

PROTOCOL FOR DETECTION OF RONCOPATHY AND OSAHS IN ADULT PATIENTS.

Instructions

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Introduction: This protocol consists of 12 factors which help in detecting the presence of snoring and/or OSAH symptoms from the clinical point of view. These are phenomena which are sometimes difficult to detect, due to the fact that many symptoms and signs are produced during the sleep. Nevertheless, we will focus on signs which can be relatively easy to observe, although the patient might be not aware of his problem.

It is very important to define the cause, and then refer the patient to a professional or professionals related to the origin and manifestation of the alteration: ENT, orthodontist, speech therapist, GP, physiotherapist, maxillofacial surgeon, etc.

In the section Anamnesis, we will give a numeric code to each answer: 0 for "NO", 1 for "YES", and 2 for "DON'T KNOW". It is not necessary to carry out this coding when filling out the protocol form, but it would be useful in statistic studies.

1. Anamnesis

Anamnesis		Yes	No	Don't know
1	1. Do you snore at night?			
	2. Does your snoring wake up or bother your partner?			
	3. Does your snoring makes your partner change the room?			
	4. Do you have any respiratory distress while sleeping?			
	5. Do you feel tired in the morning?			
	6. Do you wake up with the headache?			
	7. Do you doze off easily during the day or when driving?			
	8. Do you doze off easily while watching TV or reading?			
	9. Do you fall asleep in the cinema or theatre?			
	10. Do you have any nose allergies?			
	11. Do you smoke?			
	12. Do you drink alcohol before going to sleep?			
	13. Do you use regularly any medication to sleep?			
	14. Do you have high blood pressure?			
	15. Do you have any concentration difficulties?			
	16. Have you ever experienced any memory loss?			
	17. Do you present excessive perspiration at night (diaphoresis) ?			
	18. Do you urinate more than twice by night (nocturia)?			
	19. Do you move abruptly your limbs during the sleep?			

Figure 1

This questionnaire is designed to determine basic dysfunctions, habits and pathologies which might be the cause of the symptoms of Sleep Apnea and Hypoapnea Syndrome, or to be the manifestation of simple snoring without apnea.

Each question of anamnesis can suggest the need to refer the patient to a specialist. For example, the first four questions on snoring can indicate that the patient should be referred to ENT specialist to eliminate any pathologies of this field, or to a speech therapist who can detect a dysfunction of oropharyngeal musculature linked to the collapse of the upper air ways.

The answers in the Anamnesis part should be contrasted with the observations in the following items.

The coding is as follows: 0 for "no", 1 for "yes", and 2 for "don't know".

2. Background

This item collects the data on previous studies and diagnosis which can help in identifying the origin of symptoms. It will be useful to know if the patient has ever been subjected to any specific sleep studies (clinical, polysomnography, X-rays), in which case we can count on them.

It is important to know if there is a basic disease, and it will be registered if the patient has already undergone any treatment. This information will be useful both for diagnosis and treatment.

As far as the usual medication is concerned, some medicines can provoke hyposialia and/or relaxation of the peripharyngeal musculature, and therefore it is important to put it on record if the patient uses it.

Also, cardiovascular and respiratory background can contribute to the syndrome.

In "others" we will add the information on any pathology not mentioned in the protocol, as well as the situations that can be relevant, for example: an accident, skeletal and muscular diseases, autoimmune diseases, etc., which can intervene in the manifestation of OSAH.

2	<p>Background</p> <p>a) Have you ever been subjected to any sleep studies? Clinical study <input type="checkbox"/> polysomnography <input type="checkbox"/> X-rays <input type="checkbox"/></p> <p>b) Have you ever undergone the treatment of apnea, high blood pressure, cardiovascular or respiratory diseases? YES / NO</p> <p>c) Usual medication: Antihistaminic Drugs <input type="checkbox"/> Anxiolytic <input type="checkbox"/> Muscle relaxant <input type="checkbox"/> Antidepressant <input type="checkbox"/></p> <p>Cardiovascular background:.....</p> <p>Respiratory background:</p> <p>Other:</p> <p>.....</p>
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Figure 2

As it has already been explained, this protocol's objective is to detect and refer the patient to a corresponding specialist and therefore the aim is to collect data which will indicate us a route to follow in diagnosis elaboration and the consequent interdisciplinary treatment.

The coding is as follows: 1 for "yes" in the Background section (ticked box), and 0 for "no" (empty box).

