ORTHOPAEDIC SURGERY

1. GENERAL ASPECTS OF SURGERY RESIDENCIES

1.1. Purpose of residency

Surgery residencies are a learning and educational process, wherein the students gain suitable theoretic and practical knowledge from a particular field of surgery, to be able to independently provide complete care for most patients with acute and chronic surgical illnesses and conditions, as well as injuries in the field, covered by a particular surgical residency. By complete care, we mean diagnostics and curing of illness (injury) and rehabilitation of the patient or injured individual.

1.2. Types of surgical residencies

Surgical residencies are as follows:

- general surgery,
- abdominal surgery,
- traumatology,
- cardiovascular surgery,
- thoracic surgery
- urology,
- · orthopaedic surgery,
- plastic reconstruction and aesthetic surgery,
- neurosurgery

Surgery residencies last 6 (six) years. All but neurosurgery consist of:

- **the initial part** (common trunk), which lasts 2 years,
- the continuation, which lasts 4 years. Neurosurgery is a surgical residency with an entirely independent, separate 6 year programme of residency.

1.3. Residency completion

The main mentor finds, that the residency is complete, when they verify if the duration was suitable, the proscribed conditions fulfilled in terms of acquired knowledge, number and quality of procedures carried out and if the proscribed examinations have been successfully passed. Residency ends with a board examination.

2. KNOWLEDGE REVIEW

Every resident has a resident's paper (booklet) and a separate log, which they use to enter completed surgery procedures and first assistances in procedures as well as their professional, pedagogic and research articles.

2.1. Intermediate examination

After the completed two year part, the resident must complete a finishing colloquium in an oral and / or written form, based on the matter from the beginning part of the residency, it having to be done in front of a 3 – member commission (two teachers and the main mentor)

In continuation of the residency, the resident has to take written and / or oral colloquiums of an individual cycle or module. The knowledge is examined through

presentations of patients, preparation of seminars, review of literature, writing of articles and cooperation in researches.

The resident must, at least once per year, display acquired knowledge in public, in a way always individually defined by the direct or head mentor:

- presentation of analysis of a group of patient or interesting individual clinical case at a professional meeting of a group of experts in a teaching institution or outside it:
- preparation and leading of a clinical or clinically pathological conference with a theme which includes the subject of the residency;
- publishing of an article in a reviewed domestic or foreign magazine with a subject from the programme of the residency.

The conditions for the continuation of residency are successfully completed colloquiums and a suitable yearly grade by the head mentor.

2.2. Board examination.

After the completed proscribed programme of the continuation part of the residency, the resident takes a board examination.

The commission verifies the practical and theoretic knowledge of the candidate. The exam is taken in one or two parts, the latter done on separate times. This is decided upon by the president of the commission in agreement with the candidate.

The practical part includes:

- medical history and physical examination of one or several patients, the setting of a working diagnosis and differential diagnosis, ordering of special examinations according to the principle of rationality, an evaluation of resulting findings and the generation of a plan of therapy,
- the carrying out of the surgery procedure (with residencies that demand it).

The theoretical part may be written or oral.

1.1. THE INITIAL PART OF SURGERY RESIDENCIES

1.2. Time plan:

•	surgical infections	2 months
•	abdominal surgery	7 months
•	traumatology	9 months
•	anaesthesia with resuscitation	2 months
•	surgical intense therapy	2 months
•	burns	1 month
•	pathology or forensic medicine	1 month

24 months

A candidate takes a course in transfusiology during their abdominal surgery internship or during traumatology (possibly in the afternoon time).

1.3. Content programme

1.3.1. Surgical infections

1.3.1.1. Contents:

The resident acquires theoretical and thorough practical knowledge on the mechanisms of biological defence of the human body and avoidance of risk factors, on immunisation and preventive use of antibiotics and They also acquire chemotherapeutic medicine. knowledge on procedures for proper identification of surgical infections and their treatment with various procedures, surgical antimicrobial medicine, immunizing and supportive medication. Furthermore, they learn about the measures for the acceleration of the healing of chronic wounds, achieve knowledge of diagnostics and preoperative, surgical and postoperative medication of the following infections:

- staphylococcal infections,
- streptococcal infections,
- erysipeloid,
- anthrax,
- infections with gram negative bacteria,
- infections by clostridia,
- other anaerobic infections,
- · actinomycosis,
- mixed bacterial infections,
- fungal infections,
- viral infections.

