Pursuant to Article 101, Paragraph 4 of the Law on Health Care (“Official Gazette of Montenegro”, Nos. 3/16, 39/16, 2/17, 44/18, 82/20, 8/21, and 3/23), the Ministry of Health has enacted the

# **Rulebook on Specializations of Healthcare Workers and Healthcare Associates**

The Rulebook was published in the “Official Gazette of Montenegro”, No. 25/2024 of March 22, 2024, and entered into force on March 23, 2024.

## **Subject**

## **Article 1**

This Rulebook prescribes the types, programs, and duration of specializations, the manner of internship and examination, the conditions that healthcare institutions must fulfill to conduct internships, and the procedure for internship recognition.

## **Use of Gender-Sensitive Language**

## **Article 2**

The terms used in this Rulebook for natural persons in the masculine gender shall be understood to include the same terms in the feminine gender.

## **Types of Specializations for Medical Doctors**

## **Article 3**

Medical doctors may specialize in the following areas of health care or branches of medicine:

1. Internal medicine
2. Medical oncology
3. Infectology
4. Pediatrics
5. Neurology
6. Psychiatry
7. Pediatric neurology
8. Child and adolescent psychiatry
9. Gynecology and obstetrics
10. General surgery
11. Abdominal surgery
12. Vascular surgery
13. Thoracic surgery
14. Orthopedics and traumatology
15. Pediatric surgery
16. Neurosurgery
17. Plastic, reconstructive and aesthetic surgery
18. Maxillofacial surgery
19. Urology
20. Cardiac surgery
21. Emergency medicine
22. Anesthesiology, resuscitation, and intensive therapy
23. Otorhinolaryngology
24. Ophthalmology
25. Dermatovenerology
26. Physical medicine and rehabilitation
27. Family medicine
28. General medicine
29. Occupational medicine
30. Radiology
31. Radiation oncology
32. Nuclear medicine
33. Pathology
34. Forensic medicine
35. Medical microbiology
36. Clinical biochemistry
37. Clinical pharmacology
38. Laboratory medicine
39. Immunology
40. Public health
41. Hygiene
42. Epidemiology
43. Social medicine
44. Sports medicine
45. Transfusion medicine
46. Aviation medicine
47. Medical statistics and informatics
48. Palliative medicine

## **Types of Specializations for Dentists**

## **Article 4**

Dentists may specialize in the following areas of health care or branches of dentistry:

1. Preventive and pediatric dentistry
2. Dental diseases and endodontics
3. Dental prosthetics
4. Periodontology and oral medicine
5. Orthodontics
6. Oral surgery
7. Maxillofacial surgery
8. Medical statistics and informatics

## **Types of Specializations for Graduates in Pharmacy**

## **Article 5**

Persons with level VII educational qualifications and a completed study program in pharmacy may specialize in the following areas of health care or branches of pharmacy:

1. Clinical pharmacy
2. Medical biochemistry
3. Toxicological chemistry
4. Sanitary chemistry
5. Drug testing and control
6. Pharmacotherapy
7. Pharmaceutical technology
8. Control and application of medicinal plants
9. Social pharmacy
10. Medical statistics and informatics

## **Types of Specializations for Graduates in Medical Biochemistry**

## **Article 6**

Persons with level VII educational qualifications and a completed study program in medical biochemistry may specialize in the following areas of health care or branches of pharmacy:

1. Pharmacotherapy
2. Medical biochemistry
3. Sanitary chemistry
4. Toxicological chemistry
5. Medical statistics and informatics

## **Types of Specializations for Healthcare Associates**

## **Article 7**

Healthcare associates with level VII educational qualifications, depending on their academic study program, may specialize in the following areas of health care:

1. Medical psychology – study program in psychology
2. Medical physics – study program in physical chemistry, physics, or electrical engineering
3. Toxicological chemistry – study program in chemistry, physical chemistry, biology, technology, or agriculture
4. Sanitary chemistry – study program in chemistry, physical chemistry, technology, or agriculture

## **Specialization Programs Conducted in Montenegro**

## **Article 8**

Specializations for which education is organized by a health-focused faculty in Montenegro shall be conducted according to a specialization program that defines, for each specialization:

1. The scope of knowledge and skills the healthcare worker or associate must acquire during the specialization internship
2. The content and duration of individual parts of the specialization (labs, seminars, workshops, research, etc.)
3. Other relevant content for the conduct of the specialization

The program referred to in paragraph 1 of this Article is provided in Annex 1, which is an integral part of this Rulebook.

## **Specialization Programs Conducted Outside of Montenegro**

## **Article 9**

Specializations for which education is organized at a health-focused faculty outside of Montenegro shall be conducted according to the program of the faculty to which the healthcare worker or associate is referred and enrolled.

## **Duration of Specializations**

## **Article 10**

The duration of specializations referred to in Articles 3 to 7 of this Rulebook is determined by the specialization program from Article 8 and the implementation plan established by the health-focused faculty where the healthcare workers and associates enroll.

## **Enrollment in Specializations**

## **Article 11**

Healthcare workers and associates for whom education is organized at a health-focused faculty in Montenegro begin their specialization internship on the date of enrollment at the faculty.

Healthcare workers and associates for whom education is organized at a faculty outside of Montenegro must register with the relevant health-focused faculty in Montenegro for the purpose of referral to faculties abroad, in accordance with a cooperation agreement.

These workers begin their specialization internship on the date of enrollment at the foreign faculty.

Enrollment at a faculty in Montenegro or referral and enrollment at a foreign faculty is done after obtaining approval from the state administrative authority responsible for health affairs (hereinafter: the Ministry).

## **Conduct of Specialization Internship**

## **Article 12**

The specialization internship is generally carried out without interruption, for the full duration of the specialization.

Exceptionally, the internship may be interrupted due to temporary disability for work, parental leave, or other cases in accordance with the law.

The Ministry issues a decision on interruptions of the internship as specified in paragraph 2.

During the internship, the healthcare worker or associate is entitled to annual leave, arranged with the mentor and in accordance with general labor regulations.

## **Specialization Record Book**

## **Article 13**

A specialization record book is maintained during the specialization internship.
The record book referred to in paragraph 1 of this Article, issued by the health-oriented faculty in Montenegro upon a student's enrollment in specialization studies, is in book format, measuring 105x165 mm, with a dark blue cloth cover.
The template of the record book mentioned in paragraph 2 is provided in **Annex 2**, which forms an integral part of this Rulebook.

## **Theoretical and Practical Parts of the Specialization Internship**

## **Article 14**

The theoretical part of the specialization internship is carried out at the health-oriented faculty, while the practical part is carried out in a teaching base, i.e., a healthcare institution that meets the requirements set out in this Rulebook.
To acquire the necessary scope of knowledge, the practical part may be completed in one or more healthcare institutions as mentioned above.

## **Role of the Mentor**

## **Article 15**

Healthcare workers or associates perform their specialization internship under the supervision of a mentor appointed by the health-oriented faculty at which they are enrolled.
The mentor provides professional assistance in acquiring the skills specified in the specialization program, monitors and supervises the work of the trainee, aiming to prepare them for independent work.
The mentor prepares a report on the completed internship and submits it to the faculty.
The health-oriented faculty in Montenegro establishes a list of mentors.

## **Application for Approval to Take the Specialization Exam**

## **Article 16**

After completing the specialization internship, the healthcare worker or associate submits a request to the **Ministry** for approval to take the specialization exam.
The request must include the specialization record book.
Upon receiving approval, the healthcare worker or associate may take the exam.

## **Specialization Exam**

## **Article 17**

The specialization exam is taken before an examination committee.
For specializations conducted in Montenegro, the examination committee (hereinafter: the Committee) is appointed by the council of the health-oriented faculty.
The Committee consists of a chairperson and at least two members, as well as an adequate number of substitutes.
The chairperson and at least one member must be faculty members in the relevant field of specialization.

## **Content of the Specialization Exam**

## **Article 18**

The specialization exam consists of a theoretical and a practical part.
Upon completion of the exam, the Committee evaluates the candidate with the grade: **"excellent," "very good," "good," or "failed."**

## **Retaking the Specialization Exam**

## **Article 19**

A healthcare worker or associate who fails the specialization exam may retake it **up to two more times**, with intervals of no less than six months between attempts.

## **Diploma and Professional Title**

## **Article 20**

A diploma certifying the passing of the specialization exam is issued to the healthcare worker or associate who successfully passes.
The individual obtains the professional title of **Specialist** in the relevant field of health care, i.e., a branch of medicine, dentistry, or pharmacy.
The diploma template referred to in paragraph 1 is provided in **Annex 3**, which is an integral part of this Rulebook.

## **Requirements for Healthcare Institutions Conducting Internships**

## **Article 21**

The specialization internship is conducted in a healthcare institution which, in addition to fulfilling legally prescribed conditions for performing healthcare activities, must also:

1. Employ at least one specialist in the relevant medical field on a permanent basis, with **a minimum of five years of experience** after passing the specialization exam;
2. Meet the necessary requirements to implement the specialization program;
3. Have a library with the required professional literature.

For institutions providing internships in **family medicine**, in addition to the above, they must employ **at least one specialist in family medicine** on a permanent basis, with at least **five years of experience** working as a selected doctor for adults or children.

If the institution employs only one specialist as defined above, it may host **no more than two interns** in a given specialization field.

## **Carrying Out Part of the Specialization Internship Abroad**

## **Article 22**

Healthcare workers enrolled in a faculty in Montenegro may carry out **part of their internship abroad**—in other faculties, healthcare institutions, or entities with which the Montenegrin faculty has a cooperation agreement.

## **Recognition of Part of the Specialization Internship**

## **Article 23**

Healthcare workers who were employed in a healthcare institution prior to enrollment in specialization, and whose work overlapped with the specialization program, may have **up to six months** of their internship recognized (for specializations lasting four years or more).
A medical doctor who has completed a specialization in one field may have part of the internship in another specialization recognized based on:
– experience as a specialist,
– time worked as a selected physician, or
– participation in specific forms of professional education.

Recognition of part of the internship as described in paragraphs 1 and 2 is carried out **at the proposal of the faculty** and **with the Ministry's approval.**

## **Cessation of Validity**

## **Article 24**

On the date this Rulebook enters into force, the previous Rulebook on Specializations (“Official Gazette of Montenegro”, No. 17/14) shall cease to be valid.

## **Entry into Force**

## **Article 25**

This Rulebook enters into force on the **day following its publication** in the “Official Gazette of Montenegro”.

**Number**: 5-040/24-1110/3
**Podgorica, March 22, 2024**

**Minister,**
**Dr. Vojislav Šimun, m.p.**

**EDITOR'S NOTE:** The annexes in PDF format may be downloaded at the following links:
– **Annex 1** (Specialization Program)
– **Annex 2** (Specialization Record Book)
– **Annex 3** (Diploma of Passed Specialization Exam)

ANNEX 1

SPECIALIZATION PROGRAMS

**A. RADIOLOGY**

**Duration: Four years (48 months)**

During the specialization internship, the resident acquires theoretical and practical knowledge in the field of radiology and is trained for practical professional work in this area. The specialization program includes both theoretical and practical components.

Theoretical instruction is carried out at the Faculty of Medicine. The practical component is conducted at the Clinical Center of Montenegro, clinical-hospital centers, and state-run hospitals that have all four radiological modalities (X-ray, ultrasound, CT, and MRI), in accordance with this Rulebook.

During the specialization, the resident is entitled to annual leave in accordance with the law and in agreement with their mentor.

1. **Theoretical Instruction**

Theoretical instruction lasts nine months and includes:

* Musculoskeletal system radiology: 35 hours
* Thoracic radiology: 40 hours
* Abdominal radiology: 35 hours
* Neuroradiology: 30 hours
* Urogenital system radiology: 30 hours
* Cardiovascular system radiology: 30 hours
* Pediatric radiology: 30 hours
* Interventional radiology: 20 hours
* Emergency radiology: 15 hours
* Head and neck radiology: 15 hours
* Breast radiology: 15 hours
* Maxillofacial and dental radiology: 15 hours
1. **Practical Instruction and Professional Practice**

During practical training, the resident must master the following radiological techniques for all organ systems:

* Conventional radiology
* Angiography
* Computed tomography
* Magnetic resonance imaging
* Ultrasound
* Nuclear medicine
* Use of contrast agents
* Interventional radiology techniques

For all organ systems, the resident must acquire foundational knowledge of:

a) - Anatomy and anatomical variations

- Physiology

- Pathophysiology

- Pathology

b) Clinical characteristics of disorders:

- Congenital anomalies

- Infectious diseases

- Neoplastic diseases

- Traumatic injuries

- Degenerative diseases

- Occupational diseases

- Ischemic diseases

- Endocrine diseases

- Metabolic diseases

- Immunologic diseases

- Iatrogenic conditions

- Functional disorders

c) Basic therapeutic modalities (medical and surgical) where radiological methods are used in diagnostics.

**2.1. First Year of Specialization (10 months)**

The resident acquires basic knowledge including:

* Radiation physics
* Physical principles of image acquisition: classical X-rays, CT, nuclear medicine, MRI, and ultrasound
* Quality control in radiology
* Radiation protection
* Radiobiology
* Anatomy, physiology, biochemistry relevant to radiological procedures
* Pharmacology of contrast media
* Basic computer principles
* Use of informatics in medical facilities (PACS, RIS, HIS)
* Radiological imaging of basic pathological processes
* Basic principles of interventional radiology
* Basic principles of modern clinical practice related to clinical radiology
* Guidelines for writing radiological reports
* Administration and management in radiology departments
* Basic knowledge of research methodology, medical informatics, and statistics
* Evidence-based medicine
* Legal and medical aspects of radiological practice

Residents rotate through the following departments:

a. Conventional radiology (including film processing and archiving): 3 months

b. Ultrasound: 2 months

c. CT: 2 months

d. MRI: 3 months

Knowledge evaluation:

* Introductory radiology colloquium (5th month)
* One seminar paper

- Radiological physics and technique colloquium (10th month)

**2.2. Second, Third, and Fourth Years (38 months)**

**2.2.1. Musculoskeletal Radiology (5 months)**

Areas of interest:

* Shoulder and upper limbs
* Pelvis and lower limbs
* Thoracic cage
* Spine
* Muscles
* Ligaments
* Tendons
* Other soft tissues

Specific techniques:

* Arthrography
* Myelography
* Bone densitometry

Mandatory diagnostic procedures that residents perfom independently:

* Axial skeleton radiography: 500 cases
* Peripheral skeleton radiography: 1500 cases
* CT of musculoskeletal system: 300 cases
* MRI of musculoskeletal system: 300 cases
* Bone densitometry
* Ultrasound: 150 cases
* Fistulography: 30 cases

Basic knowledge in nuclear medicine imaging of the musculoskeletal system required.

Interventional procedures:

* Arthrography: 10 cases
* Biopsies: 15 cases

Knowledge evaluation:

* Introductory colloquium (after 2.5 months)
* Three seminar papers
* Six case reports

- Final colloquium (5th month)

**2.2.2. Thoracic Radiology (5 months)**

Areasof interest:

* Thoracic aperture
* Chest wall
* Diaphragm
* Mediastinum
* Heart
* Lungs
* Major blood vessels

Specific techniques:

* Bronchial stenting

Mandatory diagnostic procedures:

* Chest radiography: 500 cases
* CT of the chest: 200 cases
* Ultrasound (including image-guided procedures): 100 cases
* Angiography (aortography, cavography, pulmonary): 50 cases
* MRI (including mediastinal vessels, heart, pericardium): 50 cases

Interventional procedures:

* Participation in 30 image-guided nonvascular interventions

Basic knowledge of nuclear medicine diagnostics of heart and lungs required.

Knowledge evaluation:

* Introductory colloquium (after 2.5 months)
* Three seminar papers
* Six case reports

- Final colloquium (5th month)

**2.2.3. Abdominal Radiology (5 months)**

Areas of interest:

* Pharynx
* Esophagus
* Stomach
* Duodenum
* Small intestine
* Colon
* Liver
* Billiary tract
* Spleen
* Pancreas
* Periotenal cavity and mesenterium

Specific techniques:

* Swallowing studies
* Small bowel passage (including enteroclysis)
* Defecography
* Cholangiography
* Intraluminal/intraoperative ultrasound
* ERCP

Mandatory diagnostic procedures that residents perfom independently:

* Barium studies
* Upper GI studies: 50 cases
* Small bowel/enteroclysis: 35 cases
* Irrigography: 85 cases
* Abdominal ultrasound: 400 cases
* Abdominal CT: 300 cases
* Abdominal MRI: 150 cases

Interventional procedures:

* CT/US-guided biopsy: 10 cases
* CT/US-guided abscess drainage: 5 cases
* Visceral angiography: 5 cases
* PTC: 5 cases

Knowledge evaluation:

* Introductory colloquium (after 2.5 months)
* Three seminar papers
* Six case reports

- Final colloquium (5th month)

**2.2.4. Neuroradiology (4 months)**

Areas of interest:

* Skull
* Brain
* Spine
* Spinal cord
* Cranial and spinal nerves
* Blood vessels of the head and neck

Specific techniques:

* Discography
* Encephalography
* Myelography
* Ventriculography

Mandatory diagnostic procedures that residents perfom independently:

* Cranial radiographs: 100 cases
* Spine radiographs: 100 cases
* Brain CT: 200 cases
* Spine CT: 200 cases
* Head and neck CT: 200 cases
* Brain MRI: 200 cases
* Spine MRI: 150 cases
* Head and neck MRI: 150 cases

The resident must be familiar with and assist in at least 30 procedures such as myelography, radiculography, and selective cerebral angiography.

They must also have basic knowledge of advanced CNS imaging such as functional MRI, MR angiography, and MR spectroscopy.

