

THE MINISTRY OF HEALTH OF UKRAINE  
THE HIGHER STATE EDUCATIONAL INSTITUTION OF UKRAINE  
"UKRAINIAN MEDICAL STOMATOLOGICAL ACADEMY"

Approved  
at the meeting of orthodontics department  
«\_\_\_\_»\_\_\_\_\_20\_\_\_\_y.  
protocol №\_\_\_\_by \_\_\_\_\_  
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**METHODICAL RECOMMENDATION**  
**for independent work of students during the preparation**  
**to practical lessons and on the lessons**

Academic discipline	Orthodontics
Module №1	Orthodontia. Diagnostic of dento-gnathic anomalies and deformations.
The theme of the lesson № 16	The final diagnosis making. The role of classification in determining the diagnosis.
Course	III
Faculty	Preparation of foreign students

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**1. The relevance of the topic.** After conducting of the patient clinical examination in terms of one of the classifications a preliminary diagnosis formed. Carrying out of additional examination methods such as biometrics and diagnostic models of the jaws, anthropo- and photometry, radiological and functional examination, differential diagnosis, allows us to formulate the final diagnosis, according to which choose the method and plan of treatment, identify the most rational design of orthodontic appliance. Therefore knowledge of final orthodontic diagnosis composite, determination of the difficulty of orthodontic treatment degree is important in the preparation of the orthodontist.

## **2. Specific objectives:**

To folded final orthodontic diagnosis;

To know the classifications of malocclusions;

To know the basic methods of the orthodontic patients' clinical examination;

To know additional examination methods of orthodontic patients;

To know the composition of orthodontic diagnosis;

To know how determined measure of orthodontic treatment.

## **3. Basic knowledge's, abilities, skills necessary for studying the topic (interdisciplinary integration)**

Name of previous disciplines	Skills
1. Anatomy	To determine the period of the child development, the proportionality of body parts during this period of child development. Anatomical structure of maxillofacial area.
2. Orthopedic stomatology	Description of physiological bite.
3. Normal physiology	To determine the timing of muscle contractions, coordination of certain muscle groups work.
4. Radio-therapy	Reading of sciagrams.
5. Medical psychology	Principles of mastering of information. Determination of patients' motivation and his reactivity on the treatment.
6. Surgical stomatology	Determination of the TMJ state. Surgical methods of interference at orthodontic treatment/
7. Pedodonti	Terms of temporal and permanent teeth eruption. Features of the bite development in different age-old periods.

## **4. Tasks for independent work during preparation to the lesson and on the lesson**

4.1. A list of the main terms, parameters, characteristics that need to learn by the student during the preparation to the lesson:

Terms	Definition
1. Diagnosis	Diagnosis is the identification of the nature and cause of a certain phenomenon. Diagnosis is used in many different disciplines with variations in the use of logic, analytics, and experience to determine "cause and effect".
2. Classification	(lat. classis – class, and facio – acting), the system of distribution of objects into classes according to certain characteristics.
3. Norm	(lat. norma – "rule") is a regulatory rule that specifies the boundaries of its application; corresponds to something typical or usual, that occurs in a natural way and does not cause health problems.
4. Anomaly	(gr. abnormality) abnormality, an aberration from the general pattern.
5. Deformation	(from lat. deformatio "distortion") – change the size and shape of a rigid body under the action of external forces or other effects.
6. Parts of final diagnosis	Morphological, functional, etiological, aesthetical.

4.2. Theoretical questions to the lesson:

1. The definition of diagnosis in orthodontics.
  2. The definition of "norm" in orthodontics.
  3. The definition of the terms "abnormality" and "deformity".
  4. The definition of "classification".
  5. Classifications of malocclusion.
  6. Component parts of final orthodontic diagnosis.
  7. Description of morphological part of final diagnosis.
  8. Description of etiological part of final diagnosis.
  9. Description of functional part of final diagnosis.
  10. Description of aesthetic part of final diagnosis.
  11. Algorithm of diagnostics of morphological, functional and aesthetic violations.
- Methodology of determination complication of orthodontics treatment degree.  
Determination of treatment duration and his prognosis.

