CARRIERE CLASS II MOTION APPLIANCE

CORRECT SAGITTAL FIRST

CLASS II MOTION

Measure from the mesial 1/3 of the maxillary cuspid to the midpoint of the upper first molar with the measuring gauge.
Most popular sizes 23, 25 and 27 mm.
Bracket lower second molar (older patients) or lower first molar (younger patients).
Place adhesive (bonding material) on cuspid and molar pads.
Bond molars first.
Bond cuspids second.
Light cure adhesive.
Lower Essix Retainer. (.040" thickness)
Cut out window for lower brackets on buccal of lower molars.
Place elastic lower second molar to upper cuspid Force 1 elastic, ¼", 6 oz. first month.
After first month, Force 2 elastic, 3/16", 8 oz. (second, third, fourth, fifth month).
Force 2 elastic 250 grams, heavy force.

Normal Treatment time:	3-5 months
Number of components:	Two One right side, 1 red mark One left side, 2 red marks

No bands required if you use plastic aligner (Essix Tray) on the lower or TADS as source of anchorage.

Buccal Tubes:	Direct bond buccal tube lower second molars or lower first molars.
Patient comfort:	Allow full lateral, mandibular movements. Remove elastics to eat.
Esthetics:	Appliance is barely noticeable when in place.
Hygiene:	Not a problem. Patient can brush easily around the appliance.
Easy placement:	Place from mesial 1/3 cuspid to middle upper first molar.
Patient Compliance:	Extremely high. Patients are very enthusiastic prior to treatment. This will reduce time in fixed braces. Reduces overall treatment time by 3-6 months.

CLASS II MOTION APPLIANCE

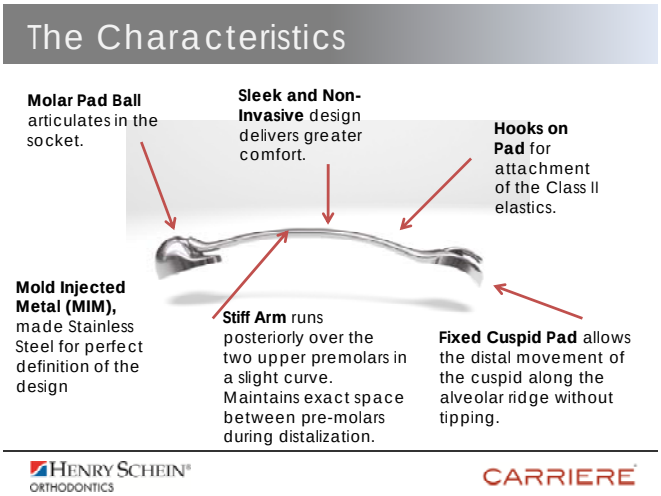
MX CUSPID TO FIRST MOLAR

BRACKET LOWER SECOND MOLAR

ESSIX RETAINER

CLASS II ELASTIC, FORCE 1 ¼", 6 oz

CLASS II MOTION SAGITTAL FIRST

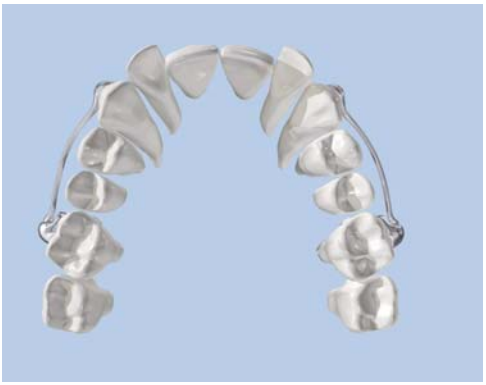


Correct Class II as soon as possible.
Convert Class II to Class I before braces start.

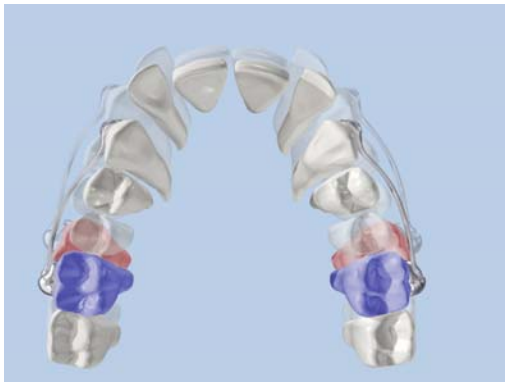
Corrects rotations and uprighting of the maxillary first molars. Built-in stops prevent over rotation and over uprighting.