Knowledge evaluation:

* Introductory colloquium (after 2 months)
* Two seminar papers
* Four case reports
* Final colloquium (4th month)

**2.2.5. Urogenital Radiology (3 months)**

Areas of interest:

* Kidneys
* Ureters
* Bladder
* Urethra
* Male genital tract (including infertility and impotence)
* Female genital tract (including infertility and obstetrics)
* Retroperitoneum
* Adrenal glands

Specific techniques:

* Hysterosalpingography
* Cystourethrography
* Antegrade pyelography

Mandatory diagnostic procedures that residents perfom independently:

* Intravenous urography: 80 cases
* Cystourethrography: 20 cases
* Transabdominal urinary tract ultrasound: 300 cases
* Transabdominal/transvaginal pelvic ultrasound
* Scrotal ultrasound: 20 cases
* Transrectal prostate ultrasound
* CT of the urinary tract and pelvic organs: 150 cases
* MRI of the urinary tract and pelvic organs: 150 cases
* Hysterosalpingography: 10 cases

Interventional procedures:

* Nephrostomy: 15 cases
* Antegrade pyelography: 10 cases
* Biopsies (e.g. renal or retroperitoneal masses): 10 cases
* Drainage of fluid collections: 5 cases
* Angiography (aortography and renal): 5 cases
* Prostate biopsy: 10 cases

Knowledge evaluation:

* Introductory colloquium (after 1.5 months)
* Two seminar papers
* Four case reports
* Final colloquium (3rd month)

**2.2.6. Cardiovascular Radiology (3 months)**

Areas of interest:

* Heart
* Great vessels
* Arteries and veins

Specific techniques:

* Cardiac ultrasound
* Pharmacologic therapy in cardiology
* Basic cardiac emergency procedures including monitoring

Mandatory diagnostic procedures that residents perfom independently:

* Chest and heart radiographs: 300 cases
* Aortography: assist in 50, primary operator in 25 cases
* Selective angiography (head and neck): assist in 50, primary in 25 cases
* Doppler/duplex ultrasound: 100 cases
* CT: 100 cases
* MRI
* Phlebography: assist in 20, primary operator in 10 cases

Knowledge evaluation:

* Introductory colloquium (after 1.5 months)
* Two seminar papers
* Four case reports
* Final colloquium (3rd month)

**2.2.7. Pediatric Radiology (2 months)**

Principles of imaging in pediatcs:

* Radiation protection
* Sedation
* Child psychology
* Positioning during imaging
* Pediatric radiology organization, contrast media, and anesthesia

Areas of interest:

* Chest
* Musculoskeletal system
* GI tract
* Urogenital tract
* CNS (brain and spinal cord)

Specific techniques:

* Cranial ultrasound
* Retrograde urethrocystography
* Fetal ultrasound

Mandatory diagnostic procedures that residents perfom independently:

* Upper GI: 25 cases
* Lower GI: 50 cases
* Neonatal chest radiographs: 100 cases
* Pediatric bone radiology: 100 cases
* CT: 50 cases
* MRI: 50 cases
* Abdominal and hip ultrasound: 100 cases
* Cranial ultrasound: 30 cases

Interventional procedures:

* Biopsies: 20 cases
* Intussusception reduction: 5 cases

Knowledge evaluation:

* One seminar paper

- Two case reports

**2.2.8. Interventional Radiology (2 months)**

Areas of interest:

* Vascular interventional radiology
* Nonvascular interventional radiology

Specific techniques:

* Vessel dilation and stenting
* Embolization
* Chemotherapy perfusion
* Thrombolysis
* Drainage of organs and collections
* Needle biopsies

Resident participates in the following interventional procedures:

* Peripheral PTA: 25 cases
* PTC/PTCD: 5 cases
* Thrombolysis: 5 cases
* Vascular stenting: 5 cases
* Embolization: 5 cases
* Venous interventions: 5 cases
* Biopsies: 50 cases
* Drainages: 10 cases
* Nonvascular stenting: 5 cases

Performs independently:

* Peripheral PTA: 5 cases
* PTC/PTCD: 5 cases
* Biopsies: 20 cases
* Drainages: 10 cases

Knowledge evaluation:

* Introductory colloquium (after 1 month)
* One seminar paper
* Two case reports
* Final colloquium (2nd month)

**2.2.9. Emergency Radiology (2 months)**

Areas of interest:

Emergency and intensive care radiology for all organ systems.

Mandatory diagnostic procedures that residents perfom independently:

* Peripheral/axial skeleton X-rays: 200 cases
* Acute abdomen X-rays: 50 cases
* Chest radiographs in acute cardiopulmonary conditions: 50 cases
* Trauma radiographs (chest/skeleton): 20 cases
* CT of chest and abdomen: 150 cases
* CT of skull, head, neck: 50 cases
* Abdominal ultrasound in emergencies: 100 cases
* Extremity ultrasound: 30 cases

Knowledge evaluation:

* One seminar paper

**2.2.10. Head and Neck Radiology (2 months)**

Areas of interest:

* Petrous bone
* Skull base and orbits
* Nasopharynx
* Salivary glands
* Oropharynx and mouth floor
* Hypopharynx
* Larynx
* Neck
* Thoracic inlet
* Thyroid and parathyroid glands

Specific techniques:

* Pharyngography
* Orthopantomography (OPG)
* Laryngography
* Sialography

Mandatory procedures that residents perfom independently:

* Cranial radiographs: 100 cases
* Sinus X-rays: 100 cases
* Head and neck CT
* Head and neck MRI
* Ultrasound

The resident must master orthopantomography and gain experience in aspiration biopsy of focal lesions.

Knowledge evaluation:

* Introductory colloquium (after 1 month)
* One seminar paper
* Two case reports
* Final colloquium (2nd month)

**2.2.11. Breast Radiology (2 months)**

Specific techniques:

* Galactography

Mandatory procedures:

* Mammography: 300 cases
* Sonography: 100 cases
* MRI: 30 cases

Interventional procedures:

* Fine-needle aspiration biopsy: 20 cases
* Pneumocystography
* Galactography

Knowledge evaluation:

* Introductory colloquium (after 1 month)
* One seminar paper
* Two case reports
* Final colloquium (2nd month)

**2.2.12. Maxillofacial and Dental Radiology (1 month)**

**2.2.13. Nuclear Medicine Imaging (2 months)**

Areas of interest:

* Physics and instrumentation of nuclear medicine
* Nuclear medicine modalities
* Imaging of the musculoskeletal system
* Thoracic/respiratory imaging
* Hepatobiliary and GI imaging
* CNS imaging
* Urogenital imaging
* Cardiovascular imaging
* Pediatric nuclear imaging
* Head and neck nuclear imaging
* Breast nuclear imaging

 **B. FAMILY MEDICINE**

**Duration of specialization: Four years (48 months)**

During the specialization internship, the resident acquires theoretical and practical knowledge in the field of family medicine and is trained for professional work in this field.

The specialization program consists of theoretical and practical components.

The theoretical part is conducted at the Faculty of Medicine alongside the practical part and lasts nine months.

The practical part consists of clinical and outpatient components and lasts 44 months.

It is conducted at the Clinical Center of Montenegro, clinical-hospital centers, and hospitals. The outpatient component is conducted in the offices of selected general practitioners for adults, selected pediatricians, and selected gynecologists at primary health care institutions (Health Centers), as well as at the Institute for Emergency Medicine.

During the residency, the resident is entitled to annual leave in accordance with the law and upon agreement with the mentor.

The residency rotations cover the following areas:

1. Family medicine – Part 1 (5 months)
2. Internal medicine (6 months)
3. Infectious diseases (2 months)
4. Surgery (2 months)
5. Pediatrics (2 months)
6. Gynecology (2 months)
7. Psychiatry (2 months)
8. Neurology (1 month)
9. Dermatology (1 month)
10. Orthopedics (1 month)
11. Ophthalmology (15 days)
12. Otorhinolaryngology (1 month)
13. Oncology (1 month)
14. Physical medicine (15 days)
15. Family medicine – Health Center – Part 2 (3 months)
16. Family medicine – Direct mentoring – Part 2 (14 months)
17. Annual leave (4 months)
18. **Clinical Rotations**
19. **Internal Medicine (6 months)**

The internship consists of practical and theoretical components.

The practical part includes: 3 months in hospital internal medicine wards; 2.5 months at the internal medicine specialist clinics, clinical-hospital centers, or at the Clinical Center of Montenegro; and 2 weeks at the Emergency Medicine Department.

**1.1 Practical training and professional work:**

Residents must master:

* Taking a detailed medical history,
* Performing a physical examination,
* Administering injections (intradermal, subcutaneous, intramuscular, intravenous),
* Puncture techniques (venous, arterial, pleural, lumbar, abdominal),
* Inserting a venous catheter
* Starting IV infusion,
* Male and female bladder catheterization,
* Rectal examination,
* Nasogastric suction and gastric lavage,
* Endotracheal intubation,
* Inhaler medication application,
* Cardiopulmonary resuscitation,
* ECG recording and interpretation.

**1.2. Theoretical training- residents must learn:**

* Emergency care measures for internal medicine conditions (cardiac and respiratory arrest, unconsciousness, MI, acute heart failure, asthma, GI bleeding, poisoning, anaphylactic shock, abdominal colic);
* Differential diagnosis and treatment of symptoms and signs: pain, dizziness/syncope, arrhythmias, murmurs, cough, dyspnea, dysphagia, constipation, diarrhea, bleeding tendencies;
* Diagnosis, therapy, complications, referral criteria, and work disability assessment for: diabetes, thyroid disorders, dyslipidemia, anemia, venous insufficiency, thrombophlebitis, hypertension, pericarditis, endocarditis, myocarditis, myocardial infarction, arrhythmias, heart failure, tuberculosis, COPD, pulmonary hypertension, pneumonias, pleural diseases, PE, asthma, interstitial lung diseases, granulomatous lung diseases, occupational lung diseases, ulcers, GI diseases, hepatitis, pancreatitis, UTIs, renal failure, connective tissue diseases, rheumatoid arthritis, seronegative spondyloarthropathies, osteoarthritis, soft tissue rheumatism, osteoporosis, vasculitis, acute arthritis, rheumatic fever, meningitis, meningoencephalitis;
* Risk factors and prevention for cardiovascular diseases;
* Early diagnosis/prevention of rheumatic fever, endocarditis, DVT, TB, cancer, AIDS;
* Smoking cessation and alcohol abuse prevention strategies;
* Home oxygen therapy management;
* Interpretation of labs (biochemistry, proteinogram, bacteriology), imaging (X-ray of skeleton, lungs, heart), ECG, spirogram, and peak flow measurements.
1. **Infectious Diseases (2 months)**

It consists of a practical and theoretical part of the internship and lasts for two months. It is carried out in infectious disease departments and outpatient clinics of hospitals, clinical-hospital centers, and the Clinic for Infectious Diseases of the Clinical Center of Montenegro.

**2.1. Practical training and professional work- resident must learn:**

* History and exam in febrile/infectious patients,
* Sample collection for microbiological diagnosis,
* Interpretation of lab, microbiology, immunology, antibiograms.

**2.2. Theoretical training:**

* Emergency care for consciousness disturbances, seizures, dehydration, shock, respiratory distress, cardiac arrest and resuscitation, vegetative syndrome, anaphylaxis, intoxications caused by microorganisms, elevated body temperature;
* Diagnosis, therapy, complications, referral, and work disability assessment for: respiratory infections, cardiac infections, GI infections, hepatitis, cholecystitis, UTIs, CNS infections, skin/soft tissue infections, childhood infections, osteomyelitis, sepsis, infections in immunosuppressed and HIV patients, bacterial/viral/fungal/parasitic infections, nosocomial infections;
* Antimicrobial indications, differential diagnosis of fever, seizures, vomiting, diarrhea, jaundice, paresis and paralysis, breathing and consciousness disturbances, substance addiction, shock;
* Epidemiology, immunoprophylaxis, legal regulations for infectious diseases in Montenegro.
1. **Surgery (2 months)**

Conducted in surgical wards, emergency departments, and outpatient clinics. The practical part consists of 1.5 months at the hospital war; 15 days in the emergency unit; and 1 month in the specialist surgical outpatient clinics of hospitals, the clinical-hospital center, or the Clinical Center of Montenegro.

**3.1. Practical training - residents must learn:**

* Surgical history and examination,
* Performing a surgical assessment for a specific organ system,
* Intradermal, subcutaneous, intramuscular, and intravenous administration of injections,
* Puncture techniques (venous, arterial, pleural, lumbar, abdominal),
* Placement of an infusion,
* Endotracheal intubation,
* Wound dressing,
* Heimlich maneuver,
* Fracture immobilization,
* Hemostasis,
* Wound suturing,
* Abscess and panaritium drainage,
* Nail removal,
* Local and regional anesthesia,
* Minor excisions (lipomas, cysts, sucutaneous foreign body removal, sending specimens for histological examination),
* Venous catheter placement,
* Hemorrhoid incision,
* Paraphimosis reduction,
* Bladder catheterization (male and female)
* Bladder puncture.

**3.2. Theoretical training - residents must learn:**

* Emergency care for trauma, cardiac/respiratory arrest, loss of consciousness, shock;
* Diagnostics, therapy, complications, referral criteria, basic assessment of work disability, and rehabilitation in surgical diseases and injuries;
* Pre- and postoperative care;
* Management of common injuries;
* Radiation protection in surgical settings;
* Prevention of tetanus and injuries;
* Interpretation of trauma X-rays.
1. **Pediatrics (2 months)**

Consists of a practical and theoretical part of the internship and lasts two months. It is carried out in the pediatric wards and outpatient clinics of the hospital and the Institute for Children's Diseases at the Clinical Center of Montenegro. The practical part includes: 1 month at a pediatric ward and 1 month at the outpatient clinics of healthcare institutions.

**4.1. Practical training and professional work:**

* Newborn examination,
* Evaluation of physical, mental, and social development,
* Otoscopy and auscultation in children,
* Vision, speech, and hearing assessment,
* Nasogastric suction and gastric lavage,
* Pediatric resuscitation,
* Urine and stool collection for lab analysis,
* Newborn transport.

**4.2. Theoretical training:**

* Emergency care in pediatrics (cardiac/respiratory arrest, shock, syncope, cardiac decompensation, arrhythmia, acute and chronic respiratory failure, hypo-/hyperglycemia, seizures, anaphylaxis, poisoning, foreign body aspiration, epiglottitis, laryngitis, asthma);
* Differential diagnosis and management of: fever, wheezing, hypertension, jaundice, vomiting, developmental delay, enuresis/encopresis, puberty disorders, school performance issues, headache, joint disorders, school absenteeism;
* Diagnosis, therapy, complications, referral, and rehabilitation in: exanthematous diseases, upper respiratory tract infections (otitis, rhinitis, rhinopharyngitis), croup, lower respiratory tract infections, asthma, allergic and immune disorders, gastroenteritis, anorexia, bulimia, UTIs, asymptomatic bacteriuria, meningitis, meningoencephalitis, epilepsy, febrile seizures, anemia, coagulation disorders, parasitic infections, orthopedic and neurological diseases, somatoform disorders, pediatric gynecology, childhood malignancies, diabetes;
* Postnatal newborn care and
* Neonatal assessment;
* Preventive examinations of preschool and school/ aged children;
* National immunization schedule, contraindications, and complications;
* Recognition of child abuse and sexual exploitation;
* Epidemiology of childhood morbidity;
* Prevention of malformations;
* School readiness assessment.
1. **Gynecology (2 months)**

It consists of a practical and theoretical part of the internship and lasts for two months.
The practical part includes: one month in a hospital ward and one month in a specialist gynecological outpatient clinic of a hospital, clinical-hospital center, or the Clinical Center of Montenegro.

**5.1. Practical training - residents must learn:**

* Gynecological exam,
* Cervical swab collection,
* Prenatal exams,
* Fetal heart monitoring,
* Normal delivery management,
* Episiotomy,
* Postnatal care of newborn.

**5.2. Theoretical training:**

* Emergency care for maternal health (genital bleeding, ectopic pregnancy, miscarriage, labor, eclampsia);
* Diagnosis, treatment, referral, rehabilitation, work assessment in: breast, ovarian, endometrial, cervical cancers, infections, abnormal bleeding, amenorrhea, uterine prolapse, cystocele, rectocele;
* Risk factors and prevention of gynecological cancers;
* Breast palpation technique and frequency;
* Self-exam technique;
* Mammography indications;
* Menopause care and HRT considerations and indications for referral to specialist care;
* Diagnosis of prolapse, cystocele, rectocele and indications for referral to specialist care;
* Contraceptive methods and counseling;
* Infertility investigation and referral;
* Family planning legislation;
* Obstetric history taking,
* Fetal age estimation;
* Psychological aspects of pregnancy and postpartum;
* Impact of pregnancy on the family dynamics;
* Recognize a high-risk pregnancy;
* Prenatal counseling on diet, vitamins, physical and sexual activity;
* Drug safety in pregnancy;
* Management of threatened miscarriage, preterm labor, PROM;
* Diagnosis of gestational diabetes and hypertension;
* Serologic interpretation (rubella, toxoplasmosis, syphilis);
* Management of common infections in pregnancy (respiratory and urinary infections);
* Rh sensitization and implications;
* Assessment of patient during the labor and delivery;
* Episiotomy indications;
* Management of the most frequent postpartum complications.
1. **Psychiatry (2 months)**

It consists of a practical and theoretical part of the internship and lasts for two months.
The practical part includes: 1 month in a hospital ward and 1 month in a specialist psychiatric outpatient clinic.

**6.1. Practical training:**

* Psychiatric interview,
* Psychotherapy techniques,
* Family functioning assessment,
* Working with the family as part of family therapy.

**6.2. Theoretical training – the resident must learn:**

* Emergency mental health care (acute psychosis, delirium, paranoia, mania, conversion disorders, suicide attempts, alcoholic hallucinosis;
* Diagnosis, treatment, referral, rehabilitation, work assessment in: anxiety, depression, the most common types of neuroses and psychoses, addictions, psychosomatic disorders, dementia, sexual dysfunctions;
* Collaboration in psychiatric rehabilitation;
* Communication techniques that foster doctor-patient relationships;
* Balint group roles;
* Mental health risk factors and preventive measures;
* Brief psychotherapy techniques;
* Recognize the signs of family dysfunction and
* Know indications for referral to family therapy;
* Diagnostic and therapeutic options;
* Impact of mental illness on the family dynamics.
1. **Neurology (1 month)**

It consists of a practical and theoretical part of the internship and lasts for one month. It is carried out in a specialist neurological outpatient clinic of a hospital, clinical-hospital center, or the Clinical Center of Montenegro.

**7.1. Practical training and professional work:**

* Neurological examination,
* Lumbar puncture,
* Eye fundus examination.

