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Core curriculum of shoulder and elbow surgery: the proposal from the European Society for Surgery of the Shoulder and Elbow



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Level of evidence: Educational Study-Development of Curriculum **Background:** Subspecialization in orthopedic surgery has become the standard approach due to the expanding body of medical knowledge. Shoulder and elbow surgery is a growing subspecialty, but it still faces challenges with undefined training standards, unclear competency levels, and a lack of delineated professional responsibilities. To address this, the European Society for Surgery of the Shoulder and Elbow-societe european chirurgie epaule et coude (ESSSE-SECEC) aims to create a core curriculum (CC) to standardize knowledge and skills within this field.

Methods: The ESSSE-SECEC Qualification Committee developed a CC through a task force established in 2022. The curriculum is divided into 2 major sections, shoulder and elbow, further categorized into 5 areas: Basic Science, Diagnosis, Pathology, Nonoperative Treatment, and Surgical Treatment. The content was developed, reviewed, and approved by leading experts within the Society.

Results: The CC contains 72 headings and 259 specific subjects, encompassing key areas of knowledge, practical skills, and behavioral attitudes necessary for competence in shoulder and elbow surgery, offering a detailed framework for the subspecialty.

Conclusion: The ESSSE-SECEC CC establishes a foundational standard for shoulder and elbow surgeons. It provides a clear framework for knowledge and competency, supporting the future development of training and assessment tools within the subspecialty. Additionally, it aims to solidify the subspecialty's identity and serve as a key tool for competency assessments within ESSSE-SECEC and beyond.

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John Charnley introduced the concept of subspecialization to the field of orthopedic surgery in the 1960s. Since then, it has become the standard for training. This is important for both surgeons, who, due to an exponentially growing body of evidence,

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cannot maintain expertise in every aspect of their specialty, and patients, who benefit from the more comprehensive care provided by an advanced subspecialist compared to a general practitioner.^{5,7} In fact, Emery et al in 2012, Horst et al in 2013, and Cannada et al in 2015 demonstrated that more than 90% of orthopedic surgeons pursue additional subspecialty training after residency, compared with approximately 60% in the 1990s.^{2,3,5}

Shoulder and elbow surgery is an expanding subspecialty within orthopedic surgery, and in line with this trend, several strong fellowship programs have emerged. However, this increase in training opportunities has not been accompanied by a clear delineation of responsibilities and standards for shoulder and elbow surgeons. Concerns persist regarding the standard of knowledge and professional competence of surgeons, significant variation in training systems and assessments, and lack of verification that acceptable standards of competence have been achieved.^{6,7}

European legislation plays a critical role in regulating Continuing Professional Development (CPD) to ensure the mobility of the medical workforce across member states, as outlined in Directive 2013/55/EU. The directive mandates that Member States promote CPD to maintain professional competence and safe medical practices. European Federation of Orthopaedics and Traumatology (EFORT), empowered by European authorities, has been entrusted with a significant responsibility to facilitate and oversee Continuing Medical Education and CPD within the field of orthopaedics and traumatology. Recognizing this, societe european chirurgie epaule et coude (SECEC) seeks to assume a similar role in advancing education and standards, specifically within the shoulder and elbow specialty across Europe.

As a Scientific Society, we aim to clarify the responsibilities and boundaries in shoulder and elbow surgery. Following the examples of other societies, we strive to establish a core curriculum (CC) for shoulder and elbow surgery. This CC is intended to guide training for both trainees and trainers and to contribute to future guidelines for assessing competency from our Society as well as other international or national societies.

A CC of shoulder and elbow surgery is necessary to establish a foundational knowledge and skills base and define the minimal level of expertise expected. This will help to delineate the boundaries and responsibilities of shoulder and elbow surgeons.

In this study, on behalf of the European Society for Surgery of the Shoulder and Elbow (ESSSE-SECEC), we present the development process and creation of a CC for shoulder and elbow surgery.

Materials and methods

To develop the CC in shoulder and elbow surgery, the ESSSE-SECEC Qualification Committee formed a task force in 2022. This task force used the work of the Turkish Spine Society¹ as a model. The task force, consisting of 10 physicians specialized in shoulder and elbow surgery, divided the CC into 2 major parts: (1) shoulder and (2) elbow.

For each part, the broad base of knowledge and skills was divided into 5 modules:

- Basic Science
- Diagnosis
- Pathology
- Nonoperative Treatment
- Surgical Treatment

Each module was further divided into subject headings according to the EFORT proposal.

For each heading, the task force defined the fields of competency, classified as knowledge (theoretical understanding), skills

(practical abilities), and attitudes (desired behavioral patterns). Each heading was assigned to a task force member for content development. These were compiled and analyzed by the task force before being reviewed by the ESSSE-SECEC Executive Committee. Following the incorporation of feedback, the CC was reviewed and approved by Dr. Gilles Walch.

Results

The shoulder module was divided into 36 headings: 5 for Basic Science, 4 for Diagnosis, 13 for Pathology, 5 for Nonoperative Treatment, and 9 for Surgical Treatment. These headings were further divided into 135 specific subjects: 16 for Basic Science, 15 for Diagnosis, 51 for Pathology, 15 for Nonoperative Treatment, and 38 for Surgical Treatment.

The elbow modules were divided into 36 headings: 5 for Basic Science, 4 for Diagnosis, 13 for Pathology, 5 for Nonoperative Treatment, and 9 for Surgical Treatment. These headings were further divided into 124 specific subjects: 14 for Basic Science, 15 for Diagnosis, 43 for Pathology, 15 for Nonoperative Treatment, and 37 for Surgical Treatment. The developed CC is attached in Appendices 2 and 3. An index is attached in Appendix 1.

Discussion

This CC aims to advance knowledge in the shoulder and elbow field and improve the skills of its practitioners. By providing guidance, the CC will ensure that future shoulder and elbow surgeons have a curriculum that guarantees a basis of safety and competency according to ESSSE-SECEC standards. We aim to promote the development of essential competencies and improve overall clinical performance in this specialty. Competencies encompass specific knowledge, skills, and attitudes necessary for surgeons to perform effectively and meet professional standards.

In alignment with European legislation, EFORT has been granted the authority to oversee Continuing Medical Education/CPD in orthopedics and traumatology. SECEC aims to take on a similar role, focusing on establishing and upholding educational standards within the shoulder and elbow specialty. By actively contributing to the advancement of CPD, SECEC seeks to ensure that professionals remain at the forefront of medical knowledge and practices, ultimately enhancing patient outcomes in this field.

This article presents the ESSSE-SECEC CC for shoulder and elbow surgery along with the methodology used in its development. This CC was developed by a task force appointed by the ESSSE-SECEC Qualification Committee specifically for this purpose.

The CC was divided into 5 areas: Basic Science, Diagnosis, Pathology, Nonoperative Treatment, and Surgical Treatment, with subsequent divisions into 72 headings and 259 specific subjects. Levels of knowledge, skills, and attitudes were defined for each subject.

This CC is unique compared to those from other shoulder and elbow societies, such as the American Shoulder and Elbow Surgeons, and is based on the methodology of the British Orthopaedic Association, which was later revised by the Turkish Spine Society when creating their CC in spinal surgery. The foundation was based on the structure provided by EFORT.

Unlike other CCs,⁵ we chose not to define entry and exit levels for knowledge, skills, and attitudes, as these can be arbitrary when evaluating competencies. If evaluation and grading are necessary, a separate tool, such as an examination, will be created for that purpose.

We acknowledge the limitations of this CC, as it represents the view of the task force appointed by the ESSSE-SECEC Qualification Committee. However, this committee included expert surgeons and

was open to extensive discussion. Additionally, it is challenging to thoroughly validate the methodology and the CC itself in the near future. Therefore, some adjustments may be needed during its application.

This ESSSE-SECEC proposal should be evaluated by an oversight task force created by ESSSE-SECEC for this purpose. Adaptations and changes can be made in the future if deemed necessary. This should be seen as the beginning of a dynamic process where future needs will guide re-evaluation and modifications.

With this CC, we aim to provide a foundational base and standard identity for shoulder and elbow surgeons, help define the necessary competencies for establishing shoulder and elbow surgery as a subspecialty in orthopedics, and serve as a tool for evaluating future applicants to the degree of shoulder and elbow surgeon recognized by ESSSE-SECEC.

Conclusion

The ESSSE-SECEC CC establishes a comprehensive and structured framework for shoulder and elbow surgery training, addressing the need for standardized competencies in this growing subspecialty. By outlining essential knowledge, skills, and attitudes, the curriculum supports both trainees and trainers, contributing to an effective and high-quality clinical practice. Although future refinements may be necessary, this curriculum serves as a foundational tool for the development of shoulder and elbow surgeons, reinforcing the identity of the subspecialty and ensuring adherence to high professional standards.

