

# Analysis of the ergonomic usage of the ARMflex® in the odontological area

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## Abstract

The aim of this paper is to analyze the importance and applicability of ARMflex® in the odontological area and its influence in preventing or stopping the involuntary habit of improperly positioning the hand under the face or under the pillow. The ergonomic usage of ARMflex® influences the design in odontological areas and innovates in the semi-immobilization of the patient to prevent future orthodontic problems.

Key-words: applied ergonomics; odontological area; design; semi- immobilization; biomaterial.

## 1. Introduction

Ergonomics is the scientific study of the relationship between man and his work environment. In this sense, the term environment includes not only the place itself in which the man works, but also his tools, methods and the organization of this work. Also, related to this, is the nature of man itself, which includes his skills and his psychological, physiological, anthropometric and biomechanical capabilities. <sup>[2]</sup>

The biomaterial is considered any substance (other than a drug) or combination of substances, synthetic or of natural origin, which can be used for a period of time, either completely or partially as part of a

system that treats, increases or replaces any tissue, organ or body function. <sup>[1][3]</sup>

*“A biomaterial is a nonviable material used in a medical device, intended to interact with biological systems” (WILLIAMS, 1987). <sup>[4]</sup>*

The purpose of ARMflex® <sup>[5]</sup>, a product that uses a sterile canvas 600, polymer, velcro and cotton as its material, is to prevent the involuntary habit of improperly positioning the hand under the face or the pillow (Fig. 1). This habit is often the cause of an orthodontic problem called "posterior unilateral or bilateral crossbite".

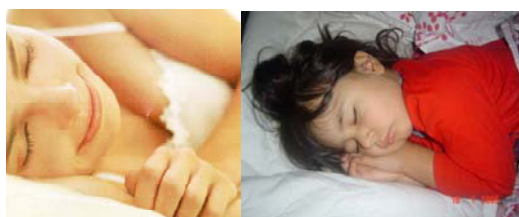


Fig. 1: Night habits for the ARMflex® usage.

## 2. Method

This article resulted from a research conducted by Dr. Alda Milagres de Assis, which used the scientific methodology to organize a series of actions structured as follows: a bibliographic research was performed, and then the main necessities associated with the ergonomic development of products designed for the area of orthodontics and studies of biomaterials were raised.

The use of ARMflex® (Fig. 2) is directed to children aged 04 to 12 years for cases of thumb sucking prevention and 04 to 13 years for cases of improperly positioned hand under the face in both sexes. It can be used in patients aged up to 18 years old as an auxiliary correction method.



Fig. 2: Use of the ARMflex.

The tests were executed in dental patients of the IPSEMG service – Brazil. The number of subjects were about 200 children and adolescents.

## 3. Results

In cases where the orthodontic stretcher was used appropriately during the whole night, the habit was completely eliminated, which facilitated the treatment. The time required for night usage is approximately 03 to 05 months, varying according to greater or lesser degree of automatic habit. It is always used in the arm-forearm articulation and has various sizes (P, M, G and GG).

This device is also interesting for hospital use, in cases which patients, especially children after surgery, mustn't move their arms and need an effective restraint, avoiding the embarrassment of having their arms bound to the sides of their beds.

## 4. Discussion

The orthodontic tensor work by the semi-immobilization of arm-forearm articulation preventing the movement of the arm that presses the jaw by compressing it inside. The initial research was done during orthodontic treatment in preventive public service by observing the evolution of the problem as a product of habit. The method used before was to apply bandages to the arm in the elbow region using several layers of material and it was not only uncomfortable but also inefficient because it gets loosen with the arm movement during sleep.

The orthodontic tensor ARMflex® emerged as way to assist preventive and interceptative orthodontic treatments which need to contain, especially in children and adolescents, the habit of putting the hand under the face. By direct clinical observation, a force countering the intermaxillary elastic and other devices used for unwinding of the first molars was perceived, reducing or neutralizing their force and delaying the fix. The product has been showing favorable results in orthodontic treatments and is under analysis for future medical applications, including postoperative uses.

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