

NATIONAL PIROGOV MEMORIAL MEDICAL UNIVERSITY, VINNYTSYA

«APPROVE»

Vice-Rector for Scientific, Pedagogical
and Educational Affairs

_____, professor of the
Higher Education Institution
Inna ANDRUSHKO

“ 29 ” August 20 25 y.

«AGREE»

Head of the Department of Therapeutic
Dentistry

_____, professor of the
Higher Education Institution
Mariia SHINKARUK-DYKOVYTSKA

“ 26 ” August 20 25 y.

SYLLABUS
OF EDUCATIONAL DISCIPLINE
CLINICAL ENDODONTICS

Specialty	221 Dentistry
Educational level	Master
Educational program	EPP «Dentistry», 2022
Academic year	2025-2026
Department	Therapeutic Dentistry
Lecturer	Mariia SHINKARUK-DYKOVYTSKA, Professor of HEI
Contact Information	terstom@vnmu.edu.ua V. Stus Street, 2
Syllabus developer	Olga POLISHCHUK, Assistant of HEI

1. Status and structure of the discipline

Discipline status	elective
Discipline code in EPP/ discipline place in EPP	EK 4.7 //discipline professional training
Course / semester	4rd year (VII semester)
The amount of discipline (the total number of hours / number of credits ECTS)	90 hours / 3 credits ECTS
Number of content modules	1 module
The structure of the discipline	Practical classes – 30 hours Lectures – 10 hours Independent work – 50 hours
Language of study	English
Form of study	Full - time (<i>or on-line by order</i>)

2. Description of the discipline

Short annotation of the course, relevance

Clinical endodontics is an elective course, the methods of which are aimed at improving knowledge of modern methods of diagnosis and treatment of complicated caries.

In practical therapeutic dentistry today endodontic treatment of teeth is one of the most difficult types of treatment. The number of patients with various forms of pulpitis and apical periodontitis is growing every year, especially among young patients. In addition, the complexity of the manipulations at the stages of endodontic treatment leads to various errors and complications. That is why the most important task of the future dentist is the ability to correctly diagnose, plan and treat endodontic pathology.

Prerequisites

- Human anatomy (clinical features of the structure of teeth, periodontium, oral mucosa and oral organs)
- Histology (histological features of the structure of teeth, periodontium, oral mucosa and oral organs, embryogenesis of oral organs)
- Bioorganic and biological chemistry (biochemical and biophysical processes in hard and soft tissues of the oral cavity)
- Pathological anatomy (pathomorphological signs of diseases of the oral cavity)
- Physiology (physiological processes occurring in the hard and soft tissues of the oral cavity, the transmission of pain impulse through the hard tissues of the tooth)
- Pathophysiology (pathological processes occurring in the hard and soft tissues of the oral cavity)

The purpose of the course and its significance for professional activities.

The purpose of teaching the discipline "Clinical endodontics" is to train a dentist who can diagnose and treat endodontic diseases using modern approaches and technologies, the formation of clinical thinking and the acquisition of professional competencies.

- Integral: IC: Specialized conceptual knowledge, which includes modern scientific achievements in the field of professional activity or field of knowledge and is the basis for original thinking and research, critical understanding of problems in the field and at the border of fields of knowledge.

- General competencies (GC):

GC1. Ability to abstract thinking, analysis and synthesis.

GC 2. Knowledge and understanding of the subject area and understanding of professional activity.

GC 3. Ability to apply knowledge in practice.

GC 6. Skills in the use of information and communication technologies.

GC 7. Ability to search, process and analyze information from various sources.

GC 8. Ability to adapt and act in a new situation.

GC 9. Ability to identify, pose and solve problems.

GC 10. Ability to be critical and self-critical.

GC 11. Ability to work in a team.

- Special competencies (SC):

SC 1. Ability to collect medical information about the patient and analyze clinical data.

SC 2. Ability to interpret the results of laboratory and instrumental research.

SC 3. Ability to diagnose: determine the preliminary, clinical, final, concomitant diagnosis, emergencies.

SC 4. Ability to plan and implement measures for the prevention of diseases of organs and tissues of the oral cavity and maxillofacial region.