1.3.1.2. The resident carries out the following surgical procedures:

treatment of purulent inflammation:

of soft tissue
panaritium
diabetic gangrene
2

1.3.2. Abdominal surgery

1.3.2.1. Contents:

The resident acquires theoretical and thorough practical knowledge on:

- acute abdominal illnesses and other most common surgical illnesses of abdominal organs, abdominal wall and inguinal and femoral areas,
- diagnostic procedures in the cases of acute abdominal illnesses and other most frequent surgical abdominal illnesses
- differential diagnosis and treatment methods of acute abdominal illnesses
- preoperative preparation of acute patients with joint heart, respiratory, kidney disease, diabetes, etc.,
- most common postoperative complications and methods of prevention and treatment thereof,
- orally administered nutrition for operated patients with the most common abdominal illnesses.

1.3.2.2. The resident carries out the following surgical procedures:

•	appendectomy	5
•	hernia treatment	10
•	laparotomy dehiscence care	2
•	ulcer stitching	2
•	intestine anastomosis	6
•	other procedures	10

1.3.3. Traumatology

1.3.3.1. Contents:

The resident acquires theoretical and thorough practical knowledge on:

- functional anatomy of the locomotory apparatus,
- general terms regarding injuries (aetiology and mechanisms of injuries, classification of injuries, theoretical knowledge of injuries of all body parts, fractures and dislocations),
- diagnostic procedures in traumatology,
- basics of ultrasound diagnostics of injuries of the abdomen, thorax and the locomotory apparatus,
- surgical approaches to typical procedures on the locomotory apparatus
- conservative care for fractures and complications.
- a series of post traumatic complications (traumatic, hemorrhagic shock) and their consequences for various organs,
- other post traumatic complications
 (thromboembolism, lipid embolism, respiratory complications, digestive disorder, electrolyte disorder, post traumatic psychoses and delirium states)
- typical accesses for surgical procedures on the limbs and other body parts
- preparation of patients for surgery (diabetes, cardiac, pulmonary and other disease)
- postoperative care
- care for light and heavy injuries and polytrauma,
- surgical procedures on bones (various kinds of osteosynthesis),
- · indication for urgent surgical procedures,

- complications in fracture healing (pseudoartioses, ostheitis),
- infections accompanying injury
- · shock therapy and resuscitation

1.3.3.2. The resident carries out the following surgical procedures:

•	extension on lower extremities	15
•	repositioning of fractures and plaster casting	15
•	joint puncture	10
•	large body cavity puncture	10
•	diagnostic arthroscopy	5
•	soft tissue care (large wounds, defects, injurie	es
	to tendons, muscles)	20
•	thoracic drainage (Bülau drainage)	5
•	osteosynthesis (simple), removal of	
	osteosynthetic materials	10

1.3.4. Anaesthesiology with resuscitation

1.3.4.1. Contents:

The resident acquires theoretical and thorough practical knowledge on:

- modern types of general, regional and combined anaesthesia for surgical procedures
- evaluation of the state of the patient and preparation of the patient for surgical procedures
- basic and additional procedures of resuscitation in the cases of respiratory arrest and / or circulatory arrest and post resuscitation syndrome,
- various ways of treating postoperative pain
- regional anaesthesia and some techniques of conductive anaesthesia

1.3.4.2. The resident carries out the following procedures:

- participation in and carrying out of procedures for 50 anaesthesias (introduction, intubation, maintenance, waking up, postoperative recovery),
- evaluation and preparation of 15 patients of groups ASA 2 and 3 (evaluation, preparation, premedication)
- cooperation in 5 hospital resuscitations, being performed by a resuscitation team,
- cooperation and carrying out of procedures on 10 gravely injured individuals,
- participation in 15 different ways of treating pain
- 25 area and conductive anaesthesias

1.3.5. Surgical intense therapy

1.3.5.1. Contents:

The resident acquires theoretical and thorough practical knowledge on:

 intensive care for a patient or injured person after all operative procedures and surgical illnesses, which belong in the field of intensive therapy, basic urgent therapeutical procedures for the needs of intensive medical care.

