

Д. В. РУБЛЕВСКИЙ, Ю. Я. НАУМОВИЧ, А. О. САКАДЫ-
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ОСНОВЫ ОРТОДОНТИИ
BASICS OF ORTHODONTICS

Минск БГМУ 2015

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Учебно-методическое пособие

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PRACTICAL SESSION 1

TOPIC: Orthodontics as a section of dentistry: aims and objectives. History of orthodontics and directions of its development. Structure of orthodontic service in Belarus. Equipment of orthodontic clinic, orthodontic instruments.

PRACTICAL QUESTIONS

1) Orthodontics as a section of dentistry. Definition of the subject. History of orthodontics and directions of its development.

2) Management of orthodontic clinic and its equipment; differences comparing to prosthetic clinic.

3) Dimensional planes, used during study of the head and jaws. Which anatomical structure do they cross and how do they interact with each other.

4) Anthropometric metrical points on the head and face, their localizations. Measuring of the facial heights and horizontal parameters of the head and face.

5) Ricketts analysis of the facial profile. Evaluation of the facial form from the frontal perspective and evaluation and calculation of facial morphology index.

6) Criteria of the dental aesthetic index (DAI). Interpretation of the DAI.

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1. *An Introduction to Orthodontics* Fourth Edition / Laura Mitchell; 2013.
2. *Contemporary orthodontics* / William R. Proffit [et al.] third edition 2010.
3. *Diagnosis of the Orthodontic Patient* / F. McDonald; J. Ireland 280 p., 1998.
4. *Facial Aesthetics: Concepts and Clinical Diagnosis* / Farhad B. Naini 454 p 2011.
5. *Comparing and contrasting two orthodontic indices, the Index of Orthodontic Treatment need and the Dental Aesthetic Index* / Jenny J, Cons NC. *Am J Orthod Dentofacial Orthop* 1997 Apr; 111 (4):454.
6. *Lecture material.*

TASKS FOR INDEPENDENT WORK OF STUDENTS

1. Orthodontics as a (specialty) is:

- a) a section of prosthetic dentistry;
- b) a section of maxillofacial surgery;
- c) an independent section of dentistry;
- d) a section of paedodontics.

2. Sagittal plane conditionally divides head into:

- a) upper and lower sections;
- b) left and right sections;
- c) anterior and posterior sections.

3. Mesial anthropometric points on the head are:

- a) oph (ophrion);
- b) or (orbitale);
- c) sn (subnasale);
- d) pg (pogonion).

PRACTICAL SESSION 2

TOPIC: Dental impressions. Impression materials applied in orthodontics. Classification and common characteristics of main properties of contemporary impression materials.

PRACTICAL QUESTIONS

1) Types of impression trays. Selection of the impression tray; parts of standard impression tray.

2) Name the main requirements applied to impression materials. Dental impression technique in children.

3) Irreversible rigid impression materials. Plaster. Its positive and negative properties as an impression material.

4) ZOE impression materials. Name the representatives of ZOE impression materials and the areas of their application. Positive and negative properties of ZOE impression materials.

5) Reversible rigid impression materials (compounds) their representatives, application techniques, positive and negative properties. Reversible hydrocolloids. Area of their application in dentistry.

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- 1. *Lecture material.*
- 2. *Textbook of Prosthodontics / Nallaswamy, Jaypee Brothers, Medical Publishers, 2008.*
- 3. *Contemporary Fixed Prosthodontics / Stephen F. Rosenstiel, Junhei Fujimoto, Martin F. Land, Elsevier Health Sciences, 2006.*
- 4. *Fundamentals of Fixed Prosthodontics / Herbert T. Shillingburg et al., Quintessence Publishing, 2012.*
- 5. *Skinner's science of dental materials. / 9th ed. Philips R.W. 1991.*
- 6. *Applied Dental Materials, 9th Edition John F. McCabe, Angus Walls , 2008.*

TASKS FOR INDEPENDENT WORK OF STUDENTS

1. Main requirements applied to impression materials are:

- a) resistance to destruction in oral environment;
- b) absence of connection with modeling material;
- c) sufficient working time;
- d) shrinkage after polymerization less than 1%.

2. Impressions are made with application of:

- a) only standard impression trays;
- b) only individual impression trays;
- c) standard and individual impression trays.

3. Depending on the aim of application impressions are divided into:

- a) functional;
- b) monolayer;
- c) diagnostic;
- d) working.

PRACTICAL SESSION 3

TOPIC: Diagnostic plaster models. Methods of study of diagnostic plaster models.

PRACTICAL QUESTIONS

1) Name the main differences in fabrication techniques, storage and aims of application of work and diagnostic plaster models.

2) Which instruments are used for measurements of diagnostic plaster models? Methods for studying of crown sizes of deciduous and permanent teeth, evaluation of the results.

3) Which methods can detect space deficiency in frontal and lateral segments of the dental arch?

4) Methods of study by Johnson-Tanaka, Moyers (measurement protocol and interpretation).

