ORIGINAL RESEARCH PAPER

Dentistry

KEY WORDS: Patient with special needs, protocol, orthodontics.

# Orthodontic treatment protocol for patients with special health care needs.

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ABSTRACT

People with special needs, in general, have high requirements for orthodontic treatment due to an increase in the prevalence and severity of malocclusions. Although their parents/caregivers are highly motivated to optimize their quality of life by improving dento-facial aesthetics and oral function, these patients are also the ones with the least access to orthodontic treatment.

**Objective:** Confection of a clinical work protocol in orthodontics, which allows an adequate diagnosis, treatment plan and prognosis in the specialty of dentomaxillary orthopedics and orthodontics.

**Material and method:** Work carried out based on a 30 year trajectory of the Craniofacial Malformation Unit of the University of Chile, including clinical experience and work in the field of Craniofacial malformations.

**Results:** Confection of a clinical work protocol for patients with special needs, to be used in the specialty of dentomaxillary orthopedics and orthodontics.

**Conclusions:** Patients with special needs present high incidence of malocclusion, therefore their evaluation is needed in the orthodontic specialty field. It is of the utmost importance, in a first check up, the complete evaluation of the patient, including clinical history and the evaluation of the cooperation degree, to perform an adequate diagnosis, treatment plan and prognosis regarding the necessary orthodontic treatment.

## Introduction:

The American Pediatric Dentistry Association (AAPD) defines special health care needs (SHCN) as any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs. The condition may be congenital, developmental, or acquired through disease, trauma, or environmental cause and may impose limitations in performing daily self-maintenance activities or substantial limitations in a major life activity[1].

Due to medical advances and the increment of more and better treatment alternatives, fewer complications related to pregnancy and childbirth have been found, including infants born prematurely who may suffer developmental or environmental constraints on their health, have significantly higher survival possibilities. As a result, the number of children with SHCN increases and the integration of people with SHCN and their families into daily activities and social life has become an important and absolutely necessary fact[2].

The prevalence and severity of malocclusions in people with SHCN is especially high. Many of them often have medical limitations in procedures that are necessary to achieve good orthodontic treatment. They may also present behavioral problems (moderate to severe) that make treatment difficult or even impossible[3].

In Chile, there are currently no records related to the coverage of health care and especially dental care of people with SHCN. The available epidemiological data comes from the Disability National Study registered in 2015 by SENADIS (Disability National Service) addressed for the population with an impairment situation, according to which 20% of the adult population has some degree of disability, as to the population of children and teenagers, it is estimated that 5.8% of them are handicapped[4,5].

The dental care of this population in many cases requires adequate equipment, professionals with specialized knowledge and at the same time technically prepared to comply with a series of specific care depending on the patient's type of pathology and their unique health needs for quality care[6].

## Objective:

At the present time, there are no national records of orthodontic care in patients with SHCN neither programs or protocols of care in the specialty that incorporate them, so the objective of this work is the preparation of a clinical care protocol (Annex) directed at orthodontics.

## Materials and methods:

This work has been carried out based on the 30 year trajectory of the Craniofacial Malformation Unit of the University of Chile, which includes clinical experience and work in the area of craniofacial malformations, adapted to the Chilean reality, where the orthodontist can collect the data necessary to reach an optimal treatment in a patient with SHCN.

## Results:

To perform a complete study of a patient with SHCN, a thorough clinical record is necessary with emphasis on the clinical history and a clinical evaluation with radiographic examinations, models and photographs; which will allow us to have further information about the presented condition by each patient and the need for orthodontic treatment.

A protocol for the evaluation of patients with SHCN is proposed for their subsequent evaluation, diagnosis and treatment with orthopedics and dentomaxillary orthodontics.

