A new standard is needed for earlier orthodontic (teeth) and orthopedic (jaw-bone) diagnosis and treatment from birth to age eight. It is warranted because published research increasingly shows that small jaws create small airways and increase the likelihood of life-threatening disorders, for life. Jaw and airway related disorders like sleep apnea have direct relationships to hypertension, heart disease and premature death have been discovered. Increasing the size of the jaws and airway during early growth and development may reduce human disease.

Since the upper and lower jawbones form the gateway to the human airway, earlier orthodontic and orthopedic jaw treatments are needed to help more small jaws and airways reach their full growth potential. Although chronological growth of the jaws needs to be better understood, it seems clear that earlier treatments cause complimentary orthopedic and orthodontic results while treatment at later ages increasingly produces less orthopedic and more orthodontic results.

This article will review some background and present some specific steps clinicians can take to provide earlier orthodontic and Functional Jaw Orthopedic (FJO) diagnosis and treatment. This article will show some early treatment techniques with patient outcomes that exhibit the various unique health benefits of earlier orthodontic and orthopedic treatment.

Newer multi-phase FJO diagnosis and treatment approaches can increase early treatment effectiveness, as well as long term overall efficiency. A new FJO protocol of routine multi-phase orthodontic examination, diagnosis and treatment involving the general dentist, pediatric dentist and orthodontist can result in superior unique health benefits for the patient. These new FJO concepts may very well help general dentists, pediatric dentists and orthodontists move dental care into a future world of medical dentistry that will include the airway, breathing, bed-wetting, ear disease, heart disease and longevity.

Early orthodontic treatment is very controversial, even among dentists. Just the definition of early orthodontics can cause major conflicts of opinion. General dentists, pediatric dentists and orthodontists all have different early orthodontic treatment approaches and protocols. Likewise, they all also have different perspectives on the advantages, disadvantages, scope and outcomes of current early treatment, which generally begins in the mixed dentition stage before all adult teeth have erupted.

Some practitioners consider early orthodontic treatment to be inefficient although they increasingly admit it is effective. The perceived inefficiency is most likely due to the general approach and protocol more than anything else. Additionally, a lack of understanding of the potential lifelong benefits of earlier orthodontic and orthopedic treatment also suppresses acceptance of earlier multi-phase therapy.

The main goal of all early orthodontic and treatment protocols should always be to provide the highest quality health service to each individual patient. Cost, convenience and efficiency are factors to consider in any health treatment. However, optimal pediatric outcomes (good balanced jaws, open airways and stable occlusion) must remain the predominant priority. Early treatment, when indicated, achieves some results that later treatment often cannot. For example, it has been shown that treatment of Class III malocclusion at age 5 results in orthopedic changes while treatment starting at age 9 yields mostly orthodontic tooth movement changes.

A review of current clubfoot pediatric orthopedic protocols, which starts at birth, is important to understanding why earlier orthodontic and jaw treatment protocols should also start at birth. Clubfoot bones and malformed jawbones have parallel needs and parallel growth patterns, but rather different treatment timing approaches. Today, clubfoot bones are routinely examined, diagnosed and treated beginning at birth. Conversely, substandard maxilla and mandible jawbones are not routinely examined, diagnosed and treated until after age 6, after about 80% of growth is already finished.

A clubfoot is an abnormal condition of the foot, which is usually present and very visible at birth. About one in every 1,000 babies are born with one clubfoot and about one in 2,000 will have both feet affected. The primary cause of a clubfoot is unknown. A clubfoot is commonly bent downward and inward and may also be rotated. Diagnosis can sometimes be made in utero. Active treatment begins as soon as possible after birth, often within days. Early treatment may involve massage, manipulation, physical therapy, splints, taping, orthopedic casts, braces and even surgery. Some deformities are mild and others are severe, so treatments and outcomes vary. A clubfoot deformity will not usually improve on its own. Untreated, it will usually worsen and become unsightly and crippling. At birth, early clubfoot treatment is a medical priority.