**7.2. Theoretical training:**

* Emergency neurological care (unconsciousness, seizures, stroke);
* Diagnosis, treatment, complications, referral, rehabilitation in: stroke, TIA, cerebral aneurysm rupture, headache, migraine, neuropathies of various ethiologies, epilepsy, tremors, CNS and PNS diseases;
* Interpretation of basic neurological diagnostics.
1. **Dermatology and Venereology (1 month)**

It consists of a practical and theoretical part of the internship and lasts for 1 month. It is carried out in a specialist dermatovenerology outpatient clinic of a hospital, clinical-hospital center, or the Clinical Center of Montenegro.

**8.1. Practical training and professional work:**

* Dermatological history taking,
* Dermatologic examination,
* Swab collection,
* Prescribing dermatologic medications,
* Application of local pharmacological treatments.

**8.2. Theoretical training:**

* Diagnosis, therapy, complications, referral, rehabilitation in: viral, bacterial, fungal skin infections, parasites, skin cancers, allergic skin diseases, hair and nail disorders, generalized pruritus, congenital skin defects, acne, contact and seborrheic dermatitis, psoriasis, varicose veins and ulcers, STDs;
* Early detection and counseling for skin cancers;
* STD-related regulations;
* Interpretation of basic diagnostic methods in dermatology and understanding the indications for their use;
* Sample collection for mycology, bacteriology, parasitology, histology.
1. **Orthopedics (1 month)**

It consists of a practical and theoretical part of the internship and lasts for 1 month. It is carried out in a specialist orthopedic outpatient clinic of a hospital, clinical-hospital center, or the Clinical Center of Montenegro.

**9.1. Practical training and professional work:**

* Taking orthopedic history,
* Examination orthopedic patients,
* Periarticular infiltrations and blocks,
* Intra-articular knee and shoulder injections,
* Use of immobilization splints.

**9.2. Theoretical training:**

* Recognition and management of orthopedic emergencies,
* Diagnosis, therapy, complications, referrals, rehabilitation, and work disability assessment in: spine disorders, joint injuries and diseases, congenital anomalies, muscular and neuromuscular disorders,
* Interpretation of orthopedic diagnostic methods and their indications.
1. **Ophthalmology (15 days)**

It consists of a practical and theoretical part of the internship and lasts for 15 days. It is carried out in a specialist ophthalmology outpatient clinic of a hospital, clinical-hospital center, or the Clinical Center of Montenegro.

**10.1. Practical training and professional work:**

* External eye examination,
* Fundus examination,
* Vision testing,
* Tonometry,
* Foreign body removal from cornea and conjunctiva.

**10.2. Theoretical training:**

* Management of ophthalmological emergencies: acute glaucoma, ocular foreign bodies, trauma, light and chemical injuries, central retinal artery embolism, hemorrhage, retinal detachment, sudden blindness;
* Diagnosis, therapy, complications, referrals, rehabilitation, and work disability evaluation for: tumors, glaucoma, refractive errors, cataracts, inflammations;
* Common causes of vision loss and response measures;
* Interpretation of ophthalmologic diagnostics and rationale for their application.
1. **Otorhinolaryngology (1 month)**

It consists of a practical and theoretical part of the internship and lasts for 1 month. It is carried out in a specialist otorhinolaryngology outpatient clinic of a hospital or the Clinical Center of Montenegro.

**11.1. Practical training and professional work:**

* ENT history taking,
* ENT examination,
* Basic hearing tests,
* Ear canal irrigation,
* Removal of foreign bodies from ear, nose, throat,
* Anterior and posterior nasal packing,
* Management of ENT injuries,
* Conicotomy,
* Heimlich maneuver.

**11.2. Theoretical training:**

* Management of ENT emergencies: foreign bodies, Quincke’s edema, epistaxis;
* Diagnosis, therapy, complications, referrals, rehabilitation, work disability assessment for: infections (nose, sinuses, throat, larynx, trachea, ear), ENT tumors, trauma;
* Tonsillectomy indications in children;
* Interpretation of ENT diagnostics and rationale for their application.
1. **Oncology (1 month)**

It is carried out over the course of 1 month of practical work, in the specialist oncology outpatient clinic of the Clinical Center of Montenegro.

**12.1. Practical training and professional work:**

* History taking and examination for cancer detection,
* Diagnostic methods for the early detection of malignancies.

**12.2. Theoretical training:**

* Early diagnosis of common cancers and patient monitoring;
* Most common therapeutic methods, their indications, effects, side effects;
* Management of common complications in cancer patients;
* Supportive care for cancer-related difficulties;
* Assisting a terminal patient in managing psychosomatic difficulties;
* Proper referral of cancer patients;
* Interpretation oncologic diagnostic methods and rationale for their use;
* Pain management.
1. **Physical Medicine and Rehabilitation (2 weeks)**

It is carried out over the course of 2 weeks of practical work in specialist outpatient clinics of a hospital, clinical-hospital center, or the Clinical Center of Montenegro.

**13.1. Practical and theoretical training:**

* Principles of comprehensive rehabilitation and balneotherapy,
* Physical medicine techniques,
* Diagnosis and treatment of locomotor disorders due to joint disease,
* Indications and contraindications for medical rehabilitation,
* Use and prescription of assistive devices,
* Functional testing and evaluation.
1. **Outpatient Part of the Residency (22 months)**

 Conducted in general practice and pediatric clinics at primary care centers.

First stage: 5 months practical work under mentor supervision. This is the initial phase of the residency. The second part of the outpatient part of the residency is carried out by the resident in the office of a chosen general practitioner, lasts for 17 months, and it takes place after the clinical rotations.

* 3 months in mentor’s pediatric practice,
* 14 months in the mentor’s outpatient clinic – the chosen general practitioner for adults – and in the resident’s own clinic, under the supervision of the mentor..

Practical skills to be acquired:

* Community health education,
* Preventive programs for assigned populations,
* Conducting home visits, which are a specific feature of family medicine,
* Family medicine-specific history and physical exam,
* Family dynamics assessment,
* Patient record keeping,
* Running working groups,
* Communication with patients and families (clinic and home),
* End-of-life care,
* Death certification.

Theoretical knowledge to be acquired:

* Family-centered care approach,
* Benefits of home care,
* Interpretation of specialist findings,
* Global developments in general practice,
* Health care and insurance legislation in Montenegro,
* Role of family medicine in the health system of Montenegro,
* Health planning for target populations,
* Medical recordkeeping, health informatics, ethics, legal implications,
* Preventive programs by population group,
* Health promotion and disease prevention,
* Communication with and referral to specialists,
* Prevention, early diagnosis, differential diagnosis, treatment, rehabilitation of conditions seen in family practice,
* Recognition of age-specific health issues and family impact,
* Rational prescribing,
* Work ability and disability evaluation,
* Use of clinical classification systems in family medicine,
* Identification of at-risk groups and communication,
* Early detection of serious illnesses,
* Understanding the scope and limitations of preventive measures,
* Adverse drug reaction management,
* Quality assurance in individual and team practice.

**C. UROLOGY**

**Duration of specialization: five years (60 months)**

During the specialization, the resident acquires theoretical and practical knowledge and skills for independently managing patients with acute and chronic urological diseases.

The program consists of a general part lasting 24 months, conducted at the Clinical Center of Montenegro, clinical-hospital centers, or hospitals founded by the state, and a special part lasting 48 months, conducted at secondary and tertiary level healthcare institutions. Theoretical education is carried out in parallel with the practical internship. During the specialization, the resident is entitled to annual leave according to the law, in agreement with their mentor.

1. **General Part (One year and ten months):**
2. **Surgical Infections (2 months)**

Includes theoretical and practical training. The resident must master the fundamentals of the immune response to infection, pathogens, prevention and treatment with chemotherapeutics and antibiotics, immunization, with special focus on: Staphylococcal and streptococcal infections, erysipelas, anthrax, infections caused by gram-negative bacilli, clostridial and other anaerobic infections, actinomycosis, fungal and viral infections.

Surgical procedures to be performed (operate – o):

* Infected soft tissue debridement (o) – 10;
* Felon drainage (o) – 6;
* Diabetic gangrene debridement (o) – 2.
1. **Abdominal Surgery (12 months)**

Includes theoretical and practical training in diagnosis, differential diagnosis, and treatment of acute abdominal conditions: peritonitis, ileus, intra-abdominal bleeding. Surgical procedures (operate – o, assist – a):

* Appendectomy (o) – 9;
* Incarcerated hernia (a) – 5; (o) – 9;
* Laparotomy wound dehiscence repair (o) – 4;
* Perforated ulcer suture (o) – 4;
* Small bowel anastomosis (o) – 10.
1. **Traumatology (3 months):**

Theoretical topics include:

* Anatomy, trauma pathogenesis and classification,
* Reanimation and shock therapy,
* Diagnostic techniques (e.g., for chest and long bone injuries),
* Ultrasound use in abdominal trauma,
* Conservative fracture management,
* Traumatic and hemorrhagic shock
* Other vital surgical complications in trauma patinents (thromboembolism, fat embolism, respiratory complications, disorders of digestive tract, electrolite disbalans, posttraumatics psychosis, delirium)
* Prepoerative care
* Postpoerative care
* Orthopedic surgical procedures
* Indications for urgent surgical interventions in traum and polytrauma patients
* Bone fracture/ related complications
* Bone infections.

Procedures (operate – o):

* Long bone traction (o) – 15;
* Fracture reduction (o) – 15;
* Joint effusion aspiration (o) – 10;
* Body cavity puncture (o) – 10;
* Diagnostic arthroscopy (o) – 5;
* Large soft tissue defect treatment (o) – 20;
* Chest drainage (o) – 5;
* Simple osteosynthesis and removal (o) – 10.
1. **Anesthesiology with Reanimatology (2 months)**

It consists of a practical and theoretical part of the residency.

The resident must acquire fundamental theoretical and practical knowledge in regional, general, and combined anesthesia.

Additionally, they must master the basics of patient assessment and preparation for planned surgical procedures, as well as the fundamentals of cardiopulmonary resuscitation.

During the practical part of the residency, the resident must perform the following number of medical procedures:

* + - * Participate in 50 general anesthesias;
			* Assess and prepare 15 patients for surgery;
			* Participate in 5 CPRs;
			* Participate in 25 regional anesthesias;
			* Insert 10 central venous catheters.
1. **Surgical Intensive Care (1 month)**

Basic theory and practice in the intensive care of surgical patients.

1. **Burns (1 month)**

It consists of a practical and theoretical part of the residency.

The resident must acquire fundamental theoretical knowledge in:

* providing first aid to burn victims
* transportation of burn victims
* primary treatment of new burns
* evaluation and assessment of the severity and extent of the burned area
* pathophysiology of burns
* mechanism of burn healing
* treatment of burn shock
* emergency surgical procedures for burns
* excision of burn wounds
* harvesting and preservation of free skin grafts
* indications for the use of free skin grafts
* theoretical foundations for creating free skin grafts from tissue culture
* acute tubular necrosis as an indication for acute hemodialysis
* respiratory tract burns
* negative energy balance in burn patients
* immunological aspects in burn victims
* chemical burns and antidotes
* mass burn casualties, burns in polytrauma, burns in wartime

Surgical procedures (operate – o):

* Major primary burn debridement (o) – 1;
* Necrotomy with tangential excision (o) – 5;
* Fascial excision (o) – 2;
* Skin graft harvesting (o) – 10;
* Escharotomy (o) – 1;
* Fasciotomy (o) – 1.
1. **Pathology (1 month)**

Theory in clinical pathology and participation in autopsies. Basics of histopathology and interpretation of histological samples in urology.

After completing the general part, the resident must pass a qualifying exam to proceed with the special part.

1. **Special Part (3 years and 2 months)**

The rotation consists of both practical and theoretical parts. The resident is required to master the fundamental theoretical knowledge in the following fields:

1. **Plastic, Reconstructive, and Aesthetic Surgery (1 month)**

It consists of both a practical and theoretical part of the residency. The resident must acquire fundamental theoretical knowledge in the following areas:

* specific surgical techniques in the field of plastic and reconstructive surgery
* principles of microsurgery
* tissue transplantation
* reconstructive hand injury surgery (reconstruction of soft tissues, tendons, nerves, treatment of hand fractures, replantation of amputated fingers)
* issues related to lower limb lymphedema
* treatment of decubitus ulcers
* treatment of skin tumors (benign and malignant)
* treatment of keloids and hypertrophic scars

Surgical procedures (operate – o):

* Simple skin graft (o) – 5;
* Abdominoplasty (o) – 4;
* Lower limb lymphedema (o) – 4;
* Inguinal lymphadenopathy (o) – 2;
* External genital reconstruction (o) – 2;
* Skin transplantation (o) – 3.
1. **Gynecology (1 month)**

The rotation consists of both a practical and theoretical part. The resident must acquire fundamental theoretical knowledge in the following areas:

* anatomy of the pelvis and pelvic floor
* physiology and pathophysiology of the female genital tract
* acute gynecological conditions
* acute illnesses during pregnancy (including uterine bleeding)
* postpartum physiotherapy methods for pelvic floor and abdominal muscles
* management of ruptured soft birth canals
* conducting breech deliveries
* operative completion of delivery (vacuum, forceps)
* principles of treating gynecological malignancies
* surgical techniques for correcting altered uterine statics
* technique of vaginal total hysterectomy
* techniques for anterior and posterior vaginal plastic surgery
* diagnosis and treatment of endometriosis
* laparoscopic techniques for extensive adhesiolysis

During the practical part of the internship, the resident must perform the following number of surgical procedures (surgeries – s):

* vaginal plastic surgery (s) – 3
* Burch colposuspension (s) – 2
* episiotomy suturing (s) – 5
1. **Oncology (1 month)**

The rotation consists of both practical and theoretical components. The resident must acquire fundamental theoretical knowledge in the following areas:

* interdisciplinary management of patients with malignant disease during the planning of diagnostic and therapeutic procedures
* the importance of histological verification and tumor typing, as well as determining the tumor differentiation grade for therapy planning and prognosis
* the significance of disease staging before therapy using the TNM system, and the diagnostic methods required: endoscopy, lymphography, scintigraphy, aspiration biopsy, etc.
* indications for various treatment methods and their combinations (surgery, radiotherapy, chemotherapy, immunotherapy, endocrine therapy), along with treatment outcomes
* the role of surgery in oncology depending on its purpose (curative, palliative, diagnostic)
* principles of surgical techniques for malignant tumors, including possible complications due to disease specifics or prior radiation or chemical treatment
* principles and techniques of intra-arterial chemotherapy
* radiotherapy techniques, and the importance of surgical methods for removing sentinel lymph nodes
* techniques and possible complications of subcutaneous venous ports
* the importance of regular follow-up examinations after treatment
* rehabilitation possibilities for cancer patients (physical, psychological, and social)
* the purpose and importance of mandatory reporting of cancer patients, their central registration, and the physician’s responsibilities in that process

During the practical part of the residency, the resident must perform the following surgical procedure:

* excision of malignant skin tumors (surgeries – s): 2
1. **Thoracic Surgery (1 month)**

The rotation consists of both a practical and theoretical part. The resident must acquire fundamental theoretical knowledge in the following areas:

* anatomy and physiology of the lungs, mediastinum, and pleura
* diagnosis, differential diagnosis, therapy, and prognosis of diseases in the field of thoracic surgery
* types of surgical procedures in thoracic surgery
* must master the technique of standard thoracotomy and rib resection

During the practical part of the residency, the resident must perform the following number of surgical procedures (surgeries – s):

* thoracotomy (s) – 5
* thoracotomy closure (s) – 5
* thoracic drainages (s) – 5
* thoracic punctures (s) – 2
1. **Cardiovascular Surgery (1 month)**

The rotation consists of both a practical and theoretical part. The resident must acquire core theoretical knowledge in the following areas:

* basic pathology and diagnostics of vascular diseases
* indications and types of surgical procedures
* fundamentals of extracorporeal circulation
* surgical approaches to major blood vessels
* arterial and venous anastomoses

During the practical part of the residency, the resident must perform the following number of surgical procedures (surgeries – s):

* vascular anastomosis or suturing of a major vessel (s) – 3
* dissection of major vessels (s) – 4
1. **Nephrology (2 months)**

The rotation consists of both practical and theoretical components. The resident must acquire fundamental theoretical and practical knowledge in the following areas:

* recognition of kidney disease syndromes
* assessment of kidney function and urine sediment analysis
* evaluation of patients with arterial hypertension
* identification and management of common fluid, electrolyte, and acid-base disorders
* conservative management of chronic kidney failure
* medication dosing in chronic kidney failure
* indications for kidney biopsy
* basics of immunosuppressive therapy in kidney transplant patients and recognition of common complications (in the hospital ward)
* principles of hemodialysis and peritoneal dialysis
* dialysis membranes, dialysis fluids, and monitors
* vascular access for hemodialysis and access for both acute and chronic peritoneal dialysis
* plasmapheresis, immunoadsorption, LDL apheresis, hemoperfusion, and management of acute and chronic dialysis complications (in the dialysis center)
* recognition and evaluation of common complications following kidney transplantation (in the kidney transplantation center)
1. **Diagnostic and Interventional Uro-Radiology (1 month)**

The rotation consists of both practical and theoretical components. The resident must acquire essential theoretical and practical knowledge in the following areas:

* diagnostic radiological methods in urology (basic X-ray diagnostics of the urinary tract, ultrasound, CT scan, MRI)
* percutaneous access to the kidney (percutaneous nephrostomy, percutaneous puncture of a renal cyst, percutaneous placement of a ureteral catheter, percutaneous dilation of ureteral stenosis)
1. **Urology (2 years and 6 months)**

The rotation consists of both practical and theoretical components. It is conducted in healthcare institutions at the secondary and tertiary levels of care. The resident must acquire essential theoretical and practical knowledge in the following areas:

* anatomy, physiology, pathophysiology, and pathology of the adrenal glands, kidneys, ureters, urinary bladder, prostate, seminal vesicles, urethra, and external genitalia (testes, tunicae, vas deferens)
* laboratory analysis of blood and urine, examination of prostatic secretions and seminal fluid
* indications and techniques for performing the following instrumental examinations
* endoscopy of the urethra, bladder, ureters, and renal pelvis (urethroscopy, cystoscopy, ureterorenoscopy)
* biopsy using forceps and aspiration
* urodynamic testing of the upper and lower urinary tract
* insertion of ureteral catheters and internal stents
* ultrasound of the urinary organs and abdomen
* puncture of the bladder and kidneys
* indications, techniques, and value of radiological examinations in urology (plain radiograph of the urogenital tract, cystogram, intravenous urography, urethrography, retrograde pyelography, angiography)
* indications and value of isotope studies, CT, and MRI in urology
* indications and contraindications for conservative and surgical treatment of urinary tract diseases
* treatment of functional urinary tract disorders (electrical stimulation, pelvic floor muscle strengthening exercises)
* preoperative preparation of the patient for surgery
* postoperative care, including enteral and parenteral nutrition
* pharmacotherapy in urology
* prevention and treatment of postoperative complications
* patient preparation and prognostic assessment in urological diseases
* minimally invasive treatments in urology (TUEVAP, thermotherapy, stents)
* disintegrative methods in the treatment of urinary tract stones (ESWL, URS, PCNL)

The practical part of the residency is carried out in tertiary-level healthcare institutions—at a urology clinic—and in secondary-level healthcare institutions. During the practical part, the resident must perform a specified number of surgical procedures, assistances, and endoscopic interventions in a healthcare facility:

**a) Secondary level healthcare:**

1. **Operative procedures – performed:**
* Circumcision: 20
* Frenulotomy: 10
* Hydrocele repair: 10
* Simple orchiectomy: 5–10
* Epididymectomy: 5
* Testicular biopsy: 10–20
* Cystostomy: 5–10
* Cystolithotomy: 5
* Varicocele surgery: 20
* Peritoneal dialysis laparotomy: 20
* Pyelolithotomy: 10–20
* Lumbar ureterolithotomy: 10
* Simple nephrectomy: 10–20
* Transvesical prostatectomy: 5–10
* Orchidopexy: 10
1. **Operative procedures – assisted:**
* Epididymectomy: 5
* Pyelolithotomy: 10
* Ureterolithotomy: 10
* Cystostomy: 10
* Cystolithotomy: 5
* Bladder tumor ablation: 5
* Radical orchiectomy: 5
* Primary nephrectomy: 10
* Pelvic/iliac ureterolithotomy: 10
* Prostatectomy: 10
* Nephrostomy: 10
* Partial penectomy: 5
* Secondary pyelolithotomy: 10
* Secondary ureterolithotomy: 10
* Simple nephrolithotomy: 10
* Orchidopexy: 5
* Renal cyst resection: 1
1. **Endoscopic procedures:**
* Bladder catheterization: 100
* Exploratory cystoscopy: 50
* Cystography: 20
* Urethrocystography: 20
* Trocar cystostomy: 10
* Exploratory urethrocystoscopy: 20
* Bladder puncture: 10
* Bimanual rectal examination: 20
* Prostate needle biopsy (transperineal): 20
* Ureteral catheterization: 30
* Bladder stone lithotripsy: 5

**b) Tertiary level healthcare:**

1. **Operative procedures – performed:**
* Surgical nephrostomy: 2–5
* Penectomy: 1
* Radical orchiectomy: 5
* UCN: 2–5
* Ureterocutaneostomy: 5–10
* Stress incontinence surgery: 3–5
1. **Operative procedures – assisted:**
* Dorsal vein ligation: 10
* Partial cystectomy: 1
* Complex nephrectomy: 10
* Ureterocystoneostomy: 5
* Ureterocutaneostomy: 5
* Perineostomy: 2
* Ureterocolostomy: 2
* Penile prosthesis implantation: 1–2
* Penile revascularization: 2
* Microsurgical epididymo-vasal anastomosis: 1–5
* Spermatocele implantation: 5
* Hypospadias repair: 1–5
* Retroperitoneal lymphadenectomy: 5
* Radical nephrectomy: 5–10
* Pyeloplasty: 5–10
* Partial nephrectomy: 2–5
* Vesicovaginal fistula repair: 3–5
* Urethrography: 2
* TUR bladder tumor: 10
* Nephroureterectomy: 5–10
* Longitudinal nephrolithotomy: 3–5
* UCN for ureterovaginal fistulas: 2–3
* TURP and internal urethrotomy: 10–20
* Total cystectomy: 3–5
* Pan-nephrectomy: 5
* Urethral reconstruction: 5
* Ileal conduit: 5
* Vesicoenteroplasty: 5
* Ureterorenoscopy: 5
* ESWL: 20
* Kidney transplantation: 2–5
1. **Endoscopic procedures:**
* Prostate ultrasound exam: 5
* TUR bladder tumor: 5
* TURP: 5
* Percutaneous nephrostomy: 5
* Ureteral stricture dilation: 10
* Internal urethrotomy: 2
* Percutaneous nephrolithotomy: 6
* Laparoscopic urology procedures: 8.

**D. ORTHOPEDICS AND TRAUMATOLOGY**

**Duration of specialization: five years (60 months)**

During the specialization, the resident acquires theoretical and practical knowledge in general surgery and traumatology, as well as the ability to independently treat patients with malformations, diseases, and injuries of the musculoskeletal system and spinal column, in accordance with the latest educational standards in the field. This includes diagnostics, prevention, decisions on operative or non-operative treatment, and multidisciplinary cooperation.

The specialization consists of general surgery (21 months) and orthopedics and traumatology (39 months). It is carried out at the Clinical Center of Montenegro, clinical-hospital centers, and state-run hospitals, in accordance with the Rulebook.

Theoretical instruction is conducted at the Faculty of Medicine and lasts nine months, simultaneously with practical training. During the specialization, the resident is entitled to annual leave according to the law and in agreement with the mentor.

**I. General Surgery (One year and nine months) includes:**

1. **Abdominal Surgery (3 months)**

The rotation consists of both a practical and theoretical part. The resident must acquire fundamental theoretical and practical knowledge in acute abdominal diseases and other common surgical conditions of the abdominal organs, abdominal wall, and inguinal region, diagnostic procedures for acute abdominal and the most common surgical abdominal diseases, differential diagnosis and treatment methods for acute abdominal conditions, preoperative preparation of acute abdominal patients with comorbidities such as heart, lung, kidney disease, diabetes, and other common postoperative complications, including their prevention and treatment, oral nutrition for postoperative patients with the most common abdominal diseases.

The resident must also master theoretical and practical knowledge related to surgical infections, including asepsis and antisepsis, mechanisms of biological defense, pathogenic microorganisms, infection prevention and reduction of risk factors, immunization and preventive use of antibiotics and chemotherapeutics, proper management of surgical infections using various surgical methods, promotion of healing in chronic wounds, antibacterial medications and other conservative treatments.

Required procedures (perform – p):

* Appendectomy (p) – 5;
* Hernia repair (p) – 10;
* Ulcer suturing (p) – 2;
* Bowel anastomosis (p) – 6;
* Cholecystectomy (p) – 1;
* Other procedures (p) – 10.
1. **General Traumatology (3 months)**

The resident must acquire fundamental theoretical and practical knowledge in:

- functional anatomy of the musculoskeletal system, general concepts related to injuries (etiology and mechanisms of injury, classification of injuries, theoretical understanding of injuries to all parts of the body, fractures and dislocations); diagnostic procedures in traumatology, basics of ultrasound diagnostics for injuries of the abdomen, chest, and musculoskeletal system; conservative treatment of fractures and complications (traumatic hemorrhagic shock) and their effects on various organs; other post-traumatic complications (thromboembolism, fat embolism, respiratory complications, digestive disorders, electrolyte imbalances, post-traumatic psychoses, and delirious states); typical surgical approaches for operative procedures on extremities and other parts of the body; preoperative preparation of patients for surgery (diabetes, cardiac, pulmonary, and other conditions); postoperative care, management of minor or severe injuries, as well as polytraumatized patients; surgical procedures on bones (various types of osteosynthesis), indications for emergency surgical interventions in trauma; complications in fracture treatment (pseudoarthrosis, osteitis), infections related to injuries; mediastinal trauma, shock therapy, and resuscitation.

Required procedures:

* Fracture/dislocation reduction and immobilization – 15;
* Joint aspiration – 2;
* Diagnostic laparoscopy – 2;
* Management of large soft tissue injuries – 6;
* Thoracic drainage – 2;
* Thoracotomy – 2;
* Laparotomy for abdominal trauma – 3;
* Simple osteosynthesis/removal – 5;
* Polytrauma care – 3;
* Abdominal puncture – 2.
1. **Anesthesiology, Resuscitation, and Intensive Care (1 month):**

The resident must acquire fundamental theoretical and practical knowledge in: modern types of general, local (regional), and combined anesthesia for surgical procedures; assessment of the patient's condition and preparation for surgery; basic and advanced resuscitation procedures in cases of respiratory insufficiency, cardiac arrest, and treatment of post-resuscitation syndrome; various methods of postoperative care; emergency therapeutic and diagnostic procedures in the intensive care unit (ICU); postoperative bleeding, organ failure (lungs, heart, kidneys, liver), multiple organ failure, sepsis, thromboembolism; use of antibiotics in the ICU; treatment of acute pain; criteria for admitting patients to the ICU

During the practical part of the residency, the resident must perform the following number of procedures—both as assistant and primary operator:

* anesthetic procedure (induction, intubation, maintenance, awakening): 15
* assessment and preparation of ASA class 2 and 3 patients: 8
* resuscitation procedures: 2
* anesthesiology approach to polytraumatized patients: 5
* treatment of patients in the intensive care unit (ICU): 8
* local and conduction anesthesia: 4
* invasive patient monitoring: 2
* placement of peripheral venous catheter: 10
* placement of central venous catheter: 10
* measurement of central venous pressure: 5
* spinal puncture with anesthesia: 4
* local anesthesia: 10
* regional anesthesia: 10
* diagnosis and treatment of acute cardiac arrest – 5
1. **Plastic, Reconstructive, and Aesthetic Surgery (2 months)**

The resident must acquire fundamental theoretical and practical knowledge of: primary management of extensive burns, burn treatment procedures, parenteral therapy for burns, surgical treatment of burns, hand injuries, hand infections, and grafts.

During the practical part of the residency, the resident must perform the following number of operative procedures:

* Primary management of burns (o) – 4
* Local flaps, tumor excision (o) – 10
* Harvesting of skin autografts (Tiersch and Blair) using a Watson knife or electric dermatome (o) – 15
* Incision for hand infection (o) – 5
* Management of hand injuries (o) – 5
* Reconstruction of hand flexor tendons (o) – 10
* Reconstruction of hand extensor tendons (o) – 10
* Reconstruction of nerves of the hand and wrist (o) – 10
* Microvascular flap transplantation (o) – 3
* Primary treatment of burns and frostbite (o) – 5
* Principles of resuscitation in severe burns (o) – 3
1. **Vascular Surgery (2 months)**

The resident must acquire and be capable of applying fundamental theoretical and practical knowledge of: the basics of angiosurgical techniques, diagnostics in vascular surgery, acute ischemia, chronic arterial insufficiency, venous insufficiency, and aneurysm surgery.

During the practical part of the residency, the resident must perform the following number of operative procedures:

* Surgical approach to blood vessels at a typical site (o) – 5
* Hemorrhage control (o) – 10
* Vascular suturing (o) – 6
* Embolectomies (o) – 3
* Amputation of ischemic limb segments (o) – 3
* Exposure of the abdominal aorta (o) – 4
* Exposure and dissection of the great saphenous vein (VSM) (o) – 4
* Vascular injuries (o) – 2
* Vascular anastomosis (o) – 4
* Arteriovenous (AV) fistulas (o) – 4
1. **Pediatric Surgery (2 months)**

The resident must acquire fundamental theoretical and practical knowledge of:
integrating basic knowledge of anatomy, physiology, and pathophysiology in children with surgical pathology in the pediatric age group; assessment of the surgical status of newborns and older children with congenital and acquired surgical conditions; urinary bladder catheterization; indication for chest drainage; planning of preoperative preparation and postoperative care.

During the practical part of the residency, the resident must perform the following number of operative procedures:

* Hand surgeries (o) – 3
* Placement of a venous catheter (o) – 2
* Inguinal hernia repair (o) – 3
* Appendectomy (o) – 3
* Management of acute scrotum (o) – 2
* Treatment of undescended testis (retentio testis) (o) – 3
* Urological surgeries (o) – 3
* Burn management (o) – 2
* Fracture reduction and immobilization in children (o) – 4
1. **Thoracic Surgery (1 month)**

The resident must acquire fundamental theoretical and practical knowledge in the fields of anatomy, physiology, and pathophysiology in patients with surgical pathology and chest trauma.

During the practical part of the residency, the resident must perform the following number of operative procedures:

* Thoracic puncture and evacuation of contents (o) – 5
* Thoracic drainage (o) – 3
* Assisting in thoracotomies (o) – 5
* Thoracotomy (o) – 1
* Assisting in thoracophrenolaparotomy (o) – 5
1. **Transfusion Medicine (1 month)**

The resident must acquire fundamental theoretical and practical knowledge in the field of transfusion medicine.

During the practical part of the residency, the resident must perform the following number of procedures:

* Blood group determination – 10
* Transfusion technique – 10
* Preparation of blood derivatives – 10
* Application of transfusion principles in surgical patients – 10
1. **Urology (1 month)**

The resident must acquire fundamental theoretical and practical knowledge in the fields of anatomy, physiology, and pathophysiology related to urological surgical pathology; assessment of the surgical status of urological patients with congenital and acquired surgical conditions; and planning of preoperative preparation and postoperative care.

During the practical part of the residency, the resident must perform the following number of procedures:

* Urinary bladder catheterization – 10
* Assistance in lumbotomy – 5
* Assistance in nephrectomy – 4
* Hydrocele surgery – 2
1. **Neurosurgery and Neurology (2 months total)**

The resident must acquire fundamental theoretical and practical knowledge of: acute neurosurgical and neurological diseases and injuries; diagnostic procedures in acute conditions; differential diagnosis and treatment methods for neurosurgical and neurological disorders; preoperative preparation of acute neurological patients; the most common postoperative complications and their prevention and treatment; and oral nutrition of postoperative patients with common neurosurgical conditions.

During the practical part of the residency, the resident must perform the following number of procedures:

* Neurological examination technique – 5
* Surgical treatment of peripheral nerves – 3
* Assistance in craniotomy – 5
* Surgery for depressed skull fracture – 2
* Surgery for epidural hematoma – 2
* Surgery for subdural and intracerebral hematoma – 2
* Herniated disc surgery – 3
* Percutaneous nucleotomies – 2
1. **Radiological Diagnostics (1 month)**

The resident must acquire fundamental theoretical and practical knowledge in radiological diagnostics.

During the practical part of the residency, the resident must perform the following number of procedures:

* Radiographs of the skeletal system – 50
* Performing and interpreting fistulographies – 10
* Interpretation of scintigrams – 10
* Performing and interpreting ultrasound of the pediatric hip – 30
* Performing and interpreting ultrasound of the shoulder, knee, muscles, and tendons – 30
* Interpretation of arteriograms – 20
* Work with mobile X-ray equipment – 10
* Interpretation of CT scans – 20
* Interpretation of MRI (NMR) scans – 30
1. **Physical Medicine (2 months)**

The resident must acquire fundamental theoretical and practical knowledge in the field of physical medicine.

During the practical part of the residency, the resident must perform the following number of procedures:

* Application of electrotherapy procedures – 10
* Application of hydrotherapy procedures – 10
* Kinesiotherapy – 10
* Occupational therapy – 10
* Interpretation of EMG

Upon completion of the general part, the resident must pass a major colloquium, which is a prerequisite for continuing the specialization.

**II. Special Part (3 years and 3 months)**

Includes theoretical and practical training.