1.3.6. Burns

1.3.6.1. Contents:

The resident acquires theoretical and thorough practical knowledge on:

- professional first aid in the case of burns,
- transport of the individual with burns,
- primary care of a large scale burn in a burn centre,
- evaluation of depth and surface of burn injuries,
- pathophysiology of burns,
- treatment process for extensive burns,
- · liquid therapy of burn shock,
- urgent surgical procedures in burn cases,
- early excision of burn injuries,
- excision to fascia,
- covering of skin gap with patient's own skin transplants,
- skin collection and storage of homologous skin transplants,
- indications for the use of homologous skin transplants,
- theory and indications of cultivating own skin transplants in a tissue culture,
- acute tubular necrosis and indications for dialysis,
- burns of the respiratory pathways, acute respiratory insufficiency and indications for intubation,
- negative energy balance and nutrition of the burn victim,
- immunological perspective of burns (immunosuppression),
- chemical burns and antidotes.
- electrical burns, burns and polytrauma, burns in wars

1.3.6.2. The resident carries out the following procedures:

•	primary care of a major burn	1
•	necrotomy with a primary	
	tangential excision	5
•	necrotomy with excision to fascia	2
•	acquisition of auto transplant skin with	
	a Watson knife or electric	
	dermatome	10
•	escharotomy	1
•	fasciotomy	1

1.3.7. Pathology or forensic medicine

1.3.7.1. Content:

The resident acquires theoretical and thorough practical knowledge on regular autopsy and biopsy activities. They take part in all clinical pathological meetings and the preparation of clinical pathological demonstrations of chosen surgical case from current casuistry.

1.3. Knowledge testing

After a completed two year initial part of residency, the resident must take a final colloquium in oral and / or written form, based on the subjects of the initial part of the residency. It is taken in from of a 3 – member commission (two teachers and the head mentor).

A completed 2-year initial part of the surgery residency and a passed colloquium are both conditions for the continuation of surgery residency.

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2. 0. CONTINUATION OF RESIDENCY

Residency in orthopaedic surgery **lasts 6 years** and consists of the general initial part (2 years) and the continuation (4 years).

2. 1. Time plan

The continuation of residency lasts 48 months.

•	general and special orthopaedics	36 months
•	plastic and reconstructive	
	surgery	2 months
•	neurology	2 months
•	neurosurgery	2 months
•	cardiovascular surgery	1 month
•	thoracic surgery	1 month
•	rheumatology	1 month
•	oncology	1 month
•	physiotherapy and rehabilitation	2 months

2.2. Content programme

2.2.1. General and special orthopaedics

2. 2. 1. 1. Content:

- knowledge of basic physiology of the muscles, cartilage, tendons, bones and joints
- knowledge of the special emphasis in orthopaedic illnesses within the medical history as such
- knowledge of basic and special tests in an orthopaedic examination
- independent performance of basic surgery in the field of orthopaedics
- knowledge of suitable orthopaedic approaches and the anatomy of the support and locomotory system., peripheral circulatory system and nerves,
- acquisition of skills in postoperative rehabilitation, ability to predict complications and suggest suitable measures for therapy and prevention thereof,
- acquisition of skills of plaster casting and splint use
- knowledge and skill in punction techniques for all key joints,
- acquisition of ability to recognise basic sports injuries, weariness fractures and know the basics of dealing with them,
- acquisition of knowledge of the following issues: anisomelia of foot arches, limping, inward and outward twisting of feet when walking and the issues of axial deformations of the knee,
- knowledge of the clinical picture, diagnosis, antibiotic therapy and surgical therapy of osteomyelitis, septic arthritis and rehabilitation,
- knowledge of pathophysiology and basics of neuromuscular disease therapy,
- knowledge of the issue of low growth, osteochondrodisplasia, neurofibromatosis, osteogenesis imperfecta, rickets, metabolic disease and haematological disease,
- knowledge of the patterns of foot pain; kinds and Zdravniškazbomica Slovenije

