EARLY ORTHODONTIC TREATMENT

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It has been estimated that 70% of children under age 12 have a malocclusion. The question is "When is the best time to treat these orthodontic and orthopedic problems?" I am a strong advocate of early treatment. Since 90% of the face is developed by age 12, we must treat the children early if we want to guide and positively modify the growth of our younger patients. The key to beautiful broad smiles which all children and adults desire is to develop the arches with functional appliances preferably at an early age. This critical arch development also makes room for all the permanent teeth which avoids the extraction of permanent teeth. Mothers will seek out orthodontic practitioners who advocate non-extraction techniques. Children with crowded teeth, retrognathic mandibles, protruding upper teeth etc, are extremely self-conscious. When these problems are solved their self image improves and they become more positive which helps determine a better future for them.

Orthodontic clinicians, including orthodontists, pediatric dentists and general dentists must determine whether they want the children in their practice to be treated early or to delay treatment until all the permanent teeth erupt.

Throughout the years the orthodontic profession has been divided into two different groups regarding philosophy of treatment.

1. The **Retractive Technique** is the treatment of patients mainly in permanent dentition with the use of fixed appliances and extra oral forces (cervical facebow headgear). This is still the technique which is being taught in the vast majority of the orthodontic graduate programs today.

2. The **Functional Technique** is the treatment of patients in the mixed dentition utilizing removable functional appliances. Patients with abnormal habits such as thumb sucking, tongue thrusting, snoring, airway problems, mouth breathing or abnormal maxilla-mandibular (skeletal problems) are treated early in order to prevent the problems from getting worse. Functional appliances are also used to treat anterior and posterior crossbites as well as deep overbites.

In my practice I have been utilizing functional appliances for over 30 years in mixed dentition to solve 80% of the transverse, sagittal and vertical problems. The fixed technique is merely used as a finishing appliance to properly align the teeth, and establish proper torque, tip and ideal occlusion when all the permanent teeth erupt. While the total treatment time is usually longer, the patients much prefer this technique because it means much less time involved in fixed braces. Clinicians who practice with this philosophy know that it is much easier to motivate an 8-year-old to wear a functional appliance than it is a 12-year-old to wear braces, elastics and headgear.

Charles Tweed, often called the world's greatest orthodontist, produced great results throughout his career with fixed appliances. Near the end of his career he stressed the importance of treating in mixed dentition. He stated, 'In other words, knowledge will gradually replace harsh mechanics and, in the not too distant future, the vast majority of orthodontic treatment will be carried out in the mixed dentition period of growth and development and prior to the difficult age of adolescence." He made these remarks in 1963. Fifty years later I suggest that most orthodontic clinicians have not embraced Dr. Tweed's philosophy.

The retractive technique, which is still being taught in the majority of the orthodontic programs in North America, is primarily a bicuspid extraction technique. Proponents believe the overjet is due to a protruded maxilla and the solution is either to distalize the molars with cervical facebow headgear or distalization appliances or extraction of the first bicuspids. This retraction of the anterior teeth frequently results in posteriorly displaced condyles which result in the compression of the nerves and blood vessels in the bilaminar zone. It also has a negative effect on the patient's profile and upper lip. They do not believe that arches should be developed, but rather lean towards extraction as a way of eliminating the crowding problem. This can lead to a constriction of the maxillary arch which subsequently prevents the mandible and condyles from assuming their correct forward position.

Proponents believe that excessive overbite is due to overerupted incisors and the solution would be to intrude the incisors with fixed mechanics. The objective of the retractive philosophy is to align the teeth on the lower arch and then move the upper teeth distally to achieve a proper occlusion. This retractive technique frequently impacts negatively on the health of the TMJ. The key to the functional philosophy is the proper development of the maxillary arch transversely and sagittally. This is necessary to accommodate all the permanent teeth and to allow the mandible and condyles to come forward to their proper position.

Two prominent orthodontic clinicians and researchers, Dr. Robert McNamara and Dr. Robert Moyers, made the startling revelation that 80% of Class II malocclusions have retrognathic mandibles. Dr. McNamara has further stated that less than 5% of Caucasian maxillas are truly prognathic. Joint Vibration Analysis and TMJ clinical exams routinely showed disc displacement in Class II patients with retrognathic mandibles prior to treatment and normal disc/condyle relationship after functional treatment. In light of these facts, how can orthodontic practitioners continue to apply mechanics which cause retraction of the maxilla? Functional clinicians favor the advancement of the receded mandible with functional (orthopedic) appliances such as the Twin Block, Rick-A-Nator or MARA appliances for the correction of overjet problems. This forward movement of the condyle almost routinely eliminates TM dysfunction in these Class II patients.