The resident must acquire fundamental theoretical and practical knowledge in the following areas:

1. **Orthopedics and Traumatology**

Upon completion, residents must be competent in diagnostic and therapeutic decisions for all areas of orthopedics and traumatology; i.e. must have the following competencies:

* The resident must acquire fundamental theoretical and practical knowledge in the following areas:
* Knowledge of anatomy, histology, and basic molecular biology of the musculoskeletal system
* Knowledge and use of diagnostic procedures related to the musculoskeletal system
* Independent performance of consultative services and outpatient care of patients
* Knowledge and treatment of metabolic diseases
* Knowledge of conservative and surgical treatment of congenital diseases
* Knowledge of conservative and surgical treatment of neuromuscular diseases
* Diagnosis and treatment of canalicular syndromes
* Knowledge and treatment of aseptic and septic arthritis, soft tissue infections, acute and chronic osteomyelitis
* Knowledge and treatment of tendon, ligament, and intra-articular structure injuries by open or arthroscopic methods
* Reconstructive surgery for the normalization of joint body alignment through corrective osteotomies and axis correction of long and short bones
* Treatment of pseudoarthrosis
* Limb length equalization through bone and soft tissue elongation with axis correction
* Joint endoprosthesis implantation, including management of complications such as septic or aseptic loosening of the prosthesis
* Conservative and surgical treatment of static foot deformities
* Diagnosis and treatment of congenital spinal deformities and spinal canal stenosis
* Knowledge and independent management of fractures of short and long bones as well as the spine, using internal and external fixation, including intra-articular fractures
* Active participation in the rehabilitation of both conservatively and surgically treated patients
1. **Orthopedics**

Observe, assist, perform:

* Bone biopsy – 2 / 5 / 5
* Curettage and sequestrectomy – 2 / 2 / 2
* Application of functional casts – 20 / 20 / 20
* Joint punctures – 20 / 15 / 15
* Various types of skeletal traction – 10 / 20 / 20
* Osteoplasty – 5 / 5 / 3
* External fixators – various – 10 / 10 / 3
* Removal of osteosynthetic material – 5 / 5 / 10
* Surgery for developmental hip disorders – 10 / 10 / 0
* Surgery for congenital foot deformities – 10 / 5 / 2
* Surgery for torticollis – 3 / 3 / 1
* Surgery for deformities in cerebral palsy – 2 / 3 / 0
* Various corrective osteotomies – 10 / 10 / 2
* Pelvic osteotomies – 5 / 3 / 0
* Limb lengthening – Ilizarov method – 5 / 5 / 1
* Revascularization surgery – 3 / 3 / 1
* Synovectomies (open and arthroscopic) – 5 / 5 / 2
* Arthrodesis of major joints – 3 / 3 / 1
* Partial hip prosthesis implantation – 10 / 7 / 5
* Total hip prosthesis implantation – 10 / 10 / 5
* Total knee prosthesis implantation – 10 / 10 / 1
* Total shoulder prosthesis implantation – 10 / 5 / 0
* Partial shoulder prosthesis implantation – 10 / 5 / 0
* Placement of suction drainage – 5 / 5 / 3
* Limb amputations – 5 / 3 / 2
* Arthroscopic diagnostics and partial meniscectomy – 15 / 15 / 5
* Arthroscopic ligamentoplasties – various – 15 / 15 / 2
* Arthroscopic and open patellar stabilization – 5 / 5 / 3
* Arthroscopic diagnostics and shoulder stabilization – 10 / 10 / 2
* Open and arthroscopic surgery of the rotator cuff – 10 / 10 / 1
* Surgery for bone tumors – 10 / 5 / 1
* Surgery for pseudoarthrosis – 10 / 7 / 1
1. **Traumatology**

Observe, assist, perform:

* Fracture reduction of humerus – 7 / 5 / 3
* Fracture reduction of the forearm – 10 / 7 / 5
* Reduction of shoulder dislocation – 5 / 5 / 3
* Non-operative treatment of hand fractures – 10 / 7 / 10
* Non-operative treatment of spinal fractures – 10 / 5 / 1
* Cervical spine traction placement – 10 / 5 / 3
* Non-operative treatment of pelvic fractures – 10 / 5 / 5
* Non-operative treatment of clavicle fractures – 10 / 10 / 10
* Non-operative treatment of femur fractures – 10 / 10 / 10
* Non-operative treatment of knee region fractures – 10 / 10 / 10
* Non-operative treatment of ankle fractures – 10 / 10 / 10
* Non-operative treatment of carpal and metacarpal fractures – 10 / 10 / 15
* Surgical treatment of spinal fractures – 10 / 15 / 2
* Surgical treatment of clavicle fractures – 10 / 5 / 2
* Surgical treatment of humerus fractures – 10 / 7 / 3
* Surgical treatment of elbow fractures in adults – 10 / 10 / 3
* Surgical treatment of elbow fractures in children – 10 / 10 / 5
* Surgical treatment of forearm fractures – 10 / 10 / 5
* Surgical treatment of carpal and metacarpal fractures – 10 / 7 / 5
* Surgical treatment of pelvic ring fractures – 10 / 10 / 2
* Surgical treatment of proximal femur fractures – 10 / 10 / 5
* Surgical treatment of femur fractures – 10 / 10 / 5
* Surgical treatment of distal femur fractures – 10 / 10 / 3
* Surgical treatment of fractures around the knee – 10 / 10 / 3
* Surgical treatment of lower leg fractures – 10 / 10 / 5
* Surgical treatment of ankle fractures – 10 / 10 / 5
* Surgical treatment of foot fractures – 10 / 10 / 7
* Intramedullary, extramedullary, and external osteosynthesis (LCP, DCP, PFN, interlocking) – 30 / 30 / 30
* Total hip endoprosthesis for hip fracture – 10 / 10 / 5
* Partial hip endoprosthesis for hip fracture – 10 / 10 / 5

Practical training takes place primarily at the Clinical Center of Montenegro, with possible rotations at:

1) Special Hospital "Vaso Ćuković":

* Hand surgery – 1 month;
* Foot surgery – 1 month;
* Bone and joint trauma – 5 months;
* Physical medicine – 2 months.

2) General hospital:

* Abdominal surgery – 3 months;
* General traumatology – 1 month.

**E. CARDIAC SURGERY**

**Duration of specialization: 6 years (72 months)**

During the residency, the resident acquires theoretical and practical knowledge in the field of cardiac surgery, in line with contemporary trends in specialist medical education, and becomes qualified to independently carry out and advance cardiac surgical practice in the areas of diagnostics, operative treatment, and clinical follow-up of cardiac patients.

Throughout the residency, the resident is also expected to acquire basic knowledge in computer technology, informatics, and biostatistics, in order to participate in scientific research (writing professional papers, attending seminars, presenting at congresses, etc.).

During the specialization, the candidate is required to publish two full-length (in extenso) articles in the field of cardiac surgery in national or international journals.

The specialization consists of two parts: general surgery, lasting two years, and cardiac surgery, lasting four years.

The general surgery portion is conducted at the Clinical Center of Montenegro, clinical-hospital centers, and hospitals founded by the state, in accordance with this Rulebook.

Cardiac surgery is conducted at the Clinical Center of Montenegro, and certain diagnostic and operative procedures may be performed in healthcare institutions outside Montenegro, in accordance with mutual cooperation agreements for conducting specialist residency training.

Theoretical instruction is conducted in parallel with the practical part of the residency.

During the specialization, the resident is entitled to annual leave, in accordance with the law, to be taken in agreement with the mentor.

**I. GENERAL PART (2 years) includes:**

1. **Surgical Infections (2 months)**

Consist of the theoretical and practical training.

The resident must master basic theoretical and practical knowledge about the body's biological defense mechanisms against infection, pathogenic microorganisms, infection prevention and treatment with chemotherapeutics and antibiotics, and immunization. Special attention should be given to groups and strains such as: staphylococcal infections, streptococcal infections, erysipelas, anthrax, infections caused by gram-negative bacilli, clostridial and other anaerobic infections, actinomycosis, fungal and viral infections.

Practical procedures that each resident is required to compete:

* operates - (o):
* Treatment of infected soft tissues (o) – 10;
* Panaritium treatment (o) – 6;
* Diabetic gangrene treatment (o) – 2.
1. **Abdominal Surgery (7 months)**

It consists of a practical and a theroretical part.

Theoretical and practical training in the diagnosis, differential diagnosis, and treatment of all acute abdominal conditions (peritonitis syndrome, ileus syndrome, intra-abdominal bleeding syndrome). Practical procedures: operates - (o), asists - (a):

* Appendectomy (o) – 5;
* Incarcerated hernia (o) – 5;
* Incarcerated hernia (a) – 5;
* Laparotomy wound dehiscence repair (o) – 2;
* Perforated ulcer suture (o) – 2;
* Small intestine anastomosis (o) – 6;
* Splenectomy (o) – 3.
1. **Traumatology (9 months)**

It consists of a theoretical and a practical part
The resident must acquire and master the basic theoretical knowledge in:

* Functional anatomy of the musculoskeletal system;
* Basic concepts of the etiology and pathogenesis of injuries (mechanisms of occurrence, classifications);
* Resuscitation and shock therapy in traumatized and polytraumatized patients;
* Diagnostic procedures in traumatology (thoracic cage, long bones);
* Mastering the basics of ultrasound diagnostics of abdominal injuries;
* Conservative treatment of bone fractures;
* Traumatic and hemorrhagic shock;
* Other vital systemic complications of trauma (thromboembolism, fat embolism, respiratory complications, digestive disorders, hydroelectrolytic imbalance, post-traumatic psychoses and other delirious states);
* Preoperative preparation of the patient;
* Postoperative care of the patient;
* Surgical procedures on the musculoskeletal system;
* Indications for urgent surgical interventions in trauma and polytrauma;
* Complications of bone fractures;
* Bone infections.

During practical training, the resident must perform the following surgical procedures:

* operates - (o)
* Traction for long bone fractures (o) – 15;
* Fracture reduction (o) – 15;
* Joint effusion aspiration (o) – 10;
* Aspiration of body cavities (o) – 10;
* Diagnostic arthroscopy (o) – 5;
* Large soft tissue defect treatment (o) – 20;
* Chest drainage (o)– 5;
* Simple osteosynthesis with removal (o) – 10.
1. **Anesthesiology and Resuscitation (2 months)**

It consists of a theoretical and a practical part of the internship. The resident must acquire and master basic theoretical and practical knowledge in regional, general, and combined anesthesia, as well as in the field of intensive care for surgical patients. They study the fundamentals of patient assessment and preparation for planned surgical procedures and master the basics of cardiopulmonary resuscitation.

During practical training, the resident must perform the following procedures:

* Participate in 50 general anesthesia cases;
* Assess and prepare 15 patients for planned surgical procedures;
* Participate in 5 cardiopulmonary resuscitations;
* Participate in the administration of 25 regional anesthesias;
* Placement of 10 central venous catheters (CVCs);
* Temporary pacemaker insertion: (0) 5 cases.
1. **Surgical Intensive Care (2 months)**

The resident must acquire and master basic theoretical and practical knowledge in the field of intensive care for surgical patients.

1. **Burns (1 month)**

It consists of a theoretical and practical part of the internship.
The resident must acquire and master basic theoretical knowledge in the following areas:

* First aid and burn care management;
* Transport of burn patients;
* Primary treatment of fresh burns;
* Evaluation and assessment of burn severity and extent;
* Pathophysiology of burns;
* Mechanism of burn wound healing;
* Treatment of burn shock;
* Emergency surgical procedures for burns;
* Excision of burn wounds;
* Harvesting and preservation of split-thickness skin grafts;
* Indications for the use of split-thickness skin grafts;
* Theoretical basics of creating split-thickness skin grafts from tissue cultures;
* Acute tubular necrosis as an indication for acute hemodialysis;
* Inhalation burns (airway burns);
* Nutritional care and energy balance in burn patients;
* Immunological aspects of burns;
* Chemical burns and antidotes;
* Mass burn injuries, burns in polytrauma, burns in wartime conditions.

During practical training, the resident must perform the following surgical procedures:

* operates - (o)
* Primary treatment of a major burn (o) 1;
* Necrosectomy with primary tangential excision (o) 5;
* Necrosectomy with excision down to the fascia (o) 2;
* Harvesting autologous skin grafts using a Watson knife or electric dermatome (o) 10;
* Escharotomy (o) 1;
* Fasciotomy (o) 1.
1. **Pathology (1 month)**

The resident must acquire and master basic theoretical knowledge in the field of clinical pathology and participate in clinical autopsies. They also learn the fundamentals of certain histopathological techniques, as well as the interpretation of histopathological slides related to their area of specialization.

After completing the general part of the training, the resident takes the main colloquium, which is a prerequisite for continuing the specialization.

**II. Special part (4 years or 48 months)**

1. **Introduction to Cardiac Surgery, Cardiac Anesthesia and Hemodynamic Monitoring (2 months)**

The resident must acquire and master basic theoretical knowledge in the following areas: anatomy and pathological anatomy of the heart and blood vessels; physiology and pathophysiology of the cardiovascular system; hemodynamics and hemodynamic monitoring; non-invasive and invasive cardiovascular diagnostics; clinical cardiology and angiology; indications and patient preparation for surgical treatment; open-heart anesthesia; and postoperative care of cardiac surgery patients.

Practical training includes work in:

* The cardiology outpatient clinic (ECG diagnostics);
* The echocardiography unit (ECHO, stress ECHO, and Doppler heart diagnostics);
* The nuclear medicine department (cardiac scintigraphy and CardioScan);
* The radiology department (peripheral angiography, endovascular stenting, MRI, CT, and MSCT in cardiovascular diagnostics);
* The vascular laboratory (vascular ECHO and Doppler diagnostics);
* The catheterization laboratory (cardiac catheterization, aortography, ventriculography, coronary angiography, electrophysiological diagnostics, and interventional cardiology procedures – balloon dilatation, stents);
* The pacemaker center (diagnostics of heart rhythm disorders – 24-hour ECG Holter monitoring, pacemaker checks);
* As well as an introduction to anesthesia (monitoring of ECG, blood pressure, CVP, and Swan-Ganz catheter).
1. **Extracorporeal Circulation (2 months)**

The resident must acquire and master basic theoretical knowledge on: extracorporeal circulation and monitoring; the heart-lung machine and components of the extracorporeal circulation (ECC) system; intraoperative myocardial protection; hemodynamic and biochemical monitoring; cardiopulmonary bypass techniques (partial, total, circulatory arrest); assisted circulation and mechanical circulatory support.

During practical training, the resident must perform the following surgical procedures — as primary surgeon (o), or assistant (a):

* Sternotomy: 100 (a);
* Sternotomy: 200 (o);
* Cannulation of the heart and aorta: 100 (a);
* Cannulation of the heart and aorta: 200 (o);
* Cannulation of femoral vessels: 10 (a);
* Cannulation of femoral vessels: 20 (o);
* Cannulation of the axillary artery: 10 (a);
* Cannulation of the axillary artery: 20 (o);
* Decannulation and de-airing of the heart: 100 (a);
* Decannulation and de-airing of the heart: 200 (o);
* Mediastinal drainage and sternotomy closure: 100 (a);
* Mediastinal drainage and sternotomy closure: 200 (o);
* Placement of epicardial pacemaker electrodes: 50 (a);
* Placement of epicardial pacemaker electrodes: 50 (o).
1. **Surgery of Congenital Heart Defects (6 months)**

The resident must acquire and master basic theoretical knowledge in: anatomy and pathological anatomy, physiology and pathophysiology of congenital heart defects in children and adults, the specifics of diagnosing congenital heart defects, clinical pediatric cardiology, and indications for surgical treatment.

During practical training, the resident must acquire basic practical skills in the field of pediatric cardiology (including the basics of diagnostics, clinical presentation, and postoperative care of congenital heart defects in children), and must perform the following surgical procedures — as operator (o), assistant (a), or observer (p):

* Ligation of the Ductus Botalli: 2 (p);
* Ligation of the Ductus Botalli: 2 (a);
* Closure of atrial septal defect (ASD): 2 (a);
* Closure of atrial septal defect (ASD): 2 (o);
* Closure of ventricular septal defect (VSD): 2 (a);
* Closure of ventricular septal defect (VSD): 2 (o);
* Coarctation of the aorta: 2 (p);
* Coarctation of the aorta: 2 (a);
* Tetralogy of Fallot:
a) Palliative surgery: 2 (p);
b) Palliative surgery: 2 (a);
c) Corrective surgery: 2 (p);
d) Corrective surgery: 2 (a).
1. **Aortic Surgery (10 months)**

The resident must acquire and master basic theoretical knowledge of the etiopathogenesis, morphology, diagnostics, clinical presentation, and treatment of acute and chronic forms of stenotic-occlusive and aneurysmal diseases, dissection, and other pathological conditions of the aorta.

During practical training, the resident must perform the following surgical procedures — as primary surgeon (o) or assistant (a):

* Thoracotomy: 10 (a);
* Thoracotomy: 5 (o);
* Surgical management of acute dissection of the ascending aorta: 10 (a);
* Surgical management of aneurysm of the ascending aorta and aortic arch: 10 (a);
* Surgical management of thoracic aortic aneurysm: 5 (a).
1. **Coronary Surgery (10 months)**

The resident must acquire and master basic theoretical knowledge in: diagnostics, clinical presentation, development, and morphological sequelae of stenotic-occlusive changes in the coronary arteries and heart muscle; the importance of preoperative assessment of left ventricular function; complications of myocardial infarction; indications and techniques for surgical management of coronary artery disease; and complications of myocardial infarction.

During practical training, the resident must perform the following surgical procedures — as primary surgeon (o), or assistant (a):

* Preparation of venous grafts: 50 (a);
* Preparation of venous grafts: 200 (o);
* Preparation of arterial grafts: 50 (a);
* Preparation of arterial grafts: 100 (o);
* **Myocardial revascularization – aortocoronary bypass surgery:**
a) On arrested heart: 100 (a);
b) On arrested heart: 10 (o);
c) On beating heart: 20 (a);
d) On beating heart: 5 (o);
* Coronary endarterectomy: 10 (a);
* Coronary endarterectomy: 5 (o);
* Surgical management of myocardial infarction complications (ventricular aneurysm, VSD, mitral insufficiency): 10 (a).
1. **Heart Valve Surgery (10 months)**

The resident must acquire and master basic theoretical knowledge in: diagnostics, clinical presentation, morphology, and hemodynamics of acquired heart valve diseases; indications for surgery; techniques of valve repair or replacement; types and characteristics of artificial valves; and postoperative complications.

During practical training, the resident must perform the following surgical procedures — as primary surgeon (o), or assistant (a):

**- Surgical treatment of acquired mitral valve disease:**
a) Mitral valve replacement: 50 (a)
b) Mitral valve replacement: 3 (o)
c) Mitral valve repair: 10 (a)
d) Mitral valve repair: 2 (o)

**- Surgical treatment of acquired aortic valve disease:**
a) Aortic valve replacement: 50 (a)
b) Aortic valve replacement: 3 (o)

**- Surgical treatment of tricuspid valve insufficiency:**
a) Tricuspid valve repair: 5 (a)
b) Tricuspid valve repair: 2 (o)
c) Tricuspid valve replacement: 5 (a)
d) Tricuspid valve replacement: 2 (o)

**- Surgical treatment of multivalvular disease:**
a) Repair or replacement of 2 or 3 heart valves: 10 (a)

1. **Pericardial and Cardiac Tumor Surgery (3 months)**

The resident must acquire and master basic theoretical knowledge in: the etiopathogenesis and clinical presentation of acute and chronic forms of pericarditis; indications and techniques for operative/non-operative treatment; the etiopathogenesis and clinical presentation of heart (myxoma) and thymus tumors; and techniques for surgical management.

During practical training, the resident must perform the following surgical procedures — as primary surgeon (o), or assistant (a):

* Pericardial resection for exudative pericarditis: 3 (a);
* Pericardial resection for exudative pericarditis: 3 (o);
* Pericardial resection for chronic constrictive pericarditis: 3 (a);
* Pericardial resection for chronic constrictive pericarditis: 2 (o);
* Excision of cardiac myxoma: 10 (a);
* Excision of cardiac myxoma: 2 (o);
* Pericardiocentesis: 3 (a);
* Pericardiocentesis: 2 (o).

**F. ANESTHESIOLOGY, RESUSCITATION, AND INTENSIVE CARE MEDICINE**

**Duration of specialization: five years (60 months)**

During the specialist training, the resident acquires theoretical and practical knowledge in the field of anesthesiology, resuscitation, and intensive care medicine and becomes qualified for independent professional work in this field.

The specialization program consists of practical and theoretical parts.

The practical part is carried out at the Clinical Center of Montenegro, clinical-hospital centers, hospitals founded by the state, and the Institute for Emergency Medicine, in accordance with this regulation.