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Supplementary data

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	OVERVIEW				
Anatomical Area	Patient Group	Differentiated in Diagnosis	Pathology	Differentiated Non-operative Therapy	
• Shoulder • Elbow	 Pediatric Adolescent Adult Geriatric 	 Imaging methods Specialist laboratory medicine Puncture and biopsy Investigation techniques 	 Infection Nerve pathology Tumors Sports injuries Trauma Developmental disorders Inherent Growth associated Caused by medical interventions Inflammatory Systematic diseases Caused by bone metabolism Degenerative 	 Physical therapy (manual therapy, ergo therapy, etc.) Immobilization Orthoses, prostheses, etc. Pain relief therapy Non-operative fracture treatment 	
Differentiated Operative Therapy	Basic Science				
ArthroscopyReconstructive proceduresOsteotomies	AnatomyApproachesBiomechanicsGenetics				
 Osteosyntheses Resections Arthroplasty Soft Tissues (Tendons/Nerves /Vessels) Amputations 	• Embryology				

• Arthrodesis

SHOULDER BASIC SCIENCE				
Anatomy	Biomechanics	Surgical approaches	Embryology/ Growth	Genetic
• Functional anatomy of the glenohumeral joint • Functional anatomy of the rotator cuff and LHB • Functional anatomy of the subacromial space • Functional anatomy of the clavicle and AC & SC joint	Basic biomechanics Shoulder kinematics Glenohumeral stability	 approaches Arthroscopic portals and approaches Deltopectoral approach Superolateral approach Posterior approach Combined approaches 	• Glenohumeral embryology	• Clinical genetics
 Anatomy of the proximal humerus Anatomy of the scapula 				

ELBOW BASIC SCIENCE					
Anatomy	Biomechanics	Surgical approaches	Embryology/ Growth		
 Functional anatomy of the elbow joint Functional anatomy of the elbow stabilizers Functional anatomy of the forearm 	 Basic biomechanics Elbow kinematics Elbow stability 	 Arthroscopic portals and approaches Lateral approach Medial approach Dorsal approach Combined approaches Ventral approach 	• Elbow embryology		

SHOULDER DIAGNOSTICS						
Imaging	Laboratory medicine	Puncture and Biopsy	Investigation techniques			
 Sonographic 	Blood parameters	Histology	• Arthroscopy			
• Nuclear medicine	Blood cultures	• Synovia analysis	 Nanoscope 			
• Radiological		 Microbiology 	• Open surgical			
• MRI/ MR			exploration			
Arthrography						
• CT/ CT Arthrography						
• DEXA						
 Scintigraphy 						

ELBOW DIAGNOSTICS					
Imaging	Laboratory medicine	Puncture and Biopsy	Investigation techniques		
• Sonographic	Blood parameters	Histology	Arthroscopy		
• Nuclear medicine	Blood cultures	• Synovia analysis	• Nanoscope		
 Radiological 		Microbiology	• Open surgical		
• MRI/ MR			exploration		
Arthrography					
• CT/ CT Arthrography					
• DEXA					

SHOULDER PATHOLOGIES				
Infection	Nerve Pathology	Tumors	Sports Injuries	Trauma
 Primary/Seconda ry empyema Prosthetic infection Infection of osteosynthesis Osteomyelitis 	 Parsonage- Turner syndrome Cervical spine pathology Plexus brachialis lesion Compression N. suprascapular Axillary nerve damage 	 Osteoid osteoma Primary malignant tumors Metastatic cancer Benign soft tissue lesions Enchondroma Osteosarcoma NOF 	 Anterior instability Posterior instability SLAP lesions Chondral lesion PSGI Biceps pathologies AC joint injuries Friedrich's disease Weightlifters shoulder Muscle/tendon injuries SC joint injuries 	 Proximal humerus fractures Fractures dislocations Glenoid fractures Scapula fractures Clavicle fractures
Developmental Disorders	Inherent/ Growth associated	Caused by medical interventions	Inflammatory/ Systemic diseases/ Bone metabolism	Degenerative
Multidirectional	• Dysplasia	• Chondral lesion	Rheumatoid	• Osteoarthritis
instability	• Stiffness	Infection	diseases	 Loose bodies
• Erb palsy	 Osteochondrosis 	 Osteonecrosis 	• PVNS	• Stiffness
• Scapula alata	dissecans	• Non-unions	• Synovitis	Chondromalacia
Scapula dyskinesia			• Bursitis	

ELBOW PATHOLOGIES					
Infection	Nerve Pathology	Tumors	Sports Injuries	Trauma	
 Primary/secondar y empyema Prosthetic infection Infection of osteosynthesis 	 Ulnar nerve syndrome Snypping ulnaris syndrome Radial tunnel syndrome Pronator teres syndrome 	 Osteoid osteoma Primary malignant tumors Metastatic cancer Benign soft tissue lesions 	 Ligamentous dislocation Chronic valgus instability Osteochondral lesion Medial epicondylitis Lateral epicondylitis 	 Radial head fracture Proximal ulna fractures Distal humerus fractures Isolated coronoid fracture / PMRI Terrible triad Monteggia Essex-Lopresti 	
Developmental Disorders	Inherent/ Growth associated	Caused by medical interventions	Inflammatory/ Systemic diseases/ Bone metabolism	Degenerative	
Chronic radial head dislocationCubitus varus	 Dysplasia Varus/valgus malalginement Radioulnar synostosis Osetochondrosis dissecans 	Condral lesionsInfectionOsteonecrosis	Rheumatoid diseasesPVNSBursitis	OsteoarthritisLoose bodiesStiffness	

SHOULDER NON-OPERATIVE					
Physical Therapy	Immobilization/ Orthoses, Prosthesis etc.	Pain Relief Therapy	Non-operative fracture treatment		
 Physiotherapy 	• Splints	• Systemic pain therapy	 Immobilization 		
• Ergotherapy	• Orthoses	(oral)	 Physiotherapy 		
• Massage	• Casts	• Systemic pain therapy			
 Manual therapy 	• Braces	(intravenous)			
• Lymph drainage					
		• Pain catheters			

ELBOW NON-OPERATIVE					
Physical Therapy	Pain Relief Therapy	Non-operative fracture treatment			
 Physiotherapy 	• Splints	• Systemic pain therapy	Immobilization		
• Ergotherapy	• Orthoses	(oral)	 Physiotherapy 		
• Massage	• Casts	• Systemic pain therapy			
 Manual therapy 	• Braces	(intravenous)			
• Lymph drainage					
		• Pain catheters			

	SHOULDER OPERATIVE				
Arthroscopy	Reconstructive procedures	Osteotomies	Osteosyntheses	Resections	
 Diagnostic arthroscopy Ligament repair Tendon repair Removal of loose bodies Cartilage treatment Removal of osteophytes Arthrolysis Synovectomy Fracture 	 Open fracture treatment Open ligament repair Open tendon repair Open stabilization procedures Open arthrolysis 	Corretive osteotomie prox. humerus Corretive osteotomie dist. humerus Corrective osteotomy glenoid	 Proximal humerus fractures Glenoid fractures Scapula fractures Clavicle fractures Dislocation fractures 	• AC joint resection • SC joint resection • Humeral head resection	
Endoprosthetics Endoprosthetics	Soft Tissues (Tendons/Nerves/ Vessels)	Amputations	Arthrodesis		
 Anatomic Total shoulder arthroplasty Hemiarthroplasty Reverse shoulder arthroplasty Resurfacing arthroplasty Partial resurfacing arthroplasty Revision arthroplasty Allograft Prosthetic Composite Tumor prosthetics 	 Ligament repair Tendon Repair Bankart repair Capsular shift Tendon transfer 	 Arm amputation Shoulder exarticulation 4-Quarter Amputation 	• Glenohumeral arthrodesis		

	ELBOW OPERATIVE				
Arthroscopy	Reconstructive procedures	Osteotomies	Osteosyntheses	Resections	
 Diagnostic arthroscopy Ligament repair Tendon repair Removal of loose bodies Cartilage treatment Removal of osteophytes Arthrolysis Synovectomy Fracture treatment 	 Open fracture treatment Open ligament repair Open tendon repair Open stabilization procedures Open arthrolysis 	Corretive osteotomie humerus Corretive osteotomie ulna Corrective osteotomy radius	 Distal humerus fractures Ulnar fractures Radius fractures Fractures dislocations Complex elbow fractures 	• Joint resection • Radial head resection	
Endoprosthetics	Soft Tissues (Tendons/Nerves/ Vessels)	Amputations	Arthrodesis		
• Total elbow	• Direct ligament	• Forearm	• Elbow arthrodesis		
arthroplastyHemiarthroplasty	repair • Ligment	• Elbow	armrodesis		
Radial head replacementInterposition arthropöasty	 reconstruction Internal bracing Direct tendon repair Tendon transfer 	exarticulationDistal humerus amputation			

	BASIC LEARNING OBJECTIVES - SHOULDER				
	Knowledge	Skill	Attitude	Key Words	
		1. Basic Science			
1.1 Anatomy					
Functional anatomy of the glenohumeral joint	Describes the detailed anatomy and functional anatomy of the glenohumeral joint. Describes the localization, function and structure of the cartilage, capsule, ligaments and labrum. Special emphasis shall be laid on the neuro-vascular anatomy around the glenohumeral joint.	Expects the surgeon to understand the functional anatomy of the glenohumeral joint to treat conditions accordingly.	Appreciates the high relevance of profound understanding and knowledge of glenohumeral anatomy for proper diagnostics and nonoperative as well as operative treatment of different pathologies.	Shoulder joint Glenohumeral joint Functional anatomy	
Functional anatomy of the rotator cuff (RC) and long head of biceps (LHB)	Describes the detailed anatomy and functional anatomy of the RC muscles and tendons as well as the muscle and tendon of the LHB. Describes the localization, function and structure of the RC and LHB.	Expects the surgeon to understand the functional anatomy of the RC & LHB to treat conditions accordingly.	Appreciates the high relevance of profound understanding and knowledge of RC & LHB anatomy for proper diagnostics and conservative as well as operative treatment of different pathologies.	Rotator cuff Long head of biceps Functional anatomy	
Functional anatomy of the subacromial space	Describes the detailed anatomy and functional anatomy of the subacromial space with its structures. Describes the localization, function and structure of the subacromial space.	Expects the surgeon to understand the functional anatomy of the subacromial space to treat conditions accordingly.	Appreciates the high relevance of profound understanding and knowledge of the subacromial space anatomy for proper diagnostics and conservative as well as operative treatment of different pathologies.	Subacromial space Bursa	