Advocates of functional treatment believe that an excessive overbite is due to overclosed posterior vertical dimension. The problem is easily diagnosed by the presence of bruxism and numerous sore muscles upon palpation, notably the deep masseter, posterior digastrics and lateral pterygoids. The functional solution would be to utilized jaw repositioning appliances to prevent the eruption of the anterior teeth and to encourage the eruption of the posterior teeth

and alveolar processes. The treatment allows the posteriorly displaced condyles to move to a downward and forward position in the glenoid fossa which helps to reduce the signs and symptoms of TM dysfunction. Patients show a vast improvement in symptoms when functional appliances are utilized which develop the maxillary arch to its proper width and length and allow the mandible to be in the proper relationship with the maxilla in three dimensions, transversely, sagittally and vertically.

Most general dentists know that they are the ones treating most of the patients in mixed dentition. One only has to talk to the owners of the labs who fabricate functional appliances to confirm this fact. General and pediatric dentists use the majority of functional appliances utilized in North America today.

Most general dentists are also painfully aware of the fact that the majority of orthodontic clinicians have geared their practices to treating patients in permanent dentition. They know this because on countless occasions mothers have complained about their children's orthodontic problems and have requested early treatment. In the majority of cases, mothers and general dentists were frustrated with the response, "No treatment is indicated at this time, the patient is too young, the malocclusion will be observed and treated only when the permanent teeth erupt." For practitioners trained with a preventive philosophy, this approach is unacceptable and illogical when statistics prove that malocclusions left untreated worsen over time.

Some may think of this as "supervised neglect". The bottom line is that mothers will often not accept this answer and frequently seek out practitioners who have taken courses on early treatment. In the future, general dentists and orthodontists must learn to treat these children who have malocclusions in the mixed dentition.

Phase 1: Mixed Dentition (Orthopedic Phase)
Thumb sucking, digital habits, anterior and lateral tongue thrusts, airway problems including mouth breathing and snoring, and jaw joint problems must be corrected early with functional appliances. Anterior and posterior crossbites, as well as deep overbites are ideally corrected early with functional appliances. Skeletal problems such as constricted maxillary or mandibular arches, retrognathic mandibles and maxillas are best treated as early as possible with functional appliances in mixed dentition.

Phase 2: Permanent Dentition (Orthodontic Phase)
Dental problems are solved with straight wire appliances in permanent dentition. Our goal must be to provide the best possible service for our patients. Orthodontic practitioners must treat patients as early as the problems are diagnosed so they can utilize functional appliances to help modify the growth and to correct the skeletal and facial dysplasias that are present.

In 1985 the *American Journal of Orthodontics* changed its named to the *American Journal of Orthodontics and Dentofacial Orthopedics.* In 1994, nine years later, the American Association of Orthodontics changed their name to the American Association of Orthodontics and

Dentofacial Orthopedics. Hopefully the Association takes this change in its name seriously and starts to stress the importance of Phase 1 treatment for dentofacial orthopedic problems.

At the present time, most of the functional orthopedic appliances are being fabricated by general dentists. Many general dentists have taken courses in functional appliances because they want to help their patients and were frustrated by the lack of interest in the majority of the orthodontic profession in helping these children. I have been teaching courses on the use of functional appliances for the past 35 years and have not yet met a general dentist who thought they received adequate training in early treatment in dental school. I would submit that the educational system has failed to provide our graduate dentists with adequate training in orthodontics and orthopedics. Approximately 70% of children under age 12 have some form of malocclusion. Therefore, it is time for the entire profession to take this subject more seriously.

Perhaps at this time it might be prudent to itemize some of the indications for early treatment.