Diagnosis of a clubfoot is much easier than diagnosis of an abnormal jaw. The dramatic difference in diagnostic capability results in a major difference in the timing of orthopedic treatment. Early foot examination can rather easily lead to early recognition, diagnosis and treatment of a very distinct clubfoot deformity. Conversely, an abnormal jawbone can be quite subtle in its irregularity.

**Proper Jaw Formation Is Influenced By Many Complex & Variable Factors**
- Genetics
- Diet & Drugs
- Birth & Delivery
- Maternal Factors & O2
- Breast Smoking
- Bottle Smoking
- Pacifier Smoking
- Environment
- Fingers & Lip Habits
- Swallowing Patterns
- Breathing Patterns
- Airway Development
- Sleeping Positions
- Occlusal Patterns
- FJO Supervision
- FJO Treatments
disassumed by the untrained eye. As a result, early upper and lower jaw active treatment protocols often have upper and lower teeth that are not aligned, and the true medical need goes unrealized.

Early jaw treatment is relatively nonexistent for most children under six years of age today because early diagnosis is relatively nonexistent. Hospital professionals in the health fields currently associated with birth and delivery lack orthodontic jaw diagnostic and therapy training.

A void in early jaw healthcare, “real” early orthodontic and orthopedic diagnosis and treatment, is clear and present. Health professionals in general lack the training and ability to recognize early maxilla and mandible deformity in children less than six years of age.

The current orthodontic specialty protocol that recommends an orthodontic screening by age 7 confirms the early jaw diagnoses gap and the indisputable need for earlier diagnostic training. Orthopedic jaw treatments from birth to age 8 will likely become a health priority once the diagnostic and treatment protocols are better defined and the health benefits are better understood.

The void in early orthodontic and early jaw knowledge and treatment is wide, even at the research level. The late medical researcher, writer and lecturer Dr. James F. Bosma (M.D.) wrote in his 1989 book, Anatomy of the Infant Head, “the death of anatomical information about postnatal anatomical changes continues to handicap understanding of the processes that of development”. Moreover, Dr. J. Daniel Sultenfuss (D.M.S.) wrote in his 2006 book, Early Orthodontic Treatment, “Much information needs to be added to our understanding of early orthodontics... long term observations of early orthodontic treatments are needed with the fact that such treatment has not been routinely pursued.”

The need for earlier orthodontics and orthopedics is clear. The upper and lower jawbones form the gateway to the human airway. Both jawbones are about 80% developed by age 6 and over 90% developed by ages 10–12. Jaw treatments from birth to age 8 can significantly improve both jawbones. New jaw growth outcomes are better than the protocols used today on older children after most jawbone growth has occurred. The formation of a new earlier diagnosis protocol, treatment protocol and standard is warranted.

Normal jaw growth and development depends upon many factors, including a good airway, diet, habits and genetics. Braces play an unquestionable role in normal jaw growth and development. Interestingly, airway, diet and habits play a primary role as the overall determinant in determining final abnormal jaw growth outcomes. While good jaws are important to having a good airway, a good airway is important to maintaining proper jaw growth and development, and in preventing jaw deformity. Diet and habits pre- and postconception are well known to affect normal bone development.

Almost half (50%) of jaw bone growth occurs before birth, especially in the maxilla. At birth, the tongue is also about 50% grown. The palate of a newborn is relatively short and high vaulted compared to the adult. As early as 1960, the palate of the average newborn was recorded to be approximately 27 mm wide from ridge to ridge at the mid-palate. Other observations confirm the average palate at birth is over 50% of an adult mid-palate width of 40–50 mm. At birth, palates come in a number of different but rather specific shapes and sizes. The preferred palatal shape at birth could be called a “U” palate because it resembles a broad “U” shaped horseshoe. Substandard palate shapes such as the narrow palate, high vaulted palate or bubble palate high peaked palate would be non-preferred shapes. These “non-U” shaped palates commonly cause a number of problems. Non-U shaped palates can interfere with breastfeeding, which is needed for early jaw and fetal development. Non-U shaped palates can reduce nasal breathing space, which reduces healthful nasal breathing, promote harmful mouth breathing and deforms jaws. Untreated non-U shaped palates can restrict and prevent full growth and development of both the maxilla and mandible for life.