Functional anatomy of the clavicle and acromioclavicular (AC) & sternoclavicular (SC) joint	Describes the detailed anatomy and functional anatomy of the clavicle with its SC and AC joints. Describes the localization, function and structure of the clavicle, SC and AC joint.	Expects the surgeon to understand the functional anatomy of the clavicle, SC & AC joint to treat conditions accordingly.	Appreciates the high relevance of profound understanding and knowledge of the clavicle, SC and AC joint anatomy for proper diagnostics and conservative as well as operative treatment of different pathologies.	Subacromial Space Acromion Bursa Functional anatomy
Anatomy of the proximal humerus	Describes the detailed bony and functional anatomy of the proximal humerus. Describes the localization, function and structure of the proximal humerus.	Expects the surgeon to understand the functional anatomy of the proximal humerus to treat conditions accordingly.	Appreciates the high relevance of profound understanding and knowledge of the anatomy of the proximal humerus for proper diagnostics and conservative as well as operative treatment of different pathologies.	Proximal humerus Humeral head Tuberosities Anatomy
Anatomy of the scapula	Describes the detailed bony and functional anatomy of the scapula. Describes the localization, function and structure of the scapula.	Expects the surgeon to understand the functional anatomy of the scapula to treat conditions accordingly.	Appreciates the high relevance of profound understanding and knowledge of the anatomy of the scapula for proper diagnostics and conservative as well as operative treatment of different pathologies.	Scapula Glenoid Anatomy Structure
1.2 Biomechanics	lm 1 :			In:
Basic biomechanics	Teaches basic biomechanics of the glenohumeral joint with all its surrounding structures as illustrated in 1.1.	Expects the surgeon to understand the basic biomechanics of the shoulder joint and its structures as illustrated in 1.1 and to transfer this	Appreciates the high relevance of profound understanding and knowledge of shoulder biomechanics for proper diagnostics and	Biomechanics shoulder Movement shoulder Testing shoulder

		knowledge into patient treatment.	treatment of shoulder pathologies.	
Shoulder kinematics	Teaches kinematics of the glenohumeral joint with all its surrounding structures as illustrated in 1.1.	Expects the surgeon to understand the kinematics of the shoulder joint and its structures as illustrated in 1.1 and to transfer this knowledge into patient treatment.	Appreciates the high relevance of profound understanding and knowledge of shoulder kinematics for proper diagnostics and treatment of shoulder pathologies.	Biomechanics shoulder Movement shoulder Testing shoulder
Glenohumeral stability	Teaches the biomechanical principles of glenohumeral stability.	Expects the surgeon to understand the principles of shoulder joint stability and to transfer this knowledge into patient treatment.	Appreciates the high relevance of profound understanding and knowledge of glenohumeral stability for proper diagnostics and treatment of shoulder pathologies.	Shoulder stability Glenohumeral stability Joint congruence
1.3 Surgical approa	iches			
Arthroscopic portals and approaches	Has detailed knowledge of the arthroscopic portals and approaches to the shoulder joint, in a step-by-step sequence, with special respect for the position and course of the major neuro-vascular structures at the shoulder. Teaches the surgeon the possibilities and limitations of the approaches.	Expects the surgeon to be able to apply basic and profound knowledge of arthroscopic portals and approaches to the treatment of shoulder pathologies.	Appreciates the high relevance of profound understanding and knowledge of shoulder surgical approaches for proper surgical treatment of shoulder pathologies.	Arthroscopy shoulder Arthroscopic approach shoulder Portal arthroscopy shoulder

Deltopectoral approach	Has detailed knowledge of the deltopectoral approach to the shoulder joint, in a step-by-step sequence, with special respect for the position and course of the major neuro-vascular structures at the shoulder. Teaches the surgeon the possibilities and limitations of the approach.	Expects the surgeon to be able to apply basic and profound knowledge of deltopectoral approaches to the treatment of shoulder pathologies.	Appreciates the high relevance of profound understanding and knowledge of shoulder surgical approaches for proper surgical treatment of shoulder pathologies.	Deltopectoral approach Cephalic vein Deltoid muscle Pectoralis muscle
Superolateral approach	Has detailed knowledge of the superolateral approach to the shoulder joint, in a step-by-step sequence, with special respect for the position and course of the major neuro-vascular structures at the shoulder. Teaches the surgeon the possibilities and limitations of the approach.	Expects the surgeon to be able to apply basic and profound knowledge of super-lateral approaches to the treatment of shoulder pathologies.	Appreciates the high relevance of profound understanding and knowledge of shoulder surgical approaches for proper surgical treatment of shoulder pathologies.	Open approach shoulder Transdeltoidal approach Superior-lateral approach shoulder
Posterior approaches	Has detailed knowledge of posterior approaches to the shoulder joint, in a step-by-step sequence, with special respect for the position and course of the major neuro-vascular structures at the shoulder. Teaches the surgeon the possibilities and limitations of the approaches.	Expects the surgeon to be able to apply basic and profound knowledge of posterior approaches to the treatment of shoulder pathologies.	Appreciates the high relevance of profound understanding and knowledge of shoulder surgical approaches for proper surgical treatment of shoulder pathologies.	Posterior approach shoulder Delta split Codman McWhorter

Combined	Has detailed	Expects the	Appreciates the	Approaches
approaches	knowledge of	surgeon to be able	high relevance of	shoulder
	combined	to	profound	Dissection
	approaches to the	apply basic and	understanding and	shoulder
	shoulder joint, in a	profound	knowledge of	Opening shoulder
	step-by-step	knowledge of	shoulder surgical	
	sequence, with	combined	approaches	
	special respect for	approaches to the	for proper surgical	
	the position and	treatment of	treatment of	
	course of the major	shoulder	shoulder	
	neuro-vascular	pathologies.	pathologies.	
	structures at the			
	shoulder. Teaches			
	the surgeon the			
	possibilities and			
	limitations of the			
	approach.			

1.4 Embryology/Growth				
Glenohumeral embryology	Teaches basic and detailed knowledge on glenohumeral embryology concerning shoulder pathologies.	Expects the surgeon to understand the principles of shoulder embryology and to transfer this knowledge into patient treatment.	Appreciates the high relevance of profound understanding and knowledge of embryology associated shoulder pathology	Embryology shoulder joint Natural history shoulder Glenohumeral embryology
1.5 Genetics				
Clinical genetics	Teaches basic and detailed knowledge on clinical genetics of shoulder pathologies.	Expects the surgeon to understand the principles of clinical genetics of shoulder pathologies and to transfer this knowledge into patient treatment.	Appreciates the high relevance of profound understanding and knowledge of clinical genetics of shoulder pathologies.	Genetics shoulder pathologies Gene defect shoulder
		2. Diagnostics		
2.1 Imaging				
Sonography/ Ultrasound	Teaches basic and detailed knowledge of ultrasound and its application in the diagnostics and treatment of shoulder pathologies. Key structures: • Rotator cuff tendons and muscles • Long head of biceps • Subacromial space • Glenohumeral joint • AC joint • SC joint	Expects the surgeon to be able to display the mentioned key structures via ultrasound and to be able to differentiate physiologic and pathologic findings.	Appreciates the high relevance of profound understanding and knowledge of shoulder ultrasound investigations.	Ultrasound Anatomical landmarks Shoulder diagnostics
Nuclear medicine	Teaches basic and detailed knowledge basics of nuclear medicine and its application in the diagnostics and treatment of	Expects the surgeon to be able to understand the mentioned key structures and to be able to differentiate	Appreciates the high relevance of profound understanding and knowledge of nuclear medicine for diagnostics and	Bone Scintigraphy Tumors Shoulder Arthroplasty Implant Loosening

	shoulder pathologies.	physiologic and pathologic findings.	treatment of shoulder pathologies.	
MRI/ MR Arthrography	Teaches basic and detailed knowledge of MRI and MR arthrography and its application in the diagnostics and treatment of shoulder pathologies.	Expects the surgeon to be able to understand the mentioned key structures in MRI and to be able to differentiate physiologic and pathologic findings.	Appreciates the high relevance of profound understanding and knowledge of MRI and MR arthrography for diagnostics and treatment of shoulder pathologies.	MRI MR Arthrography Inflammation Rotator cuff
CT/ CT Arthrography	Teaches basic and detailed knowledge on the theoretical basics of CT and CT arthrography and its application in the diagnostics and treatment of shoulder pathologies.	Expects the surgeon to be able to understand the mentioned key structures in CT and to be able to differentiate physiologic and pathologic findings.	Appreciates the high relevance of profound understanding and knowledge of CT and CT arthrography for diagnostics and treatment of shoulder pathologies.	CT CT Arthrography Bone Fracture
DEXA	Teaches basic and detailed knowledge on the theoretical basics of bone density measurements and its application in the diagnostics and treatment of shoulder pathologies.	Expects the surgeon to be able to understand the mentioned bone structures by using DEXA and to be able to differentiate physiologic and pathologic findings.	Appreciates the high relevance of profound understanding and knowledge of bone density measurements for diagnostics and treatment of shoulder pathologies.	Bone mineral density Children and adolescents Dual-energy X-ray absorptiometry
Scintigraphy	Teaches basic and detailed knowledge basics of scintigraphy and its application in the diagnostics and treatment of shoulder pathologies.	Expects the surgeon to be able to understand the mentioned key structures and to be able to differentiate physiologic and pathologic findings.	Appreciates the high relevance of profound understanding and knowledge of nuclear scintigraphy for diagnostics and treatment of shoulder pathologies.	Bone Scintigraphy Tumors Shoulder Arthroplasty Implant Loosening

2.2 Laboratory Me	dicine			
Blood parameters	Teaches basic and detailed knowledge on the theoretical basics of blood parameters and its application in the diagnostics and treatment of shoulder pathologies. • CRP • WBC • PCT • IL-6 • Rheumatoid factors • Anti-CCP • ESR	Expects the surgeon to be able to understand the mentioned blood parameters and to be able to differentiate physiologic and pathologic findings.	Appreciates the high relevance of profound understanding and knowledge of blood parameters for diagnostics and treatment of elbow pathologies.	CRP Cytokine ESR Inflammatory marker Rheumatic disease WBC
Blood cultures	Lists the possibilities and value of blood cultures in the diagnosis of systemic infections accompanying shoulder pathologies.	Expects the surgeon to be able to understand the results of the mentioned blood cultures and to be able to differentiate physiologic and pathologic findings.	Appreciates the high relevance of profound understanding and knowledge of blood cultures for diagnostics and treatment of systemic infections accompanying shoulder pathologies.	Microbiology Resistance Organism Antibiotics Evasion
2.3 Puncture and b	iopsy			
Histology	Teaches the basic knowledge of histologic findings for the identification of shoulder pathologies in differentiating infectious and inflammatory diseases.	Expects the surgeon to be able to gather the relevant samples via open, miniopen and minimally invasive techniques while complying with necessary rules of hygiene and prevention of infection.	Appreciates the high relevance of profound understanding and knowledge of histology for diagnostics and treatment of systemic infections accompanying shoulder pathologies.	Histology Histopathology Synovium Sectioning
Synovia analysis	Teaches the basic knowledge of the use of synovia analysis for the identification of	Expects the surgeon to be able to gather the relevant samples via open, mini-	Appreciates the high relevance of synovia analysis for diagnostics and treatment of	Synovium Analysis Inflammation Rheumatic disease

