

Документ подписан простой электронной подписью
Информация о владельце:
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Должность: И.о. ректора
Дата подписания: 06.10.2026 15:31:52
Уникальный программный ключ:
d59234ba928aea5c04c54eb9013e367220bcb2a

Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY

Director of the Institute of Dentistry
_____/ Pervov Yu.Yu./
"8th" of June 2026

COLLECTION OF ASSESSMENT TOOLS
B1.V.EC.02.05 Adhesive technologies in Dentistry
of the basic educational program
of Higher Education

Specialty	31.05.03 Dentistry for foreign students (English-language program) (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing health care in patients with dental pathology)
Mode of study	Full-time
Period of mastering the BEP	5 years (nominal length of study)
Institute	of Dentistry

Vladivostok, 2026

1. INTRODUCTION

1.1. Collection of Assessment Tools is a document that regulates the format, content, and types of assessment tools for continuous assessment, interim examination and final (state final) examination, and graded criteria for each type of assessment tools.

1.2. Assessment tools allows to evaluate the development of universal, general professional, and professional competencies (UCs, GPCs and PCs respectively) outlined in Federal State Educational Standard of Higher Education and defined in the basic educational program of higher education for the specialty 31.05.03 Dentistry for foreign students (English-language program), profile 02 "Healthcare" (in the field of providing health care in patients with dental pathology).

([BEP HE for the 31.05.03 Dentistry for foreign students \(English-language program\)](#) specialty, section 3 Learning Outcomes Requirements of the Basic Educational Program of Higher Education)

2. DOCUMENT BODY

2.1. Types of Assessment, Formats of Assessment Tools

No.	Types of assessment	Assessment Tools Format
1	Continuous assessment	Interview Questions
		Tests
		Mini-Case Studies
2	Interim assessment	Tests

3. The contents of assessment tools for continuous and interim examination are prepared by the teacher of the course

Interview questions

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.03	Dentistry for foreign students (English-language program)
C	PC-2	ability to administer and apply modern methods and/or digital technologies to treat dental patients as well as monitor the effectiveness and safety of the treatment
F	A/02.7	Prescribing and monitoring the effectiveness and safety of non-pharmacological and pharmacological therapies
I		ANSWER THE QUESTIONS
		1. Name of the topics of practical classes 2. History of the development of adhesive systems 3. Terminology in adhesive dentistry 4. Requirements for adhesive systems 5. Principles of classification of adhesive systems 6. Indications and contraindications for the use of adhesive systems in dental restoration. Functionality of adhesive systems. 7. Formation of a hybrid layer at the enamel level. 8. Formation of a hybrid layer at the dentin level. 9. Methods of working with modern adhesive systems 10. Advantages and disadvantages of adhesive systems

		11. The influence of filler type on the properties of adhesive systems 12. The influence of solvent type on the properties of adhesive systems 13. Errors and complications when working with adhesive systems, and ways to prevent them
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Assessment criteria

"Very good" grade is given to a student who possesses knowledge of the subject in full scope outlined in the curriculum, has a sufficiently deep insight into the subject; is able to answer all questions clearly, exhaustively, and with no outside help; structures their answers logically, with emphasis on the most important information; is able to analyze, compare, classify, summarize, refine, and structure the course content, giving particular attention to cause-and-effect relationships.

"Good" is given to a student whose knowledge of the subject is almost in full scope outlined in the curriculum (gaps are only present in the knowledge of some especially complex aspects); is able to answer questions exhaustively with little to no outside help; does not always put emphasis on the most important information, but does not make significant mistakes.

"Satisfactory" is given to a student who possesses the bulk of knowledge on the subject; has difficulties answering questions with no outside help, uses imprecise wording; makes mistakes in substantial number of their answers.

"Unsatisfactory" is given to a student who does not have the mandatory minimum of knowledge on the subject, is not able to give an answer even with additional guiding questions.