1. Constructed maxillary arch with resultant unilateral or bilateral crossbite. These arches must be developed to their normal width in order to ensure that:

a) There will be adequate space for the eruption of all the permanent teeth.

b) Allow room to advance the mandible in cases of Class II skeletal with retrognathic mandibles. Patients and parents much prefer the use of functional appliances such as the Twin block, Rick-A-Nator, Herbst Appliance, and MARA (Mandibular Anterior Repositioning Appliance) to advance the mandible non-surgically in mixed dentition rather than delay treatment until permanent dentition and have it treated surgically.

c) When the maxilla expands the palate drops and this increases the size of the nasal cavity which helps encourage nasal breathing.

d) When the maxilla expands this helps provide more space for the tongue which helps eliminate speech problems.

e) The development of the maxilla encourages the patient to have a broad smile.

f) Some patients with unilateral posterior crossbites have facial asymmetries due to a shifting of the mandible to one side during closure. It is critical that the crossbite be corrected as early as possible in order to eliminate this facial asymmetry.

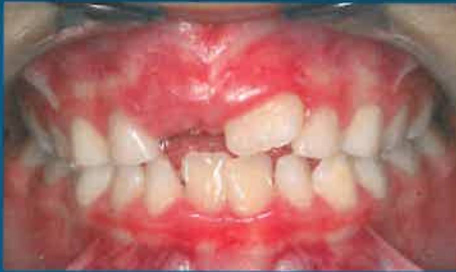
g) The proper development of the maxillary arch allows the mandible to assume its correct position and allows the condyles to move downward and forward. This helps eliminate the signs and symptoms of TM dysfunction. Clinicians who treat and monitor the health of the TMJ routinely find that the proper development of the maxillary arch is one of the main keys to TMJ health.

Treatment

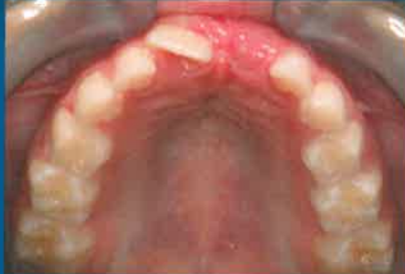
Removable: Schwarz Appliances

Fixed: Maxillary Banded Hyrax

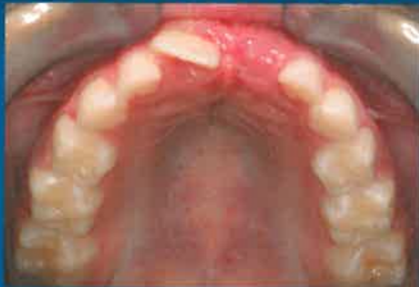
NARROW ARCH
NO ROOM FOR LATERALS



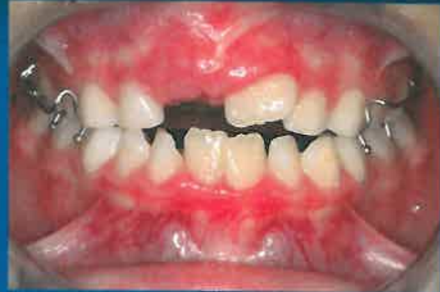
CONSTRICTED UPPER ARCH
NO ROOM FOR LATERALS



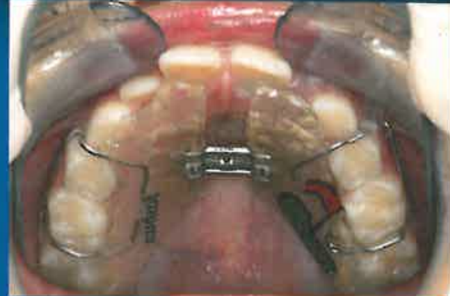
CONSTRICTED UPPER ARCH
NO ROOM FOR LATERALS