	Τ	Τ .	T	1
	shoulder pathologies, in	open and	infectious and	
	1 0	minimally invasive techniques while	inflammatory shoulder	
	differentiating infectious and	<u> </u>	pathologies.	
		complying with	paulologies.	
	inflammatory diseases.	necessary rules of hygiene and		
	uiseases.	prevention of		
		infection.		
Microbiology	Lists the	Expects the	Appreciates the	Microbiology
Wherobiology	possibilities and	surgeon to be able	high relevance of	Resistance
	limitations of the	to gather the	microbiology for	Organism
	essential diagnostic	relevant samples	diagnosis of	Antibiotics
	tools of	via open, mini-	pathogens and	Antiblotics
	microbiology in	open and	antibiotic	
	pathologies around	minimally invasive	resistance in the	
	the shoulder joint.	techniques while	treatment of	
	ano sinounder joint.	complying with	infectious shoulder	
		necessary rules of	pathologies.	
		hygiene and	Paulio10gios.	
		prevention of		
		infection.		
2.4 Investigation Te	chniques			
Arthroscopy	Teaches the	Expects the	Appreciates the	Shoulder
	possibilities and	surgeon to be able	relevance of	Arthroscopy
	limitations of	to perform	diagnostic	Diagnosis
	arthroscopy as a	diagnostic shoulder	arthroscopy and	Visualization
	minimally invasive	arthroscopy while	the appropriate	Hygiene
	diagnostic tool for	respecting the	treatment for	, 6
	shoulder	complex anatomy	shoulder	
	pathologies. The	of the shoulder	pathologies.	
	surgeon is taught	joint and its		
	how to respect the	surrounding neuro-		
	critical role of	vascular structures.		
	sterility and			
	hygiene when			
	applying			
	arthroscopy to the			
	shoulder joint.			
Nanoscope	Teaches the	Expects the	Appreciates the	Shoulder
	possibilities and	surgeon to be able	diagnostic	Nanoscope
	limitations of the	to perform	relevance of the	Diagnosis
	nanoscope as a	diagnostic shoulder	nanoscope for	Visualization
	minimally invasive	exploration by	shoulder	Hygiene
	diagnostic tool for	using a nanoscope	pathologies.	
	shoulder	while respecting		
	pathologies. The	the complex		
	surgeon is taught how to respect the	anatomy of the		
	critical role of	shoulder joint and its surrounding		
	sterility and	neuro-vascular		
	hygiene when	structures.		
	ingerence when	sa actares.		

On an surgical	applying arthroscopy to the shoulder joint. Teaches the	Expects the	Approximate the	Shoulder
Open surgical exploration	possibilities and limitations of open surgical exploration as a diagnostic tool for shoulder pathologies. The surgeon is taught how to respect the critical role of sterility and hygiene when applying arthroscopy to the shoulder joint.	surgeon to be able to perform open diagnostic shoulder exploration while respecting the complex anatomy of the shoulder joint and its surrounding neuro-vascular structures.	Appreciates the relevance of open diagnostic surgical exploration and the appropriate treatment for shoulder pathologies.	Open surgical exploration Diagnosis Visualization Hygiene
	3.	. Shoulder Pathologi	es	
3.1 Infections				
Primary/Secondary Empyema	Teaches the epidemiology, etiology and pathobiomechanics of the primary/secondary empyema. Lists the diagnostic algorithms of clinical and imaging investigations assessing infections (primary and secondary). Lists the exams and culture analysis needed for identification of shoulder infection. Knows the indications for non-operative and operative treatment according to the available literature.	Expects the surgeon to be able to treat the empyema in the early phase and afterwards. Expects the trainee to perform arthroscopic and open surgical approaches and procedures like articular debridement, capsular release, synovialectomy and other soft tissue procedures.	Appreciates the relevance of primary and secondary empyema, the necessity for proper diagnostics and therefore adequate indications for treatment.	Infection shoulder Glenohumeral infection Empyema shoulder Pus shoulder

Prosthetic	Teaches the	Expects the	Appreciates the	Periprosthetic
Infection	epidemiology,	surgeon to be able	relevance of	infection shoulder
miccuon	etiology and	to treat	periprosthetic	PPI
		periprosthetic	infection, the	Revision shoulder
	pathobiomechanics	1 1	· ·	
	of infections	infections in the	necessity for	arthroplasty
	around the	early phase and	proper diagnostics	Infected shoulder
	prosthesis.	afterwards	and therewith	replacement
	Lists the diagnostic	conservatively as	adequate	
	algorithms of	well as operatively.	indications for	
	clinical, laboratory	Expects the trainee	treatment.	
	and imaging	to be able to		
	investigations	supervise non-		
	assessing	operative treatment		
	periprosthetic	- if indicated.		
	infections (acute	Expects the trainee		
	and chronic). Lists	to perform surgical		
	the exams and	approaches and		
	culture analysis	procedures like		
	needed to identify	Debridement,		
	the pathogen	Antibiotics, and		
	microorganism of	Implant Retention		
	the infection.	(DAIR), capsular		
	Knows the	release,		
	indications and the	synovialectomy,		
		, ,		
	time for operative	implant removal,		
	treatment, the steps	and 1 or 2-stage		
	for the surgical	revisions.		
	procedure, and the			
	devices available			
	(spacer, cement,			
	implants)			
	according to the			
	available literature.			
Infection of	Teaches the	Expects the	Appreciates the	Infection
Osteosynthesis	epidemiology,	surgeon to be able	relevance of	osteosynthesis
	etiology and	to treat the	infections around	Infection plate
	pathobiomechanics	infection around an	the synthesis, the	shoulder
	of the infection	osteosynthesis and	necessity for	Shoulder fracture
	around	afterwards	proper diagnostics	infection
	osteosynthesis.	conservatively as	and therefore	Infected nail
	Lists the diagnostic	well as operatively.	adequate	shoulder
	algorithms of	Expects the trainee	indications for	5110 0110 01
	clinical laboratory	to be able to	treatment.	
	and imaging	supervise		
	investigations	conservative		
	assessing	treatment in those		
	infections around	cases where the		
		indication exists.		
	osteosynthesis			
	(acute and	Expects the trainee		
	chronic). Lists the	to perform open		
	exams, and culture	surgical		

	analysis needed to identify the pathogen microorganism of the infection. Knows the indications and the time for operative treatment, the steps for the surgical procedure, the devices available, negative pressure wound therapy and implant change/removal according to the available literature.	approaches and procedures of tissue debridement, synovialectomy, implant removal etc.		
Osteomyelitis	Teaches the epidemiology, etiology and pathobiomechanics of osteomyelitis. Lists the diagnostic algorithms of clinical laboratory and imaging investigations assessing infections (acute and chronic). Lists the exams, and culture analysis needed to identify the pathogen microorganism of the osteomyelitis. Knows the indications and the time for operative treatment, the steps for the surgical procedure, the devices available, and negative pressure wound therapy according to the available literature.	Expects the surgeon to be able to treat the infection in the bone and afterwards conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment in those cases where the indication exists. Expects the trainee to perform open surgical approaches and procedures of tissue debridement, synovialectomy and other soft and bone tissue procedures.	Appreciates the relevance of infection in bone osteomyelitis, the necessity for proper diagnostics and therefore adequate indications for treatment.	Osteomyelitis shoulder joint Osteomyelitis humerus Osteomyelitis scapula

3.2 Nerve Pathologies				
Parsonage Turner Syndrome	Explains the relevant background of Parsonage Turner syndrome, looking into etiology and pathophysiology, including possible etiologic triggers (autoimmune, biomechanical, inflammatory) and risk factors (infections, immunizations, stress, drugs, iatrogenic). Familiar with the typical clinical course of this syndrome. Comfortable with the differential diagnosis (cervical spine, rotator cuff, nerve entrapment syndromes) and associated conditions. Knowledge of the various relevant complementary studies needed for diagnosis, including imaging studies and neurophysiologic exams.	Expects the surgeon to be comfortable with the physical exam of the patient with this pathology, including the neurologic exam of the affected extremity. Surgeons should be familiar with the treatment course, including pain management and physical therapy, and know when to select patients without improvements that may benefit from surgical treatment, including neurolysis/neurorr haphy/nerve graft or tendon/muscle transfers.	Recognizes the importance of this syndrome in the differential diagnosis of neurological deficits of the upper limb. Understands the importance of the conservative treatment.	Parsonage Turner Syndrome Nerve compression Idiopathic brachial plexus neuropathy
Cervical Spine Pathology	The trainee is able to distinguish between spine and shoulder pathology and to identify the pathologies included in the differential diagnosis of these two anatomical regions. Teaches its correct	Trainee to be comfortable with the physical exam of the patient with cervical spine pathology, including the neurologic exam, as well as cervical and shoulder objective evaluation.	Appreciates the importance of excluding cervical pathology in the patient with shoulder complains. Comfortable with protocols for correct diagnosis and orientation of these pathologies.	Compression Diagnosis Cervical Spine pathology Nerve pathology Nucleus pulposus prolapse Disc herniation

	diagnosis, including physical examination, complementary exams and treatment possibilities.	Surgeon should be able to identify and apply diagnosis and conservative treatment protocols for patients with cervical spine pathology.		
Plexus brachialis lesion	Lists the possible causes (obstetric, traumatic, inflammatory, idiopathic, transient) for brachial plexus injuries, and is able to identify the different involvement patterns. Teaches its correct diagnosis and treatment possibilities and how to differentiate it from other nerve syndromes.	Should be familiar with nerve recovering physiology and timing, and conservative treatment protocols.	Understands the relevance of brachial plexus injuries and thorough diagnostic and therapeutic protocols for the correct approach to these lesions.	Decompression Pronator teres syndrome Nerve compression Nerve pathology Plexus lesion Erb palsy
Compression suprascapular nerve	Lists the multitude of causes for suprascapular nerve compression and differentiates it according to the location of compression. Explains the important clinical findings in these syndromes and knows the associated pathology. Comfortable with the diagnosis and treatment protocols.	Expects the surgeon to be able to perform decompression of the suprascapular nerve at the spinoglenoid or suprascapular notch. Able to treat concomitant shoulder pathology.	Recognizes these syndromes and respective causes, as well as their importance in patients with neurologic lesions around the shoulder girdle. Understand the importance of thorough diagnostic and therapeutic protocols for the correct diagnosis and treatment of suprascapular nerve compression.	Suprascapular nerve Spinoglenoide notch Suprascapular notch Nervus suprascapularis