## Medical Record[6,7,8,9,10]

Knowledge of the patient's medical history is essential to avoid and reduce the risk of aggravating a medical condition while performing dental care. A precise, complete and up-to-date medical history is required for a correct diagnosis and treatment plan. Information related to the reason for consultation, medical conditions and/or illnesses, history of the current illness, physicians who control, current medications, social history, systems review, allergies/sensitivities, hospitalizations/surgeries, anesthesia experiences and a complete dental history if the patient has one,it

must be obtained.

If the patient/parents are unable to provide necessary information, the caregiver, parent, and/or treating physician should be consulted.

Medical Consultation: If it´s necessary, the dentist should coordinate the treatment through consultation with other professionals in charge of the patient's care, including doctors, nurses, social workers and therapists. In that case, the doctor must be consulted regarding medications, sedation, general anesthesia, and special restrictions that may be necessary to ensure safe care.
Informed Consent / Assent: Informed consent is required for all patients or, in the case of children, consent from parents and/or caregivers. The pattern of this document comes from the medical practice and is based on free will, ability and knowledge. Therefore, the patient or parent/caregiver must understand the potential risks and benefits of treatment and legally accept these risks in writing. In the case of underage patients, the assent is made in conjunction with the informed consent, where the minor expresses voluntariness in the decisions taken in said register.

Informed consent/assent must comply with state laws and, where appropriate, applicable institutional requirements. Informed consent must be well documented in the clinical file.

Patient complexity assessment: Based on the Case mixing Model of the British Dental Association, certain criteria are used to determine the complexity of each patient and their possible care, in this case for orthodontic treatment (Table 1).

**Table 1: The case mix model criteria**

| Criteria | Type of factor considered | | | Score (0 to 7) |
|---|---|---|---|---|
| 1. Ability to communicate | Need for interpreter or other means of communication; degree of learning disability or dementia. | | | |
| 2. Ability to co-operate | Additional appointment time or acclimatisation visits required; need to use sedation or GA. | | | |
| 3. Medical status | Treatment modification required; degree of impact of medical or psychiatric condition on the provision of care. | | | |
| 4. Oral risk factors | Ability to carry out oral hygiene; dietary conditions, eg PEG feeding, severe xerostomia. | | | |
| 5. Access to oral care | Support of carer required to get to the surgery; use of wheelchair recliner or hoist; need for home care. | | | |
| 6. Legal and ethical barriers care | Degree of capacity to consent; need to consult with other professionals or carers; need to hold best interest meeting or case conference. | | | |
| | High complexity 0-14 | Mild complexity 15-28 | Low complexity 29-42 | |

**Clinical examination**[11]
The clinical examination should include a characterization of the patient including extraoral and intraoral examination.

Extraoral examination:
- Type of skull, face, TMJ status and nodes is specified.
- Profile examination.
- Frontal examination.

**Intraoral examination:**
- Specify the condition of soft tissues, braces, tongue, hard tissues (teeth) and type of dentition.

**Cephalometric Examination:**
Performed according to requested radiographs, skeletal class, type of profile and cephalometric values will be evaluated.

**Examination of models:**
Regarding the taking of models, it is possible that due to the conditions of the patient, it is not possible to perform a classic technique of printing, so it is necessary to make modifications to the conventional technique such as printing with adapted acrylic cuvettes, use of heavy and light silicone without impression tray.

After analyzing the models separately and in occlusion, the type of occlusion in the sagittal, transverse and vertical sense should be recorded in the clinical file.

**Complementary tests:**
Tests will be requested depending on the evaluation presented by the patient. For the orthodontic analysis, they are: profile teleradiography and/or panoramic radiography.

As for the model making, it might not be possible to perform a classic impression technique due to the patient's conditions, so it is necessary to make modifications to the conventional technique like impressions with adapted acrylic trays or the use of heavy and light body silicone without a tray.

**Conlusions:**
The clinical history in patients with SHCN is of great importance, so a complete clinical record is necessary, also taking into account the degree of cooperation of each patient to obtain a good diagnosis and prognosis regarding the necessary orthodontic treatment.