Placement: 7 minutes
Removal: 3 minutes

1. Provide controlled rotational movement of the maxillary first molar and the palatal root.
2. Upright the maxillary first molars
3. Distalize the maxillary posterior segment cuspid to molar as a unit while controlling unwanted torquing or tipping.
4. Distal rotates mesially rotated first molars. Cannot achieve Class I cuspid or Class I molar when maxillary first molar is mesially rotated. Research indicates that 83% of malocclusions present with a mesial rotation of the maxillary first molars.[62]



MESIALLY ROTATED FIRST MOLAR



DISTAL ROTATION FIRST MOLAR USING MOTION APPLIANCE

Anterior Pad Carriere Appliance

Attached to the mesial 1/3 of the cuspid or to the first bicuspid and is a rigid half-round arm. The arm then curves posteriorly over the bicuspids, ending as an articulation ball utilizing a socket on the posterior pad, which direct bonds to the maxillary first molar.

Moveable Posterior Pad

Direct bonds to the maxillary first molars and houses an articulating ball in a socket to create free yet controlled movement that allows the molars to travel directly to the desired position after derotating and uprighting it.

Rigid Half-round Arm

Curves over the two bicuspids and connects the anterior and posterior pads providing stability to the cuspids. If cuspids are not erupted arm could go from first bicuspid to first or second upper molar.

Fixed Anterior Pad

Fixed anterior pad bonds directly to the maxillary cuspid or first bicuspids. This promotes bodily distal movement of the cuspid along the alveolar ridge. Class II elastics are attached to the hook on the cuspids.

Arm is metal injection molded. Extremely smooth. Stainless steel. Arms and pads are smooth and rounded for patient comfort.

Posterior Pad

Ball and socket joint offers maximum freedom of movement that allows molars to travel directly to the desired position. It has built-in stops that prevent unwanted over rotations, tipping and torquing.

To prevent a relapse, the clinician must continue distalization of the cuspid until the distal inclined plane of the upper cuspid touches the mesial inclined plane of the lower first bicuspid. (Super Class I Cuspid). Once the Carriere Motion Appliance has been removed we must ligate the posterior teeth together with .012 stainless steel ties in a figure 8 from the maxillary cuspids to the maxillary second bicuspids.

First Molar Movement 3 Movements
CARRIERE MOTION APPLIANCE

1. Derotate the mesially rotated molar
2. Upright the molar
3. Distalize the molar

Once the molar uprights the articulator of the ball within the socket prevents unwanted distal tipping.

Molar Distalization: Children, 3 months.
Adults, 5 months

Facial Types: Best indicator, **Brachiocephalic**
Least indicator, **Dolichocephalic**

Indications:

1. **Class II, Div 1 malocclusion**
2. **Class II, Div 2 malocclusion**
   First step would be to convert Class II Div 2 to Class II Div 1 by torquing the upper central incisors either with an Anterior Sagittal Appliance or Straight Wire.

3. **Class II mixed dentition and permanent dentition with maxillary dentoalveolar protrusion.**

4. **Class II mixed dentition. Anterior attachment primary cuspids**.

5. **Unilateral Class II molars.**
   Class I molar one side
   Class II molar one side

Anchorage

Must have excellent anchorage on the lower arch to prevent protrusion of the mandibular incisors when the patient is wearing the Class II elastics.

Three types of mandibular anchorage:

1. A mandibular Essix appliance with direct bond buccal tube on the mandibular second molars (preferred method). Younger patients, buccal tube mandibular first molars.
2. Mandibular lingual arch with molar tubes on the buccal lower molar bands. Mesial rests lower first bicuspids (flowable composite). Mixed/Permanent dentition.
3. TADS, Temporary Anchorage Devices placed in the area of the mandibular molars. Attach TADS to mandibular molars with S.S. ligature ties to increase posterior anchorage.