3. Profile

Three types of facial profile are considered, according to Dr. Arnett's classification to normal or altered ^{1,2}:

- Normal, or Class I (dental arches are correctly positioned).
- Convex, or Class II (advanced maxilla, and retracted mandible)
- Concave, or Class III (retracted maxilla, and advanced mandible).

A patient with altered profile should be referred to a dentist.

The coding is as follows: 0 for Class I profile (normal), 1 for Class II profile (altered), and 2 for Class III (altered).

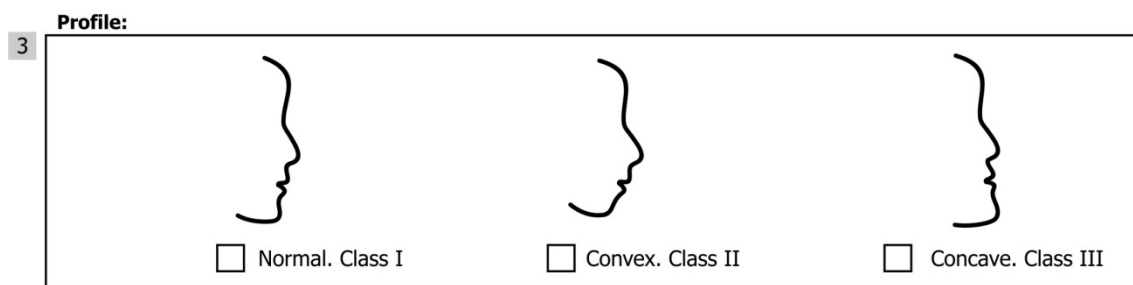


Figure 3

4. Evaluation of oropharyngeal space

The aim of this classification is to evaluate oropharyngeal space and visibility of the structures³. The patient will be asked to open his mouth as much as he can, and the interior of buccal cavity will be observed: tonsils, uvula, soft and hard palate. The corresponding box should be ticked according to the observed.

- Class 1: All structures are visible.
- Class 2: Upper portion of tonsils, hard and soft palate and uvula are visible.
- Class 3: Tonsils are invisible. Only hard and soft palate and the uvula base are visible.
- Class 4: Only hard palate is visible.

The coding is the same as in Friedman Classification.

The 3 and 4 class patients should be referred to a speech therapist specialized in orofacial movement disorders to carry out the evaluation of the oropharyngeal musculature and functions.

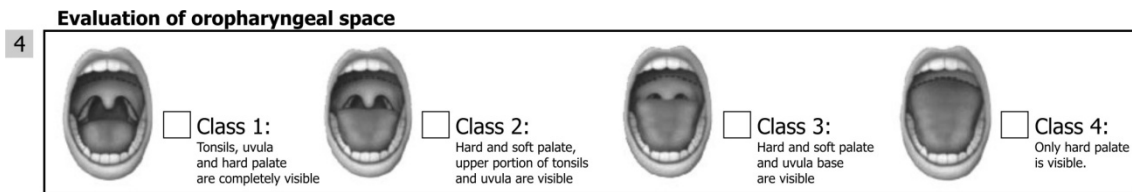


Figure 4

5. Tongue mobility

Dr. Durán⁴ coded the tongue mobility: there are five levels of the tongue mobility depending on how much the tongue tip can be lifted in a wide open mouth, plus a 0 level used for the absolute absence of the problem due to the previous surgical intervention:

- Level 0: Surgical intervention (liberation) of the lingual frenum (lingual frenectomy).
- Level 1: The tip of the tongue touches the palate behind the upper incisors in the wide open mouth.
- Level 2: The tip of the tongue almost touches the palate behind the upper incisors in the wide open mouth.
- Level 3: The tip of the tongue reaches the half distance between the upper and lower incisors in the wide open mouth.
- Level 4: The tip of the tongue is lifted a little bit above the lower incisors.
- Level 5: The tip of the tongue doesn't reach lower incisors (very close to ankyloglossia).

The coding in this part is the same as Dr. Duran's levels.

A patient with altered tongue mobility should be referred to a speech therapist or to an ENT specialist.