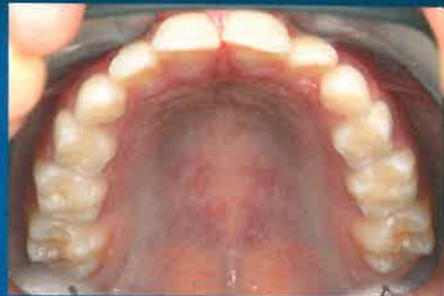
MX SCHWARZ APPLIANCE

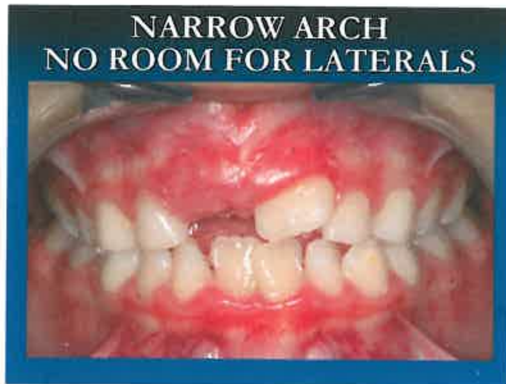


ROOM FOR LATERALS



MX ARCH EXPANDED

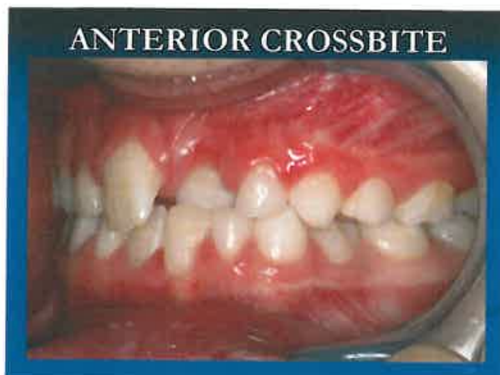


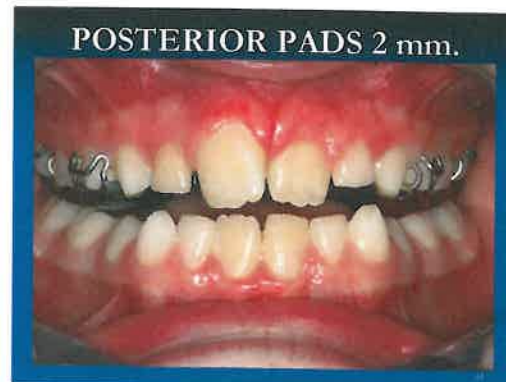


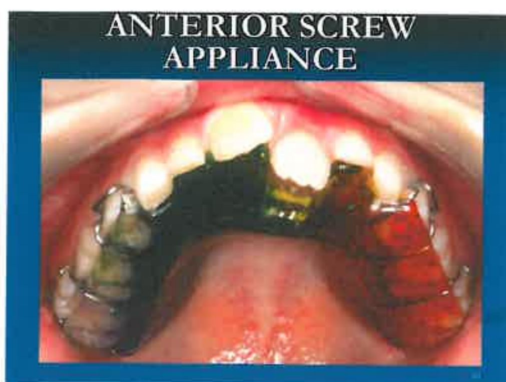
2. Anterior crossbites must be eliminated as soon as possible. If an anterior tooth is in crossbite this can result in the mandible being locked in an unfavorable position this adversely affects the occlusion as well as the health of the TMJ. Parents are most concerned about the appearance of these teeth as one is frequently longer than the other and a different height. Also, the problem of traumatic occlusion and gingival recession must be addressed.

