lip, a tendency for a longer lower third of her face, and a receded lower jaw. In her case, all of the above clinical assessments are a result of “mouthbreathing” and failure to recognize it early enough in her development.
Adenoids:

Enlarged adenoids that may be obstructive

When discussing enlarged tissues that may impair normal nasal breathing, I am not advocating drugs or surgery as a first line of defense. Rather I am suggesting an acute awareness that obstructed breathing can interfere with normal dento-facial development and significantly impair the FORM FUNCTION environment. I am suggesting that underlying factors be considered for a more holistic approach to managing naso-respiratory dynamics.
Tonsils:

Very enlarged tonsils, which can lead to an unfavorable tongue position. This finding does not mean that the tonsils need to be removed. It definitely means that the specialist needs to determine what affects the enlarged tonsils have on facial growth and the positions of the teeth. This is also an indication for determining the cause of the enlarged tonsils.

Turbinates:

Enlarged tonsils can displace the tongue in a forward and lower tongue position. In this image, space is observed above the tongue and below the palate or roof of the mouth. This space will not exist with normal or favorable tongue position. If the tongue is not resting in the roof of the mouth, normal development of the upper jaw will not take place usually resulting in a deficiency in size. If the tongue remains in a low, forward position, as in this illustration, excessive lower jaw development is a possibility as is protrusion of the lower front teeth.

Turbinates are normal structures within the nose. Quite often the soft-tissue covering (mucous membrane) can become inflamed due to “allergic rhinitis”. With inflammation comes enlargement and, thus, obstruction. Again, determine cause.
Clinically, the specialist can look up the nose to assess enlargement and the presence of an inflammatory response perhaps due to an allergen, such as a food sensitivity or absence of certain nutrients so often missing in our food supply today.

Enlarged turbinates can be observed on a standard orthodontic x-ray called a lateral cephalogram. On this image, one can see an enlarged turbinate “bulging” out the back of the nose, which can be obstructive to normal nasal breathing. Again, “cause” and “effect” needs to be very much a part of overall diagnosis and treatment plan.
The orthodontic specialist should obtain a frontal x-ray to assess for the presence of asymmetries as well as for septal deviation. Even though this particular x-ray is not a 100% confirmation of turbinate enlargement, it can provide the specialist with an idea of the airway opening or patency and attach concern where needed relative to the patient’s medical history and clinical presentation. The picture to the left, will give you some idea of relative patency or opening for unrestricted airflow.

**The Deviated Nasal Septum:**

This is an example of a significantly deviated nasal septum causing a smaller nasal chamber on the side of the deviation, which can be a cause of impaired nasal breathing. A referral to an ENT specialist is appropriate for a clinical assessment. Birthing trauma as well as a “blow” to the nose can cause a deviation in the nasal cartilage.
Tongue-Tie:

Airway obstruction is not the only reason for an abnormal tongue position. A “tongue-tie” is another reason. The picture on the left side illustrates a tongue-tie relationship:

Tongue-tie due to a fibrous connective tissue attachment just behind the lower incisors.
To Sum It All Up:

Failure to factor in airway dynamics into any treatment plan involving growth and development will only result in more failure. The orthodontic specialist needs to place airway management as the number one consideration to normalize dental and skeletal development whether it be in a growing child, an adult patient, or a TMJ patient. This is a first line consideration and is not to be overlooked. Airway considerations affect posture as well:

Airway obstruction is often associated with a forward head posture as the body will compensate for abnormalities in one area by making adjustments in other areas. This is just another example of:

**FORM** —> **FUNCTION**

Forward head posture

Improved head posture
This is not new information. It has been around in medical journals since the 1930’s. Below is an excerpt that appeared in a medical journal over 25 years ago.

As a naturopathic physician / orthodontist, I embrace a more holistic approach. Let’s intervene early to prevent the problems in the first place or at least reduce the severity. This is the time when you have the greatest opportunity to influence growth and development, avoid extractions of teeth, prevent early damage to the jaw joints, and arrive at the most esthetic and stable / durable outcome.

What’s next? Let’s take a look at more easily recognized features that contribute to bite disharmonies or malocclusions in general and the treatment objectives associated with these discrepancies. Since most orthodontic problems are problems of deficiencies and occasionally excesses, let’s now take a look one of the most common reasons for crowded and protruded teeth: narrow arch form or arch deficiency. Let’s begin with the upper jaw as it influences all other considerations.
The Upper Jaw:

This is a picture of an upper arch (upper dentition) exhibiting an ideal width and shape in one of our orthodontically treated patients. By seeing an ideal shape, you can more easily draw a distinction between normal or constricted arch form. A distinction can easily be drawn between the optimal size and shape to the narrow upper arch:

Other examples of a narrow upper jaw include the following:

Assessing a narrow upper jaw from the frontal view:

These two cases present with exceptionally narrow upper jaws with crossbites on both sides. You will also notice that there is no overlap of the upper front teeth over the lower front teeth. This relationship is called an anterior openbite, which is most often associated with "mouthbreathing" and an unfavorable tongue position.
Treatment progression