Tests for continuous and interim assessment

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.03	Dentistry for foreign students (English-language program)
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F	A/02.7	Prescribing and monitoring the effectiveness and safety of non-pharmacological and pharmacological therapies
I		ANSWER LEVEL 1 TEST QUESTIONS (SELECT CORRECT ANSWER(S))
		1. 1. Adhesives of the sixth generation are produced in the form of 1) two-component systems 2) four-component systems 3) one-component systems 4) three-component systems 2. Adhesives of the 7th generation are available in the form of 1) one-component systems 2) four-component systems 3) two-component systems 4) three-component systems 3. Most single-component adhesives of the sixth generation, in accordance with the recommendations of the manufacturers, should be stored in the refrigerator at a temperature 1) from 0 to +2°C 2) from -2 to -8°C 3) from -2 to +2°C

4) **from +2 to +8°C**

4. In dentistry, adhesion occurs in

- 1) **obtaining impressions**
- 2) **fixation of fixed dentures**
- 3) **filling, when connecting the filling and tooth tissue**
- 4) filling of root canals

5. Factors that influence the ability of an adhesive to come into close contact with a substrate include

- 1) adhesive filling
- 2) **relief of the substrate surface**
- 3) **adhesive viscosity**
- 4) **wettability of the substrate by the adhesive**

6. The value of adhesive strength for dentin is

- 1) **4-6 MPa**
- 2) 10-12 MPa
- 3) 2-4 MPa
- 4) 20-40 MPa

7. The value of adhesive strength for enamel is

- 1) 20-40 MPa
- 2) 2-4 MPa
- 3) **10-12 MPa**
- 4) 4-6 MPa

8. The adhesive strength of enamel is higher than that of dentin due to the high content of

- 1) fluorine
- 2) phosphorus
- 3) potassium
- 4) **calcium**

9. The substance that is absorbed is called

- 1) sorbent
- 2) **sorbate**
- 3) bond
- 4) adhesive

10. The emergence of a connection between the surface layers of two dissimilar bodies brought into contact is

- 1) **adhesion**
- 2) diffusion
- 3) cohesion
- 4) stickiness

11. All adhesive systems of the 5th generation can be divided into

- 1) methanol-containing
- 2) glycerin-containing
- 3) **acetone-containing**
- 4) **ethanol-containing**

12. The second stage of using IV generation adhesive systems is

		1) application of primer 2) introduction of a bond 3) enamel etching 4) photopolymerization 13. Dentin adhesive is 1) hygroscopic 2) hydrophilic 3) neutral to water 4) hydrophobic 14. For adhesion to occur, the distance between interacting molecules must be no more than 1) 0.0007 μm 2) 0.007 μm 3) 0.07 μm 4) 0.07 μm 15. For ideal wetting, which provides ideal conditions for adhesion, the angle between the solid and the liquid must be equal to 1) 0 2) 0.5 3) 5 4) 10 16. To create a strong adhesive bond, the following conditions must be met 1) penetration of the adhesive into the surface of the substrate;+ 2) maximum internal stresses; 3) minimal shrinkage during hardening;+ 4) cleanliness of the surface on which the adhesive is applied.+ 17. The liquid material or layer that is applied to produce an adhesive bond is 1) adhesive 2) substrate 3) etching 4) composite 18. Adhesion is achieved due to the unevenness of the surface 1) mechanical 2) biological 3) diffuse 4) chemical 19. Types of adhesives include 1) dentinal 2) enamel 3) cement 4) enamel-dentin 20. The mechanisms of destruction of the adhesive bond include 1) shift 2) compression 3) stretching 4) uneven separation
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21. Mechanical resistance to destruction of the adhesive joint is
- 1) micromechanical retention
 - 2) adhesive bonding
 - 3) **adhesive strength of the connection**
 - 4) adhesive force
22. One of the main conditions of adhesion is
- 1) the gap between the bodies
 - 2) surface tension
 - 3) the presence of a binder
 - 4) **tight contact**
23. The first stage of using IV generation adhesive systems is
- 1) introduction of a bond
 - 2) application of primer
 - 3) **enamel etching**
 - 4) photopolymerization
24. The intertwining, or interdiffusion, of the molecules of the adhesive and the substrate, the formation of a diffusion (hybrid) layer containing both phases, is the basis
- 1) chemical adhesion
 - 2) mechanical adhesion
 - 3) **diffuse adhesion**
 - 4) biological adhesion
25. Overdrying the dentin surface before applying the dentin adhesive leads to
- 1) **the occurrence of postoperative sensitivity**
 - 2) **development of debonding**
 - 3) **disruption of adhesive penetration**
 - 4) improving adhesion
26. According to the mechanism of action, adhesion is
- 1) mechanical
 - 2) diffuse
 - 3) biological
 - 4) **chemical**
27. The absorbing substance is called
- 1) sorbate
 - 2) bond
 - 3) adhesive
 - 4) **sorbent**
28. The absorption of various substances from the environment by a solid body (or liquid) is
- 1) stickiness
 - 2) diffusion
 - 3) **sorption**
 - 4) adhesion
29. Correctly etched and dried enamel becomes
- 1) **chalky white**

