

Williams Appliance

The first phase lower fixed arch development appliance

Correct crowding in early mixed dentition with the Williams fixed appliance.

Pedodontist Jeff Williams has developed an appliance to correct crowding in the early mixed dentition. Dr. Williams likes to start cases when at least 2 permanent lower incisors are erupted and the upper centrals are starting to erupt.

Appliance Design

The Williams Appliance has been able to establish quite stable lower incisor alignment when these arch expansion measures have been applied to children during early mixed dentition.

The Williams appliance consists of bands on the lower E's, with tubes soldered to the bands. An expansion screw is soldered to the tubes to create the posterior arch development. Constant force is maintained by a NiTi wire creating optimum anterior alignment of the lower incisors. This design also offers the option of banding the first molars, however, this will incur additional stress on the tubing and may increase the risk of breakage.

Advantages of the Williams Appliance.

There are several important orthodontic advantages in the use of the special lower arch expansion appliance described here:

1. This is a fixed appliance, with the chief anchorage being the mandibular second primary molars. Being fixed, it lessens the potential for loss or damage, as well as the need for constant repair during the treatment period.

“The Williams Appliance was developed to allow lateral development of early mixed dentition cases with a fixed appliance. I find it especially useful in mild or moderately crowded cases, where the arch form is narrow or posterior teeth are lingually inclined, and the patient is not protrusive or otherwise a likely extraction case. Its advantages are the controlled expansion afforded by a screw, the gentle force of the lingual nickel-titanium wire to align the incisors, and the fixed appliance to minimize breakage and compliance factors.”

Dr. Jeff Williams—Pedodontist

2. It is composed of heavy duty materials, yet is comfortable for the patient to wear, and easy for the parent to see and adjust the special expansion screw.

3. Use of the fixed expansion screw allows a predictable expansion force with an increase of dimension at the recommended rate of 2mm a month (2 turns each week).

4. It is versatile in that the light Nickel-Titanium wire forces against the lower incisors which can be adjusted to provide force to a single lingually posed incisor, to two lingual incisors, to all incisors, or to none at all.

5. Construction is quite straightforward, if instructions are carefully followed. Chairside adjustments are easy, requiring only a few moments of the dentist's time.

6. Patient and parent acceptance has been excellent.

According to Dr. Williams, the ideal time to initiate treatment to uncrowd mandibular arches is when the child's lower permanent central incisors have erupted, but the lateral incisors have not.



The Williams Appliance, shown above, was designed to correct crowding in the early mixed dentition. Johns Dental has upgraded its function with the addition of a micro-screw treated with a protective NyLok® coating to prevent potential unwinding during and after expansion.



At Johns Dental, we have added C-clasps to the cuspids to allow for better appliance anchorage and more efficient movement of the lower anteriors.



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Fitting the Appliance

The separators are removed, and the appliance is trial fitted to check the seating of the molar bands, the contact of the tubing along the lingual surfaces of the posterior teeth, lack of impingement on the lingual tissues, and to ascertain that the slightly curved extension wires contact the primary cuspids at their most mesial-lingival aspect.

Finally, the NiTi wire should touch the lingual of the lower incisor(s) about half-way down the crown of the tooth. Once good fit is assured, the appliance is removed and dried, then cemented to the child's lower arch with a glass ionomer cement. A light-cured button of composite is bonded to the lingual of one of the incisors, with the NiTi segment of arch-wire fitting *below* the button, so the arch of resilient wire is prevented from riding up the lingual slope of the incisors.

As the child's lower arch expands during the treatment, the NiTi wire is free to slide forward out of the tube ends so it automatically maintains contact with the incisors and encourages their labial alignment.

Placement of the tubes is very important to direct the wire properly.

Appliance Adjustments

Once the appliance is seated, a parent will turn the screw 1/4 turn twice per week. This equals 1/2mm expansion per week or 2mm per month, 1mm per side. The child should be seen one week after the initial fitting of the appliance to check for comfort and to make certain the parents are following the correct expansion procedures. After this, the child can be seen at six week intervals to check on the expansion progress.

It helps greatly to give the child or parent an orthodontic calendar in which they can keep a record of expansion turns. For better compliance, have the patient bring their calendar with them to the appointment.

Once the proper expansion has been obtained, the appliance should be left in place passively for about 6 months. A lingual arch can be used if desired. This appliance can also be used in conjunction with an upper RPE or other type of upper arch development appliance.

Johns Dental Uniqueness

At Johns Dental, we have added C-clasps to the lower cuspids to provide better anchorage. This stabilizes the appliance and allows for easier movement of lower anterior's.

We have also recently improved the appliance function by using a small cylinder screw treated with Nylok® coating to prevent potential unwinding during and after expansion.

Lab Requirements

For appliance fabrication, bands are fitted at chairside, then removed. The impressions are taken after fitting the bands and removing them from the E's. The bands should be packed separately and sent with models to Johns Dental. Our technicians will then fabricate the appliance to Dr. William's specifications. We can also supply bands at an additional cost, if needed.

Contra-Indications

As with any appliance, there are several situations in growing children when it would not be in the best interests of the children to utilize the Williams expansion appliance. Following are some contra-indications of its use:

1. Extremely severe crowding of maxillary and mandibular incisors.
2. Absence of several bicuspids.
3. Presence of several severely ankylosed lower primary molars.
4. Premature loss of lower primary cuspids.
5. Primary 2nd molar roots that are nearly completely resorbed.
6. Children who have passed their 10th birthday.

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You will soon be able to read this article in its entirety on our website: www.johnsdental.com



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