The forces of birth (contractions and forces) often produce undiagnosed asymmetrical maxillae and mandibles. Just as the forces of delivery are strong enough to produce a “cone-headed” newborn, they can also alter the nasal septum, the maxilla and the mandible. Birth pressures have often been blamed as a major cause of nasal septum deformation and dental malocclusion.

After birth, the maxilla and mandible must grow forward and position down and forward in order to attain full size during their 20-plus year growth cycle. It is essential to understand that the maxilla and mandible interface throughout life, especially during the early stages of development. The size and position of either jawbone can affect the other jawbone during growth and development, and continue to do so for life. If either jawbone is distorted—too small, too narrow, too large, too wide, too protruded or too retruded—normal growth of both bones can be negatively affected. The earliest possible jaw treatment can have the greatest effect on jawbone growth. The type of early orthodontic treatment matters because certain jaw treatments will affect the other. For example, either a small maxilla or distal forces on a maxilla can distort a mandible.

Abnormal maxilla shape can only be clearly observed at birth. A cleft-palate is commonly diagnosed when present at birth. A severely retruded (retrogнат) mandible is the common abnormal feature of the maxilla recorded at birth because it signals a high risk for a blocked airway, breathing difficulties and even sudden infant death. Less distinctive abnormal upper and lower jaws are harder to recognize and diagnose.

Abnormal jaw growth can be distinct and has been recorded for both the maxilla and the mandible at birth. A cleft-palate is commonly diagnosed when present at birth. A severely retruded (retrogнат) mandible is the common abnormal feature of the maxilla recorded at birth because it signals a high risk for a blocked airway, breathing difficulties and even sudden infant death. Less distinctive abnormal upper and lower jaws are harder to recognize and diagnose.

Abnormal maxilla shape can promote continuous abnormal upper and lower jaw growth. When the palatal shelves join in utero but do not fall and flatten, they can remain high and obstruct the nasal space. Small, palate, bubble-peaked “palates” promote abnormal jaw development often seen as a skeletal open bite. Lack of breathing, use of pacifiers and bottles, and the very associated finger sucking habits also can deform jaws, especially the maxilla.

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Upper and lower jaw growth can best be guided with early appliances instead of extractions for most patients. The past few decades saw a back and forth swing in orthodontics from extraction to non-extraction techniques. Just a few decades ago, over 70% of teenage orthodontic patients had numerous teeth removed in order to align crowded dental arches. Now less than 25% have the need for such extensive extractions because of dental arch and jaw development techniques. Serial extractions, a form of guided dental arch collapse, have declined dramatically. Phased orthodontic treatments have increased and so have the end-sizes of dental arches and related airways. Guided jaw growth is becoming the norm for progressive practitioners, to the benefit of their patients.

Lifelong interceptive Functional Jaw Orthopedics (FJO) can help develop and maintain good airways, good jaw balance and changing dental occlusions. Multi-phase FJO treatments have contributed dramatically to the decline in extractions and recurrence overall lengths of treatment for many patients. Earlier application of FJO appliance...
treatment phases can benefit the patient dramatically. Earlier FJO treatment can help guide jaw growth, reduce aggregate treatment times and increase benefi-
cial treatment results. It is no-
table that while just a few years ago many believed jaw growth could not be stimulated with ap-
pliances, newer research has shown it to be very possible.

To apply new earlier FJO or-thodontic and orthopedic princi-
pies requires five key steps.