1. Mandibular Essix Appliance:

The mandibular Essix appliance is an excellent source of anchorage for Class II elastics. It unlocks the occlusion and allows the mandible to come forward in certain cases. It must be worn full time when the patient is wearing the Class II elastics. Should be removed for meals. Recommended material is A+ with .040" (1 mm thickness) (Dentsply Raintree Essix). This helps control flaring of the lower incisors.

A window is cut around the brackets bonded to the buccal of the lower second molars. Impressions for Essix appliance use PVS material (Polyvinylsiloxane) or alginate. You may also scan lower arch and send scan to orthodontic lab.

2. Mandibular Lingual Arch

A mandibular lingual arch is particularly suited for patients with strong musculature for providing anchorage to prevent protrusion of the lower incisors with Class II elastics. The ideal wire is .036" and goes from second molars if erupted, otherwise from the lower first molars. The lingual arch is passive and patient acceptance is high. The lingual arch is preferable for younger patients or in cases where you might be concerned that the patient may not cooperate wearing the lower Essix retainer as prescribed.

Mesial rests lower first bicuspids (bonded with flowable composite).

Extrusion of mandibular molars.
This is minimal (less than 1 mm.) with Class II elastics due to the anchorage control of the lower Essix appliance or the lower lingual arch.

3. TADS (Temporary Anchorage Devices)

Ideally placed between the lower first and second molars.

Sizing the Appliance

Use the disposable Carrière Motion Appliance ruler provided with the appliance. There are 23 sizes from cuspid to molar or bicuspid to molar.

a) Measure from the mesial 1/3 of the maxillary cuspid to the midpoint of the maxillary first molars.
b) If the cuspid is not accessible then measure from the midpoint of the first bicuspid to the midpoint of the second molar.
c) When the measurement is between two sizes, between 24 mm., and 25 mm., select the appliance based on the amount of rotation desired.
    - For more molar rotation select the smaller size
    - For less molar rotation select the large size

Appliance Selection

R Right Motion Appliance
L Left Motion Appliance

Bonding Procedure, Motion Appliance

1. Use pumice to clean teeth being bonded.
2. Rinse thoroughly with water.
3. Dry the teeth with air water syringe.
4. Etch the surfaces of the teeth.
5. Rinse thoroughly with water.
6. Dry the etched teeth.
7. Uniform coating of primer/sealant.
8. Grasp the arm of the Motion Appliance with locking hemostat and add light curing bonding adhesive to both pads.
9. Place posterior pads first.
   There is a vertical line engraved on the posterior pad to line up with the midpoint of the upper first molars. Place the posterior pad in the center of the buccal surface of the molar.
10. Position the anterior pad on the mesial third of the labial surface of the cuspid or first bicuspid (not on the midline).
11. Align the pads so the arm is horizontal.
12. Remove excess bonding adhesive from around the pads while keeping the arm horizontal.
13. Light cure starting with the molars and then the cuspids or bicuspids.

IMPORTANT: **Do not try in Motion Appliance on the patient's teeth prior to bonding. This may contaminate the pads with saliva and adversely affect the bonding procedure. To check the fit of the Motion Appliance try it on the study model.**

Attach Class II elastics. Elastics may be added immediately after bonding the Motion Appliance.

Patient Acceptance: High

Patients love the fact that there are no braces on the upper front teeth and there is only a clear retainer on the lower arch. The Motion Appliance is comfortable to wear and the new Clear Motion Appliance is esthetically pleasing. The Class II elastics are worn for the first 3-6 months when compliance is the best at the beginning of treatment.

Instructions on Elastics

Due to the vertical force vector as a result of opening the mouth while talking this may result in mild extrusion of the maxillary cuspids. This can be an advantage if the patient presents with a deep overbite. Elastics are to be removed for eating. Patients should change the elastics after every meal. If the patient wears elastics when eating this can cause excessive extrusion of the upper cuspids.

Class II elastics from upper cuspid to lower first or second molar.
1st month Force One elastic ¼", 6½ oz.
2nd – 5th month Force Two elastic 3/16", 8 oz.