SC 5. Ability to design the process of providing medical care: to determine the approaches, plan, types and principles of treatment of diseases of organs and tissues of the oral cavity and maxillofacial region.

SC 7. Ability to determine the tactics of management of patients with diseases of organs and tissues of the oral cavity and maxillofacial region with concomitant somatic diseases.

SC 8. Ability to perform medical and dental manipulations.

SC 9. Ability to treat major diseases of organs and tissues of the oral cavity and maxillofacial region.

SC 14. Ability to maintain regulatory medical records.

Postrequisites

The knowledge acquired in the process of studying the discipline "Clinical endodontics" helps students to study such disciplines as therapeutic dentistry, orthopedic dentistry, surgical dentistry. Develop professional skills for successful treatment of complicated caries using modern techniques, tools and materials. This in turn allows you to keep devital teeth without the risk of complications.

3. Learning outcomes.

“Clinical Endodontics” as a discipline lays the foundation for the further formation of integrative final learning outcomes in accordance with the educational-professional program of the second (master's) level of knowledge _22 “Health” _, specialty _221 “Dentistry” _, educational program _ “Dentistry” _, namely:

PLO1. Identify the leading clinical symptoms and syndromes (according to list 1 - 3. 6. 8. 10. 13. 15. 17. 22. 23. 24. 27. 28. 33. 34. 40. 44. 48. 51. 52); according to standard methods, using preliminary history of the patient, examination of the patient, knowledge of the person, his organs and systems, to establish a probable nosological or syndromic preliminary clinical diagnosis of dental disease (according to list 2 - section 1 AB).

PLO2. Collect information about the general condition of the patient, assess the psychomotor and physical development of the patient, the condition of the maxillofacial area, based on the results

of laboratory and instrumental studies to assess information about the diagnosis (list 5 - 6. 7. 11. 14).

PLO3. Prescribe and analyze additional (mandatory and optional) examination methods (laboratory, radiological, functional and / or instrumental) according to the list 5 - 6. 7. 11. 14 patients with diseases of organs and tissues of the oral cavity and maxillofacial region for performing differential diagnosis of diseases (according to the list 2, section 1 AB).

PLO4. Determine the final clinical diagnosis in accordance with the relevant ethical and legal norms, by making an informed decision and logical analysis of the obtained subjective and objective data of clinical, additional examination, differential diagnosis under the supervision of a doctor in a medical institution (according to list 2.1, and namely 1, 2, 3, 4).

PLO8. Determine the approach, plan, type and principle of treatment of dental disease (according to the list 2, section 1 AB) by making an informed decision according to existing algorithms and standard schemes.

PLO10. To determine the tactics of managing a dental patient with somatic pathology (according to list 3 - the entire section) by making an informed decision according to existing algorithms and standard schemes.

PLO11. To carry out treatment of the basic stomatologic diseases according to existing algorithms and standard schemes under the control of the doctor-head in the conditions of medical institution (according to the list 2.1, namely 1, 2, 3, 4).

PLO19. Adhere to the requirements of ethics, bioethics and deontology in their professional activities.

PLO20. Organize the necessary level of individual safety (own and persons cared for) in case of typical dangerous situations in the individual field of activity.

PLO22. Perform medical dental manipulations on the basis of preliminary and / or final clinical diagnosis (according to list 2, section 1 A, B, according to list 2.1, namely 1, 2, 3, 4) for different segments of the population and in different conditions (according to list 7, namely 2, 11, 13, 24, 29, 30, 33, 34, 46).

Upon completion of the elective course "Clinical Endodontics" students **should know:**

- additional methods of examination of a dental patient with complicated caries;
- topographic anatomy of the pulp chamber and the root system of the teeth of the upper and lower jaw;
- modern endodontic systems, endodontic tips and endomotors;
- modern endodontic instruments;
- modern methods of instrumental processing of the root system;
- modern means and methods of drug treatment of the root system;
- modern methods and systems of root canal filling;
- physiotherapeutic means of diagnosis and treatment of complicated dental caries;
- diagnosis of endodontic and periodontal lesions;
- tactics of the doctor at injuries of teeth;
- modern methods of surgical treatment of endodontic pathology;
- modern methods of intra-channel teeth whitening;
- methods of retrograde filling.

be able:

- prescribe the necessary additional methods of examination of a dental patient with complicated caries and evaluate their results;
- use modern endodontic systems, endodontic tips and endomotors;
- use modern endodontic instruments;
- to process root canals, using modern methods of instrumental processing of the root system;
- to irrigate the root system using modern means and methods of drug treatment of the root system;
- to carry out filling of root canals with use of modern methods and systems;
- use physiotherapy for the diagnosis and treatment of complicated dental caries;
- use an endodontic microscope;
- provide emergency care for dental injuries;
- to carry out differential diagnosis of endodontic-periodontal lesions;
- to carry out intracanal teeth whitening.