The theoretical classes are conducted at the Faculty of Medicine during the fourth and/or fifth year of specialization, in parallel with the practical part of the training and acquisition of practical skills.

During the specialization, the resident is entitled to annual leave which counts as part of the training period, in accordance with the law and in agreement with the mentor.

**A. SPECIALIZATION PROGRAM**

The specialization program consists of:

1. Introductory theoretical classes – 15 days
2. General anesthesia, regional anesthesia, and immediate postoperative treatment – 15 months
3. Special anesthesia – 14 months
4. Pain treatment (acute and chronic) – 2 months
5. Basics of resuscitation and selected topics from emergency medicine – 2 months
6. Intensive care medicine – 21 months and 15 days
7. Annual leave – 5 months

**1. INTRODUCTORY THEORETICAL CLASSES**

Conducted at the Faculty of Medicine. During the introductory theoretical classes, the resident must master:

1. Introduction to anesthesiology, resuscitation, and intensive care medicine
2. Medical documentation management
3. Scientific research
4. Evidence-based medicine
5. Medical ethics
6. Communication skills
7. Teamwork and multidisciplinary approach
8. Organization of the healthcare system
9. Planning and control of work processes
10. Forensic medical aspects of anesthesiology, resuscitation, and intensive care medicine
11. **GENERAL ANESTHESIA, REGIONAL ANESTHESIA, AND IMMEDIATE POSTOPERATIVE TREATMENT**

Conducted in departments, clinics, and centers for anesthesia, resuscitation, and intensive care of healthcare institutions. During theoretical and practical professional work, the resident must master:

1. Preoperative evaluation and preparation for anesthesia – 1 month
2. Anesthesia for abdominal surgery – 3 months
3. Anesthesia in gynecology – 1 month
4. Anesthesia in outpatient/day surgery – 2 months
5. Anesthesia in traumatology – 2 months
6. Anesthesia in urology – 2 months
7. Anesthesia in orthopedics – 2 months
8. Anesthesia in plastic, reconstructive, and aesthetic surgery – 1 month
9. Postoperative monitoring in the recovery room (PACU) – 1 month
10. Colloquium

**3. SPECIALIZED ANESTHESIA**

It is conducted in the department, clinic, and center for anesthesia, resuscitation, and intensive care of healthcare institutions.

During theoretical and practical professional training, the resident must master:

1. Anesthesia in otorhinolaryngology – 2 months
2. Anesthesia in maxillofacial and oral surgery – 1 month
3. Anesthesia in neurosurgery – 2 months
4. Pediatric anesthesia – 2 months
5. Anesthesia in ophthalmology – 1 month
6. Anesthesia in gynecology, obstetrics, and perinatology – 1 month
7. Anesthesia in clinical radiology – 15 days
8. Thoracic anesthesia – 2 months
9. Anesthesia for cardiac surgery – 1 month
10. Anesthesia for vascular surgery – 1 month
11. Anesthesiological aspects of transplant medicine – 15 days
12. Colloquium
As an exception to points 1 through 11 above, residents training specifically in pediatric anesthesia , or anesthesia for cardiac surgery must undergo training in those respective departments for **seven months**, with a **reduction in the remaining specialized anesthesia training** in accordance with the duration of that part of the residency program.

**4. PAIN MANAGEMENT**

It is carried out in the department, clinic, and center for anesthesia, resuscitation, and intensive care, as well as in the pain management outpatient clinic of healthcare institutions. During theoretical and practical professional training, the resident must master:

1. Management of acute pain in the department/clinic/center for anesthesia, resuscitation, and intensive care – 1 month
2. Management of chronic pain in the pain management outpatient clinic – 1 month
3. Colloquium

**5. BASICS OF RESUSCITATION AND SELECTED TOPICS IN EMERGENCY MEDICINE**

This training is conducted at the Institute for Emergency Medicine, in the emergency block, and in the hospital emergency unit and admissions department. During theoretical and practical professional training, the resident must master:

1. Resuscitation in out-of-hospital settings at the Institute for Emergency Medicine – 1 month
2. Resuscitation in in-hospital settings in the hospital emergency unit and admissions department – 1 month
3. Colloquium

**6. INTENSIVE CARE MEDICINE**

This training is conducted in the department, clinic, and center for anesthesia, resuscitation, and intensive care of healthcare institutions. During theoretical and practical professional training, the resident must master:

1. Intensive care medicine in surgical disciplines – 14 months and 15 days
2. Internal medicine intensive care with nephrology – 2 months
3. Intensive care in cardiology – 1 month
4. Intensive care in infectious diseases – 1 month
5. Intensive care for neonates – 1 month
6. Intensive care for pediatric patients of other age groups – 1 month
7. Intensive care in neurology – 1 month
8. Colloquium

**B. COMPETENCIES ACQUIRED BY THE RESIDENT**

During the course of specialist training, the resident acquires professional knowledge, skills, and abilities for independent specialist work (general and specific competencies).

### ****1. General Competencies****

Upon completion of the specialization, the resident must have fully acquired general competencies. Particular attention must be given to acquiring general competencies relevant to the specific field within the specialization in anesthesiology, resuscitation, and intensive care medicine.

**Upon completing the specialization, the resident must be able to:**

1. Understand and apply the principles of medical ethics and deontology;
2. Demonstrate professionalism, humanity, and ethical behavior, with an obligation to protect the privacy and dignity of the patient;
3. Possess communication skills with patients, colleagues, and other professionals;
4. Understand the importance of and apply principles of good collaboration with other healthcare professionals;
5. Clearly and appropriately convey relevant information and explanations to the patient (both orally and in writing), to their family, colleagues, and other professionals, with the aim of joint participation in planning and delivering healthcare;
6. Identify, select, and properly document relevant patient data, gather information, and respect the views of the patient, their family, colleagues, and other professionals;
7. Improve their competencies and attitudes through continuous education and self-assessment to enhance the quality of professional work;
8. Embrace the principles of managing their own practice and experiences for professional development;
9. Develop the skill of knowledge transfer to junior colleagues and other healthcare workers;
10. Understand the importance of a scientific approach to the profession;
11. Participate in scientific research, respecting the ethical principles of scientific research and clinical trials, and participate in preparing scientific and professional papers for publication;
12. Contribute to the creation, application, and dissemination of new medical knowledge and experience, and take part in the implementation of specialization and subspecialization programs;
13. Accept and apply the principles of evidence-based medicine;
14. Understand the importance of and apply proper and effective record-keeping in accordance with current regulations;
15. Coordinate and prioritize in team settings and participate effectively in multidisciplinary healthcare teams;
16. Assess the need to involve other professionals in the provision of healthcare;
17. Understand the importance of and actively cooperate with public health institutions and other bodies involved in the healthcare system;
18. Understand the organization of the healthcare system and acquire the ability to responsibly participate in managing activities, assessing needs, planning improvement measures, increasing efficiency, and developing and improving the quality of healthcare services;
19. Be familiar with healthcare regulations, especially those governing patients' rights and the protection of personal data;
20. Recognize their responsibility and the importance of protecting personal data and patients’ rights;
21. Understand workflows, scheduling, and control of work processes, and the basics of healthcare resource management, especially financial resources;
22. Use resources and equipment rationally, with consideration for patient interests and the protection of public interest;
23. Assess health status and determine the healthcare needs of each patient;
24. Identify and implement measures and activities for maintaining, protecting, and improving the health of the population, including health promotion, prevention, and protection, in accordance with regulations;
25. Take required colloquia (progress exams).

### ****2. Specific Competencies****

Upon completion of the specialization, the resident acquires specific competencies as well as practical knowledge and skills in the following areas:

**2.1** General anesthesia, regional anesthesia, and immediate postoperative care
**2.2** Specialized anesthesia
**2.3** Pain management
**2.4** Basics of resuscitation and selected topics in emergency medicine
**2.5** Intensive care medicine

### ****2.1 General Anesthesia, Regional Anesthesia, and Immediate Postoperative Care****

**2.1.1** The resident acquires theoretical and practical knowledge related to the specifics of anesthesiology techniques and perioperative care and must demonstrate the ability to:

a) Perform preoperative evaluation and preparation for anesthesia
b) Assess preoperative risk and prepare adult patients
c) Assess preoperative risk and prepare pediatric patients for surgery
d) Assess and prepare patients for surgical interventions performed in outpatient or day surgery settings (ambulatory surgery and anesthesia)
e) Assess and prepare patients for elective anesthesia and surgery
f) Assess and prepare patients for emergency anesthesia and surgery
g) Evaluate volume and electrolyte imbalances
h) Assess cardiovascular risk in non-cardiac surgery
i) Assess pulmonary risk
j) Know and use scoring systems relevant to anesthesia
k) Master the skill of performing premedication

The resident must perform or assist in **50 preoperative assessments and preparations for anesthesia**, including **10 high-risk cases**.

### **2.1.2 Regional Anesthesia**

During theoretical and practical professional training, the resident must demonstrate the ability to:

a) Perform peripheral nerve blocks of the upper and lower extremities
b) Perform central neuraxial blocks
c) Understand the complications of regional anesthesia

The resident must perform or assist in the following procedures: **Spinal anesthesia** – 100 procedures; **Epidural anesthesia** – 100 procedures; **Peripheral nerve blocks of the upper extremities** – 50 procedures; **Peripheral nerve blocks of the lower extremities** – 50 procedures

### **2.1.3 Anesthesia Machine, Equipment, and Monitoring**

During theoretical and practical professional training, the resident must:

a) Demonstrate the ability to use the anesthesia machine
b) Acquire knowledge and skills in the use of medical gases, fluids, and vaporizers
c) Demonstrate the ability to use mechanical ventilation devices (ventilators/respirators)
d) Understand safety protocols in operating rooms
e) Demonstrate the ability to assess the use of basic and advanced monitoring of vital functions
f) Master the application of statistics and informatics in perioperative care

The resident must perform or assist in **100 procedures of testing the anesthesia machine and ventilator**.

### **2.1.4 Anesthesia for Abdominal Surgery**

During theoretical and practical professional training, the resident must be qualified in understanding the etiology, pathophysiology, clinical presentation, and interventions in abdominal surgery, as well as in performing anesthesia for:

a) Open and laparoscopic cholecystectomy
b) Pancreatic surgery
c) Colorectal surgery
d) Esophagogastrectomy
e) Abdominal trauma
f) Abdominal obstruction and perforation
g) Hernia surgeries

The resident must perform or assist in **300 anesthesia procedures for abdominal surgery**.

### **2.1.5 Anesthesia in Gynecology**

During theoretical and practical professional training, the resident must be qualified in understanding the etiology, pathophysiology, clinical presentation, and interventions in gynecology, as well as in performing anesthesia for:

a) Minor gynecological procedures
b) Laparoscopic surgery
c) Radical cancer surgeries
d) Hysteroscopy, laser procedures, and fertility-related surgeries

The resident must perform or assist in **75 anesthesia procedures in gynecology**.

### **2.1.6 Anesthesia in Outpatient and Day Surgery**

During theoretical and practical professional training, the resident must be qualified to:

a) Perform anesthesia for minor short-duration procedures
b) Be skilled in postoperative management of pain, nausea, and vomiting
c) Perform outpatient regional anesthesia
d) Understand and apply patient sedation techniques

The resident must perform or assist in **150 anesthesia procedures in outpatient and day surgery**.

### **2.1.7 Anesthesia in Traumatology**

During theoretical and practical professional training, the resident must be qualified to:

a) Manage the airway in acute trauma
b) Understand the airway management algorithm in trauma (use of laryngeal mask and other techniques and equipment in accordance with locally adapted protocols)
c) Perform regional anesthesia (central and peripheral blocks)

The resident must perform or assist in **150 anesthesia procedures in traumatology**.

### **2.1.8 Anesthesia in Urology**

During theoretical and practical professional training, the resident must be qualified in understanding the etiology, pathophysiology, clinical presentation, and interventions in urology, as well as in performing anesthesia for:

a) Cystoscopy and percutaneous nephrolithotomy
b) Cystectomy
c) Nephrectomy
d) Radical prostatectomy
e) Transurethral prostatectomy

The resident must perform or assist in **75 anesthesia procedures in urology**.

### **2.1.9 Anesthesia in Orthopedics**

During theoretical and practical professional training, the resident must be qualified to perform regional anesthesia for hip and knee arthroplasty with or without autotransfusion, and to administer anesthesia for:

a) Fractures of the musculoskeletal system
b) Arthroscopy
c) Orthopedic surgery in children

The resident must perform or assist in **100 anesthesia procedures in orthopedics**.

### **2.1.10 Anesthesia in Plastic, Reconstructive, and Aesthetic Surgery**

During theoretical and practical professional training, the resident must be qualified to understand anesthesiological complications in plastic, reconstructive, and aesthetic surgery.

The resident must perform or assist in **30 anesthesia procedures in plastic, reconstructive, and esthetic surgery**.

### **2.1.11 Resuscitation**

During theoretical and practical professional training, the resident must be qualified to perform resuscitation (basic and advanced life support measures).

The resident must perform or assist in **10 resuscitation procedures**.

### **2.1.12 Postoperative Monitoring in the Recovery Room (PACU)**

During theoretical and practical professional training, the resident must be qualified to:

a) Recognize and manage delayed awakening after anesthesia
b) Recognize and treat allergic and transfusion reactions
c) Recognize and treat respiratory insufficiency and bronchospasm
d) Recognize and treat postoperative arrhythmias
e) Recognize and treat postoperative hypotension and hypertension
f) Recognize and treat neuroleptic syndrome, malignant hyperthermia, and hypothermia
g) Be skilled in the management of postoperative pain
h) Distinguish between superficial and deep vein thrombosis
i) Recognize and treat pulmonary embolism
j) Recognize and treat postoperative oliguria
k) Recognize and treat drug and local anesthetic toxicity
l) Recognize and treat TURP syndrome

The resident must perform or assist in **10 postoperative monitoring procedures**.

**2.2 Special Anesthesia**

The resident acquires theoretical and practical knowledge of the specifics of anesthesiology techniques and perioperative care in the field of specialized surgeries and must:

### **2.2.1 Demonstrate proficiency in performing anesthesia in otorhinolaryngology and provide anesthesia for:**

a) Laryngoscopy and microlaryngeal surgery
b) Middle ear surgeries
c) Nasal surgeries
d) Tonsillectomy and adenoidectomy
e) Esophagoscopy
f) Tracheostomy and perform percutaneous tracheostomy
g) Provide anesthesia and perioperative care for thyroidectomy

The resident must perform or assist in **130 anesthesia procedures in otorhinolaryngology**.

### **2.2.2** Demonstrate proficiency in performing anesthesia in **maxillofacial and oral surgery** (in adults and children), provide anesthesia for **dental procedures in high-risk patients**, and perform anesthesia and:

a) Perioperative care in oral surgery
b) Perioperative management of facial trauma
c) Management during laryngectomy and radical neck dissection
d) Perioperative care in major reconstructive surgery with blood transfusion

The resident must perform or assist in **50 anesthesia procedures in maxillofacial and oral surgery**.

### **2.2.3** Demonstrate proficiency in performing **anesthesia in neurosurgery**, and:

a) Understand the pathophysiology and general principles of neuroanesthesia
b) Assist in anesthesia for posterior fossa surgery
c) Assist in anesthesia for transsphenoidal hypophysectomy
d) Assist in anesthesia for intracranial neurovascular surgery
e) Perform anesthesia for spinal surgery
f) Perform anesthesia for interventional neuroradiology and MRI
g) Be skilled in measuring intracranial pressure
h) Demonstrate the ability to perform anesthesia and monitor patients with head trauma in the intensive care unit

The resident must perform or assist in **30 neuroanesthesia procedures**.

### **2.2.4** Demonstrate proficiency in performing **specialized pediatric anesthesia**, and:

a) Perform anesthesia for circumcision and minor surgical procedures
b) Assist in anesthesia for major and complex surgical procedures
c) Assist in anesthesia for surgery of congenital diaphragmatic hernia
d) Assist in anesthesia for surgery of congenital hypertrophic pyloric stenosis
e) Assist in anesthesia for surgery of tracheoesophageal fistula and esophageal atresia

The resident must perform or assist in **100 specialized pediatric anesthesia procedures**.

### **2.2.5** Demonstrate proficiency in performing **anesthesia in ophthalmology**, and:

a) Perform general anesthesia in high-risk patients undergoing cataract surgery
b) Perform general anesthesia for strabismus surgery in children
c) Understand the pathophysiology of intraocular pressure
d) Perform anesthesia and management of penetrating eye injuries
e) Understand regional anesthesia techniques in eye surgery

The resident must perform or assist in **45 anesthesia procedures in ophthalmology**.

### **2.2.6** Demonstrate proficiency in performing **anesthesia for surgeries in gynecology, obstetrics, and perinatology**, and:

a) Demonstrate knowledge and ability to recognize pathophysiology, clinical presentation, and treatment in these areas
b) Demonstrate knowledge and ability to manage medical problems related to these fields
c) Demonstrate knowledge and ability in managing pain during childbirth
d) Perform anesthesia for elective cesarean section
e) Perform anesthesia for emergency cesarean section
f) Demonstrate knowledge and ability to recognize and manage severe complications in pregnancy (e.g., hemorrhage, preeclampsia)
g) Demonstrate knowledge and skill in administering regional anesthesia in obstetrics

The resident must perform or assist in **25 anesthesia procedures in these areas**.

### **2.2.7** Demonstrate proficiency in performing **anesthesia for clinical radiology** (interventional radiology and magnetic resonance imaging)

The resident must perform or assist in **50 anesthesia procedures for clinical radiology**.

### **2.2.8** Demonstrate proficiency in performing **anesthesia for burns and major plastic surgeries**, and provide anesthesia and perioperative monitoring for:

a) Burn surgeries
b) Aesthetic surgeries
c) Free flap and microsurgical procedures on the limbs
d) Plastic surgeries in children

The resident must perform or assist in **30 anesthesia procedures for burns and major plastic surgeries**.