Motion Appliance and Invisalign®

Many Invisalign® clinicians are very excited about the use of the Motion Appliance prior to Invisalign®. The Motion Appliance corrects the Class II molar relationship either bilaterally or unilaterally prior to the use of the clear aligners to straighten the teeth.

The objective is to correct the sagittal problem (Class II molar relationship) before straightening the teeth with Invisalign®.

TRANSITIONING TO FIXED APPLIANCES

1. Start with maxillary arch only.
   .014 Copper NiTi from molar to molar.

   Do not remove the Essix appliance from the lower arch.
   Ligate the distalized upper teeth from cuspid to second bicuspid under the archwire using .012" stainless steel ligature wire tied in a figure 8. Keep these teeth tied together throughout treatment. The ligature wire must remain passive to prevent the maxillary molars from derotating mesially.

2. Remove the Essix appliance in 10 weeks and start straight wire on the mandibular arch.

Function of the Motion Appliance

a) Molar part is a ball and socket.
Placed on the midpoint of the upper first molar.
Molar movement 3 ways:
- Corrects mesially rotated molars, 1-2 mm space created in the arch. There is a stop in molar part which prevents molar from over rotating distally.
- Molar distalizes 1-2 mm.
- Uprights mesially tipped first molars, 1-2 mm space created in the arch. When molar is upright it is more stable.

b) Cuspid part is a firm pad. Cuspid distalizes 3 mm if necessary. Space opens between cuspid and lateral incisor when the patient wears the Force 1 and Force 2 elastics as prescribed.

c) When the bite is opened using either:
- Lower Essix Retainer covering all the lower posterior teeth. If you do not cover the lower molars with the lower Essix Retainer the Class II elastics will extrude the molars. Essix Retainer cancels the occlusion encourages mandibular advancement.
- Lower Essix Retainer covering all the posterior teeth, composite buildups on the upper first or second molars. Opens the bite encourages mandibular advancement.
- Lower lingual arch. Composite buildups on the lower first or second molars. Opens the bite encourages mandibular advancement.

When the bite is open and the condyles are posteriorly displaced this frequently results in some mandibular advancement. This anterior movement of the mandible and the tongue helps open the airway which helps prevent future sleep disorder problems such as snoring and obstructive sleep apnea.
Also, when the bite is opened and the condyle moves down and forward this is helpful in preventing temporomandibular dysfunction.

Trouble Shooting Class II Motion Appliance

- Always overcorrect to slight Class III cuspid with Class II Motion Appliance.
- Severe overcorrection, no elastics.
- Cuspid in correct position. Elastics night only.
- Slight overcorrection, elastics night only.
- If the cuspid extrudes excessively remove Motion Appliance from the cuspid. Add a Shortie (Motion Appliance from first bicuspid to the first or second molars).
- Cuspid high. Place cuspid part of Class II Motion Appliance high.
- If you want to extrude cuspid slightly to open the bite, put the cuspid part of the Class II Motion Appliance in the middle of the cuspid (gum line to cuspid tip).
- If the cuspid is too high or labially displaced, start the case with a Shortie (first bicuspid to first molar).

- After you remove the Class II Motion Appliance when you start the straight wire, tie the second bicuspid to the second bicuspid with stainless steel figure 8. Do not extend to the first molars or you may cause mesial rotations of the molars.
- To help correct the deep overbite in younger patients use the lower lingual arch, Class II elastics Force 1 and Force 2 elastics will help erupt the lower first molars and open the bite.
- If your main problem is flared lower incisors or you do not want to cause flaring of the lower incisors, place an Essix Retainer over all the lower teeth when using Class II (Force 1 and Force 2) elastics.
- Larger overjet on adults. Bracket lower second molars. Increase the length of the elastics increases grams of force.
- Younger patients bracket lower first molars.
- Older patients bracket lower second molars. Overcorrect 1 mm to allow for relapse.
- If the lower incisors are vertical or slightly lingually inclined and you would like some torque then use the fixed lower lingual arch with the Class II Motion Appliance.
- Deep overbite, older patients, lower lingual arch. Band lower second molars. Class II Force 1 and Force 2 elastics will extrude the lower second molars and open the bite.
- Mixed dentition. If the primary cuspid has 2/3 root then you can use the Class II Motion Appliance.
- Class II cuspid right, Class I cuspid left:

  Right Side: Force 1 elastic 1 month
  Force 2 elastic 2-4 months
  Left Side: Force 1 elastic only, Night Only
  Must wear elastics both sides or you will cause a cant to the occlusal plane.