4.3. Practical works (task) which are executed at the lesson:

1. To make a final diagnosis of the existing malocclusion according to classification by Angle;
2. To make a final diagnosis of the existing malocclusion according to classification by Betel'man;

3. To make a final diagnosis of the existing malocclusion according to classification by Kalvelis;
4. To make a final diagnosis of the existing malocclusion according to classification by Grigorieva;
5. To make a final diagnosis of the existing malocclusion according to classification by WHO.

**The content of the topic:**

After conducting a clinical examination of orthodontic patient is determined by a preliminary diagnosis, which is formulated in terms of one of the malocclusion classifications: Angle, Kalvels, Betel'man, Grigorieva, WHO etc.

However, in order to plan of treatment insufficient clinical examination. This study only allows to determining the morphological changes, without specifying the degree of their severity. For this purpose, conduct biometric, graphic and radiographic studies, which determine the severity of morphological violations. The next stage of orthodontic examination is the dynamic study, which includes the consistent application of clinical tests, and functional tests aimed at the characterization and study of the general condition of the patients. Functional impairment determines by inspection and study of the facial and internal oral characteristics by the method of clinical functional tests and laboratory examination methods (masticate, morphometric, electromyography and the like). The severity of aesthetic violations determination of the aesthetic treatment, it is determined by conducting anthropo- and photometric studies. After analysis of examination conducted to formulate a final orthodontic diagnosis, which contains the following composition:

- morphological part is expressed in terms of one of classifications. Contains the characteristics of malocclusion supplemented with biometric, graphic or x-ray examination methods. For example: prognathic distal deep bite (by Grigoryeva classification); dento-alveolar form (based on the analysis of cephalometric examination); uniform narrowing of the upper jaw in lateral areas 2 mm, the elongation of the frontal part of the upper dental arch on 3 mm, retrusion and crowding of lower frontal teeth at 1 degree (based on biometrics);

- etiological part includes a description of the etiological factors that led to the development of malocclusion and act at the time of patient treatment to the doctor. The importance of determining the etiological diagnosis is made up of is that if the cause is not shifted, the possible recurrence of the disease. Determination of etiological factors is conducted with the patient interviews (anamnesis of a life) – clinical study. Due to the bad habit of mouth breathing (adenoid vegetation the presence of II-III degrees);

- functional part includes a description of disorders and degree of their severity on the basis of clinical or an additional examination methods. Functional disorders, as well as not shifted the etiological factors can later lead to relapse of disease, unfavorable aesthetic result, and so on for example: violation of respiratory function, reduced masticatory efficiency and the like.

- aesthetic part includes a description of the changes in facial features that are very important in the aesthetic prognosis of treatment. For example: short upper lip, a tight closing of the lips (symptom of "thimble"), deep lip-chin fold. If a short upper lip, the expansion of upper dental arch or medial shift of the mandible can lead to the appearance of "gummy smile", the formation of the "puzzled face" up on the closing of the lips and even greater strain muscles of the chin.

Malocclusions are variable for monsters, the severity of morphological, functional and aesthetic violations, and therefore, prognosis of treatment. To select the method, the treatment plan and choice of the rational design of orthodontic appliance is not enough to diagnose and to classify the malocclusion. It is also necessary to determine the degree of severity of these disorders and the difficulty of their elimination. For this purpose, use the method of assessment on a five-point by Zibert-Malign (1973). The essence of the method lies in the fact that evaluates the severity of morphological and functional disorders and the difficulty of their elimination.

A measure of the complexity treatment of each patient is the sum of the scores. Distinguish 4 degrees of orthodontic treatment difficulty for Zibert-Malign: I degree – easy treatment (27 points); grade II – the treatment of medium difficulty (28-40 points); III degree – the heavy treatment (41-54 points); grade IV – very severe treatment (55 or more points).