Axillary Nerve Damage	Being able to clinically diagnosis an axillary nerve injury and choose the appropriate complementary studies. Understand and differentiate the possible causes of axillary nerve damage, including idiopathic, inflammatory, traumatic, compressive and iatrogenic. Being able to determine the need for conservative vs surgical treatment and being familiar with the therapeutic protocols for the correct diagnosis and treatment of these lesions.	Surgeon should be familiar with nerve recovering physiology and conservative treatment when appropriate. Expects the surgeon to be able to perform release of the quadrangular space or neurorlysis or neurorrhaphy of the axillary nerve if needed.	Appreciates the relevance of axillary nerve lesions, and of thorough surgical techniques to avoid some of these injuries.	Quadrangular space syndrome Axillary nerve injury Brachial plexus Nerve injury
Osteoid osteoma	Teaches the etiology	Expects the surgeon	Appreciates the	Osteoid osteoma
	and epidemiology of this rare benign	to be able to perform minimally	relevance of osteoid osteoma of the	Shoulder Osteoblastic tumor
	tumor. Lists the	invasive and open	shoulder, the	Neoplasia
	diagnostic modalities to	approaches to get access to the sites of	necessity for thorough diagnostics	
	differentiate it from	the lesions and how	and careful surgical	
	other lesions and other causes of non-	to remove them while preserving	techniques for treatment.	
	traumatic pain.	intact bone.	rieaunent.	
Primary malignant	Lists the rare	Expects the surgeon	Appreciates the	Malignant bone
Tumors	primary malignant	to be able to	relevance of primary	tumour shoulder
	bone tumors of the shoulder, and their	perform surgical approaches to get	malignant tumors of the shoulder, the	Tumor shoulder
	diagnostic and	access to the sites of	necessity for	
	treatment	the lesions to either	thorough diagnostics	
	algorithms.	perform a diagnostic	and careful surgical	
		biopsy or to remove	techniques for	
		the lesions while	treatment, while	
		preserving intact bone and soft	adhering to established	
		tissues.	treatment	
			algorithms.	

Metastatic cancer	Lists the possible primary malignancies that may cause metastatic disease to the shoulder area and teaches their diagnostic and treatment algorithms.	Expects the surgeon to be able to perform surgical approaches to get access to the sites of the lesions to either perform a diagnostic biopsy or to remove the lesions while preserving intact bone and soft tissues.	Appreciates the relevance of metastatic cancer of the shoulder, the necessity for thorough diagnostics and careful surgical techniques for treatment, while adhering to established treatment algorithms.	Metastasis shoulder Carcinoma Malignant tumor Shoulder joint
Benign Soft Tissue Lesions	Lists the possible benign soft tissue lesions that may be encountered on the shoulder and teaches their diagnostic and treatment algorithms.	Expects the surgeon to be able to perform surgical approaches to - if indicated - get access to the sites of the lesions to either perform a diagnostic biopsy or to remove the lesions while preserving intact bone and soft tissues.	Appreciates the relevance of benign soft tissue lesions of the shoulder, the necessity for thorough diagnostics and careful surgical techniques for treatment, while adhering to established treatment algorithms.	Benign lesion Shoulder tumor Soft tissue tumour
Enchondroma	Teaches the etiology and epidemiology of this benign shoulder tumor. Lists the diagnostic modalities to differentiate it from other lesions.	Expects the surgeon to be able to perform minimally invasive and open approaches to get access to the sites of the lesions and how to remove them while preserving intact bone.	Appreciates the relevance of enchondroma of the shoulder, the necessity for thorough diagnostics and careful surgical techniques for treatment.	Enchondroma shoulder Multiple enchondromatosis Chondrosarcoma
Osteosarcoma	Teaches the etiology and epidemiology of this rare malignant shoulder tumor. Lists the diagnostic and treatment algorithms.	Expects the surgeon to be able to perform surgical approaches to get access to the sites of the lesion to either perform a diagnostic biopsy or to remove the lesions while preserving intact bone and soft tissues.	Appreciates the relevance of osteosarcoma of the shoulder, the necessity for thorough diagnostics and careful surgical techniques for treatment, while adhering to established treatment algorithms.	Osteosarcoma shoulder Malignant bone tumour shoulder

NOF	Teaches the etiology and epidemiology of this benign shoulder tumor. Lists the diagnostic modalities to differentiate it from other lesions.	Expects the surgeon to be able to perform minimally invasive and open approaches to get access to the sites of the lesions and how to remove them while preserving intact bone.	Appreciates the relevance of non-ossifying fibroma (NOF) of the shoulder, the necessity for thorough diagnostics and careful surgical techniques for treatment.	Bening shoulder tumor Non-ossifying fibroma (NOF) Neurofibromatosis
3.4 Sports Injuries				
Anterior Dislocation - First Episode	Teaches the epidemiology, etiology and pathobiomechanics of the first episode of anterior shoulder dislocation. Lists the diagnostic algorithms of clinical and imaging investigations assessing the first episode of dislocation both before and after reduction. Knows the indications for conservative and operative treatment after the first episode of dislocation according to the available literature.	Expects the surgeon to be able to reduce anterior shoulder dislocations in the acute setting. Expects the surgeon to be able to supervise conservative treatment following the reduction of the first episode - if indicated. Expects the surgeon to perform arthroscopic and open surgical approaches and procedures to the shoulder joint to address the instability of the shoulder following the first episode of dislocation - if indicated.	Appreciates the relevance of shoulder instability after the first episode of anterior shoulder dislocation, the necessity for proper diagnostics and therefore adequate indications for treatment.	Shoulder dislocation Anterior dislocation Luxation shoulder joint Glenohumeral dislocation Shoulder instability
Anterior Dislocation - Recurrent Episodes	Teaches the epidemiology, etiology and pathobiomechanics of recurrent episodes of anterior shoulder dislocation. Lists the diagnostic algorithms of clinical and imaging investigations assessing recurrent episodes of dislocation. Evaluates both	Expects the surgeon to be able to perform arthroscopic and open surgical approaches and procedures to the shoulder joint to treat recurrent anterior shoulder dislocation - these include soft tissue procedures to the glenoid, bony stabilization	Appreciates the relevance of shoulder instability after recurrent episodes of anterior shoulder dislocation, the necessity for proper diagnostics and therewith adequate indications for treatment.	Recurrent anterior shoulder dislocation Shoulder instability Multiple dislocations shoulder

	alamatal coddi			
	glenoid and humeral soft tissue injuries,	surgeries to the glenoid (Latarjet and		
	evaluates and	free bone grafts		
	quantifies glenoid	transfers), humeral		
	and humeral bone	head reconstruction		
	loss, distinguishes	and remplissage		
	between unipolar	procedures to the		
	and bipolar injuries,	humerus. Expects		
	distinguishes	the surgeon to be		
	between on-track	able to perform		
	and off-track	arthroscopic and		
	instability. Knows	open surgical		
	the indications for	approaches to revise		
	conservative and	previous surgeries		
	operative treatment	performed to treat		
	after the recurrent	recurrent anterior		
	episodes of	shoulder dislocation		
	dislocation,	that have failed.		
	according to the			
	available literature.			
	Acknowledges the			
	importance of			
	humeral and glenoid			
	injuries in the			
	decision and risk of			
	failure for each			
	surgical procedure			
Anterior Dislocation	Teaches the	Expects the surgeon	Appreciates the	Locked anterior
- Locked Dislocation	epidemiology,	to be able to	relevance of locked	shoulder dislocation
	etiology and	perform surgical	anterior shoulder	Locked shoulder
	pathobiomechanics	approaches and	dislocation, the	Dislocation shoulder
	of locked anterior	procedures to the	necessity for proper	Missed dislocation
	shoulder dislocation	shoulder joint to	diagnostics and	shoulder
	Lists the diagnostic	treat locked anterior	therefore adequate	
	algorithms of clinical	shoulder dislocation	indications for	
	and imaging	- these include soft	treatment.	
	investigations	tissue procedures to		
	assessing locked	the glenoid or		
	anterior dislocation.	humerus, bony		
	Knows the	stabilization		
	indications for	surgeries to the		
	conservative and	glenoid, humeral		
	operative treatment	head reconstruction		
	after diagnosis of a	and shoulder		
	locked dislocation,	arthroplasty.		
	according to the			
	available literature.			
	Acknowledges the			
	importance of			
	humeral and glenoid			
	injuries in the		I	
	decision and risk of			

	failure for each			
	surgical procedure			
	Surgical procedure			
Posterior Dislocation	Teaches the	Expects the surgeon	Appreciates the	Shoulder dislocation
- First Episode	epidemiology,	to be able to reduce	relevance of	Posterior dislocation
	etiology and	posterior shoulder	shoulder instability	Luxation shoulder
	pathobiomechanics	dislocations in the	after the first	joint
	of the first episode	acute setting.	episode of anterior	Glenohumeral
	of posterior	Expects the surgeon	shoulder dislocation,	dislocation
	shoulder dislocation.	to be able to	the necessity for	Shoulder instability
	Lists the diagnostic	supervise	proper diagnostics	
	algorithms of clinical	conservative	and therefore	
	and imaging	treatment following	adequate indications	
	investigations	the reduction of the	for treatment.	
	assessing the first	first episode - if		
	episode of	indicated. Expects		
	dislocation both	the surgeon to		
	before and after	perform		
	reduction. Knows	arthroscopic and		
	the indications for	open surgical		
	conservative and	approaches and		
	operative treatment	procedures to the		
	after the first	shoulder joint to		
	episode of	address the		
	dislocation	instability of the		
	according to the	shoulder following		
	available literature.	the first episode of		
	available interaction.	dislocation - if		
		indicated.		
Posterior Dislocation	Teaches the		Appreciatos the	Pocurrent nectorier
- Recurrent Episodes	epidemiology,	Expects the surgeon to be able to	Appreciates the relevance of	Recurrent posterior shoulder dislocation
- Necurrent Episoues	etiology and	perform	shoulder instability	Shoulder instability
	pathobiomechanics	arthroscopic and	after recurrent	Multiple dislocations
	of recurrent	open surgical	episodes of anterior	shoulder
	episodes of anterior	approaches and	shoulder dislocation,	Silvuluel
	shoulder dislocation.	procedures to the	•	
		l '	the necessity for	
	Lists the diagnostic	shoulder joint to treat recurrent	proper diagnostics and therewith	
	algorithms of clinical and imaging	anterior shoulder	and therewith adequate indications	
	investigations	dislocation - these	for treatment.	
	_	include soft tissue	וטו נופמנווופוונ.	
	assessing recurrent episodes of	procedures to the		
	dislocation.	·		
	Evaluates both	glenoid, bony stabilization		
	glenoid and humeral	surgeries to the		
	soft tissue injuries,	glenoid (Latarjet and		