4. Content and logistic of the discipline

Module 1 (title)	__ VII __ semester __ 90 __ hours / __ 2 credits	Lecture 1-5 Practical classes 1-15 Topics for self- study 1-7
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The course includes 5 lectures, 15 topics of practical classes, which are divided into 1 thematic modules.

Topics of practical classes

Topic 1. Structure and functions of tooth pulp. Anatomical and histological features of periapical tissues. Anatomy of root canals.

Topic 2. Examination methods in endodontics. Determination of pulp vitality. Diagnosis. Drawing up a treatment plan.

Topic 3. Preparation for endodontic treatment. Choice of anesthesia method. Modern methods of operating field isolation.

Topic 4. Creating of endodontic access. Magnification in endodontics: endodontic microscope. Methods of measurement of root canal length.

Topic 5. Endodontic instruments. Classification. The structure of endodontic instrument. Hand tools. Rules of work.

Topic 6. Machine instruments. Classification, standardization, rules of work. Endomotor. Technique of rotary instrumentation of the root canal.

Topic 7. Modern methods of irrigation of the root canal system. The main irrigants in endodontics: sodium hypochlorite and complexones. Algorithm of root canal irrigation.

Topic 8. Materials for temporary filling of the root canal system. Calcium hydroxide: indications for use, effects. The concept of “temporary filling” in endodontics.

Topic 9. Materials for permanent filling of root canals. Modern sealers and fillers. Root canal obturation techniques. Quality control of endodontic treatment.

Topic 10. Secondary endodontics. Indications for re-treatment. Methods of filling material removing from root canal system. Revision of pins.

Topic 11. Errors and complications in endodontics. Perforations. Removal of fragments of endodontic instruments.

Topic 12. Endodontic-periodontal lesions. Diagnosis and treatment.

Topic 13. Dental trauma. Doctor's tactics. Diagnosis and treatment of endodontic complications.

Topic 14. Tooth discoloration and bleaching of non-vital teeth. Potential adverse effects from intracoronary bleaching.

Topic 15. Microsurgical endodontics. Indication. Retrograde filling of root canals.

Topics of lectures

Topic 1. Topographic anatomy of the pulp chamber of different groups of teeth. Diagnostics in endodontics. Endodontic microscope.

Topic 2. Preparation for endodontic treatment. Methods of isolation of the operating field. Creating of endodontic access. Methods of measurement of root canal length.

Topic 3. Endodontic instruments. Manual and machine instruments. Classification. Rules of work. Mechanical instrumentation of root canal system by manual and machine methods.

Topic 4. Microbiology in endodontics. Microbial biofilm. The main irrigants in endodontics. Methods of irrigation of the root canal system.

Topic 5. Materials for temporary and permanent filling of the root canal system. Root canal obturation techniques. Quality control of endodontic treatment.

Topics for independent work

Topic 1. Pain in endodontics. Differential diagnosis of orofacial pain.

Topic 2. Microbiology in endodontics. Microbial biofilm.

Topic 3. Vital pulp therapy. Indication. Algorithm.

Topic 4. Emergencies in endodontics. First aid.

Topic 5. Root resorption: classification, diagnosis, treatment.

Topic 6. Features of postendodontic tooth restoration. Indications for the setting of pins. Preparation of the root canal under the pin.

Topic 7. Use of laser in endodontics.