The amount of treatment measures		Score	The number of points		The degree of treatment difficulty in scores				Group the complexity of the treatment
			Upper jaw	Total	Easy	Medium difficulty	Heavy	Very severe	
			Lower jaw		I	II	III	IV	
1. For correction of the shape of dentition									
The number of teeth or groups of teeth that are to be moved	1 -2 teeth	1			5-7	8-10	11-15	More than 16	
	1 group of teeth	2							
	All groups of teeth	3							
The amount of movement in mm	1-3	1							
	3-5	3							
	>5	5							
Type of tooth movement	With a favorable tilt	1							
	Corpus movement	3							

Applied support	Reciprocal	1							
	Stationary	5							
Reactivity of the patient, taking into account the design, age, early or late treatment and its duration	Very favorable	1							
	Good	3							
	Adverse	5							
2. To establish the lower jaw in a proper position									
The value of dentition in occlusion (in mm or in relation to the width of the premolar crowns):	1-2	1			4-8	9-10	11-12	More than 13	
	½ of the width of premolar crown	1							
	From ½ to 1 of the width of premolar crown	3							
	More than 1 of the width of premolar crown	3							
Localization:	One side	1							
	Two sides	3							
The direction in which to change the bite:	Mesial	1							
	Lateral	3							
	Distal	5							
Reactivity of the patient, taking into account the design, age, early or late treatment and its duration:	Very favorable	1							
	Good	3							
	Adverse	5							
3. For normalization of oral cavity functions									
	Lips closing	1			1-5	6-10	11-14	More than 15	
	Mastication	2							
	Speaking	3							
	Breezing	4							
	Swallowing	5							
Total:					27	28-40	41-54	>55	

In the table define the amount of therapeutic measures to normalize the shape of each dental arches, bite correction, normalization of functions. This method can be applied for the characterization of malocclusions.

### **The duration and scope of orthodontic treatment depending on its complexity**

The severity of malocclusions and the complexity of their treatment			
points	months	visits	labor units
I (to 27 points)			
1	1	2	3
2	1	3	5
3	2	5	7
4	3	6	9
5	3	7	11
6	4	9	13
7	4	10	15

8	5	11	17
9	6	13	19
10	6	14	21
11	7	15	22
12	7	17	24
13	8	18	25
14	8	19	27
15	9	20	28
16	9	21	29
17	10	23	31
18	11	24	32
19	11	25	33
20	12	25	34
21	12	27	35
22	13	28	36
23	13	29	37
24	14	30	38
25	14	31	39
26	15	32	40
27	15	33	41
II (28-40 points)			
28	16	34	42
29	16	34	43
30	17	35	44
31	18	36	45
32	18	37	46
33	19	38	47
34	19	38	47
35	20	39	48
36	20	40	49
37	21	41	50
38	21	41	51
39	22	42	52
40	22	43	53
III (41-54 points)			
41	23	41	54
42	23	44	55
43	24	44	56
44	24	45	57
45	25	46	59
46	25	46	60
47	26	46	61
48	26	47	62
49	27	48	64
50	27	48	65
51	28	48	67
52	28	49	68
53	29	49	70
54	29	50	72
IV (55-75 points)			
55	30	50	73
56	30	50	75
57	31	51	77
58	31	51	79

59	32	51	81
60	32	52	83
61	33	52	86
62	33	52	88
63	34	52	90
64	34	52	93
65	35	53	96
66	35	53	98
67	36	53	101
68	36	53	104
69	37	54	107
70	38	54	111
71	38	54	114
72	38	54	118
73	39	54	121
74	40	54	125
75	40	54	129

L. P. Zubkova (1998) suggested that in group 1 (correction of the upper and lower dental arches shapes), such measures as the elimination of dento-alveolar elongation and shortening in the lateral and frontal parts of the jaws. Elimination of dento-alveolar shortening in frontal and lateral areas up to 2 mm is worth 3 points, more than 3 mm in 5 points, and the elimination of dento-alveolar elongation respectively 4 and 5 points.