5) Methods of study by Pont, Korkhaus, Shmudt (measurement protocol and interpretation).

6) Which method is used to reveal the rotation of first permanent molars?

7) Methods of study by Gerlah, Snagina, Bolton.

8) Graphical method of study by Hawley-Herbert-Herbst (protocol and interpretation).

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3. *Bolton W. A. The clinical application of a tooth size analysis / Am. J. Orthod 48, 504-529.*
4. *Lundstrom A. / Intermaxillary tooth width ratio and tooth alignment and occlusion Acta. odont. Scand 265-292 (1954).*
5. *Moyers R. E. Handbook of Orthodontics, 3rd Edition .Year Book Medical Publisher, Chacago 1973.*
6. *Nance H. N. The limitations of orthodontic treatment 1 and 2. Am J Orthod (1947).*

TASKS FOR INDEPENDENT WORK OF STUDENTS

1. Name the differences between work and diagnostic plaster models:

- a) are fabricated of plaster;
- b) work model is terminated in the process of fabrication of the orthodontic appliance while diagnostic is saved till the end of treatment;
- c) give the precise mapping of hard and soft tissues;
- d) the base of work model is cut maximally, the base of diagnostic model is formed by the rubber matrix.

2. The following instruments are used for study of diagnostic plaster models:

- a) compasses;
- b) ruler combined with protractor;
- c) bussol;
- d) caliper and orthocrest.

3. The largest mesiodistal width of the lower incisors crowns is located on the level of:

- a) contact points with the adjacent teeth;
- b) equators;
- c) incisal edge;
- d) cervical area.

4. Diagnostic line RPT is normally located on the level of:

- a) contact point of the canine and premolar evenly on both sides;
- b) middle of canine crowns evenly on both sides;
- c) contact point of the canine and lateral incisor evenly on both sides.

PRACTICAL SESSION 4

TOPIC: General concepts of application of orthodontic appliances. Effect of force magnitude, distribution, and types of tooth movement, effects of force duration and force decay, methods of fixation, anchorage and its control. Biologic control of tooth movement. Types of orthodontic appliances.

PRACTICAL QUESTIONS

1. The general concept of orthodontic appliances, their assignment, classification.
2. Possible changes in the dentition during treatment with orthodontic appliances.
3. Characteristic of orthodontic appliances according to their effect on dentition.
4. Effect of force magnitude, distribution; types of tooth movement.
5. Effect of force duration and force decay.
6. Relationship of tooth movement to force.
7. Anchorage: resistance to unwanted tooth movement. Reciprocal tooth movement. Stationary anchorage.
8. Deleterious effect of orthodontic force.
9. Conditions required for tooth movement.
10. Methods of fixation of orthodontic appliances.

References

1. *An Introduction to Orthodontics* Fourth Edition / Laura Mitchell; 2013.
2. *Diagnosis of the Orthodontic Patient* / F. McDonald; J. Ireland 280 p., 1998.
3. *Contemporary orthodontics* / William R. Proffit [et al.] // P. 296-361.
4. *Contemporary orthodontics* / William R. Proffit [et al.] // P. 364-384.
5. *Lecture material.*

TASKS FOR INDEPENDENT WORK OF STUDENTS

- 1. By type of anchorage orthodontic devices are classified into:**
 - a) fixed, removable, combined;
 - b) reciprocal, stationary.
- 2. By the method of fixation orthodontic devices are classified into:**
 - a) fixed, removable, combined;
 - b) devices for one jaw, apparatus for two jaws, combined.

3. Orthodontic appliances according to its intended purpose are divided into:

- a) fixed, removable, combined;
- b) mechanical, functional;
- c) preventive, retention and treatment devices.

PRACTICAL SESSION 5

TOPIC: The main principles of the orthodontic appliances design. Components of the removable orthodontic appliances (clasps, labial bow, springs). Classification, purpose, fabrication techniques.

PRACTICAL QUESTIONS

1. What are the general principles in the removable orthodontic appliances design?
2. What types of clasps are used in orthodontics?
3. What are the main components of the clasp? What determines the springy properties of the clasp? What type of orthodontic wire is used for clasp fabrication?
4. Adams clasp steps of the fabrication?
5. Which wire is used for the labial bow fabrication?
6. What kinds of springs are used in the removable appliances? Areas of their application. Spring designs for individual teeth.
7. What springs are used for normalization of the dental arches shape?
8. Which wire is used for the orthodontic spring fabrication?

References

1. *An Introduction to Orthodontics* Fourth Edition / Laura Mitchell; 2013.
2. *Contemporary orthodontics* / William R. Proffit [et al.] // P. 364-384.
3. *Lecture materials*.

TASKS FOR INDEPENDENT WORK OF STUDENTS

1. Constituents of the semicircular clasp are:

- a) elbow;
- b) shoulder;
- c) body;
- d) base.

2. The Adams clasp is made of wire of which diameter:

- a) 0,2;
- b) 1,2;
- c) 0,6;
- d) 0,7.