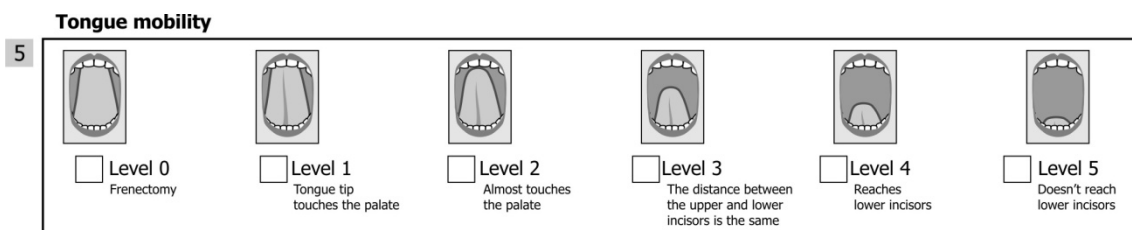


Figure 5

6. Tonsils

There are five levels of tonsils size according to their relation with the pharyngeal space in which they are, plus 0 level for the absolute absence of the problem^{4,5}:

- Level 0: Previous tonsillectomy.
- Level 1: No visible tonsils.
- Level 2: The tonsils occupy less than a third of a total pharyngeal space (<25%).
- Level 3: The tonsils occupy the third part of the pharyngeal space (25% - 50%)

- Level 4: The tonsils occupy two thirds of the pharyngeal space, although they still don't touch each other in their midline (50% - 75%).
- Level 5: The Tonsils occupy all pharyngeal space and they touch each other (>75%).

The coding in this part is the same as Dr. Duran's levels.

A patient with altered tonsils size (especially Levels 4 and 5) should be referred to an ENT specialist.

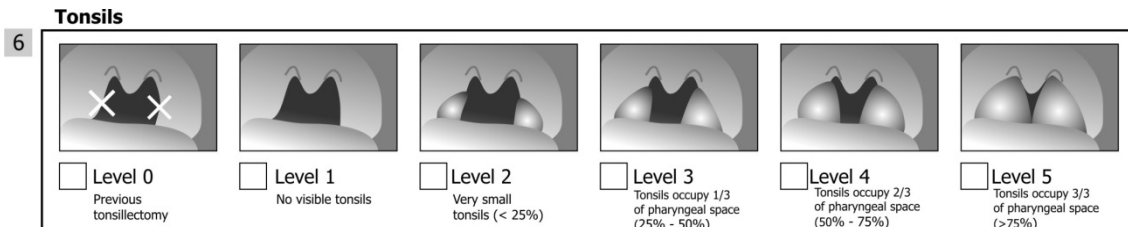


Figure 6

7. Adenoids

To establish if there are any alterations of adenoids or not, a phonetic test is carried out, which consists of asking a patient to pronounce a word with nasal consonants, for example, "morning", first with and then without the pinched nose. If the vocal timbre sounds the same in both cases, it is the indication of a possible adenoid hypertrophy. If the vocal timbre sounds different, it means that the nasopharynx isn't occupied by adenoid hypertrophy.

The box "Endoscopy" will be ticked by an ENT specialist in case the results of endoscopy are positive.

The box "Profile X-ray" will be ticked by an orthodontist in case the results are positive.

Both specialists will put on record the findings in the respective boxes: "No obstruction", "Partial obstruction", or "Severe obstruction".

The coding of this section is as follows: 0 for the absence of obstruction, 1 for the partial obstruction, and 2 for severe obstruction.

Adenoids

7

Phonetical test (morning) Negative (different) Endoscopy (only ENT) No obstruction

Positive (same) Profile X-ray (only orthodontists) Partial obstruction

Severe obstruction

Figure 7

8. Daytime breathing

The breathing type of a patient is determined, which can be: nasal, mouth or mixed. In an orthodontic treatment, the functional matrix reeducation is extremely important, as well as the establishment of eight rules of functional matrix by Dr. Durán⁶. One of the first keys to functional matrix is the establishment of an adequate nose breathing pattern. Nevertheless, due to the obstructions or habits, a patient sometimes presents a different breathing pattern with open mouth, mandibular clock-wise rotation, and air way through the mouth. In the long term, this breathing pattern provokes various consequences in growth and craniofacial development.

A patient with altered breathing should be referred to a ENT specialist and speech therapist. The coding in this section is as follows: 0 for nose breathing, 1 for mixed breathing, and 2 points for mouth breathing.

Daytime breathing			
8	<input type="checkbox"/> Nasal	<input type="checkbox"/> Mixed	<input type="checkbox"/> Mouth

Figure 8.