Practical classes provide a theoretical justification of the main issues of the topic and the acquisition of the following **practical skills**:

- 1) Diagnosis of various forms of acute and chronic inflammation of the pulp and pathology of the peri-apical tissues, using basic and additional methods of examination.
- 2) Providing emergency care to a patient with acute pulpitis.
- 3) Insulate the operating field using a system of rubber dams.
- 4) The choice of local anesthetic and type of local anesthesia for various forms of pulpitis and periodontitis.
- 5) Open the tooth cavity.
- 6) Search for the mouth of the root canals.
- 7) Amputation and extirpation of the pulp.
- 8) Determining the working length of the root canal using different methods.
- 9) Creating a "glide path"
- 10) Instrumental treatment of the root canal with modern hand tools.
- 11) Instrumental treatment of the root canal with modern machine tools.
- 12) Irrigation of the root canal. Remove the smeared layer.
- 13) Activation of irrigators by ultrasound.
- 14) Drying of the root canal.
- 15) Temporary obturation of the root canal with a paste based on calcium hydroxide.
- 16) Permanent obstruction of the root canal by various methods.
- 17) Evaluation of radiograph, computed tomography.
- 18) Closing the perforation in the area of furcation, in the mouth of the tooth root.
- 19) Sealing of the root canal.
- 20) Removal of a fragment of an endodontic instrument from the root canal.

The student's independent work involves preparation for practical classes and intermediate tests, study of topics for independent extracurricular work, preparation of presentations, tables. Control of mastering the topics of independent extracurricular work is carried out in practical classes and final control of the discipline.

Individual work includes the study of scientific literature, preparation of reviews on the topics provided for presentation at the meetings of the student scientific circle, the implementation of scientific and practical researches, participation in specialized competitions, scientific and practical conferences and organization of students' research works.

Calendar plans of practical classes, thematic plan of independent extracurricular work, volume and directions of individual work are published on the website of the department.

The route for obtaining materials: Department Therapeutic dentistry / for students / Full-time education / (specialty) / 4 course / Educational materials / or through the link <https://www.vnmu.edu.ua/en/> department Therapeutic dentistry #. Access to the materials is carried out through the student's corporate account s000XXX@vnmu.edu.ua.

5. Forms and methods of monitoring academic performance

Current control in practical studies	Methods: <i>oral or written survey, electronic survey, solving situational problems</i>
Control of mastering the thematic section of the discipline at intermediate control lessons	Methods: <i>oral or written survey, electronic testing, situational problem solving, control of practical skills</i>
Final control of the discipline (credit) at the end of the VII semester	According to the Regulation of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link https://www.vnmu.edu.ua/en/general-regulations)

Learning success diagnostic tools	Theoretical questions, tests, clinically-oriented situational tasks, practical tasks, practical skills demonstration
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6. Assessment criteria

Knowledge assessment is carried out in accordance with the Regulations of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link <https://www.vnmu.edu.ua/en/general-regulations>)

Continuous assessment	On a four point system of traditional assessments: 5 «excellent», 4 «good», 3 «satisfactory», 2 «unsatisfactory»
Midpoint separation assessment	On a four-point system of traditional assessments
Control of practical skills	According to the four-point system of traditional assessments
Discipline assessments:	On a 200-point scale (arithmetic mean for the semester is converted into points) Credited: from 122 to 200 points Not credited: less than 122 points (see Evaluation Scale).

Discipline Score Scale: National and ECTS

The sum of grades for all types of educational activities	Score ECTS	Score on a national scale	
		For exam, course project (work), practice	for credit test
180-200	A	excellent	credited
170-179,9	B	good	
160-169,9	C		
141-159,9	D	satisfactory	
122-140,99	E	satisfactory	-
120-140,99	E	-	credited
119-61	FX	unsatisfactory with the possibility of reassembly	is not credited with the possibility of reassembling
1-60	F	unsatisfactory with a mandatory reexamination of discipline	is not credited with mandatory reexamination of discipline

7. Policy of discipline / course

The student has the right to receive high-quality educational services, access to contemporary scientific and educational information, qualified advisory assistance during the study of discipline and mastering practical skills. The policy of the department during the providing of educational services is a student-centered, based on normative documents of the Ministry of Education and the Ministry of Health of Ukraine, the Statute of the University and the Procedure for the Providing of Educational Services regulated by the main principles of the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsya and the principles of academic integrity (link <https://www.vnmu.edu.ua/en/general-regulations>).

Adherence to the rules of VNMU, safety techniques in practical classes.