Restoration of function by L. P. Zubkova is estimated as follows:

- Mastication – 1 point;
- Speaking – 2 points;
- Lips closing – 5 points;
- Breezing – 5 points;
- Swallowing – 5 scores.

To plan a treatment, you must also consider contact between doctor and patient. Depending on the treatment there are 4 types of patients:

Type 1 – adjusts well, independent. These patients are confident, poised, have a clear motivation for action. The appeal is independent, healthy. A patient will learn any design of orthodontic appliance and use it as recommended by the physician. Require only small control from the parents in the treatment period.

Type 2 – does not adapt, dependent, dependent by nature, irresponsible. Such a patient should not wait for self-use of orthodontic apparatus. Child refuses to treat, irregular visits to the doctor. For the treatment is better to use non-removable devices of mechanically acting.

3 type – adapts well, but not independent. Strict monitoring and control lead to treatment that adapts.



4 type – does not adapt, independent. These patients do not obey the doctor, stubborn, rebellious. We can recommend non-removable devices that are mechanical, widely used surgical connection apparatus and methods of treatment.

If in the determination of the severity of morphological and functional disorders and the difficulty of their elimination on the stages of treatment found to decrease the amount of points, then the patient is transferred to the group a less complex treatment. Through the allocation of 4 degrees of treatment difficulty can be more accurately determine its average duration and prognosis.

The application of this method contributes to the planning of orthodontic care issues of the organization.

Data the clinical examination the doctor fills in a medical card of dental patients. If necessary, writes out an outfit for performing of orthodontic design.

### **Materials for self-control:**

A. Tasks for self-control (tables, diagrams, drawings, graphs):

1. To conduct clinical examination, formulate a preliminary diagnosis;
2. To conduct and analyze data of additional examinations;
3. To master the method of the final diagnosis making;
4. To master the method of the degree of orthodontic treatment difficulty determining;
5. To able a plan of orthodontic treatment and to choose a rational design of orthodontic appliance;
6. To draw the table by Zibert-Malignin.

B. Tasks for self-control:

1. Orthodontic diagnosis has the following number of compound:  
four  
one  
two  
three  
five
2. The morphological part of the diagnosis does not depend on data:  
functional studies  
radiographic studies  
photometric studies  
biometric examination  
anthropometric studies
3. The functional part of the diagnosis is made on the basis of data:  
functional studies  
photometric studies  
biometric examination

anthropometric studies  
X-ray studies

4. The aesthetic part of the diagnosis is made on the basis of data:  
clinical examination  
photometric studies  
biometric examination  
functional examination methods  
X-ray studies

5. The etiological part of the diagnosis is made on the basis of data:  
clinical examination  
radiographic studies  
photometric studies  
biometric examination  
anthropometric studies

6. A simple treatment for Zilbert-Malygin is:  
to 27 points  
to 10 points  
to 8 points  
to 20 points  
to 13 points

7. Treatment of medium complexity according to Zilbert-Malygin is:  
28-40 points  
21-23 points  
41-54 points  
18-21 points  
25-30 points

8. Difficult treatment Zilbert-Malygin is:  
41-54 points  
28-40 points  
25-30 points  
30-40 points  
25-40 points

9. Highly difficult treatment Zilbert-Malygin is:  
55 points or more  
60 points or more  
50 points or more  
40 points and more  
70 points and more

10. Using the method of determining the degree of orthodontic treatment difficulty is possible:

- to determine the average of an orthodontic treatment duration
- to determine the prognosis of the retention period course
- to solve the scale of orthodontic care organization
- to determine the possibility of outpatient conditions treatment
- to make recommendations about the optimal timing of treatment

11. The algorithm for determining the degree of orthodontic treatment difficulty according to Zilbert-Malygin has the following number of dento-alveolar anomalies groups, which are subject to elimination:

- three
- two
- four
- five
- six

12. The first group of the algorithm for determining the degree of orthodontic treatment difficulty according to Zilbert-Malygin provides:

- determination of the teeth number that are moving
- determination of the ratio of dentition in occlusion
- determination of the direction in which to change the bite
- complexity of the functions of chewing and speech normalization
- complexity of the functions of chewing and swallowing normalization

13. Depending on the behavior of the following quantity types of patients:

- four
- two
- three
- five
- six

14. The first type of patients, depending on the behavior are as follows:

- well adapted, independent; self-confident, balanced, have a clear motivation for action
- do not adapt slavishly; forgetful, scattered, irresponsible
- well adapted, dependent
- do not adapt, but independent; such patients openly disobey the doctor, stubborn, rebellious
- badly adapted, not independent, but balanced and have a clear motivation for action

15. The second type of patients, depending on the behavior as follows:

do not adapt slavishly; forgetful, scattered, irresponsible  
well adapted, independent; self-confident, balanced, have a clear motivation for action  
well adapted, dependent  
do not adapt, but independent; such patients openly disobey the doctor, stubborn, rebellious  
badly adapted, not independent, but balanced and have a clear motivation for action

16. The third type of patients depending on behavior as follows:  
well adapted, dependent  
well adapted, independent; self-confident, balanced, have a clear motivation for action  
do not adapt slavishly; forgetful, scattered, irresponsible  
do not adapt, but independent; such patients openly disobey the doctor, stubborn, rebellious  
badly adapted, not independent, but balanced and have a clear motivation for action

17. The fourth type of patients depending on behavior as follows:  
do not adapt, but independent; such patients openly disobey the doctor, stubborn, rebellious  
well adapted, independent; self-confident, balanced, have a clear motivation for action  
do not adapt slavishly; forgetful, scattered, irresponsible  
well adapted, dependent  
badly adapted, not independent, but balanced and have a clear motivation for action

18. The second group of algorithm for determining the degree of orthodontic treatment difficulty according to Zilbert-Malygin provides:  
determination of the dentition in occlusion relation  
determining the number of teeth that are moving  
determination of individual or groups of teeth movement  
normalization of dentition functions  
determine the type of individual or groups of teeth movement

19. The third group of algorithm for determining the degree of orthodontic treatment difficulty according to Zilbert-Malygin provides:  
normalization of dentition functions  
determining the number of teeth that are moving  
determination of individual or groups of teeth movement  
determination of the dentition in occlusion relation  
determination of individual or groups of teeth movement

20. For the treatment of the children first type depending on the behavior, most appropriate design of orthodontic appliances is:

- the child will treating with any design of appliances
- functionally active appliances
- non-removable mechanically appliances
- removable mechanical appliances
- removable one jaw maxillary appliances

21. For the treatment of the second type children in dependence on the most acceptable the design of orthodontic appliances is:

- non-removable mechanically operating
- functionally active appliances
- removable mechanical appliances
- removable one jaw the maxillary apparatuses of the action
- child will treating with any designed appliances

22. In child 5 years old, the occlusion of temporary teeth. Determined symptom of "thimble", vertical gap between the front teeth 2 mm, tremas and diastemas, symptom Zelinskiy is positive, infantile type of swallowing. Formulate aesthetic part of orthodontic diagnosis.

- symptom of "thimble"
- positive symptom of Zelinskiy
- infantile type of swallowing
- vertical gap between the teeth
- open bite

23. In child 5 years old, the occlusion of temporary teeth. Determined symptom of "thimble", vertical gap between the front teeth 2 mm, tremas and diastemas, symptom Zelinskiy is positive, infantile type of swallowing. Formulate etiological diagnosis of the orthodontic.

- positive symptom of Zelinskiy
- symptom of "thimble"
- infantile type of swallowing
- vertical gap between the teeth
- open bite

24. At 9 years old child as result of a bad habit of mouth breathing is adenoid type of the face formed. The front teeth of both jaws in a state of protrusion, the vertical gap 3 mm, the relation of first permanent molars is neutral. Formulate the functional part of orthodontic diagnosis.