### **2.2.9** Demonstrate proficiency in performing **anesthesia for thoracic surgery**, and the ability to:

a) Explain the etiology and pathophysiology of thoracic conditions
b) Perform anesthesia for bronchopleural fistulas
c) Perform anesthesia and perioperative management for aspiration of foreign bodies
d) Assist in anesthesia for lobectomy and mediastinal surgeries
e) Assist in anesthesia for pleurectomy and pneumonectomy
f) Demonstrate the ability to provide postoperative analgesia in thoracic surgery
g) Perform anesthesia for rigid bronchoscopy

The resident must perform or assist in **50 anesthesia procedures for thoracic surgery**.

### **2.2.10** Demonstrate proficiency in performing **anesthesia for heart surgery**, and the ability to:

a) Understand the principles, physiology, biochemistry, and consequences of cardiopulmonary bypass
b) Assist in anesthesia for coronary artery bypass surgery
c) Assist in anesthesia for aortic and mitral valve surgery
d) Understand general principles and preoperative assessment for congenital heart diseases
e) Understand the procedures for postoperative care following cardiac surgeries

The resident must perform or assist in **25 anesthesia procedures for heart surgery**.

### **2.2.11** Demonstrate proficiency in performing **anesthesia for vascular surgery** and the ability to:

a) Assist in anesthesia for thoracic aortic surgery
b) Perform anesthesia for abdominal aneurysm surgery
c) Perform anesthesia for carotid artery surgeries
d) Perform anesthesia for limb revascularization and amputations

The resident must perform or assist in **25 anesthesia procedures in vascular surgery**.

### **2.2.12** Assist in anesthesia for **organ transplantation** and demonstrate the ability to:

a) Understand organ-specific criteria in transplant surgery
b) Recognize pathophysiological diagnoses, disease severity, and technical anesthesiology and surgical factors in assessing prognosis relative to available organs
c) Understand the procedures for heart transplantation
d) Assist in anesthesia for kidney transplantation
e) Assist in anesthesia for liver transplantation

The resident must perform and assist in 5 organ procurement and transplantation procedures.

**2.3 Pain Management**

The resident acquires theoretical and practical knowledge in **pain management** and is trained to:

### **2.3.1** Assess the differential diagnosis and treatment of acute pain in the perioperative period

### **2.3.2** Assess the differential diagnosis and treatment of chronic pain

### **2.3.3** Demonstrate knowledge of the recommendations of the **International Association for the Study of Pain (IASP)**

### **2.3.4** Demonstrate knowledge of comprehensive pharmacology, including: Opioid analgetics; Non-steroidal anti-inflammatory drugs (NSAIDs); NMDA receptor antagonists; Non-opioid analgetics; Neuroleptics; Local anesthetics; Drug interactions;

### **2.3.5** Demonstrate the ability to integrate knowledge of **pain physiology**, including: Peripheral and central mechanisms of pain generation and transmission; Factors influencing pain duration; Pain modulation and documentation of pain types;

### **2.3.6** Demonstrate knowledge in applying general principles of **pain assessment and treatment in adults and children** for acute pain, including: Working in a team led by the Acute Pain Service; Performing procedures, assessing outcomes, and documenting analgesic therapy; Administration of infusion-based medications; Use of "Patient-Controlled Analgesia (PCA)" and Patient-Controlled Epidural Analgesia (PCEA); Working in the recovery room: pain assessment; and analgetic titration;

### **2.3.7** Demonstrate knowledge of the **pathophysiology, clinical presentation, and treatment of chronic pain;**

### **2.3.8** Demonstrate knowledge in the treatment of **malignant and benign chronic pain**, including complex regional pain syndrome (CRPS), neuropathic pain, and other forms of chronic and cancer-related pain;

### **2.3.9** Demonstrate knowledge and skill in performing **epidural block**, with or without catheter;

### **2.3.10** Demonstrate knowledge and skill in performing **spinal block**, with or without catheter;

### **2.3.11** Demonstrate knowledge and skill in performing **perineural block** with local anesthetic, with or without catheter;

### **2.3.12** Demonstrate knowledge and skill in performing **interpleural analgesia;**

### **2.3.13** Demonstrate knowledge and skill in **somatic ganglion blocks** and **pain point infiltration;**

### **2.3.14** Demonstrate the ability to assess indications for **stimulation methods**, including: Acupuncture; Needle and laser stimulation; Transcutaneous electrical nerve stimulation (TENS); Pharmacological treatment of malignant and benign chronic pain;

The resident must perform or assist in the following procedures:

a. **Analgesic therapy** – 50 procedures
b. **Medication therapy via infusion** – 10 procedures
c. **Patient-Controlled Analgesia (PCA)** – 10 procedures
d. **Patient-Controlled Epidural Analgesia (PCEA)** – 30 procedures
e. **Subarachnoid block** – 5 procedures
f. **Epidural block with or without catheter** – 20 procedures
g. **Plexus and peripheral nerve blocks** – 20 procedures
h. **Ganglion block** – 5 procedures
i. **Intravenous regional anesthesia (IVRA)** – 5 procedures
j. **Interpleural analgesia** – 5 procedures
k. **Pain point infiltration** – 5 procedures

### ****2.4 Basics of Resuscitation and Selected Topics in Emergency Medicine****

The resident acquires theoretical and practical knowledge in the fundamentals of resuscitation and selected topics in emergency medicine and is trained to:

**2.4.1** Resuscitate and treat critically ill and traumatized patients in both prehospital and hospital settings;
**2.4.2** Organize and carry out monitoring and treatment of vital functions during anesthesia, diagnostic, and therapeutic procedures;
**2.4.3** Participate in certified courses in basic and advanced resuscitation techniques for adults and children (4 courses);
**2.4.4** Organize and conduct intra- and interhospital transport under supervision;
**2.4.5** Identify the etiology and pathophysiology of cardiac arrest;
**2.4.6** Determine indications for resuscitation;
**2.4.7** Provide care and stabilization of the patient after resuscitation;
**2.4.8** Understand and apply the **European Resuscitation Council (ERC)** recommendations and perform standard resuscitation techniques for adults, children, and neonates;
**2.4.9** Know the dosages, indications, contraindications, and methods of administration of drugs used in resuscitation of adults and children;
**2.4.10** Interpret ECG during resuscitation of adults, children, and neonates;
**2.4.11** Master and demonstrate the skill of establishing peripheral venous access;
**2.4.12** Master and demonstrate the knowledge and skill to recognize and manage airway obstruction;
**2.4.13** Master and demonstrate the skill of airway management during resuscitation in adults, children, and neonates;
**2.4.14** Master and demonstrate the skill of performing artificial respiration in adults, children, and neonates;
**2.4.15** Master and demonstrate the skill of external chest compressions in adults, children, and neonates;
**2.4.16** Master and safely perform defibrillation;
**2.4.17** Rapidly assess, diagnose, and stabilize patients with life-threatening injuries or conditions;
**2.4.18** Apply monitoring and evaluation in assessing stable trauma patients and detecting hidden injuries;
**2.4.19** Conduct triage of injured persons in hospital settings and manage mass casualty situations;
**2.4.19** Master and demonstrate the skill of venous preparation;
**2.4.20** Assess the need for infusion and transfusion therapy;
**2.4.21** Master and demonstrate the skill of establishing **central venous access** (subclavian vein, internal jugular vein, femoral vein);
**2.4.22** Master and demonstrate the skill of establishing **intraosseous access** in adults and children;
**2.4.23** Know the indications, contraindications, and dosages of IV analgesics, sedatives, and muscle relaxants, including rapid sequence induction (RSI);
**2.4.24** Understand the causes, pathophysiology, clinical presentation, and treatment of **acute respiratory arrest** in emergency settings;
**2.4.25** Know how to operate and apply a **suction device;**

**2.4.26 Know and master the indications and complications of endotracheal intubation;
2.4.27 Master and demonstrate knowledge of alternative airway management techniques;
2.4.28 Master and demonstrate the ability to monitor respiratory function – assess adequacy of oxygenation, ventilation, and respiratory mechanics;
2.4.29 Master cardiovascular monitoring and hemodynamic surveillance;
2.4.30 Master and demonstrate the ability to monitor body temperature;
2.4.31 Master and perform arterial catheterization – radial and femoral artery;
2.4.32 Master and apply oxygen therapy;
2.4.33 Master and know indications for mechanical ventilation, ventilation modes, initial ventilator; settings, sedation and muscle relaxation of ventilated patients, monitoring of mechanical ventilation, and ventilation in special conditions;
2.4.34 Master and demonstrate the ability to diagnose and treat shock, burns, acid-base disorders, fluid and electrolyte imbalances, and head and spinal injuries;
2.4.35 Master and demonstrate skill in bag-mask ventilation in adults and children;
2.4.36 Master and demonstrate skill in orotracheal intubation of adults and children;
2.4.37 Master and demonstrate skill in nasotracheal intubation in adults;
2.4.38 Master and demonstrate skill in laryngeal mask airway (LMA) placement in adults and children;
2.4.39 Master and demonstrate skill in performing cricothyroidotomy and/or percutaneous tracheotomy;
2.4.40 Master and apply non-invasive positive pressure ventilation (NIPPV);
2.4.41 Master and apply rapid sequence induction (RSI) of anesthesia;
2.4.42 Master and apply mechanical ventilation;
2.4.43 Master and demonstrate skill in performing needle thoracentesis;
2.4.44 Master and demonstrate skill in chest tube placement;
2.4.45 Master and apply respiratory monitoring and interpretation of capnography and pulse oximetry;
2.4.46 Master and apply urinary bladder catheterization using a Foley catheter;
2.4.47 Know the pathophysiology and treatment of acute and chronic pain;
2.4.48 Know the principles of conduction (nerve block) anesthesia;
2.4.49 Know the principles of local anesthesia and pain control techniques;
2.4.50 Master and demonstrate knowledge of clinical signs and methods of monitoring and warming a hypothermic patient;
2.4.51 Master and demonstrate understanding of the specifics of resuscitating a hypothermic patient;
2.4.52 Master and demonstrate knowledge of the clinical picture, monitoring, and treatment of patients with heat stroke;
2.4.53 Master and demonstrate knowledge of the management of drowning victims;
2.4.54 Master and demonstrate knowledge of the clinical picture and treatment of patients after electrical shock or lightning strike;
2.4.55 Master and demonstrate knowledge of the causes, clinical picture, and treatment of decompression sickness;**

**The resident must:**

a. **Treat all types of shock** – 10 procedures
b. **Participate in the resuscitation team and emergency service (adults)** – 25 procedures
c. **Participate in the resuscitation team and emergency service (children aged 1–5 years, newborns, infants)** – 5 procedures
d. **Participate in the treatment of massive hemorrhage under supervision** – 5 procedures
e. **Perform endotracheal intubation (adults)** – 40 procedures
f. **Perform endotracheal intubation (under 5 years of age)** – 10 procedures
g. **Use manual and mechanical ventilation in emergency situations (adults)** – 40 procedures
h. **Use manual and mechanical ventilation in emergency situations (children under 5 years)** – 10 procedures
i. **Insert a peripheral IV line (adults)** – 10 patients
j. **Insert a peripheral IV line (children under 5 years)** – 10 procedures
k. **Insert a central venous line** – 30 procedures
l. **Insert a pleural drain** – 10 procedures
m. **Perform cardiopulmonary resuscitation (CPR) in a hospital** – 5 procedures
n. **Perform CPR in the field / manage a severely injured or ill patient outside the hospital** – 5 procedures
o. **Participate in the treatment of a polytraumatized patient** – 5 procedures
p. **Perform cricothyroidotomy or percutaneous tracheotomy** – 5 procedures
q. **Administer total intravenous anesthesia (adults)** – 20 procedures
r. **Administer total intravenous anesthesia (children under 5 years)** – 10 procedures
s. **Participate in diagnosis and treatment of severe head injury** – 5 procedures
t. **Monitor a trauma patient for 48 hours, apply alternative airway management techniques** – 5 procedures
u. **Apply cervical spine immobilization for patient transport** – 5 procedures
v. **Maintain trauma protocols and apply trauma scoring systems** – 25 procedures
w. **Administer anesthesia during emergency patient admission** – 25 procedures
x. **Participate in emergency patient case conferences** – 25 procedures
y. **Apply warming methods for hypothermic individuals, children, or newborns** – 5 procedures
z. **Perform suprapubic bladder puncture** – 5 procedures

### ****2.5 Intensive Care Medicine****

The resident acquires theoretical and practical knowledge in intensive care medicine and is trained to:

**2.5.1** Assess and triage patients;
**2.5.2** Diagnose cardiopulmonary arrest, restore respiratory and cardiac function, perform intubation (orotracheal and nasotracheal), and apply advanced airway management techniques in difficult airway situations;
**2.5.3** Recognize and treat hemodynamic instability and shock in conditions such as: acute pulmonary edema, arrhythmias, acute myocardial infarction and its complications, cardiac tamponade, valvular diseases, metabolic cardiac dysfunctions, congenital heart defects, pulmonary thromboembolism and air embolism, hypertensive crisis, aortic dissection, drug-induced cardiac dysfunction, myocarditis, peripheral vascular diseases, specific cardiovascular surgical issues, and myocardial contusion;
**2.5.4** Recognize and treat acute respiratory failure, ARDS, aspiration and other pneumonias, barotrauma, status asthmaticus, upper airway obstruction, hypercapnic respiratory failure, chest trauma, respiratory muscle diseases, and apply appropriate ventilation techniques;
**2.5.5** Diagnose acute renal failure, perform basic and advanced treatment of renal failure, and initiate hemodialysis;
**2.5.6** Recognize and treat coma, status epilepticus, delirium tremens, neuromuscular diseases; recognize brain tumors, hemorrhages, head trauma, intracranial hypertension, cerebral vasospasm, meningoencephalitis, spinal trauma; diagnose brain death;
**2.5.7** Recognize and treat metabolic and endocrine disorders: acid-base imbalances, fluid and electrolyte disturbances, severe acute endocrine disorders (including diabetes), assess and monitor nutritional needs, provide enteral and total parenteral nutrition, manage hypothermia, malignant hyperthermia, inherited and acquired metabolic disorders, and acute poisonings;
**2.5.8** Demonstrate the ability to: monitor hospital hygiene and nosocomial infections; recognize and treat sepsis and septic shock, necrotizing fasciitis, gas gangrene, superinfections, severe bacterial (aerobic and anaerobic), viral, fungal, and parasitic infections; treat infections in immunocompromised patients; revise antimicrobial therapy; participate in immunotherapy; and recognize immune system disorders;
**2.5.9** Diagnose severe coagulation disorders, acute hemolysis, acute and chronic anemia; plan and conduct blood transfusions and transfusion of blood components;
**2.5.10** Participate in managing life-threatening conditions in gynecology, obstetrics, and perinatology: preeclampsia, eclampsia (including HELLP syndrome), amniotic fluid embolism, and hemorrhage;
**2.5.11** Participate in treating life-threatening gastrointestinal conditions: acute pancreatitis, peritonitis, acute gastrointestinal bleeding, acute and chronic liver failure, inflammatory bowel disease, mesenteric infarction, intestinal perforation, obstruction, abdominal trauma, and specific features of abdominal surgery;
**2.5.12** Participate in the treatment of trauma;
**2.5.13** Demonstrate skills in pediatric intensive care: acute respiratory failure, recognition of heart failure, trauma, severe infections, metabolic disturbances, and colic;
**2.5.14** Participate in the management and resuscitation of other critical conditions such as burns, drowning, electric shock, heat stroke, lightning strike, chemical injuries, animal bites and stings; Becomes familiar with pharmacology, pharmacokinetics, pharmacodynamics, and drug interactions; Provide analgesia, sedation, and muscle relaxation; Participate in the transport of critically ill patients; Manage multiple organ failure, maintain and prepare organ donors; Know and apply scoring systems for illness severity and outcome prediction;

**2.5.15** Participate in **clinical research;**

**2.5.16** Determine brain death, maintain a potential deceased organ donor, participate in multi-organ procurement and transplantation teams, be involved in immediate postoperative care of transplant patients, and take part in the organization and activities of the national transplant program and in education about organ donation awareness;

**2.5.17** Master monitoring skills and measurement techniques, including **imaging** techniques;
**2.5.18** Master the skill of mechanical ventilation in various clinical conditions;
**2.5.19** Demonstrate knowledge of the anatomy, physiology, and pathophysiology of the respiratory system and maintain adequate ventilation and oxygenation of the patient;
**2.5.20** Demonstrate knowledge in measuring pulmonary mechanics during controlled ventilation, in respiratory support monitoring, and in managing ventilation-perfusion mismatch;
**2.5.21** Recognize, manage, and treat respiratory complications during ventilation; apply inhalation therapy and respiratory physiotherapy;
**2.5.22** Demonstrate knowledge in determining indications for non-invasive oxygen therapy and administer drugs affecting the respiratory system;
**2.5.23** Master the skills of endotracheal and nasotracheal intubation (skills also acquired during general anesthesia rotation);
**2.5.24** Demonstrate knowledge and skills in conducting respiratory therapy: breathing exercises, spirometry, non-invasive ventilation, inhalation therapy, bronchial aspiration, fiberoptic bronchoscopy, mechanical ventilation, and oxygen therapy;
**2.5.25** Demonstrate skills and knowledge in assessing and implementing enteral and parenteral nutrition;
**2.5.26** Demonstrate skills and knowledge in administering infusions, blood transfusions, and transfusions of blood components;
**2.5.27** Demonstrate knowledge and skill in performing **hemodialysis**, **hemofiltration**, **peritoneal dialysis**, and **plasmapheresis;**
**2.5.28** Demonstrate the ability and knowledge to determine indications for placing **gastrointestinal stomas and drains;**
**2.5.29** Demonstrate skill and knowledge in placing a **urinary catheter;**
**2.5.30** Demonstrate skill in inserting **arterial, venous, and pulmonary catheters;**
**2.5.31** Demonstrate the ability to provide **analgo-sedation** in both adult and pediatric patients;
**2.5.32** Demonstrate the ability to determine indications for **laboratory diagnostics**, including **blood gas analysis;**
**2.5.33** Demonstrate knowledge and ability to determine indications for **bronchoscopy** and perform the procedure;
**2.5.34** Demonstrate knowledge and ability to determine indications for and perform **pleural puncture and drainage;**
**2.5.35** Demonstrate the ability, knowledge, and skill to safely perform **defibrillation and cardiac pacing;**
**2.5.36** Demonstrate skill in the use of **mechanical assist devices;**
**2.5.37** Demonstrate knowledge and ability to carry out **organ procurement and transplantation;**
**2.5.38** Apply mechanical ventilation during **patient transport;**
**2.5.39** Demonstrate skill and knowledge in the use of **cricothyrotomy and percutaneous tracheotomy kits;**