Requirements for preparation for practical classes. Student should be present at the practical lesson on time, theoretically prepared according to the topic.

Usage of mobile phones and other electronic devices.

Forbidden

Academic integrity. When studying the discipline, the student must be guided by the Code of Academic Integrity and Corporate Ethics of National Pirogov Memorial Medical University, Vinnytsya (link: <https://www.vnmu.edu.ua/en/general-regulations>)/ Code of Academic Integrity).

In case of violation of the norms of academic integrity during the current and final controls student receives a grade of "2" and must work it out to his teacher in the prescribed manner within two weeks after receiving an unsatisfactory assessment).

Missed classes. Missed classes are practiced in the manner prescribed by the Regulations on the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsya (link <https://www.vnmu.edu.ua/> General information / Basic documents) at the time specified in the schedule of work (published on the website of the department <https://www.vnmu.edu.ua/кафедра-терапевтичної-стоматології> to duty teacher. In order to complete the missed lesson, the student must answer theoretical questions and perform practical tasks on the missed topic. To complete the lecture, the student must make a short summary of the missed topic, navigate the topic and be ready for discussion / answer to questions on the subject of the lecture.

The procedure for admission to the final control of the discipline is given in the Regulations on the organization of the educational process in National Pirogov Memorial Medical University, Vinnytsya (link <https://www.vnmu.edu.ua/> General information / Basic documents). Students who have not missed unfinished practical classes and lectures and received an average traditional grade of at least "3" are admitted to the final control.

Additional individual points. Individual points in the discipline (from 6 to 12) the student can get for individual work, the amount of which is published on the website of the department in educational materials of the discipline, the number of points is determined by the results of IRS according to the Regulations on the organization of educational process in National Pirogov Memorial Medical University, Vinnytsya (link https://www.vnmu.edu.ua / General information / Basic documents).

Conflict resolution. In the event of misunderstandings and complaints to the teacher due to the quality of educational services, assessment of knowledge and other conflict situations, the student must first report their claims to the teacher. If the conflict issue is not resolved, the student has the

right to submit an appeal to the head of the department in accordance with the Regulations on the consideration of appeals of applicants for higher education in National Pirogov Memorial Medical University, Vinnytsya (<https://www.vnmu.edu.ua> / General information / Basic documents).

Politics in terms of distance learning. The procedure for distance learning is regulated by the Regulations on the introduction of elements of distance learning in National Pirogov Memorial Medical University, Vinnytsya (<https://www.vnmu.edu.ua> / General information / Basic documents). The main training platforms for training are Microsoft Team, Google Meets. The procedure for performing practical classes and lectures, exercises and consultations during distance learning is published on the website of the department (<https://www.vnmu.edu.ua> / Department of Therapeutic Dentistry / Student or <https://www.vnmu.edu.ua> / Department of Therapeutic Dentistry / News).

Feedback from the teacher is via messengers (Viber, Telegram, WhatsApp) or e-mail (at the teacher's choice) during business hours.

Educational resources.

Educational and methodological support of the discipline is published on the website of the department (<https://www.vnmu.edu.ua/kafedra-terapevtychnoi-stomatologii> / Student). Consultations are held twice a week according to the consultation schedule.

2. The schedule and distribution of groups by teachers is published on the web page of the department (<https://www.vnmu.edu.ua/kafedra-terapevtychnoi-stomatologii>/ Student).

3. Questions to the intermediate and final controls of the discipline are published on the web page of the department (<https://www.vnmu.edu.ua/kafedra-terapevtychnoi-stomatologii>/ Student)

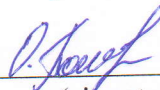
List of recommended literature for self-training of students in «Clinical endodontics»

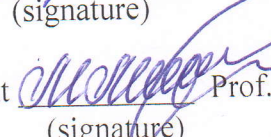
Basic:

1. Lecture materials of the Department of Therapeutic Dentistry.
2. Berman, L. H., Hargreaves, K. M. (2020). Cohen's Pathways of the Pulp - E-Book. Нідерланди: Elsevier Health Sciences.
3. Operative Dentistry. Endodontics: in 2 volumes. Volume 1: textbook edited by Prof. A.V. Borysenko / M.Yu. Antonenko, L.F. Sidelnikova, O.F. Nesyn et al. – 2nd edition, 2020, 384 p. ISBN: 978-617-505-788-9.
4. Stomatology: textbook: in 2 books. Book 1 / M.M. Rozhko, Z.B. Popovych, V.D. Kuroiedova et.al.; edited by M.M. Rozhko. – Kyiv: AUS Medicine Publishing, 2020. – 792 p.
5. Propaedeutics of therapeutic dentistry. The textbook for higher education applicants of dental and foreign faculties of higher education institutions of Ministry of health of Ukraine/ I.M. Tkachenko, I.Y. Marchenko, M.A. Shundryk, Z.Y. Nazarenko, S.A. Pavlenko, O.V. Pavlenkova, A.I. Sydorova, Y.Y. Vodorig, N.M. Brailko / “Magnolia 2006”, 2023. – 423p.

1. Torabinejad, M., Fouad, A., & Shabahang, S. (2020). Endodontics e-book: Principles and practice. Elsevier Health Sciences.
2. Gopikrishna, V. (2019). Preclinical Manual of Conservative Dentistry and Endodontics E-Book. Elsevier India.
3. Evans, M. (2020). Ingle's Endodontics
4. Gupta, R., Hegde, J., Prakash, V., & Sirekha, A. (2019). Concise Conservative Dentistry and Endodontics-E Book. Elsevier Health Sciences.
5. Patel, S., & Barnes, J. J. (Eds.). (2019). The principles of endodontics. Oxford University Press, USA.
6. Kinariwala, N., & Samaranayake, L. (Eds.). (2021). Guided Endodontics. Springer International Publishing.
7. Orstavik, D. (Ed.). (2020). Essential endodontology: prevention and treatment of apical periodontitis. John Wiley & Sons.
8. Perry, E. S., Patel, S., Kanagasingam, S., & Hamer, S. (Eds.). (2024). Pitt ford's problem- based learning in endodontology. John Wiley & Sons.
9. Davies, A., Foschi, F., & Patel, S. (2019). Endodontology at a Glance. John Wiley & Sons.
10. Siqueira Jr, J. F., & Rôças, I. N. (Eds.). (2022). Treatment of endodontic infections. Quintessenz Verlag.
11. Berman, L. H., & Hargreaves, K. M. (2020). Cohen's Pathways of the Pulp-E-Book: Cohen's Pathways of the Pulp-E-Book. Elsevier Health Sciences.
12. Van Noort, R., & Barbour, M. E. (2023). Introduction to Dental Materials-E-Book: Introduction to Dental Materials-E-Book. Elsevier Health Sciences.
13. Zhou, X., & Li, Y. (Eds.). (2021). Atlas of oral microbiology: From healthy microflora to disease. Springer Nature.
14. Scheid, R. C., & Weiss, G. (2020). Woelfel's dental anatomy. Jones & Bartlett Learning.
15. Torres, C. R. G. (Ed.). (2019). Modern operative dentistry: Principles for clinical practice. Springer Nature.
16. Stefanac, S. J., & Nesbit, S. P. (2023). Diagnosis and Treatment Planning in Dentistry: Diagnosis and Treatment Planning in Dentistry-E-Book. Elsevier Health Sciences.
17. Gopikrishna, V. (2023). Preclinical Manual of Conservative Dentistry and Endodontics-E-Book. Elsevier Health Sciences.
18. Della Bona, A. (Ed.). (2020). Color and appearance in dentistry(Vol. 1). Switzerland: Springer.
19. Odell, E. W. (2024). Cawson's Essentials of Oral Pathology and Oral Medicine-E-Book: Cawson's Essentials of Oral Pathology and Oral Medicine-E-Book. Elsevier Health Sciences.
20. Rezaie, H. R., Rizi, H. B., Khamseh, M. M. R., & Öchsner, A. (2020). A review on dental materials. Springer International Publishing.

The syllabus of the subject "Clinical endodontics" was discussed and approved at the meeting of the department Therapeutic dentistry (record № 1, dated "26" August 2025)

Syllabus developer  Ass. of HEI Olha POLISHCHUK
(signature)

Head of the Department  Prof. of HEI Mariia SHINKARUK-DYKOVYTSKA
(signature)