	г	<u> </u>	T	Т
	evaluates and	free bone grafts		
	quantifies glenoid	transfers), humeral		
	and humeral bone	head reconstruction		
	loss, distinguishes	and remplissage		
	between unipolar	procedures to the		
	and bipolar injuries,	humerus. Expects		
	distinguishes	the surgeon to be		
	between on-track	able to perform		
	and off-track	arthroscopic and		
	instability. Knows	open surgical		
	the indications for	approaches to revise		
	conservative and	previous surgeries		
	operative treatment	performed to treat		
	after the recurrent	recurrent anterior		
	episodes of	shoulder dislocation		
	dislocation,	that have failed.		
	according to the			
	available literature.			
	Acknowledges the			
	importance of			
	humeral and glenoid			
	injuries in the decision and risk of			
	failure for each			
Posterior Dislocation	surgical procedure Teaches the	Even acts the surgoon	Approxiatos the	Laskad pastariar
- Locked Dislocation		Expects the surgeon to be able to	Appreciates the relevance of locked	Locked posterior shoulder dislocation
- Locked Dislocation	epidemiology, etiology and	perform surgical	anterior shoulder	Locked shoulder
	pathobiomechanics	approaches and	dislocation, the	Dislocation shoulder
	of locked anterior	procedures to the	necessity for proper	Missed dislocation
	shoulder dislocation	shoulder joint to	diagnostics and	shoulder
	Lists the diagnostic	treat locked anterior	therefore adequate	Silouldei
	algorithms of clinical	shoulder dislocation	indications for	
	and imaging	- these include soft	treatment.	
	investigations	tissue procedures to	treatment.	
	assessing locked	the glenoid or		
	anterior dislocation.	humerus, bony		
	Knows the	stabilization		
	indications for	surgeries to the		
	conservative and	glenoid, humeral		
	operative treatment	head reconstruction		
	after diagnosis of a	and shoulder		
	locked dislocation,	arthroplasty.		
	according to the			
	available literature.			
	Acknowledges the			
	importance of			
	humeral and glenoid			
	injuries in the			
	decision and risk of			
	failure for each			
	surgical procedure.			

superior labrum perform arthroscopy shoulder SLAP	um lesion
anterior to posterior to the shoulder dysfunction affected Overl	tear 'tear
antended posterior to the shoulder aystunction uncetted Over	head
lesions and explains joint, to treat the by the SLAP lesion, Snyde	ler classification
the pathology of the the necessity for	
pathobiomechanics. labrum in particular proper diagnostics	
Teaches of the superior and therefore	
classifications such portion that is part adequate indications	
as the one by Snyder of the bicipital for treatment.	
et al. (Type I - IV). anchor perform	
Lists the diagnostic refixation of these	
algorithms of clinical structures in the	
and imaging acute setting in	
investigations, as young patients as	
well as the well as tenotomy or	
indications for tenodesis of the	
conservative and long head of biceps	
operative treatment, in the chronic setting	
according to the and depending on available literature. the age and activity	
of the patient.	
	um lesion
	al tear
, , , , , , , , , , , , , , , , , , , ,	ulder instability
l ' '	ulder dislocation
labrum lesions and open surgical the necessity for	alact dislocation
explains the approaches and proper diagnostics	
pathobiomechanics. procedures to the and there with	
Lists the diagnostic shoulder joint to adequate indications	
algorithms of clinical treat recurrent for treatment.	
and imaging anterior shoulder	
investigations, as dislocation - these	
well as the include soft tissue	
indications for procedures to the	
conservative and glenoid, bony	
operative treatment, stabilization	
according to the surgeries to the	
available literature. glenoid (Latarjet and	
free bone grafts	
transfers), humeral	
head reconstruction and remplissage	
procedures to the	
humerus. Expects	
the surgeon to be	
able to perform	
arthroscopic and	
open surgical	
approaches to revise	
previous surgeries	
performed to treat	
recurrent anterior	

		shoulder dislocation		
		that have failed.		
Postero- and	Teaches the	Evnocts the surges	Approxiates the	Labrum lesion
postero- and posteroinferior	epidemiology of	Expects the surgeon to be able to	Appreciates the relevance of	Labrum lesion Labral tear
labrum lesion	anterior- and	perform	posterior and	Shoulder instability
	anteroinferior	arthroscopic and	postero-inferior	Shoulder dislocation
	labrum lesions and	open surgical	labrum lesions and	
	explains the	approaches and	the necessity for	
	pathobiomechanics.	procedures to the	proper diagnostics	
	Lists the diagnostic	shoulder joint to	and there with	
	algorithms of clinical	treat recurrent	adequate indications	
	and imaging investigations, as	posterior shoulder dislocation - these	for treatment.	
	well as the	include soft tissue		
	indications for	procedures to the		
	conservative and	glenoid, bony		
	operative treatment,	stabilization		
	according to the	surgeries to the		
	available literature.	glenoid (free bone		
		grafts transfers), humeral head		
		reconstruction and		
		reverse-remplissage		
		procedures to the		
		humerus. Expects		
		the surgeon to be		
		able to perform		
		arthroscopic and		
		open surgical		
		approaches to revise previous surgeries		
		performed to treat		
		recurrent posterior		
		shoulder dislocation		
		that have failed.		

Chondromalacia	Defines the	Expects the surgeon	Appreciates the	Chondromalacia
humeral head	pathology with its	to be able to treat	relevance of	shoulder
2 3 232	multiple	chondral lesions	osteochondral	CAM procedure
	pathogenesis and	conservatively with	lesions of the	Osteoarthritis
	epidemiologies. Lists	physiotherapy and	humeral head and	shoulder
	the currently	injections. Expects	the necessity for	Cartilage damage
	available	the surgeon to	proper diagnostics	
	classification	perform	and there with	
	systems such as the	arthroscopic and	adequate indications	
	classifications	open surgical	for treatment.	
	according to:	approaches and		
	 Kellgren and 	procedures to the		
	Lawrence	shoulder joint to		
	Samilson and	treat chondral		
	Pietro	lesions - these		
	• Gerber	include		
	 Guyet and Allain. 	debridement, micro		
	Teaches the	fracturing,		
	treatment	chondrocyte		
	algorithms for	transplantation and		
	osteochondral	other procedures.		
	lesions and cartilage			
	wear on the humeral			
	head. Presents the			
	common indications,			
	based on the			
	present literature.			
Chondromalacia	Defines the	Expects the surgeon	Appreciates the	Chondromalacia
glenoid	pathology with its	to be able to treat	relevance of	shoulder
	multiple	chondral lesions	osteochondral	CAM procedure
	pathogenesis and	conservatively with	lesions of the	Osteoarthritis
	epidemiologies. Lists	physiotherapy and	glenoid and the	shoulder
	the currently	injections. Expects	necessity for proper	Cartilage damage
	available	the surgeon to	diagnostics and	
	classification	perform	there with adequate	
	systems such as the	arthroscopic and	indications for	
	classifications	open surgical	treatment.	
	according to:	approaches and		
	 Kellgren and 	procedures to the		
	Lawrence	shoulder joint to		
	Samilson and	treat chondral		
	Pietro	lesions - these		
	Gerber	include		
	 Guyet and Allain. 	debridement,		
	Teaches the	microfracture,		
	treatment	chondrocyte		
	algorithms for	transplantation and		
	osteochondral	other procedures.		
	lesions and cartilage			
	resions and carthage			
	wear on the glenoid.			
	_			

	1 1 1			<u> </u>
	based on the present literature.			
Posterosuperior Glenoid Impingement (PSGI)	Describes the natural course. Defines the etiology (traumaticatraumatic) Defines the symptomatology and significance. Defines the typical radiologic findings Lists conservative treatment indications. Lists surgical treatment indications. Lists possible complications and results of treatment.	Expects the surgeon to be competent in examination under anaesthesia and diagnostic arthroscopy. Recognise anatomical variations. Expects the surgeon to perform posterior labral repair and other techniques like glenoplasty or rotator cuff repair if indicated.	Appreciates the importance and challenges of diagnosis of PSGI condition. Appreciate anatomical variations in radiological imaging and arthroscopy. Appreciate surgical anatomy relevant to open techniques.	Inlet Impingement Internal Impingement Labrum lesion Impingement
Rupture of the long head of biceps (LHB)	Teaches the epidemiology of LHB ruptures and explains the pathobiomechanics of it. Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for nonoperative and operative treatment, according to the available literature.	Expects the surgeon to be able to treat ruptures of the LHB in the acute phase and afterwards. Expects the trainee to be able to supervise non-operative treatment following the acute treatment - if indicated. Expects the trainee to perform arthroscopic and open surgical approaches and procedures to the joint to address the pathology (tenodesis, removal of intraarticular LHB stump).	Appreciates the relevance of LHB ruptures, the necessity for proper diagnostics and therewith adequate indications for treatment.	Biceps rupture Popeye sign LHB rupture Rupture long head biceps