The treatment of a patient with SHCN should have a multidisciplinary approach, since there will be several health care professionals working together and it is important to maintain a fluent communication to give the patient the best in order to maintain good health.

The patient, parents/caregivers and the dental team must generate an alliance that allows an optimal communication and care for a better result in each appointment and in the whole treatment.

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## ORTHODONTIC Y ORTHOPEDICS DENTOMAXILAR

PROTOCOL OF ORTHODONTIC CARE IN PATIENTS WITH SPECIAL HEALTH CARE NEEDS
CRANIOFACIAL MALFORMATION UNIT OF THE UNIVERSITY OF CHILE

Name: _____. Age: _____.
Address: _____.
Telephone number: _____- _____.
Caregiver: _____ Occupation: _____.
Chief complaint: _____.
Date:_____. Derived by:_____.

**General evaluation of patient complexity** (Score 0 to 7, 7 is best).

| | |
|---|---|
| 1. Ability to communicate | |
| 2. Ability to cooperate | |
| 3. Medical status | |
| 4. Oral risk factors | |
| 5. Access to care | |
| 6. Legal and ethical barriers to care | |
| Total score | |
| Complexity | |

### Medical history

Family history.

| Heart disease | Asthma | Allergy | Diabetes | AIDS | Blood Dyscrasia | Syndromes |
|---|---|---|---|---|---|---|
| | | | | | | |

Observations:_____.
Maternal and child history.

| | | | | |
|---|---|---|---|---|
| Pregnancy | Normal | | Pathology | |
| Child birth | Full term | | Premature | |
| Birth | Healthy | | Pathology | |
| Lactation | | | | |

**Diseases or systemic disorders.**

| | | | |
|---|---|---|---|
| **1. Cardiovascular System** | | **6. liver Diseases** | |
| Angina | | Jaundice | |
| Hypertension | | Hepatitis | |
| History of AMI | | Cirrhosis | |
| Heart surgery | | Others : | |
| Valvular surgery | | **7. SNC** | |
| Infectious endocarditis | | Epilepsy | |
| Rheumatic fever | | Cerebral infection | |
| Others: | | Multiple sclerosis | |
| **2. Respiratory System** | | Parkinson | |
| Asthma | | Cerebral palsy | |
| Emphysema | | Intellectual / physical disability | |
| Tuberculosis | | Others : | |
| Others: | | **8. Skeletal Muscle** | |
| **3. Endocrine System** | | Bone pathology | |
| Diabetes | | Muscular pathology | |
| Thyroid disorder | | Others : | |
| Nutritional disorder(obesity / malnutrition) | | **9. Gastrointestinal** | |
| Others: | | Hiatal Hernia | |
| **4. Hematology** | | Peptic ulcer | |
| Anemia | | Cholecystitis | |
| Coagulation disorders | | Others : | |
| Others : | | **10. Connective/Dermatological Tissue** | |
| **5. Genito/Urinary System** | | Systemic lupus erythematosus | |
| Urinary problems | | Systemic sclerosis | |
| Renal disease | | Eczema | |
| Sexually transmitted disease | | Others : | |
| Others: | | **11. Genetic alterations/ Syndromes** Wich? | |

**Observations:**

_____

_____.

**Surgical history:**

| Date | Intervention | Doctor/ Hospital | Type of Anesthesia |
|---|---|---|---|
| | | | |
| | | | |

**Current medications:**

| Name | Dose | Frequency / Schedule |
|---|---|---|
| | | |
| | | |
| | | |

Hipersensitivity / allergies background: _____.

Blood group: _____.