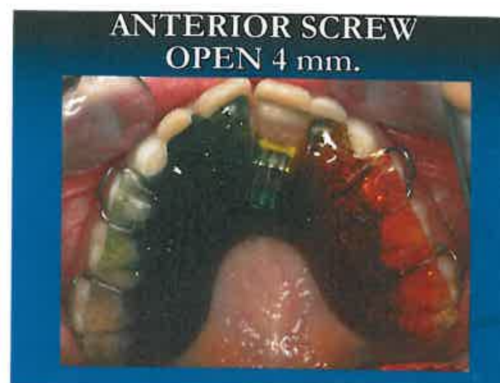
   Treatment

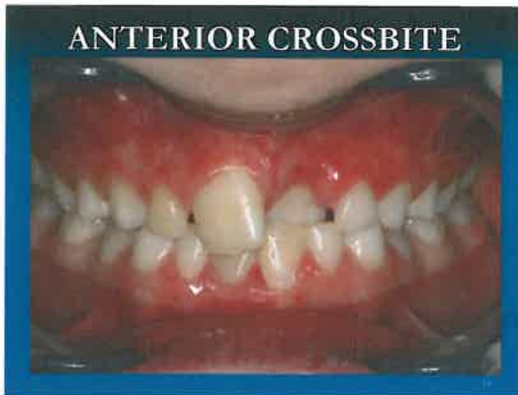
   Removable: Anterior Sagittal







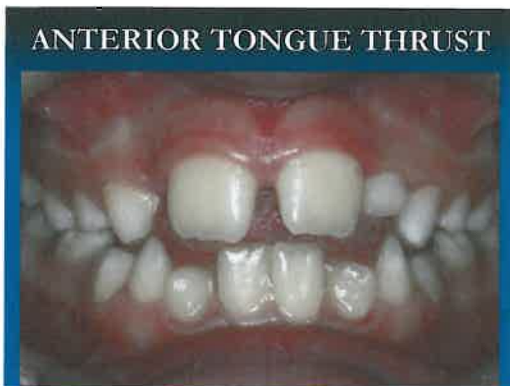


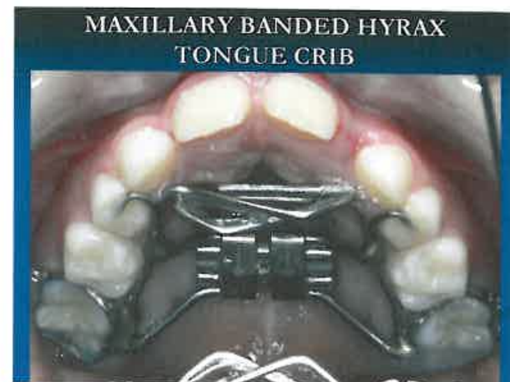


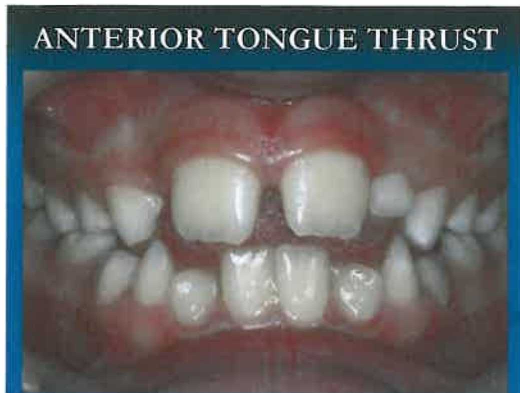
3. Anterior open bite caused by a digital habit such as thumb sucking or tongue thrusting must be corrected as early as possible. These habits are much harder to correct when the patient has permanent teeth and much easier to correct in mixed dentition when the children are much more cooperative.

Treatment

Fixed: Maxillary Banded Hyrax with Tongue Crib

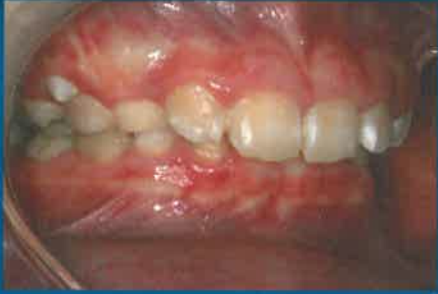


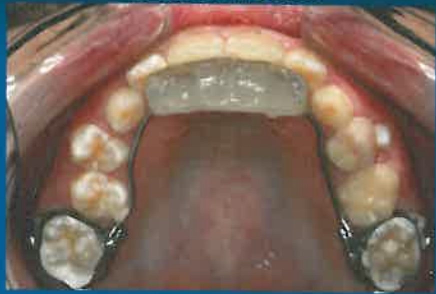


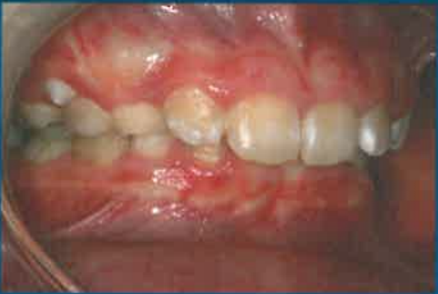


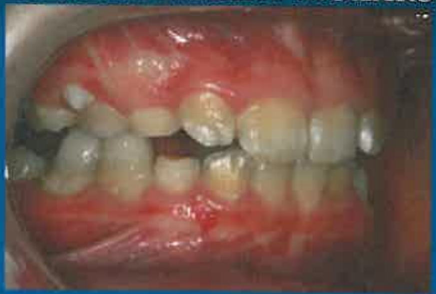
4. Deep overbites can often cause headaches in children. If left untreated the majority of females over age 20 develop severe headaches on a regular basis. In an effort to avoid headaches present and future, the deep overbites should be corrected as soon as possible. The appliance of choice is the Rick-A-Nator. This fixed-functional appliance consists of an anterior bite plate lingual to the six anteriors connected to the first permanent molars by two .050 connector wires. The Rick-A-Nator helps to correct the deep overbite by preventing the eruption of the anterior teeth.