Sagittal First or Sagittal Last

Sagittal Last

Many orthodontic clinicians that use mainly straight wire to treat their patients use the Sagittal last philosophy. They start cases the traditional way using round wires to level and align the brackets and then finish with rectangular wires to establish the correct tip and torque for the crowns and the roots of the teeth. If the patient has an overjet and a Class II molar relationship they will try to correct this with Class II elastics (light forces). The problem is that the patient has a rectangular wire usually and trying to distalize a cuspid with a rectangular wire attached to two bicuspids and possibly 2 molars is very inefficient due to too much friction. Many clinicians spend more than 12 months on this very inefficient method of cuspid distalization. The other problem is that long term Class II elastic use can cause the patient to end up with a dual bite which is occlusally extremely unstable.

Sagittal First

Sagittal first is a relatively new philopsphy of treatment developed by Dr. Luis Carrière.

It is much more efficient to distalize a cuspid from Class II to Class I using the Carriere Class II Motion Appliance. It is to be used piror to the placement of orthodontic brackets. When the Class II Motion Appliance is placed on the cuspid and the first molar there is less friction and this moves the cuspid into Class I usually in 3-4 months as long as the patient wears the Force 1 and Force 2 elastics as prescribed. The other main advantage of the Sagittal first is that it drastically reduces treatment time compared with doing Sagittal correction at the end of treatment.

Transverse Correction vs. Sagittal Correction

1. Class I mixed dentition correct the transverse first.

2. Class II mixed dentition, correct the sagittal first.
   Move Class II cuspid to Class I cuspid.
   Move Class II molar to Class I molar.
   Then solve the transverse problem with an arch expansion appliance such as removable Schwarz, fixed Transforce Transverse or Banded Hyrax appliance.

The main reason for this is that after transverse development of the upper arch it is necessary to wear the appliance for at least 6 months to prevent a relapse. Also when you are wearing the fixed expanders you can proceed to straight wire if required.

Clinical Signs

If the patient is wearing the Force 1 and Force 2 elastics as prescribed then you should see a space open between the cuspid and the lateral incisors within the first 2 months. After 3-4 months usually the transseptal fibers encourage the lateral incisors to also drift distally.

Same Day Start

Many patients who want orthodontic treatment would prefer to start immediately. With the Carriere Class II Motion Appliance that is possible. Since the appliance can be placed in as quickly as 7 minutes, same day stars are the treatment of choice.
Book 1 ½ hour appointment. Take full records. Review the records, Informed Consent, Financial agreements.

Ideal Case

1. Class I skeletal, Class II molars, horizontal grower.

2. Class II skeletal, Class II molars. Overjet 6 mm or less. Normal vertical or horizontal grower.
   Review and sign Informed Consent Agreement and Financial Agreement. Place Class II Motion appliance on the upper arch usually from the mesial of the cuspid to the middle of the first molars.

Lower Lingual Arch
Place separators for the lower molar bands. Bring the patient back in 1 week. Remove separators. Fit two lower bands. Remove the molar bands. Take can alginate impression of the lower arch or scan the lower arch. Send working model or scan to the lab to fabricate lower lingual arch.

Lower Essix Retainer
Bond a molar bracket or bond Schein special lower hook to the buccal of the lower first or second molars.

Take an impression of the lower arch with alginate or scan the lower arch and send the working model or scan to the lab to fabricate the Essix Retainer. Bring the patient back in a week hopefully when you will insert the Essix Retainer.

Then immediately place the Force 1, 6 oz elastic for 1 month.
Second, third, fourth months, Force 2, 8 oz elastic.

Reason for Same Day Start

Most patients know that they need and want orthodontic treatment. They are very enthusiastic and highly motivated to start treatment as soon as possible. Why not accommodate them and start the same day as the initial consultation if that is what they want. This will minimize the chance for them to seek other orthodontic opinions elsewhere.