More ideal shape and FORM

Narrow upper arch

Approaching a more optimal size and shape

Adult: Narrow upper arch

Optimal upper arch with all teeth maintained

Hopefully, these comparisons helped..........now let's look at examples of a narrow lower arch form:
The lower dental arch:

Whenever you see crowding, the immediate assumption is that the dental arch is too small. These cases are examples of various degrees of arch constriction leading to crowding. In the mixed dentition (combination of “baby” teeth and permanent teeth, you have the best opportunity of keeping all of the permanent teeth through growth guidance using orthopedic devices designed by the orthodontic specialist. Remember, this is best done before all the permanent teeth erupt.

Hopefully, these comparisons help............now let’s look at examples of a narrow lower arch form:
**Treatment Progression:**

What can one expect the progression to look like during the initial phase of care in a two-phase treatment plan?

- **Narrow upper arch**
  - Treatment progression
  - More ideal shape and **FORM**

- **Narrow lower arch**
  - Approaching a more optimal size and shape
  - Progressive development of the lower jaw
Narrow lower jaw:

Progressive development of the lower jaw

Note the inadequate space for the lower permanent cuspids.

Note that with expansion of the lower arch, room was created for the lower cuspids.

After expansion, we then proceed to **align “key” permanent teeth** in readiness for the development and eruption of the remaining teeth.

The four upper and lower front teeth and first molars are referred to as the “key” permanent teeth positioned in such a manner as to maintain space for the remaining permanent teeth.
The Mixed Dentition: Age range from 7-10

It is impressive to see the “activity” going on under the surface in the mixed dentition. All of this activity can be “directed” to arrive at the most optimal outcome that has no rival in esthetics, function, maintaining TMJ integrity, and long-term stability.

Treatment in Two Phases:

The primary treatment objectives for a two-phase treatment protocol:

1. Establish normal airway
2. Expand the upper and lower arches to make room for all permanent teeth
3. Reduce any growth discrepancies between the upper and lower jaws
4. Align certain “key” teeth to facilitate the eruption and favorable positioning of all remaining permanent teeth.
5. Treat the upper and lower jaws together as part of a functional “system.”

What does the last statement mean?

Quite often a provider will expand the upper jaw without doing anything else. If one does not address the deficiency problems elsewhere, such as in the lower jaw, the non-treated area will negatively influence the treatment accomplishments and the expansion to the upper jaw will be lost, for example.

NOTE: Narrow upper and lower jaws need to be addressed at the same time!!
Now what?

Let’s now look at deep overbites. Not the “buck” tooth kind but the vertical kind:

The picture to the left demonstrates an example of a deep, vertical overbite; the kind that is most damaging to the jaw joints and restricts normal lower jaw development. The upper teeth in this instance appear to be “pushed-in” or retruded, further complicating the problem. A primary treatment objective is to eliminate the deep overbite and reposition the upper front teeth soon as possible to facilitate normal lower jaw development and prevent damage to the developing jaw joints (TMJ).

This is another example of a deep overbite involving the right side and protrusion of an upper front tooth on the left side. It is the tooth on the right side that can restrict normal lower jaw development.

Again, the presence of a deep overbite. For comparisons, a vertical overbite should be about 10% meaning that the upper front teeth should only overlap the lower front teeth by about 10-20%.

Consistent with a deep overbite, we often find a receded or underdeveloped lower jaw. So what does this look like? Let’s do a little facial profiling then:
Facial Profiling:

The facial profile commonly associated with a deep overbite is that of a receded lower jaw. This could mean that the lower jaw is underdeveloped at this age, or is displaced in a “backward” relationship compromising the integrity of the developing jaw joint. Images of the jaw joint are recommended to assess the
Early intervention provides the best outcome without comprise or surgery:

This patient had a receded lower jaw due the presence of a deep overbite and narrow upper jaw structure. Prior to the eruption of all permanent teeth, we placed in orthopedic appliance to facilitate lower jaw development thus avoiding more complicated intervention at a later date.

Before: 

After:

The Openbite

Well, what about the opposite extreme..............................................the openbite?

The six views above represent various openbite conditions; most of which are due to abnormal tongue position and airway obstruction. Inadequate vertical overlap of the upper front teeth over the lower
front teeth can be caused by digital habits as well, but the most common cause is the airway/tongue position relationship.

**For comparison:**

Openbite  Optimal overbite relationship

Openbite  Deep overbite

**Crossbites:**

From simple to complex:

**Simple:**
The "Underbite" or anterior crossbite: more complex

Crossbites involving single teeth quite often are related to crowding. It is recommended that as soon as a crossbite is detected, it should be corrected. The displaced right lateral incisor above could not be repositioned until which time the upper jaw was expanded to make room for the displaced tooth.