- 2) yellowish
- 3) shiny
- 4) **matte**

30. When a reliable connection is formed between the composite filling and the walls of the cavity in the tooth, shrinkage occurs during the curing process of the composite

- 1) 11-13%
- 2) 5-7%
- 3) 8-10%
- 4) **3-5%**

31. The use of fourth generation adhesive systems provides for

- 1) 5 stages
- 2) **3 stages**
- 3) 4 stages
- 4) 2 stages

32. Etching of enamel is carried out using

- 1) EDTA
- 2) **orthophosphoric acid**
- 3) hydrochloric acid
- 4) sulfuric acid

33. The process of sorption of one substance by another, in which a chemical interaction occurs, is the basis

- 1) diffuse adhesion
- 2) biological adhesion
- 3) **chemical adhesion**
- 4) mechanical adhesion

34. The process by which the absorption of the sorbate by the entire volume of the sorbent occurs is

- 1) adsorption
- 2) **absorption**
- 3) adhesion
- 4) cohesion

35. The separation of the material and tissues of the tooth with the formation of microspaces between them is called

- 1) **debonding**
- 2) bonding
- 3) stickiness
- 4) adhesion

36. The recommended exposure time of the etching gel on enamel is

- 1) 5-10 seconds
- 2) 45-60 seconds
- 3) 60-90 seconds
- 4) **15-30 seconds**

37. From a chemical point of view, sixth generation adhesive systems are a mixture of adhesive substances and

- 1) calcium oxides

- 2) **phosphoric esters**
- 3) monohydric alcohols
- 4) phosphates

38. The self-etching system provides adhesive bond strength equal to

- 1) 23-27 MPa
- 2) 20-40 MPa
- 3) 5-10 MPa
- 4) **14-16 MPa**

39. The layer that is formed as a result of instrumental processing of dentin and consists of hydroxyapatite particles, remnants of destroyed odontoblast processes, denatured collagen fibers, microorganisms, and components of oral fluid is called

- 1) **lubricated**
- 2) hybrid
- 3) inhibited
- 4) hydrophilic

40. The layer that forms in enamel, dentin, and cementum after etching and subsequent infiltration of hard dental tissues with components of the adhesive system that are completely polymerized is called

- 1) hydrophilic
- 2) **hybrid**
- 3) inhibited
- 4) lubricated

41. The ability of a system to stick to the surface of a solid body upon contact is called

- 1) adhesion
- 2) stickiness
- 3) **stickiness**
- 4) cohesion.

42. The adhesion at the molecular level of parts of the same homogeneous body (solid or liquid) is called

- 1) absorption
- 2) adhesion
- 3) adsorption
- 4) **cohesion**

43. Solids that are joined together with an adhesive are called

- 1) composite
- 2) etching
- 3) adhesive
- 4) **substrate**

44. The third stage of using IV generation adhesive systems is

- 1) application of primer
- 2) **introduction of a bond**
- 3) enamel etching
- 4) photopolymerization

45. An increase in the concentration of a dissolved substance at the interface between two phases (solid phase-liquid) due to the uncompensated nature of the

		intermolecular interaction forces at the interface is 1) absorption 2) adsorption 3) adhesion 4) cohesion 46. Chemisorption can be by nature 1) ionic 2) electrochemical 3) covalent 4) micromechanical 47. Through unprotected dentin, bacteria can penetrate into the pulp. 1) blood 2) toxins 3) chemical reagents 4) medicinal preparations 48. Enamel-dentin adhesives can form a bond with 1) gum 2) dentin 3) cement 4) enamel 49. Enamel adhesive is 1) neutral to water 2) hydrophobic 3) hydrophilic 4) hygroscopic 50. The phenomenon in which an action occurs due to the formation of a strong adhesive bond between the adhesive layer and the surfaces being joined is called 1) stickiness 2) adhesion 3) cohesion 4) sickness
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Assessment criteria

“Very good” - more than 91% correct answers of questions of every level

“Good” - 81-90% correct answers of questions of every level

“Satisfactory” - 71-80% correct answers of questions of every level

“Unsatisfactory” - less than 71% correct answers of questions of every level

Standardized case studies and checklists for **B1.V.EC.02.05 Adhesive technologies in Dentistry** course

Case Study No. 1

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.03	Dentistry for foreign students (English-language program)
C	PC-2	ability to administer and apply modern methods and/or digital technologies to treat dental patients as well as monitor the effectiveness and safety of the treatment
F	A/02.7	Prescribing and monitoring the effectiveness and safety of non-pharmacological and pharmacological therapies