3. The labial bow in the removable appliances is used for:

- a) to move the teeth and their groups;
- b) better fixation, stabilization;
- c) elastic recoil fixing;
- d) easy device removal.

4. Strength of the spring depends on:

- a) the degree of activation;
- b) the length of the acting part;
- c) the distance at which you want to move a tooth;
- d) the diameter of the wire from which they are made.

PRACTICAL SESSION 6

TOPIC: Basis of orthodontic appliances fabrication. Production in dental laboratory. Features of manufacturing of orthodontic crowns.

PRACTICAL QUESTIONS

1. The boundaries of the base plate on the upper jaw.
2. The boundaries of the base plate on the lower jaw.
3. Manufacturing steps for one jaw removable orthodontic appliance hot polymerization method of acrylics.
4. Fabrication steps for functional orthodontic appliances by the method of hot polymerization of acrylics.
5. Fabrication steps for functional orthodontic appliances by the method of cold polymerization of acrylics.
6. Vacuum formed orthodontic appliances and devices from heated plastic plates. Pneumatic vacuum formation method.
7. Features of manufacturing of orthodontic crowns.

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1. *Contemporary orthodontics* / William R. Proffit [et al.] // P. 391-397.
2. *Textbook of Complete Dentures*, Arthur O. Rahn, John R. Ivanhoe, Kevin D. Plummer, PMPH-USA, Limited, ISBN: 1607950251, ISBN-13: 9781607950257, 01/2009.
3. *Lecture material*.

TASKS FOR INDEPENDENT WORK OF STUDENTS

1. How many steps are required for one jaw orthodontic appliance fabrication:

- a) one;
- b) two;
- c) three;
- d) five?

2. How many steps are required for functional orthodontic appliance fabrication:

- a) one;
- b) two;
- c) three;
- d) five?

3. While applying the method of cold polymerization of acrylics under increased pressure the material is polymerized for:

- a) 60 min;
- b) 90 min;
- c) 45–50 min.

4. The pressure in the polymerizer is:

- a) 0,5-1 atm;
- b) 2,5-3 atm.

PRACTICAL SESSION 7

TOPIC: Screws. Types of orthodontics screws. Features of installation in orthodontic appliances.

PRACTICAL QUESTIONS

1. Screws. Construction. Use.
2. Screws for individual tooth movement.
3. Screws for even expansion of dental arch.

4. Screws for uneven expansion of dental arch.
5. Screws for simultaneous expansion and extension of dental arch.
6. Screws for intermaxillary impact.

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1. *Contemporary orthodontics* / William R. Proffit [et al.] // P. 370, 372, 375-376.
2. *Orthodontics: Principles and Practice* / Basavaraj Subhashchandra Phulari // P. 315-317, 557.
3. *Lecture materials*.

TASKS FOR INDEPENDENT WORK OF STUDENTS

1. Name the screw for rapid disclosure of palatal median suture:

- a) screw by Weise;
- b) screw by Biedermann;
- c) screw by Bertoni.

2. Name the screws for normalization of occlusion:

- a) screw by Gast, Jaak, screw by Planas;
- b) screw by Philip Bertoni, screw by Biedermann;
- c) screw by Weise, Frenzt, Weller.

3. For the simultaneous expansion and extension of dental arches which screws are used:

- a) Bertoni and Clay;
- b) Planas and Jaak;
- c) Weise and Franz.

PRACTICAL SESSION 8

TOPIC: Concept of norm and pathology in orthodontics. Occlusion in different periods of its formation. General concepts of diagnosis of dentofacial anomalies.

PRACTICAL QUESTIONS

1. Definitions:

- a) the norm;
- b) the average norm;
- c) the average individual norm;
- d) an integral norm;
- e) the optimal individual norm.

2. The concept of «disease» in orthodontics.
3. The norm of occlusion in different periods of its formation.
4. Classification of malocclusion by Angle, advantages and disadvantages.
5. Clinical and morphological classification of dentoalveolar anomalies by Kalvelis.

6. Classification by Persin.
7. Protocol of orthodontic diagnosis.

References

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3. *Lecture materials*.

TASKS FOR INDEPENDENT WORK OF STUDENTS

- 1. At what age do cusps of temporary teeth begin to wear off:**
 - a) 3 years;
 - b) 4 years;
 - c) 5 years?
- 2. When dental system's functions are fully formed:**
 - a) 2 years;
 - b) 3 years;
 - c) 4 years?
- 3. How many classes of malocclusion Angle singled out:**
 - a) 2;
 - b) 3;
 - c) 4?
- 4. In classification by Persin the occlusion is studied in how many dimensions:**
 - a) in one plane;
 - b) two planes;
 - c) in three planes?

CONTENTS

Practical session 1.....	4
Practical session 2.....	5
Practical session 3.....	6
Practical session 4.....	7
Practical session 5.....	9
Practical session 6.....	10
Practical session 7.....	11
Practical session 8.....	12

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