Dullan lasiana	Ta a ala a a Ala a	C	A	Dullan lasian
Pulley lesions	Teaches the	Expects the surgeon to be able to treat	Appreciates the	Pulley lesion
	epidemiology of		relevance of Pulley-	CH ligament
	Pulley lesions and	Pulley lesions in the	lesions, the	Hidden lesion
	explains the	acute phase and	necessity for proper	Long head biceps
	pathobiomechanics	afterwards. Expects	diagnostics and	
	of it. Teaches	the trainee to be	therewith adequate	
	classifications such	able to supervise	indications for	
	as the one by	conservative	treatment.	
	Habermeryer et al.	treatment following		
	(type I - IV).	the acute treatment		
	Lists the diagnostic	- if indicated.		
	algorithms of clinical	Expects the trainee		
	and imaging	to perform		
	investigations, as	arthroscopic and		
	well as the	open surgical		
	indications for	approaches and		
	conservative and	procedures to the		
	operative treatment,	joint to address the		
	according to the	pathology		
	available literature.	(tenotomy vs.		
		tenodesis).		
Tendinitis of the long	Teaches the	Expects the surgeon	Appreciates the	Sentinel sign
head of biceps (LHB)	epidemiology of LHB	to be able to treat	relevance of LHB	Hourglass biceps
	tendinitis and	LHB tendinitis in the	tendinitis, the	Long head of biceps
	explains the	acute phase and	necessity for proper	Biceps pathology
	pathobiomechanics	afterwards	diagnostics and	Tendinitis
	of it.	conservatively as	therefore adequate	Terrorities
	Lists the diagnostic	well as operatively.	indications for	
	algorithms of clinical	Expects the trainee	treatment.	
	and imaging	to be able to	diedement.	
	investigations, as	supervise non-		
	well as the	operative treatment		
	indications for	following the acute		
	conservative and	treatment - if		
	operative treatment,			
	according to the	indicated. Expects the trainee to		
	according to the available literature.			
	avaliable literature.	perform		
		arthroscopic and		
		open surgical		
		approaches and		
		procedures to the		
		AC-joint to address		
		the pathology		
		(tenotomy vs.		
		tenodesis).		

AC-Joint dislocation	Teaches the	Expects the surgeon	Appreciates the	AC dislocation
	epidemiology of AC-	to be able to treat	relevance of AC-joint	Rockwood
	joint dislocations	AC joint dislocations	dislocations, the	classification
	and explains the	in the acute phase	necessity for proper	AC joint separation
	pathobiomechanics	and afterwards	diagnostics and	, to joint oop at a tion
	of it. Teaches the	conservatively as	therefore adequate	
	classification	well as operatively.	indications for	
	according to	Expects the trainee	treatment.	
	Rockwood grade I -	to be able to		
	VI.	supervise		
	Lists the diagnostic	conservative		
	algorithms of clinical	treatment following		
	and imaging	the acute treatment		
	investigations, as	- if indicated.		
	well as the	Expects the trainee		
	indications for	to perform		
	conservative and	arthroscopic and		
	operative treatment,	open surgical		
	according to the	approaches and		
	available literature.	procedures to the		
		AC-joint to address		
		the pathology.		
AC-Joint arthritis	Teaches the	Expects the surgeon	Appreciates the	AC joint arthritis
	epidemiology of AC-	to be able to treat	relevance of AC-joint	AC pain
	joint arthritis and	AC joint arthritis in	arthritis, the	Osteophytes
	explains the	the acute phase and	necessity for proper	Mumford
	pathobiomechanics	afterwards	diagnostics and	
	of it.	conservatively as	therewith adequate	
	Lists the diagnostic	well as operatively.	indications for	
	algorithms of clinical	Expects the trainee	treatment.	
	and imaging	to be able to		
	investigations, as	supervise		
	well as the	conservative		
	indications for	treatment following		
	conservative and	the acute treatment		
	operative treatment,	- if indicated (e.g.		
	according to the	injections,		
	available literature.	physiotherapy).		
		Expects the trainee		
		to perform		
		arthroscopic and		
		open surgical		
		approaches and		
		procedures like AC-		
		joint resection		
		according to		
		Mumford or a co-		
		plaining to address		
		the pathology.		

Friedrich's disease	Teaches the	Expects the surgeon	Appreciates the	Necrosis AC joint
	epidemiology of the	to be able to treat	relevance of the	AC joint
	aseptic	the osteonecrosis of	aseptic	Aseptic
	osteonecrosis of the	the lateral clavicle in	osteonecrosis of the	osteonecrosis
	lateral clavicle and	the acute phase and	lateral clavicle, the	
	explains its	afterwards	necessity for proper	
	pathomechanism.	conservatively as	diagnostics and	
	Lists the diagnostic	well as operatively.	therefore adequate	
	algorithms of clinical	Expects the trainee	indications for	
	and imaging	to be able to	treatment.	
	investigations, as	supervise non-		
	well as the	operative treatment		
	indications for	following the acute		
	conservative and	treatment - if		
	operative treatment,	indicated. Expects		
	according to the available literature.	the trainee to		
	avanable iileralure.	perform arthroscopic and		
		open surgical		
		approaches and		
		procedures to		
		address the		
		pathology.		
Weightlifters	Teaches the	Expects the surgeon	Appreciates the	AC joint pain
shoulder	epidemiology of AC-	to be able to treat a	relevance of	Painful shoulder
	joint lesions and	weightlifter's	weightlifters'	Weightlifting
	explains the	shoulder in the	shoulder, the	shoulder
	pathobiomechanics	acute phase and	necessity for proper	
	of a weightlifter's	afterwards. Expects	diagnostics and	
	shoulder.	the trainee to be	therefore adequate	
	Lists the diagnostic	able to supervise	indications for	
	algorithms of clinical	conservative	treatment.	
	and imaging	treatment following		
	investigations, as	the acute treatment		
	well as the	- if indicated.		
	indications for	Expects the trainee		
	conservative and	to perform		
	operative treatment,	arthroscopic and		
	according to the	open surgical		
	available literature.	approaches and		
		procedures to the		
		AC-joint to address		
		the pathology.		

Muscle/ Tendon	Teaches	Expects the surgeon	Appreciates the	Muscle injury
injuries	epidemiology,	to be able to treat	relevance of muscle-	Tendon injury
Injuries	etiology and	acute muscle-	/ and tendon injuries	Rotator cuff tear
	pathobiomechanics	tendon injuries in	of the shoulder, the	Muscle edema
	of different kinds of	the acute phase and	necessity for proper	Tendon trauma
	muscle- and tendon	afterwards. Expects	diagnostics and	Muscle trauma
	injuries like rotator	the trainee to be	therewith adequate	ividecie tradina
	cuff tears, ruptures	able to supervise	indications for	
	at the myotendinous	conservative	treatment.	
	junction, muscle	treatment following	treatment.	
	fibre injuries etc.	the acute treatment		
	Lists the diagnostic	- if indicated.		
	algorithms of clinical	Expects the trainee		
	and imaging	to perform		
	investigations that	arthroscopic and		
	are necessary for the	open surgical		
	treatment	approaches and		
	algorithm. Teaches	procedures to the		
	the indications for	shoulder joint to		
	conservative and	address the muscle-/		
	operative treatment	tendon injury - if		
	according to the	indicated.		
	condition, recent	marcatea.		
	scientific knowledge			
	and the available			
	literature.			
Sternoclavicular	Teaches the	Expects the surgeon	Appreciates the	Dislocation
joint Dislocation	epidemiology of	to be able to	relevance of	Sternoclavicular
John Biolocation	ligamentous	perform surgical	sternoclavicular joint	joint
	sternoclavicular joint	approaches to the	instability after	Refixation
	dislocation and	sternoclavicular joint	sternoclavicular joint	Physiotherapy
	explains the	joint, its ligamentous	dislocation, the	Overhead
	pathobiomechanics.	stabilizers to - if	necessity for proper	0.0
	Lists the diagnostic	indicated - perform	diagnostics and	
	algorithms of clinical	refixation of these	therefore adequate	
	and imaging	structures in the	indications for	
	investigations, as	acute setting, or	treatment.	
	well as the	perform		
	indications for non-	augmentation and		
	operative and	repair in the chronic		
	operative treatment,	setting.		
	according to the			
	available literature.			
Osteochondral	Defines the	Expects the surgeon	Appreciates the	Osteochondral
Lesion SC-joint	pathology with its	to be able to	relevance of	lesions
	pathogenesis and	perform surgical	osteochondral	Osteochondritis
	epidemiology. Lists	approaches to the	lesions of the	dissecans
	the currently	sternoclavicular joint	sternoclavicular joint	Sternoclavicular
	available	to - if indicated -	the necessity for	joint
	classification	perform	proper diagnostics	Arthritis
	systems and	osteochondral	and there with	
	treatment	debridement or	adequate indications	
	algorithms for		for treatment.	
		<u> </u>	l	l .

	osteochondral lesions. Presents the common indications, based on the present literature.	cartilage repair strategies.		
Intraarticular Disc lesion	Defines the pathology with its pathogenesis and epidemiology. Lists the currently available classification systems and shows their limitations. Offers recommendations for treatment algorithms. Presents the common indications for conservative/operati ve treatment, based on the present literature.	Expects the surgeon to be able to perform minimally invasive, arthroscopic and open surgical approaches to the sternoclavicular joint to - if indicated - perform repositioning, fixation and replacement	Appreciates the relevance of intraarticular disc lesion and its implications on sternoclavicular joint biomechanics, the necessity for proper diagnostics and therewith adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation or replacement.	Fracture fixation Open reduction internal fixation Intraarticular disc Lesion Anatomy

