The Quad-Helix appliance is superior to a removable expansion plate in expansion amount, stability, rate and extent of movements with less treatment time.

The Quad-Helix appliance proves effective for increasing widths of intermolar, intercanine, and dentoalveolar regions and for molar derotation. Maxillary arch reshaping is superbly accomplished by gradual and comfortable activations over 6-12 months. The Quad-Helix appliance is superior to a removable expansion plate in expansion amount, stability, rate and extent of movements with less treatment time. Unlocking the malocclusion (Ricketts, Bench, Gugino, Hilgers, Sellke, Grummons) typically begins with a Quad.

The Quad-Helix appliance has versatility to reshape arches, correct posterior arch width deficiencies and correct anterior crossbite when auxiliary wires are extended behind the incisor(s). Crossbite corrections are further helped with composite onlay occlusal buildups (turbos) in the lower posterior dentition when indicated.

In aviation, the three planes (pitch, yaw and roll) are well understood. Similarly, the maxillary first molars position in 3 planes can be influenced favorably and differentially by strategic and accurate Quad-Helix activations. Molars can derotate the same on each side, or more on one side than the other. Molars can be extruded, held or intruded. Molars can be expanded on one or both sides and differentially, if prescribed.

Quad-Helix Considerations
- Age - growing patient
- Facial pattern and transverse norm
- Dentoalveolar maxillary transverse hypoplasia
- Transverse deficiency requirement: Sutural versus dentoalveolar
- Oral hygiene and periodontal conditions favorable

The pre-formed Quad-Helix (Rocky Mountain Orthodontics - Ricketts) when properly activated provides physiologic forces toward treatment objectives of efficient orthodontic treatment. Maxillary transverse changes with use of the Quad-Helix appliance are predictable and impressive. Dental tipping is minimized by lighter and gradual activations. (References available upon request.)

"Utilizing a Quad Helix is like having an ACE up your sleeve.”
Denture Unlocking Properties

Typically, a Class II or Class III malocclusion begins with correction of the maxillary width deficiency. Most Class I cases also require transverse increase in arch perimeter. The Quad-Helix is effective in each of these clinical situations.

1. Transverse width - first priority in treatment
2. Vertical control - facial axis management
3. Anterior/posterior sagittal correction achieved

Overexpansion of the maxillary arch width is preferred by 20-30%, followed by a guided intermolar width contraction with rebound to create optimal molar uprighting axial inclinations and transverse stability after the expansion process.

Quad-Helix Advantages

- In the deciduous, mixed or permanent dentition, the quad provides mild to moderate expansion.
- It also provides for:
  - Reshaping of maxillary arch form
  - Molar derotation (Class II correction)
  - Anchorage and torque control in tandem with archwire
  - Incisors alignment and placement
  - Oral habit correction, when evident
  - Vertical control - tongue influence with slow expansion
  - Ease of placement in one appointment (pre-formed RMO Quad)

Functional Transverse Evaluation

1. Clinical Evaluation
   a) Facial skeletal features
   b) Airway – breathing, tongue, etc.
   c) Musculature – jaw and peri-oral
   d) Habits – tongue, thumb, etc.
   e) Parafuction, when evident
   f) Malocclusion conditions
   g) Smile esthetics and disharmonies

2. Photos and Models Analysis
   - Intermolar width, intercanine width, arch perimeter, smile esthetic features

3. Frontal Image
   - Skeletal and dental transverse differentiation
   - Asymmetry analysis; coronal/frontal renderings

4. CBCT-3D Renderings, if indicated
Shallow occlusal composites on the functional cusps of lower primary or permanent molars assist by unlocking the malocclusion and clearing deflective cuspal inclines. This facilitates a neutral mandible posture as the upper arch Quad-Helix changes occur.

Quad Activations:

1. Distal-lateral molar derotation
2. Lingual arm 1-2 mm from premolar teeth as molars rotate disto-laterally
3. Expansion - intermolar width increased; arch perimeter develops
4. Buccal root torque individualized per patient requirements

Activations should be light and intermittent (8-10 weeks) to permit controlled and comfortable movements with least molar tipping. To derotate and/or to distalize molars, it is preferable to adjust one side of the quad to produce desired movement on the opposite side of the arch. This is followed by alternating molar activation on the opposite side of the arch to produce controlled molar movement changes. A midline 3-prong activation increases the arch width.

Transverse widening while primary molars are still in the arch produces additional benefits by remodeling wider alveolar bone for the premolars to erupt into.

Arch development during the early or late mixed dentition phase, or in the permanent dentition are the preferred timings for Quad-Helix therapy.
Figs 8, 9, 10: The Quad arms can be shortened during treatment.

Figs 11, 12, 13, 14, 15, 16: Quad-Helix with partial brackets and/or segmental overlay archwire with a utility arch. Generally, the quad is kept in place until the upper premolars and canines are sufficiently erupted.
ROCKY MOUNTAIN ORTHODONTICS
WWW.RMORTHO.COM
PRE-FORMED QUAD-HELIX
REMOVABLE (RICKETTS)
TRU-CHROME SS .036 .914 MM
CATALOG # A01230 (SIZE 1)
CATALOG # A01231 (SIZE 2)
CATALOG # A01232 (SIZE 3)

1. Rocky Mountain Orthodontics Quad-Helix
2. Quad-Helix order information
3. Size 1 RMO pre-formed quad from package
4,5. Insertion loop adjusted to angle of molar sheath in mouth, and add 5-10 degrees of buccal root torque, and to keep loop away from palatal tissue
6,7,8. Arm bent palatally to ease insertion
9. Midline adjustment to expand at molars
10. 3-prong pliers applies intra-oral adjustment to add expansion
J. 3-prong can expand or upright molars more
Q. Well-adjusted Quad-Helix in place
Case Example 1: Quad-Helix accomplished arch development and optimal molar placement within 8 months. As teeth erupted, brackets were added and a stunning nonextraction result was achieved.

Case Example 2: Asymmetric Quad with one arm which influences contralateral arch reshaping and widening within 16 months resulting in a symmetric arch perimeter at the finish of treatment.

Case Example 3: Typical narrow arch form was expanded within 4 months pre-Invisalign, and made optimal during Invisalign treatment.

Case Example 4: Transverse development first with an RPE for maxillary sutural expansion (8 months). A subsequent maxillary Quad-Helix was placed in the late mixed dentition to derotate molars with optimal symmetric positioning, and to establish an ideal arch width. Full brackets with a nonextraction approach (20 months) followed. An exceptional smile and fine esthetic zone were achieved; exceptional treatment goals are evident at the finish.

Case Example 5: Quad without arms created ideal arch form and a balanced esthetic perimeter, with ideal molars 3-D placement. Final smile is stunningly beautiful with great facial harmonies.

Grummons Signature SmilesSM