9. Profile occlusion

Here, the first molars, canines and incisors relationship is analyzed:

- Class I (normal): mesiolabial cusp of the first upper molar occludes in the mesiolabial groove of the lower first molar. Upper canine occludes between the distal slope of the lower canine cusp and mesial slope of the lower first bicuspid. The incisors present an overjet or antero-posterior distance of 2-3 mm (upper incisor in front of the lower incisor).
- Class II/1: The upper first molar, canine and incisors are in more forward position in respect to the lower ones.
- Class II/2: The upper first molar and canine are in a more forward position in respect to the lower ones. The upper central incisors are inclined towards palatal (palatoversion).
- Class III: The upper first molar, canine and incisors are in more backward position in respect to the lower ones.

A patient with altered occlusion should be referred to a dentist.

The coding in this section is as follows: 0 for Class I malocclusion, 1 for Class II/1 malocclusion, and 2 for Class II/2 malocclusion, and 3 for Class III malocclusion.


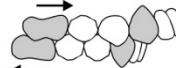
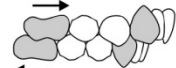

Profile occlusion				
9				
	<input type="checkbox"/> Class I (Normal)	<input type="checkbox"/> Class II/1	<input type="checkbox"/> Class II/2	<input type="checkbox"/> Class III

Figure 9

10. Frontal occlusion

The occlusion alterations are examined from the vertical and transverse point of view^{6,7}:

Vertical point of view:

- Normal bite
- Anterior deep bite: upper incisors cover the lower ones for more than 2-3 mm.
- Open bite: upper incisors cover the lower ones for less than 0 mm.

Transverse point of view:

- Uni (or bilateral) cross bite: labial cusp of upper bicuspid and molars occlude on the inner side of the labial cusp of lower molars.

A patient with altered bite should be referred to a dentist.

The coding in this section is as follows: 0 for normal relationship, 1 for anterior deep bite, and 2 for open bite, and 3 for posterior cross bite (uni or bilateral).

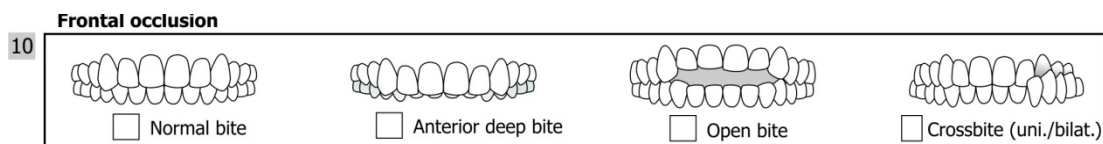


Figure 10

11. Summary of positive signs and symptoms

The summary of positive data found in the first 10 items of the evaluation will be written.

Summary of positive signs and symptoms

11

.....

.....

.....

Figure 11

12. Recommended assessment by...

At the end of the protocol, a professional or professionals to whom the patient should be referred in order to undergo adequate interdisciplinary treatment are included.

Apart from the professionals indicated in continuation, it is possible that in some cases a patient should be referred to other professionals, such as: pulmonologist, neurologist, geriatrician, psychologist, etc.

The coding of professionals to whom the patient should be referred is as follows: 1 for an **ENT specialist**, 2 for an **orthodontist**, 3 for a **speech therapist**, 4 for a **physiotherapist**, 5 for a **maxillofacial surgeon**, 6 for **other professionals** (specify), 7 for **more than one of them**.

We'll use the same coding (in this case, 1-5) to specify which professional carried out the study.

Recommended assessment by:

<input type="checkbox"/> ENT	<input type="checkbox"/> Orthodontist	<input type="checkbox"/> Speech Therapist	<input type="checkbox"/> Physiotherapist
<input type="checkbox"/> Maxillofacial surgeon	<input type="checkbox"/> Others	<input type="checkbox"/> More than one of them	

Figure 12

CONCLUSIONS

This protocol presents a simple and quick clinical procedure which allows us to carry out the preliminary evaluation of a patient and to assign the specialists who should be a part of an interdisciplinary team which should participate in the diagnosis and the treatment, in order to facilitate the correction, to carry out the etiological treatment, and in this way to achieve the maximal post-treatment stability possible.

This protocol also tries to unify the concepts and nomenclature used by different specialists, with an aim to facilitate and encourage the understanding among them. Furthermore, if this examination is repeated after the treatment, the treatment evolution can be defined in an objective way, and when the work of one or various specialist who participated in the treatment is finished.

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