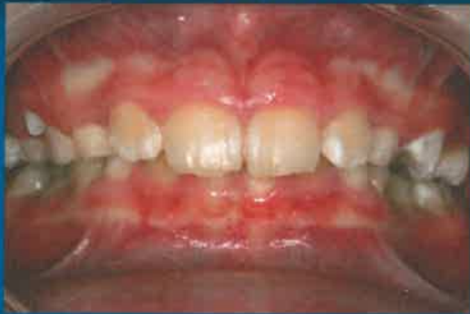
   The Rick-A-Nator is ideal for patients with deep overbites and overjets less than 3 mm. The construction bite is taken with midlines aligned and a 1 mm overbite, 1 mm overjet. The mandibular first and second primary molars have buildups with composite to fill in the posterior open bite after the Rick-A-Nator is inserted. These composite buildups provide posterior support which is necessary for TMJ health and to allow the patient to chew their food properly. The mandibular first molars will then passively erupt to occlude with the upper molars within 3-4 months. The objective is to establish a new correct occlusal plane into which the bicuspids will erupt into their proper position.
   Problem: Deep Overbite
   Solution: Fixed Upper Rick-A-Nator


CLASS II MOLAR
OVERBITE 6 mm.

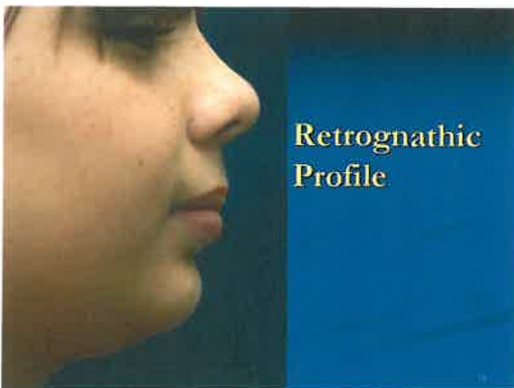

RICK-A-NATOR
CEMENTED

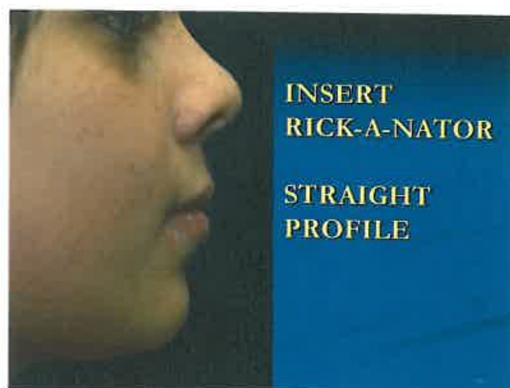

CLASS II MOLAR
OVERBITE 6 mm.


COMPOSITE BUILDUPS
LOWER PRIMARY MOLARS


OVERBITE 6 mm.

RICK-A-NATOR


Retrognathic
Profile


INSERT
RICK-A-NATOR
STRAIGHT
PROFILE

My objective in writing this article was to make general dentists aware of the advantages of early orthodontic treatment for children. I strongly believe that general dentists can help prevent malocclusions from worsening and improve the self-esteem of their younger patients by treating these children at an early age. Functional appliances are extremely prevalent all over Europe and South America. I would encourage general dentists to take courses to learn how to treat these simple orthodontic cases as I have shown in this article.

The parents and the children in your practice will appreciate the results and it will give you a greater sense of satisfaction from your practice. It is my opinion that these simple functional appliances should have been taught in dental schools in North America but in many cases were not. You need to ask yourself the questions, "If this was your own child with a malocclusion would you want to treat early with functional appliances and non-extraction or would you want the alternative treatment."

The problem is that at this time, although the trend is certainly towards non-extraction, the majority of orthodontic clinicians are not treating in the mixed dentition. Mark Twain made an interesting comment, "When you find yourself on the side of the majority, it is time to pause and reflect".

I think the time has come for general dentists to consider what is the best treatment for their younger patients with malocclusions. I would like to suggest that either they get adequate training to treat the children in their practice or refer their younger patients to an orthodontist or general dentist that practices with a functional philosophy. It has been my clinical observation, having treated orthodontic patients for the past 35 years, that patients treated early with the functional philosophy have less temporomandibular joint problems and are less likely to suffer from life threatening obstructive sleep apnea later in life. Think carefully about how you want to treat your younger patients as it has far reaching effects on their total health and quality of life.