**1)** The resident must maintain complete medical documentation for **75 patients** with complex clinical conditions, including:

a. Acute pulmonary insufficiency with aerobic and anaerobic infections – **10 cases**
b. Shock of various etiologies – **10 cases**
c. Acute renal insufficiency, and chronic renal insufficiency during the perioperative period – **10 cases**
d. Acute abdomen – **10 cases**
e. Sepsis and septic syndrome; multiple organ failure – **10 cases**
f. Acute coagulation disorders – **10 cases**
g. Acute central nervous system disorders – **10 cases**
h. Acute metabolic disorders – **5 cases**

**2)** Apply various modes of mechanical ventilation and make decisions regarding weaning patients from prolonged controlled ventilation – **50 procedures**

**3)** Provide respiratory support for non-intubated patients – **30 procedures**

**4)** Perform bedside pulmonary function tests – **20 patients**

**5)** Perform diagnostic and therapeutic bronchoscopies during intensive monitoring or intensive treatment – **25 patients**

**6)** Use extracorporeal supportive therapies for acute organ dysfunctions (e.g., continuous hemofiltration, continuous hemodialysis, extracorporeal membrane oxygenation – ECMO) – **5 procedures**

**7)** Perform pulmonary artery catheterization with appropriate measurement techniques – **5 procedures**

**8)** Perform pleural drainage during intensive monitoring or treatment – **5 procedures**

**9)** Measure and calculate cardiovascular, respiratory, and metabolic parameters such as PVR, SVR, AaDO2, QS/Qt, VO2, RQ – **10 procedures**

**10)** Determine indications for blood transfusions, blood components, additional therapy, and autotransfusion – **50 procedures**

**11)** Place a transvenous pacemaker in emergency cardiac conditions – **5 patients**

**12)** Perform cardioversion – **3 procedures**

**13)** Master the measurement, monitoring, and treatment of elevated intracranial pressure – **10 procedures**

**14)** Master the evaluation and scoring of disease severity – **50 procedures**

**15)** Use imaging techniques in emergency situations – **50 procedures**

### **Certain segments of the eesidency training must be conducted at the following institutions:**

1. **Hospital Rotations:** General hospitals, with emphasis on departments of anesthesiology, intensive care medicine, hospital emergency medicine; Pain management centers and clinics; Intensive care units (ICUs); Operating rooms; Emergency medical services; Outpatient clinics and day hospitals; Clinical laboratories (biochemistry); Blood transfusion services; Radiology departments (X-ray, CT, MRI, ultrasound); Interventional radiology units.
2. **Infectious Disease Intensive Care ath the** Intensive care units for infectious diseases.
3. **Pediatric Intensive Care at the** Intensive care units for pediatric patients.
4. **Theoretical Education at the** Postgraduate specialist studies at the **Faculty of Medicine, University of Montenegro, in Podgorica**.
5. **Continuing Professional Development Courses at the** Institutions designated by the official plan and program for conducting such courses.
6. **Colloquia (Midterm Assessments) are h**eld at the **Department for Postgraduate Studies**, Faculty of Medicine, University of Montenegro.
7. **Two-Semester Theoretical Training are c**onducted exclusively at the **Faculty of Medicine in Podgorica**.

### ****G. EMERGENCY MEDICINE****

****Duration:** Five years (60 months)**

During the residency, the resident acquires **theoretical and practical knowledge, skills, and competencies** required to perform highly specialized professional duties in the field of emergency medicine, with the application of scientific advancements in clinical practice.

The specialization program includes both **theoretical education and practical training**.

**Theoretical training** is conducted at the **Faculty of Medicine** over two semesters, lasting a total of **nine months**.

**Practical professional work** is carried out at the **Clinical Centre of Montenegro – Emergency Centre**, at **clinical-hospital centers**, **state-run hospitals**, and the **Institute for Emergency Medicine**.

During the course of the residency, the resident is entitled to **annual leave** in accordance with applicable laws, and it is taken in **consultation with the mentor**.

Throughout the specialist training, the resident is trained to: **Independently assess and manage emergency medical conditions; Master practical and professional skills;** and **Work independently in emergency medical units and hospitals**, in **resuscitation and emergency admission clinics**, and to **lead emergency medical teams in the field** across the following areas:

1. **Cardiology** – 5 months
2. **Pulmonology** – 3 months
3. **Nephrology** – 1 month
4. **Hematology** – 1 month
5. **Gastroenterology** – 2 months
6. **Endocrinology** – 1 month
7. **Allergology** – 15 days
8. **Pediatrics** – 3 months
9. **Infectious Diseases** – 1 month
10. **Surgery** – 4 months
11. **Pediatric Surgery** – 1 month
12. **Urology** – 1 month
13. **Orthopedics and Traumatology** – 3 months
14. **Neurosurgery** – 1 month
15. **Gynecology and Obstetrics** – 1 month
16. **Otorhinolaryngology (ENT)** – 1 month
17. **Ophthalmology** – 1 month
18. **Psychiatry** – 1 month
19. **Emergency Radiology and Ultrasonography** – 2 months
20. **Neurology** – 3 months
21. **Anesthesiology, Reanimatology, and Intensive Care** – 1 month
22. **Toxicology** – 15 days
23. **Forensic Medicine** – 6 months
24. **Emergency Medical Services – Institute for Emergency Medicine of Montenegro** – 6 months
25. **Emergency Medicine – Emergency Centre** – 5 months
26. **Annual Leave** – 5 months (cumulative across 5 years)

**During the specialization training, the resident must master techniques of cardiopulmonary resuscitation, airway management, and support of vital functions, as well as skills in the initial management of severely traumatized patients. They must acquire proficiency in triage of injured patients during mass casualty incidents, and in resuscitation and stabilization measures during patient transport.**

During the practical professional training, the resident must acquire, through **assisting or independently performing**, specific skills in the following areas:

### ****1) Cardiology (5 months)****

The resident must assist or independently perform and master the skills in **recognizing and providing emergency care for the following conditions**:

| Condition | Assist | Perform |
| --- | --- | --- |
| Anginal attack | 5 | 5 |
| Myocardial infarction | 5 | 5 |
| Malignant cardiac arrhythmia | 5 | 5 |
| Syncopal and collapse states | 5 | 5 |
| Acute aortic dissection | 3 | – |
| Cardiogenic pulmonary edema | 3 | 3 |
| Pericarditis | 3 | 3 |
| Decompensated cardiomyopathy | 5 | 5 |
| All forms of cardiac decompensation | 5 | 5 |
| Hypertensive crisis | 5 | 5 |

### ****2) Pulmonology (3 months)****

The resident must assist or independently perform and master the skills in **recognizing and providing emergency care for the following conditions**:

| Condition | Assist | Perform |
| --- | --- | --- |
| Acute respiratory insufficiency | 3 | 1 |
| Acute exacerbation of chronic respiratory insufficiency | 3 | 2 |
| Severe acute asthma attack | 3 | 2 |
| Status asthmaticus | 2 | 2 |
| Acute pulmonary embolism | 2 | – |
| Hemoptysis | 5 | – |
| Severe acute pulmonary infection | 5 | – |

### ****3) Nephrology (1 month)****

The resident must assist or independently perform and master the skills in **recognizing and providing emergency care to patients**:

| Condition | Assist | Perform |
| --- | --- | --- |
| With acute renal failure | 5 | 2 |
| With exacerbation of chronic renal failure | 3 | 1 |
| During transport for hemodialysis | 2 | 2 |

### ****4) Hematology (1 month)****

The resident must assist or independently perform and master the skills in **recognizing patients with**:

| Condition | Assist | Perform |
| --- | --- | --- |
| Hemolytic anemias | 10 | – |
| Post-hemorrhagic anemia | 5 | – |
| Neutropenia and agranulocytosis | 5 | – |
| Emergency care for patients with leukemia | 5 | – |
| Emergency care for patients with hemorrhagic syndrome | 5 | – |

### ****5) Gastroenterology (2 months)****

The resident must assist or independently perform and master the skills in **recognizing and providing emergency care to**:

| Condition | Assist | Perform |
| --- | --- | --- |
| Emergency care for patients with gastrointestinal bleeding | 10 | 5 |
| Patients with hepatobiliary and pancreatic diseases | 10 | 10 |
| Emergency care for patients with acute liver failure | 10 | 5 |

### ****6) Endocrinology (1 month)****

The resident must assist or independently perform and master the skills in **recognizing and providing emergency care to**:

| Condition | Assist | Perform |
| --- | --- | --- |
| Patient in thyrotoxic crisis | 3 | 1 |
| Patient with diabetic coma | 3 | 1 |
| Patient in hypoglycemia | 3 | 1 |
| Patient with pheochromocytoma and hypertensive crisis | 1 | — |
| Patient in emergency state after ovarian hyperstimulation | 4 | — |

### ****7) Allergology (15 days)****

The resident must assist or independently perform and master the skills related to:

| Clinical Task | Assist | Perform |
| --- | --- | --- |
| Recognizing and diagnosing allergic diathesis | 5 | 1 |
| Understanding the basic principles of allergic disease | 1 | – |
| Treatment of Quincke’s edema | 1 | – |
| Treatment of anaphylactic shock | 1 | – |
| Recognizing and provising emergency care for generalized urticaria | 3 | 1 |

### ****8) Pediatrics (3 months)****

The resident must assist in or independently perform and master the following skills related to recognition and emergency care in children:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Children with high fever | 10 | 5 |
| Children with convulsions | 5 | 5 |
| Children with worsening of congenital heart defects | 5 | – |
| Children with acute exacerbation of a haematological disorder | 5 | – |
| Children with acute respiratory insufficiency | 5 | 5 |
| Children with febrile exanthematous diseases | 5 | 2 |
| Children with acute intoxication | 3 | – |

### ****9) Infectious Diseases (1 month)****

The resident must assist in or independently perform and master the following skills related to recognition and emergency care of patients with:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Acute meningitis and encephalitis | 5 | 2 |
| Acute intestinal infection | 5 | 5 |
| Acute severe respiratory infection | 5 | 5 |
| Severe generalized infection | 3 | – |
| Febrile exanthematous diseases | 5 | 2 |
| Puncture wounds with risk of tetanus | – | – |
| Hyperthermia of unknown origin | 5 | 2 |
| Epidemic disease | 5 | – |

### ****10) Surgery (4 months)****

The resident must assist in or independently perform and master the skills for recognition and emergency care of patients with:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Acute abdomen | 10 | 5 |
| Peritonitis | 5 | – |
| Acute intestinal obstruction | 5 | 2 |
| Incarcerated hernia | 5 | 5 |
| Acute appendicitis | 5 | 5 |
| Acute anorectal diseases and injuries | 5 | 2 |
| Burns | 5 | 5 |
| Urgent vascular conditions | 5 | 5 |
| Injuries of peripheral arteries and veins | 5 | 5 |
| Arterial embolism | 5 | – |
| Deep vein thrombosis | 5 | 5 |

### ****11) Pediatric Surgery (1 month)****

The resident must assist in or independently perform and master the skills for recognition and emergency care of patients with:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Acute abdomen | 5 | 2 |
| Incarcerated hernia | 5 | 2 |
| Phimosis, paraphimosis, and balanitis | 3 | 2 |
| Testicular disorders, including torsion and epididymitis | 3 | 2 |

### ****12) Urology (1 month)****

The resident must assist in or independently perform and master the skills for recognition and emergency care of patients with:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Renal colic | 5 | 5 |
| Testicular torsion | – | 5 |
| Urinary retention | 5 | 5 |

### ****13) Orthopedics and Traumatology (3 months)****

The resident must assist in or independently perform and master the skills for recognition and emergency care of patients with:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Spinal injuries | 5 | 2 |
| Upper extremity injuries | 5 | 5 |
| Pelvic injuries | 5 | 5 |
| Lower extremity injuries | 5 | 5 |

### ****14) Neurosurgery (1 month)****

The resident must assist in or independently perform and master the skills for recognition and emergency care of patients with:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Subarachnoid hemorrhage | – | 4 |
| Spontaneous intracerebral hemorrhage | – | 4 |
| Deterioration in condition due to brain tumor | – | 4 |

### ****15) Gynecology and Obstetrics (one month)****

The resident must assist in or independently perform and master the skills for recognition and emergency care of:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Patient with spontaneous miscarriage | 2 | 5 |
| Pregnant woman with hypertension | – | 3 |
| Pregnant woman with preeclampsia | – | 2 |
| Pregnant woman giving birth in out-of-hospital setting (field delivery) | – | 1 |
| Patient with peritonitis caused by gynecologic or obstetric condition | – | 1 |

### ****16) Otorhinolaryngology (1 month)****

The resident must assist in or independently perform and master the skills for recognition and emergency care in the following situations:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Ear injuries | 1 | 5 |
| Mastoiditis and labyrinthitis | – | 2 |
| Vertiginous syndrome | 5 | 5 |
| Nasal injuries and epistaxis | – | 5 |
| Foreign bodies in the larynx and trachea | – | 2 |
| Neck injuries and phlegmon | – | 1 |
| Familiarization with basic technique of emergency tracheostomy | – | 2 |

### ****17) Ophthalmology (1 month)****

The resident must assist in or independently perform and master the skills for recognition and emergency care in the following conditions:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Eye injuries | 5 | – |
| Acute iridocyclitis and other acute ocular inflammations | 5 | – |
| Acute glaucoma | 5 | – |
| Vascular disorders of the eye | 2 | – |

### ****18) Psychiatry (1 month)****

The resident must assist in or independently perform and master the skills for recognizing and providing emergency care in the following situations:

| Clinical Scenario | Assist | Perform |
| --- | --- | --- |
| Recognition of suicidal risk and provision of emergency care | 3 | – |
| Management of violent (aggressive) patients | 1 | – |
| Recognition and emergency care in schizophrenia and paranoid states | 3 | – |
| Emergency care in affective disorders | 4 | 2 |
| Emergency care in acute stress reactions | 4 | 2 |
| Recognition and emergency care in organic mental disorders | 2 | – |
| Emergency care in delirious states | 3 | 3 |
| Emergency care in acute alcohol intoxication | 4 | 4 |
| Emergency care in narcotic overdose | 4 | 2 |

### ****19) Emergency Radiological and Ultrasound Diagnostics (2 months)****

The resident must assist in or independently perform and master the following skills:

| Procedure | Assist | Perform |
| --- | --- | --- |
| Chest X-ray, skeletal X-ray, and plain abdominal X-ray | 5 | 5 |
| Emergency abdominal ultrasound – gallbladder, aorta, kidneys | 5 | 10 |
| Emergency focused abdominal ultrasound for trauma | 5 | 5 |
| Emergency echocardiography | 5 | 5 |
| Doppler ultrasound of blood vessels | 5 | 3 |
| CT scan – brain, cervical/thoracic/lumbar spine, chest, abdomen, facial bones | 10 | – |
| MRI – brain and spine | 10 | – |

### ****20) Neurology (3 months)****

The resident must assist in or independently perform and master the skill of recognizing and providing emergency care to patients:

| Condition | Assist | Perform |
| --- | --- | --- |
| with ischemic stroke | 5 | 5 |
| with hemorrhagic stroke | 5 | 5 |
| in status epilepticus | 5 | 5 |
| with impaired consciousness | 5 | 3 |
| in delirium | – | 4 |
| with acute polyradiculoneuritis | 5 | 5 |
| in myasthenic crisis | 3 | – |
| with acute paraplegia | 3 | – |
| with multiple sclerosis | 3 | – |
| emergency care for a patient in coma | 4 | 5 |

### ****21) Anesthesiology (5 months)****

The resident must assist in or independently perform and master the skills related to:

| Skill/Area | Assist | Perform |
| --- | --- | --- |
| intubation technique | 10 | 10 |
| complications of intubation | 5 | – |
| parenteral volume replacement | 10 | 10 |
| technique of artificial ventilation | 10 | 5 |
| cardiovascular monitoring | 10 | 5 |
| principles of analgesia and sedation in critically ill patients | 10 | 5 |

### ****22) Toxicology (1 month)****

The resident must assist in or independently perform and master the skills related to recognizing symptoms and treatment of:

| Condition | Assist | Perform |
| --- | --- | --- |
| acute drug poisoning | 2 | 1 |
| pesticide poisoning | 1 | – |
| organophosphate poisoning | 1 | 1 |
| mushroom poisoning | 1 | – |
| poisoning with chemical warfare agents | 1 | – |

### ****23) Forensic Medicine (15 days)****

The resident must assist in or independently perform and master the following skills:

| Skill | Assist | Perform |
| --- | --- | --- |
| handling a person who has not died in a healthcare institution or with another healthcare provider, in accordance with the law, particularly in the presence of potential signs of violence | 1 | 1 |
| determining the time, circumstances, and cause of death | 1 | 1 |
| recognizing early signs of death and postmortem changes | 1 | – |
| recognizing visible signs of mechanical injury, asphyxia, physical, nutritional, and psychological trauma in both deceased and living persons | 1 | 1 |
| recognizing signs suggestive of domestic violence, particularly in women and children | 1 | 1 |

### **24 and 25) Emergency Medicine at the Institute for Emergency Medicine+ Emergency Center (6 months each)**

During the residency, the resident must assist in or perform and master the following emergency procedures:

| Clinical Skill | Assist | Perform |
| --- | --- | --- |
| Recognition and emergency management of cardiogenic shock | – | 5 |
| Recognition and emergency management of septic shock | 5 | 10 |
| Recognition and emergency management of hemorrhagic shock | 10 | 10 |
| Familiarity with resuscitation procedures in traumatized patients | 10 | 10 |
| Familiarity with resuscitation procedures in craniocerebral injuries | 10 | 10 |
| Recognition and emergency care for thoracic trauma | 10 | 10 |
| Recognition and emergency care for blunt abdominal trauma | 10 | 10 |
| Recognition and emergency care for penetrating abdominal trauma | 10 | 10 |
| Recognition and emergency care for musculoskeletal trauma | 10 | 10 |

### ****26) Annual leave (5 months)****