This image demonstrates a crossbite relationship of the upper and lower front teeth and is oftentimes referred to as an “underbite.” It is very important to “unlock” this crossbite as soon as possible to avoid restriction of upper jaw growth and “over-growth” of the lower jaw.
The image to the left illustrates the correction of the crossbite in the primary dentition roughly between the ages of 3-5.

This young 5 ½ year old presented with a concave facial profile with a prominent chin. Her front teeth were in a crossbite relationship. Failure to address this problem at a young age when the specialist can “re-direct” growth, will predispose a patient to a more significant imbalance involving the jaw bones, teeth, and jaw joints necessitating surgical assistance at a later date when growth has been completed. This is a good example of the FORM \(\rightarrow\) FUNCTION model of growth and development.
Class III before and after case

Using early facial orthopedics at age 5 ½, we were able to “unlock” the crossbite and improve the facial profile.

Bilateral crossbite involving a group of teeth on both sides. In order for the lower teeth to fit, the lower jaw will posture or move forward to accommodate a functional fit [FORM and FUNCTION] quite often leading to overdevelopment of the lower jaw. Let’s look at this case in the progression from BEFORE to AFTER.
Oftentimes, a crossbite can occur just on one side, which will cause the lower jaw to be positioned to the right or the left, but not on center. If the crossbite persists, the lower jaw will grow more on one side than the other leading to a jaw asymmetry requiring surgical assistance for correction.

Again, facial profiling:

For comparison: facial profiles....sometimes the differences are quite subtle and oftentimes not so subtle

Receded lower jaw  Well-balanced profile  Prominent lower jaw
So Why Is It So Important to Maintain Your Teeth:

As in all of health care, it is important to address the underlying causes as the ultimate treatment objective. To extract or remove teeth is addressing symptoms pretty much like conventional medicine prescribes a drug for every diagnosis and one for every symptom. Please understand, there is no statistical difference in tooth size from those individuals who have crowding from those who exhibit no crowding. It is a matter of jaw size. Remember: *crowding or protrusion typically results from the presence of narrow jaw structure.* So what’s the big deal anyway? Well, at least three concerns....functional and esthetic. Let’s talk about appearance first as that seems to be what most people care about.

Problem Number One: Esthetics

Think about this....tooth removal most often reduces lip support. In other words, the lips “sink in” somewhat reducing the lip prominence and thickness. As this occurs, the lines extending from the nose to the lip deeps and becomes pronounced over time. The marionette lines deepen as well. These are the parentheses (    ) on each side of the mouth extending toward the chin. Please see the examples below of patients who had previous orthodontic treatment involving tooth removal:

Extraction Profile:

![Extraction Profile](image)

Very thin lips and marionette lines due to a loss of lip support from orthodontic extraction therapy.
Deepened naso-labial folds  Marionette lines  Very thin, unsupported lips

These patients have two options:

1. Orthodontic treatment to improve lip support with or without surgery to bring the upper jaw forward;
2. Dermal fillers such as Juvederm Ultra, Restylane, or Platelet Rich Plasma (prp)....see Dermal Fillers

The example below will give you some idea of what happens to the upper front teeth when teeth are removed:

“Over-retraction” of the upper front teeth with extraction compared to the positions of the front teeth on the non-extraction side. It is not too difficult to see how this “over-retraction” can contribute to a loss of lip support.

Problem Number 2: Jaw-joint Dysfunction

“Over-retraction” of the upper front teeth will cause the lower jaw to close in a more backward direction, this predisposing one to jaw joint problems called temporomandibular dysfunction (TMD/TMJ), which is the most common reason for chronic head and neck pain, joint noises, limited opening, and loss of the normal curvature of the spine. [See TMD/TMJ for more information].
The illustration below demonstrates what happens to the TMJ space when the jaw closes more in a backward position. The middle illustration is a dramatization to show how the front teeth influence a “push-back”, and the x-ray image on the right side demonstrates how the joint space is reduced. YOU DO NOT WANT THE JOINT SPACE VIOLATED...PERIOD!!!

Tomographic Image of the right jaw joint (TMJ):

I don’t want to get into a TMJ course or seminar here, but want you to understand what Steven Covey stated several years ago: “Begin with the end in mind.” In most cases, if teeth are removed, then be prepared for the consequences! By starting early, you can do so much for a child and prevent future problems.

Problem Number Three: Sleep Apnea

If we pay close attention to the illustration above, we can’t help but notice that the mouth is now smaller. Most often the mouth was small to begin with leading to the decision to remove teeth. Once over-retraction occurs, a small mouth has just become smaller. The net result: reduced oral volume. The tongue size remains the same and often becomes larger or “thickened” as we age due to a more sluggish metabolism. Unknowingly, the tongue no longer has the room that it once had relative to the space available and will find additional space or somewhere to go. Most commonly, the tongue will then “fall” into the oropharyngeal space or throat leading to interrupted breathing or sleep apnea.

Again, once we realize the importance of a two-phase level of care and the problems associated with not taking the opportunity to arrive at a better overall result, why would we want to predispose a loved-one to future problems?