- forms of deformation of toes, aductus of the foot, equinovarus at birth, flatfoot, cavus foot and vertical talus,
- knowledge of the characteristics of knee pain, diseases in the patelofemoral joint area, innate hyperextension of the knee and innate pseudoarthrosis of the tibia and neurofibromatosis,
- knowledge of the characteristics of hip pain, transitional synovitis, developmental dysplasia of the hip, Pertes disease and issues, connected with the femoral head slide,
- knowledge of the basic characteristic of lumbar pain, conservative and surgical medication of idiopathic scoliosis, kyphosis and lordosis
- knowledge of aetiology and therapy of torticollis, post natal paralysis and basic deformation of shoulder and neck
- knowledge of basics and differential diagnostics of upper extremity pain, basic innate deformations of fingers and acquired issues of hands and basic infections of the hand
- knowledge of tumours and clinical picture of tumours, differential diagnostic processing, benign and malign bone tumours and soft part tumours,
- in orthopaedia of adults, the knowledge of degenerative joint diseases and joint diseases in the context of systemic diseases, degenerative diseases as a consequence of innate deformations, injury states and circulation disturbance, the conservative and surgical treatment thereof, along with various surgical techniques, surgical approaches and rehabilitation after these procedures
- in connection with the above, knowledge of planning of ostheotomias, use of various fixation, including intermedular fixation, fixation techniques with plates and screws and the outer bone fixator,
- acquisition of surgical technique of insertion of a hip endoprosthetic and knee endoprosthetic, knowledge of basic principles of treatment, complications and rehabilitation,
- acquisition of skill in differential diagnostics of degenerative diseases (mentioned 3 paragraphs ago),
- knowledge of level based treatment, from conservative to surgical, in the field of degenerative diseases, knowledge of evaluations of the right treatment method in regards to general physical condition of the patient and the biological age, as well as psychomotoric state,
- knowledge of the compartment syndrome of the cervical and lumbar spine; furthermore, knowledge of the issue of radioculopathy and mielopatia and the ability to define the indication for surgical treatment; recognition of the syndrome of lumbar stenose and its conservative and surgical treatment, along with the possibilities of the stiffening of affected segments,
- knowledge of all basic clinical pictures of typical diseases of individual joints, along with special tests, by which it is possible to set a diagnosis and be capable to indicate and interpret special examinations such as: ultrasound, MR, RT (CT) as well as tomography and regular x-ray image,

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- acquisition of arthroscopy skill for the major joints such as e.g. arthroscopy of the knee, shoulder and ankle.
- familiarity with basic sports injuries, their diagnostics, differential diagnostics and treatment,
- knowledge of local and regional anaesthesia in the field of orthopaedics,
- familiarity with physical therapy and physiotherapy, along with functional and developmental physiological processing of exercises, as well as professional and work therapy,
- knowledge on training in the use of orthopaedic and other accessories,
- knowledge of technical orthopaedics,
- familiarity with documentation of test results, medical reports, suitable provisions of social legislation (insurance, contracts for health, pension and accident insurance, maternal security, security of youth and work safety, along with other provisions) and legal norms, relating to the relationship between patient and doctor,
- familiarity with the basic psychosomatic care,
- ability to ensure quality performance of the medical profession,
- ability to provide an expert opinion,
- skill in passing on and acquiring knowledge on: surgical – operative skill, along with surgical intensive care, sports medicine, medicine of work and social medicine, carrying out laboratory tests and neurologic diagnostics.

2.2.1.2. Examination and treatment procedures

- independent performance of ultrasound diagnostics, interpretation, synchronisation with the clinical picture and issuing of an examination result as well as record keeping, for infants and adults,
- independent performance and issuing of examination results, as well as archiving, of x-ray diagnostics in orthopaedics, along with the protection from radiation, uninterrupted following of 300 patients within the scope of specialist training (skeleton, joints), also independent indication setting for RT (CT) and osteodensiometry as well as evaluation of test results for 200 patients,
- independent indication setting for MRI and scintigraphy and evaluation of test results for 100 patients, independent leading and record keeping of 100 completed disease records,
- independent carrying out of 20 functional treatments for growth disorders in the hip area
- independent leading of 30 cases of conservative treatment of innate and acquired deformations,
- independent performance of 50 compression, support and fixation bandaging and plaster and artificial material casts
- independent carrying out of local and regional anaesthesia on 30 patients,
- independent performance of special injection techniques, along with diagnostic and therapeutic procedures of injecting of pain treatments in 150 cases