I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS Patient Z., 37, complained of pain in the area of tooth 44 when drinking cold water. According to the patient, he is practically healthy and sees a dentist once a year. Objectively: tooth 4.4 – on the vestibular surface in the cervical area, a focus of enamel demineralization and a medium-depth carious cavity filled with pigmented and softened dentin are detected. Probing along the walls of the cavity is painful. Percussion of the tooth is painless. The reaction to cold is short-lived. 
	Q 1	Question: Make a preliminary diagnosis and justify it
	Q 2	Question: Specify the necessary additional examination methods
	Q 3	Question: Conduct differential diagnostics
	Q 4	Question: Make a treatment plan
	Q 5	Question: Characterize the class of this carious cavity in accordance with Black's classification

Case Study No.1 Checklist

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.03	Dentistry for foreign students (English-language program)
C	PC-2	ability to administer and apply modern methods and/or digital technologies to treat dental patients as well as monitor the effectiveness and safety of the treatment
F	A/02.7	Prescribing and monitoring the effectiveness and safety of non-pharmacological and pharmacological therapies
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS Patient Z., 37, complained of pain in the area of tooth 44 when drinking cold water. According to the patient, he is practically healthy and sees a dentist once a year.

		Objectively: tooth 4.4 – on the vestibular surface in the cervical area, a focus of enamel demineralization and a medium-depth carious cavity filled with pigmented and softened dentin are detected. Probing along the walls of the cavity is painful. Percussion of the tooth is painless. The reaction to cold is short-lived. 
Q	1	Question: Make a preliminary diagnosis and justify it
A		Correct answer: Dentin caries (Moderate caries) p.44 Based on: 1. Patient complaints (about pain when drinking cold water in the area of tooth 44) 2. Medical history (practically healthy, visits the dentist once a year.) 3. Basic research methods (– on the vestibular surface in the cervical region, a focus of enamel demineralization and a carious cavity of medium depth filled with pigmented and softened dentin are determined. Probing is painful along the walls of the carious cavity. Percussion of the tooth is painless) 4. Additional research methods (Short-term reaction to cold.)
R2	Very good	All descriptors of the correct answer have been listed
R1	Good/Satisfactory	3-4 descriptors of the correct answer have been listed
		1-2 descriptors of the correct answer have been listed
R0	Fail	No descriptors of the correct answer have been listed
Q	2	Question: Specify the necessary additional examination methods
A		Correct answer: 1. EOD 2. X-ray diagnostics 3. Thermal diagnostics
R2	Very good	All descriptors of the correct answer have been listed
R1	Good/Satisfactory	2 descriptors of the correct answer have been listed
		1 descriptor of the correct answer have been listed
R0	Fail	No descriptors of the correct answer have been listed
Q	3	Question: Conduct differential diagnostics
A		Correct answer: 1. Enamel caries

		2. Dentin caries (deep caries) 3. Chronic periodontitis 4. Wedge-shaped defect
R2	Very good	All descriptors of the correct answer have been listed
R1	Good/Satisfactory	3 descriptors of the correct answer have been listed
		1-2 descriptor of the correct answer have been listed
R0	Fail	No descriptors of the correct answer have been listed
Q	4	Question: Make a treatment plan
A		Correct answer: 1. Surface cleaning 2. Pain relief 3. Cavity preparation and medicinal treatment 4. Filling 5. Grinding and polishing the filling
R2	Very good	All descriptors of the correct answer have been listed
R1	Good/Satisfactory	3-4 descriptors of the correct answer have been listed
		1-2 descriptors of the correct answer has been listed
R0	Fail	No descriptors of the correct answer have been listed
Q	5	Question: Characterize the class of this carious cavity in accordance with Black's classification
A		Correct answer: 1. V class 2. Location in the cervical region 3. On the vestibular surface
R2	Very good	All descriptors of the correct answer have been listed
R1	Good/Satisfactory	2 descriptors of the correct answer have been listed
		1 descriptor of the correct answer has been listed
R0	Fail	No descriptors of the correct answer have been listed

4. Assessment criteria for learning outcomes

"**Pass**" is given to a student who has shown a sufficiently strong knowledge of the basic concepts of the subject; is able to complete specific practical tasks outlined in the program with no outside help, use recommended reference material, and correctly evaluate the results.

"**Fail**" is given to a student who has significant gaps in knowledge of the basic concepts of the subject, is not able reach the correct solution to a specific practical task outlined in the curriculum even with outside help.