- bad habit of mouth breathing
- the adenoid type of face
- protrusion of the frontal teeth, the vertical gap

neutral relation of first permanent molars  
maxillary protrusion

25. At 9 years old child as result of a bad habit of mouth breathing is adenoid type of the face formed. The front teeth of both jaws in a state of protrusion, the vertical gap 3 mm, the relation of first permanent molars is neutral. Formulate aesthetic part of orthodontic diagnosis.

the adenoid type of face  
protrusion of the frontal teeth, the vertical gap  
neutral relation of first permanent molars  
bad habit of mouth breathing  
infantile type of swallowing

26. Examination of the orthodontic patient includes:

general examination, determination of constitution; inspection of the face and mouth  
inspection of the vestibule of the oral cavity, inspection of the face  
general inspection, inspection of the oral cavity  
examination of dentition and occlusion, the definition of the physique  
general examination, x-rays, examination of the oral cavity

27. Gnathic form of malocclusion is:

pathology developed as a result of violations of the size of one or both jaws  
pathology developed as a result of violations of the sizes of the teeth in the dentition  
pathology developed as a result of violations of the first molars location  
pathology developed as a result of violations of the dental arches sizes  
pathology developed as a result of dentition defects

28. Classification E. Angle, for diagnosis cannot be used if:

permanent and mixed bite with extracted first permanent molars  
lateral displacement of the lower jaw  
absence of the first permanent molars and canines  
presence of pathology in the transversal plane  
presence of pathology in a vertical plane

29. In diagnosis, the term "infraocclusion" that characterizes the position of the teeth:

below the occlusal plane  
above the occlusal plane  
rotation around the axis  
palatal position  
buccal position

30. According to the classification of Kalvelis etiological diagnosis part of the "open bite" can have the following varieties:

- rachitic and traumatic
- frontal and lateral
- symmetric and asymmetric
- muscle and joint
- distal and mesial

31. The diagnosis of "maxillary prognathia" provides a classification:

WHO

Grigorieva

Angle

Kalvelis

Betel'man

32. Diagnosis – the first class of malocclusion on Angle is characterized by:

- neutral relation of first permanent molars
- distal relation of the first permanent molars
- mesial relation of the first permanent molars
- distal relation of the second permanent molars
- mesial relation of the second permanent molars

33. Diagnosis of class II malocclusions by Angle is characterized by:

- distal relation of the first permanent molars
- distal relation of the first permanent molars
- mesial relation first permanent molars
- distal relation of the second permanent molars
- mesial relation of the second permanent molars

34. Diagnosis – class II, subclass 1 malocclusions by Angle is characterized by:

- distal relation of the first permanent molars and vestibular inclination of the upper anterior teeth
- distal relation of the first permanent molars and lingual inclination of upper anterior teeth
- mesial relation of the first permanent molars and vestibular inclination of the lower front teeth
- distal relation of the second permanent molars and lingual inclination of upper anterior teeth
- mesial relation of the second permanent molars and the vestibular inclination of the upper front teeth

35. Diagnosis – class II, subclass 2 malocclusions by Angle is characterized by:

distal relation of the first permanent molars and palatal inclination of upper anterior teeth  
 mesial relation of the first permanent molars and lingual inclination of upper anterior teeth  
 mesial relation of the first permanent molars and vestibular inclination of the lower front teeth  
 distal relation of the second permanent molars and vestibular inclination of upper anterior teeth  
 mesial relation of the second permanent molars and the vestibular slope of the upper front teeth

36. Diagnosis of class III malocclusions by Angle is characterized by:  
 mesial relation of the first permanent molars  
 distal relation of the first permanent molars  
 mesial disharmony of the first permanent molars  
 distal relation of the second permanent molars  
 mesial relation of the second permanent molars

## **Literature**

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