- 100 recorded, completed cases of setting indications for physical therapy and control over its carrying out (massage, electro-, thermo-, hydro-, balneo- and climatherapy), for physiotherapy, along with functional and neurophysiologic processing of exercises, professional and work therapy, along with measures to protect joints, training for the use of orthopaedic and other accessories an the use of special orthopaedic devices,
- 30 recorded concluded cases of teaching a patient on preventive actions towards their health (counselling and motivation of patients and carrying out of suitable programmes),
- 50 recorded concluded cases of setting indications for care and monitoring over the performance of care with orthopaedic accessories, along with the knowledge of materials, construction principles and methods of construction of prosthetics, orthoses, inlays and orthopaedic footwear with differentiated prescription, all with consideration of suitable directives and lists of accessories, performance of measuring techniques and procedures of moulding, preparation of suitable construction plans and examination of accessories in regards to material, fit, functioning and therapeutic effect, both after the fitting and after the construction,
- 50 recorded, concluded cases of prescription and education for the use of other orthopaedic accessories such as wheelchairs, accessories for daily life, along with accessories at work place and training for the use of prosthetics,
- 50 recorded rehabilitation plans of medical, social and professional rehabilitation and their legal foundations,
- 5 independently carried out and recorded cases of diagnostics and differential diagnostics of psychosomatic conditions from the field of orthopaedics with an emphasis on the psychogene symptomatics and somatopsychic reactions,
- methodics and performance of basic laboratory tests in the professional area and evaluation of test results,
- definition of sedimentation: setting of indications, taking of a sample, proper processing of a sample and placement of test results into the clinical picture for laboratory tests within the framework of professional knowledge of laboratory testing. Methodics and performance of special laboratory tests in the field of orthopaedics and, at the same time, evaluation of test results: C-reactive protein, Rheuma factor, cross test.

2.2.1.3. The resident carries out the following surgical procedures:

Shoulder girdle, upper extremity with hand

- 60 procedures, those being:
- 30 procedures on soft parts skin, muscles, tendons and nerves, along with wound care
- 10 procedures on bones along with osteosynthesis with internal and external fixation and amputations,
- 20 procedures on joints along with endoscopy, endoprosthetics and sinovectomy

Pelvis, lower extremity, foot

- 180 procedures, those being:
- 35 procedures on soft parts, along with the care for wounds, on the skin, muscles, tendons and nerves
- 50 procedures on bones along with osteosynthesis with internal and external fixation and amputations,
- 95 procedures on joints, along with endoscopy, endoprosthetics and sinovectomy

Spine

 10 procedures, e.g. closed and open biopsies, resections, excisions, removal of flashpoint, fusions, decompressions, ostheotomias, as well as closed and open procedures on intervertebral discs and surgical treatment of fractures.

Conservative treatment

• 50 conservative treatments of fractures and dislocations, along with repositioning

Cooperation in 100 higher difficulty procedures, those being:

- 30 procedures on spine, extremities, hand,
- 60 diagnostic and therapeutic endoscopic procedures,
- 10 plastic orthopaedic surgeries.

2.2.2. Plastic, reconstructive and aesthetic surgery

2.2.2.1. Content:

The resident acquires theoretical and thorough practical knowledge on:

- specialties of surgical technique in the field of plastic and reconstructive surgery,
- knowledge of microsurgery principles,
- basics of transplantation of soft tissue,
- basics of reparatory surgery of a damaged hand,
- knowledge of operative technique and care for Dupuvtren contacture.
- basic problematic of rheumatoid hand, basics on the cure of decubital ulcerations,
- skin tumour treatment,
- cheloid and hypertrophic scar treatment

2.2.2.2. The resident carries out the following procedures:

•	Z-plastics	3
•	intradermal wound suture	5
•	primary tendon suture	3
•	osteosynthesis of hand bone	3
•	radical necrectomy on damaged extremities	3
•	epineural suture of hand nerve	1
•	assisting in rotation and transposition lobes	1
•	transplantation of full skin thickness	2

2.2.3. Neurology

2.2.3.1. Content:

The resident acquires theoretical and thorough practical knowledge on diagnostics and treatment of

neurological diseases. They are also familiarised with the work at the intensive care unit of the Neurological clinic.

