Title: **Hints for improved insertion, activation and troubleshooting for the fixed functional MARA (Mandibular Anterior Repositioning Appliance)**

The MARA is an appliance that can be used from the age of 3 to 4 up to old adult patients at the age of 70 or more.

General activation recommendations are as follows: Generally speaking, one should use a maximum of 2 mm mandibular advancement at the first insertion. Usually, the mandible can be advanced by 1 mm every four weeks. In younger children, the clinician should not activate the appliance much. Also, boys should be given a little less frequent activation, at smaller increments, than girls, esp. in the beginning. This applies esp. to rough, sporty boys, etc. After the appliance has been inserted, it is important to talk to the patients and watch how they adjust to it. This is called a speech centric test. Always make sure there is no contact with the mucosa in the area of the molars during medio- and laterotrusion.

The reason why the MARA is the best class II correction appliance is that there is no contact intermaxillary connection with the upper and lower bars and the lower jaw is totally free. This gives the patient more freedom of movement. It is important to have a loose vertical rubber band at nights, so the patient can't open his mouth to such an extent that the upper arm no longer contacts the lower leg so the mandible cannot move posteriorly.

As far as the question of when to remove the MARA is concerned, it is important to leave it in long enough, so that the speech centric test shows the patients functioning in class I at all times – without need of Class II elastics to hold the mandible forward. Class II elastics cause lower anterior flaring. Class II division 2 cases are an exception here. If indicated, Class II elastics can be used on Class II division 2 cases, because here, frequently, the lower anteriors need to be flared anteriorly.

In open bite cases the crowns on the molars should keep as much material as possible, leaving only a hole of 4-5 mm diameter for later removal. This crown material helps encourage intrusion of the molars. The reverse is true for deep bite cases. Here, there should be no metal contact because we do not want to intrude the molars because of the already existing deep bite. It is recommendable in deep bites slightly to overcorrect to an open bite situation and in open bites slightly to correct to a deep bite as much as possible.

For 100 % bite control, plateaus can be bonded to the palatal surface of the upper incisors, either during active treatment or during retention, in order to ensure lifetime vertical stability.

Magnetic Resonance Imaging (MRI) is recommendable wherever possible. MRIs are the optimal part and the keystone for orthodontic records. For example, they are used to view disc position in Class II patients and to determine the optimal treatment plan.