Step #1 Recommend preconception and prebirth nutrition counseling. This is the first step in the new era of early preventive orthodontics. A few cultures worldwide encourage mothers to go on special nutritious diets for months before conception, not just afterward, in order to in-
crease the chances for a healthy full-term baby. This action makes good nutritional sense. Our modern society emphasizes good nutrition, vitamins and avoidance of drugs, smoking and alcohol after conception, but it does not promote the vital need to have a nutritionally healthy mother before conception. Sim-
ple Vitamin A or B deficiency has been shown to cause bone de-
mities and even cleft palates.14

Bottle, pacifier and digit suck-
ing create backward destructive forces on bone structures in upper and lower jaws. Pacifier sucking magnifies negative jaw forces because the pacifier is often sucked more ex-
tensively and with more force than a bottle. Sucking forces gen-
erally act to constrict and form narrow dental arches out of soft 
moldable cartilaginous bone. Sucking promotes poor swallow muscle tone, which interferes with proper jaw and air-
way growth. Essentially, sucking forces during the critical post-natal growth period block the full genetic growth po-
tential.

Breast-fed babies (suckled infants) are less likely to develop malocclusion-high pre-maxilla, abnormal alveolar ridges and palate, and posterior cross-bite.19

There are less likely to develop allergies.20 Breast-fed infants are much less likely to be over-
weight,21 a major risk factor for diabetes, kidney and heart dis-
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ly to develop ear infections,22 insulin-dependent diabetes,23 respiratory infections,24 gastro-
intestinal infections, diarrhea,25 and lymphomas (type of child-
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ized for serious illnesses,26 less likely to die of SIDS,27 and gen-
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Step #2 Recommend “ex-
clusive” breastfeeding (no con-
current pacifier or bottle use) for 3-6 months (6-12 months over-
al) and recommend latching consultation counseling before de-
ivery. This is the next step in early preventive orthodontics. Breastfeeding after birth, true suckling, is usually better for in-
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riods of time than just a few decades ago. Some women still choose not to breastfeed at all for various reasons including lack of convenience and ignorance of the many health benefits to the infant and mother. FJO dentists should encourage new parents-
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creases markedly in size, and the an-
terior part of the mandible that
contains the baby teeth (decid-
uous dentition) more or less attains its adult size.18

Rhythmic elevation and lowering of the jaws provides sequential changes in tongue positions coordinated with sucking contractions to stimulate growth.19 The forces of sucking actively act on the jaws like orthopedic appliances to induce forward and lateral jaw growth and airway growth early on.20

Breast suckling aids proper development of the jaws, which form the gateway to the human airway. It also cultivates positive down and forward growing forces required by both upper and lower jaws. Sucking forces act to spread and widen dental arches and promotes good swal-
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Early FJO Treatment
Age 3: Right Cross Bite
Flat Composite Bonding on D’s & E’s

Vertical dimension primary molar composite build-ups work especially well in Class II Division I situations from age 2 to age 10 to open deep bites. When a Class II Division I malocclusion is opened, the mandible gains room to translate forward and often does so on its own. This occurs frequently when the composites are inclined properly, allowing forward mandibular positioning without side interference. The tongue gains more room too so it can act to orthopedically develop small dental arches during swallowing that can occur thousands of times a day. Also, when normal room becomes available for a normal sized tongue, impaired speech can be affected and can improve.

Gaphalometric evaluation and diagnosis is important to review before vertical occlusion is altered because three-dimensional planes of occlusion can be altered too. For example, Class II Division 2 malocclusions may benefit from vertical dimension primary molar build-ups. But Class II Division 2 malocclusions may require a three-segment maxillary expansion appliance or utility arch to move a retruded anterior segment forward. The maxillary three-way appliance may be needed to turn the Class II Division 2 into a Class II Division 1. Then bonding to open the bite can free the mandible to translate forward into a Class I Division I without going into an anterior Class III malocclusion.

Functional Jaw Orthopedics
FJO Braces Change Faces!

This article has shown “real” early functional Jaw Orthopedics (FJO) diagnosis and treatment is needed from birth to age 8. Earlier orthodontic treatments make good preventive sense, so a timely new FJO standard is warranted and has been introduced. Earlier orthodontic treatments, specifically unique Functional Jaw Orthopedic treatments have been discussed and described, and should be prescribed by progressive general dentists, pediatric dentists and orthodontists for the benefit of their patients.

Literature List