**Functional habits:**

| Breathe | Suction | Interposition | | | |
|---|---|---|---|---|---|
| Nasal | | Pacifier | | Labial | |
| Oral | | Baby bottle | | Finger | |
| Mixed | | Lip | | Onycophagy | |
| | | Finger | | Other objects | |

**Social History** (Caregivers / residence / transport / marital status / family):

_____

_____

_____

_____.

**Patient complexity assessment:**

_____

_____

_____

_____.

**Clinical Examination:**

| Extraoral Examination | | | | | | |
|---|---|---|---|---|---|---|
| Skull | Brachyicephalic | | Mesochepalic | | Dolicocephalic | |
| Face | Euryprosopic | | Mesoprosopic | | Leptoprosopic | |
| TMJ | Normal | | Altered | | Characteristics : | |
| Palpable Nodes | Yes | No | Characteristics: | | | |

| Profile Facial Examination | | | | | | |
|---|---|---|---|---|---|---|
| Profile Type | Anterior | | Medium | | Posterior | |
| | Forward inclined | | Straight | | Retro inclined | |
| TMJ | Normal | | Altered | | Characteristics: | |
| Frontal Facial Examination | | | | | | |
| Symmetrical | | Asymmetric | | Specify: | | |

| **Intraoral Examination** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Soft tissues** | | | | | | | |
| Sulcus | | Mucous | | | | | |
| Gingiva | | | Tongue | | | | |
| Tonsils | Normal | | Hyperplastic | | Absent | | |
| **Frenulum** | | | | | | | |
| Upper Lip Medial | Normal | | Close to ridge | | Fibrous | | Other: |
| Lower Lip Medial | Normal | | Close to ridge | | Fibrous | | Other : |
| Lingual | Normal | | Short | | Functional | | No functional |
| **Hard Tissues** | | | | | | | |
| Palate | Vertical | Normal | | High | | | |
| | Horizontal | Normal | | Wide | | Crossed | |
| Apical Bases | Upper | Normal | | Wide | | Crossed | |
| | Lower | Normal | | Wide | | Crossed | |
| **Dentition** | | | | | | | |
| Deciduous | Mixed 1ª phase | | Mixed 2ª phase | | | Permanent | |

**Cephalometric Examination:**

| Cephalometric Examination | | | | | | |
|---|---|---|---|---|---|---|
| Profile Type | Anterior | | Medium | | Posterior | |
| | Forward inclined | | Straight | | Retro inclined | |
| Skeletal Class: | | | | | | |

**Exam of models:**

| Occlusion Examination | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sagital | | | | | | | | |
| Anterior | Overjet | _____ mm. | | | | | | |
| Lateral | Canine relation | | Molar relation | | | | | |
| Transverse | | | | | | | | |
| Anterior | Upper middle line | Normal | | Right Deviated | | Right Deviated | | |
| | Lower middle line | Normal | | Right Deviated | | Left Deviated | | |
| Lateral | Right | Normal | | Vis a Vis | | Crossbite | | |
| | Left | Normal | | Vis a Vis | | Crossbite | | |
| Vertical | | | | | | | | |
| Anterior | Overbite | _____ mm. | | | | | | |
| Lateral | Normal | | | Open | | Note. | | |

**Complementary tests**

Exams requested: _____.

_____.

_____.

_____.

_____.

**Required radiographs:**

| | | |
|---|---|---|
| Orthopantomography | | |
| Profile x-ray | | |
| Bitewing | | |
| Occlusal | | |
| Cone Bean | | |
| Others | | |

**Médical consultation:**

| | |
|---|---|
| Derivared to: | _____ _____. |
| In consult for: | _____ _____ _____ __. |

| **ORTHODONTIC Y ORTHOPEDICS DENTOMAXILAR** | |
|---|---|
| Diagnosis: _____ _____ _____. | |
| Treatment Plan | Skeletal:_____ _____. |
| | Occlusal:_____ _____. |
| | Dentoalveolar:_____ _____. |
| | Functional:_____ _____. |
| Level of patient complexity: 1 – 2 – 3 – 4 – 5 – 6 – 7 (Circle). _____. | |
| Level of ortodontic treatment complexity: 1 – 2 – 3 – 4 – 5 – 6 – 7 (Circle). _____. | |