2.2.4. Neurosurgery

2.2.3.2. Content:

The resident acquires theoretical and thorough practical knowledge on:

- urgent states in neurosurgery, hydrocephalus, increased intracranial pressure,
- signs of spontaneous subarachnoid haemorrhaging and indication for surgical treatment,
- clinical picture of compressive, spinal processes, diagnostics and indications for surgical treatment,
- indications for surgical treatment of injuries, peripheral nerves, care for impression fracture, care for various kinds of traumatic intracranial haemorrhages and surgical treatment of firearm injuries to the head.

2.2.4.1. The resident carries out the following procedures:

•	treatment of an open fracture of the skull bone	1
•	treatment of epidural haematoma	1
•	treatment of acute subdural haematoma	1
•	treatment of chronic subdural haematoma	1
•	external ventricular drainage	1
•	osteoplastic trepanation	2

2.2.5. Cardiovascular surgery

2.2.3.3. Content:

The resident acquires theoretical and thorough practical knowledge on:

 pathophyisiology of the cardiovascular system, indications for heart and artery surgery and diagnostic procedures and technical aids which enable said procedures.

2.2.5.1. The resident carries out the following procedures:

•	vascular anastomosis or suture of a large vein	3
•	sapheneous vein stripping	3
•	sternotomy and sternotomy suture	2
•	preparation of large veins	4
•	amputation (large)	2

2.2.6. Thoracic surgery

2.2.3.4. Content:

The resident acquires theoretical and thorough practical knowledge on diagnostics, differentiated diagnosis, therapy and prognosis of diseases from the field of thoracic surgery. In practice, the student must master typical thoracotomy, typical resections of ribs and typical urgent intrathoracic procedures in thoracic injuries (evacuation of haemothorax, haemostasis in intrathoracic haemorrhaging).

2.2.6.1. The resident carries out the following

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procedures:

•	Thoracotomy	2
•	Closing of thoractomy	2
•	Thoracic drainage	3
•	Thoracic punction	5

2.2.7. Rheumatology

2.2.3.5. Content:

The resident acquires theoretical and thorough practical knowledge on:

 diagnostics and treatment of rheumatic diseases and interdisciplinary approach to the treatment thereof.

2.2.8. Oncology

2.2.3.6. Content:

The resident acquires theoretical and thorough practical knowledge on:

- interdisciplinary (group) processing of cancer patients in programming of diagnostic and treatment procedures,
- importance of histological verification and typisation as well as the definition of the differentiation level of the tumour for the development and planning of treatment and a prognosis
- importance of definition of the state of the expansion of disease before the therapy by the TNM-system and diagnostic means, which are required for it, e.g.: endoscopy, lymphography, scinigraphy, aspirative biopsy and others,
- indications for various methods of treatment and their combinations (surgery, radiotherapy, chemotherapy, endocrinous therapy, immunotherapy), as well as the related results of treatments,
- role of surgery in oncology relative to its purpose (curative, palliative, diagnostic), principles of surgery technique with malign tumours, considering possible complications in regards to the specialties of the illness and possible previous radiation or chemical treatment,
- principles and techniques of intra-arterial chemotherapy,
- importance and surgical technique of removal of the protected lymph node,
- technique and possible complications of subcutaneous vein compartments,
- importance of regular, periodic check ups after the treatment,
- possibility of rehabilitation of cancer patients (physical, psychological and social),
- purpose and importance of obligatory reporting of cancer patients, their central registration and obligations of the doctor to this activity.

(and perhaps carries out an independent removal of a malign skin tumour).

2.2.9. Physiotherapy and rehabilitation

2.2.3.7. Content:

The resident acquires theoretical and thorough practical knowledge on:

- principles of complex rehabilitation,
- rehabilitation for patients from individual surgical fields (thoracic, cardiovascular, abdominal, etc.),
- problematic of patients with locomotory apparatus damage of various etiologies, damage of nervous – muscular system, patients with amputations of extremities, etc.,
- principles of physical therapy for patients with damage to the locomotory apparatus and use of orthopaedic accessories.

The student must take part in physiotherapy teams and at professional meetings.

2.3. **Board examination**

The board examination consists of the practical and theoretic part. The practical part consists of analysis of a clinical case and surgery. The theoretical part is oral.

2.4. **Title**

After completing the prescribed residency and successfully passing the board examination, the candidate obtains the title Specialist for Orthopaedic Surgery.