3.5 Trauma					
Proximal Humerus	Teaches the	Expects the surgeon	Appreciates the	Proximal humerus	
Fractures	epidemiology of	to be able to treat	relevance of	fracture	
	proximal humerus	proximal humerus	proximal humerus	ORIF	
	fractures and	fractures in the	fractures, the	Surgery fracture	
	explains the	acute phase and	necessity for proper	Conservative	
	pathobiomechanics	afterwards	diagnostics and	treatment humerus	
	of it.	conservatively as	there with adequate	PHF	
	Lists the diagnostic	well as operatively.	indications for		
	algorithms of clinical	Expects the trainee	treatment.		
	and imaging	to be able to			
	investigations, as	supervise			
	well as the	conservative			
	indications for	treatment following			
	conservative and	the acute treatment			
	operative treatment	- if indicated.			
	including	Expects the trainee			
	osteosynthesis	to perform			
	(arthroscopic	arthroscopic and			
	fixation, K-wires,	open surgical			
	nailing, plating) and	approaches and			
	arthroplasty (hemi	procedures to			
	and reverse	address the			
	shoulder	pathology.			
	arthroplasty)				
	according to the				
	available literature.				
	Teaches the different				
	classifications of				
	proximal humerus				
	fractures with the				
	according treatment				
	algorithm				
	(classification of				
	Neer, AO, Hertel and				
Fracture dislocations	others). Teaches the	Expects the surgeon	Appreciates the	ORIF	
of the Proximal	epidemiology of	to be able to treat	relevance of	Reverse Arthroplasty	
Humerus	dislocation fractures	dislocation fractures	dislocation fractures	Proximal Humeral	
Tiullielus	of the proximal	of the proximal	of the proximal	Plating	
	humerus and/ or	humerus in the	humerus, the	Proximal Humeral	
	glenoid and explains	acute phase and	necessity for proper	Nailing	
	the	afterwards	diagnostics and	0	
	pathobiomechanics	operatively. Expects	there with adequate		
	of it. Lists the	the trainee to	indications for		
	diagnostic	perform	treatment.		
	algorithms of clinical	arthroscopic and			
	and imaging	open surgical			
	investigations, as	approaches and			
	well as the	procedures to			
	indications for	address the			
	conservative and	pathology.			
	operative treatment				
05050 0 0	on Shoulder and Flbow	C			

	including			
	~			
	osteosynthesis			
	(arthroscopic			
	fixation, fixation			
	with screws, nailing,			
	plating) and			
	arthroplasty			
	(hemiarthroplasty			
	and reverse			
	shoulder			
	arthroplasty)			
	according to the			
	available literature.			
	Teaches the different			
	classifications of			
	proximal humerus			
	fractures with the			
	according treatment			
	algorithm			
	(classification of			
	Neer, AO, Hertel and			
	others).			
Glenoid Fractures	Teaches the	Expects the surgeon	Appreciates the	Glenoid fractures
	epidemiology of	to be able to treat	relevance of glenoid	Conservative
	glenoid fractures	glenoid fractures in	fractures, the	treatment
	and explains the	the acute phase and	necessity for proper	Arthroscopy
	pathobiomechanics	afterwards	diagnostics and	Fixation glenoid
	of it.	conservatively as	there with adequate	Open surgery
	Lists the diagnostic	well as operatively.	indications for	
	algorithms of clinical	Expects the trainee	treatment.	
	and imaging	to be able to		
	investigations, as	supervise		
	well as the	conservative		
	indications for	treatment following		
	conservative and	the acute treatment		
	operative treatment	- if indicated.		
	including	Expects the trainee		
	osteosynthesis	to perform		
	(arthroscopic	arthroscopic and		
	fixation, fixation	open surgical		
	with screws, plating)	approaches and		
	and arthroplasty	procedures to		
	(reverse shoulder	address the		
	arthroplasty with	pathology.		
	bone grafting of the			
	glenoid - if			
	indicated) according			
	to the available			
	literature. Teaches			
	the Ideberg			
	classification with			
	the according			
	the according			

	1	<u> </u>		<u> </u>
	treatment algorithm.			
Scapula Fractures	Teaches the epidemiology of scapula fractures and explains the pathobiomechanics of it. Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for conservative and operative treatment including osteosynthesis (arthroscopic fixation, fixation with screws, plating) according to the available literature. Teaches the Ideberg classification with the according treatment algorithm.	Expects the surgeon to be able to treat scapula fractures in the acute phase and afterwards conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment following the acute treatment - if indicated. Expects the trainee to perform arthroscopic and open surgical approaches and procedures to address the pathology.	Appreciates the relevance of scapula fractures, the necessity for proper diagnostics and there with adequate indications for treatment.	Scapula fractures Nonoperative Treatment Arthroscopy Glenoid Fixation Open Surgery
Clavicle Fractures	Teaches the epidemiology of clavicle fractures and explains the pathobiomechanics of it. Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for conservative and operative treatment including osteosynthesis	Expects the surgeon to be able to treat clavicle fractures in the acute phase and afterwards conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment following the acute treatment - if indicated. Expects the trainee to perform	Appreciates the relevance of clavicle fractures, the necessity for proper diagnostics and there with adequate indications for treatment.	Clavicle fractures Nonoperative Treatment Plating Intramedullary Nails Clavicle ORIF Open surgery

	(arthroscopic fixation, fixation with tight-rope, fixation with screws/nails, plating) according to the available literature. Teaches the different classifications (Robinson, Allman, AO, Neer & Rockwood, Jaeger and others) with the according treatment algorithm.	arthroscopic and open surgical approaches and procedures to address the pathology.		
3.6 Developmental Di				
Multidirectional Instability	Teaches the aetiology of multidirectional instability including issues of collagen disorder, repetitive microtrauma and muscle patterning including Stanmore triangle. Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for conservative and operative treatment, according to the available literature.	Expects the surgeon to be able to perform conservative treatment as well as minimally invasive, arthroscopic and open surgical approaches to the unstable glenohumeral joint regarding labral repair, capsular repair & capsular repair. Awareness of revision and salvage procedures.	Appreciates the relevance of multidirectional instability, the necessity for proper diagnostics and there with adequate indications for treatment.	Shoulder instability Hyperlax shoulder Unstable shoulder
Erb Palsy	Teaches the epidemiology of Erb's palsy and risk factors e.g. obstetrical shoulder dystocia, avoidance, early identification and treatment. Understand the anatomy of the brachial plexus and relevant lesion of C5/6 and resultant deficit. Understand relevant imaging.	Expects the surgeon to appreciate the importance of qualified prolonged physiotherapy. Ability to perform an informative examination under anaesthesia & diagnostic arthroscopy. Ability to perform appropriate labral repair, and capsular repair/plication. Appreciates revision	Appreciates the relevance of Erb palsy, the necessity for proper diagnostics and there with adequate indications for treatment.	Plexus injury Upper limb injury Nerve damage

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	Understand	procedures/salvage		
	indications for	procedures.		
	interventions			
	including nerve			
	transfer,			
	subscapularis			
	lengthening and			
	latissimus transfer.			
	Understand long-			
	term sequelae and			
	treatment of			
	secondary			
	degenerative			
	conditions.			
Scapula alata	Understands	Expects the surgeon	Appreciates the	Winging scapula
2000000	common forms of	to be able to	relevance of Scapula	Serratus anterior
	scapular winging	supervise prolonged	alata, the necessity	Palsy
	and causes.	physiotherapy.	for proper	Shoulder Blade
	Understands	Ability to refer the	diagnostics and	Silvaluel blade
	common causes of	1	there with adequate	
		patient	indications for	
	medial winging (appropriately for		
	serratus weakness	neurolysis if	treatment.	
	due to long thoracic	indicated.		
	nerve palsy) and	Knowledge of		
	lateral winging (due	tendon transfer		
	to spinal accessory	options and		
	nerve palsy) and	scapulothoracic		
	other causes of	arthrodesis.		
	more global peri -			
	scapular weakness			
	due to more			
	generalised			
	muscular dystrophy			
	such as			
	fascioscapulohumer			
	al dystrophy (FSHD).			
	Understands			
	relevant			
	investigations			
	including			
	electrophysiological			
	testing, genetic			
	testing and			
	specialized			
	neurological testing.			
	Understands non-			
	operative and			
	operative			
	intervention			
	including neurolysis,			
	tendon transfer and			
	scapulothoracic			
1	arthrodesis.			

Scapula dyskinesia	Teaches the epidemiology of scapular dyskinesia and explains the pathomechanics. Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for conservative and operative treatment, according to the available literature. Understands the differences between	Expects the surgeon to be able to perform minimally invasive, arthroscopic and open surgical approaches to resolve issues causing scapular dyskinesia such as rotator cuff lesions or stiffness. In rare cases have awareness of solutions to primary scapular dyskinesia refractory to non-	Appreciates the relevance of scapula dyskinesia, the necessity for proper diagnostics and there with adequate indications for treatment.	Kibler classification Dyskinesia shoulder Dysbalance shoulder Scapulothoracic Abnormal Motion (STAM)
	primary and secondary scapular dyskinesia.	operative treatment such as scapulothoracic arthroscopy		
3.7 Inherent/ Growth				ı
Dysplasia of the glenoid	Teaches the epidemiology of glenoid dysplasia and explains the pathomechanics and Classification as the one by Walch et al Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for conservative and operative treatment, according to the available literature.	Expects the surgeon to be able to treat the dysplastic glenoid in the early phase and afterwards conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment - if indicated. Expects the trainee to perform arthroscopic and open surgical approaches and procedures like corrective osteotomies, capsular shifts and other soft tissue procedures as well as shoulder replacement surgery to address the pathology.	Appreciates the relevance of glenoid dysplasia, the necessity for proper diagnostics and therefore adequate indications for treatment.	Dysplastic glenoid Type C glenoid Bone loss glenoid

Dysplasia of the proximal humerus	Teaches the epidemiology of humeral dysplasia and explains the pathomechanics. Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for conservative and operative treatment, according to the available literature.	Expects the surgeon to be able to treat the dysplastic proximal humerus in the early phase and afterwards conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment - if indicated. Expects the trainee to perform arthroscopic and open surgical approaches and procedures like corrective osteotomies, capsular shifts and other soft tissue procedures as well as shoulder	Appreciates the relevance of humeral dysplasia, the necessity for proper diagnostics and therefore adequate indications for treatment.	Dysplastic humeral head Bone loss proximal humerus Deformity proximal humerus
Adhesive capsulitis/ Frozen shoulder	Teaches the epidemiology of adhesive capsulitis and explains the pathomechanics as well as possible risk factors. Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for conservative and operative treatment, according to the available literature.	replacement surgery to address the pathology. Expects the surgeon to be able to treat adhesive capsulitis in the early phase and afterwards conservatively. Expects the trainee to be able to supervise conservative treatment like intraarticular or oral steroid medication if indicated. Expects the trainee to perform arthroscopic procedures like arthrolysis to address the pathology.	Appreciates the relevance of adhesive capsulitis, the necessity for proper diagnostics and therefore adequate indications for treatment.	Capsulitis Shoulder Stiffness Frozen Shoulder Nonoperative Steroid Treatment

Osteochondrosis	Teaches the	Expects the surgeon	Appreciates the	Joint mouse
dissecans glenoid	epidemiology of and	to be able to treat	relevance of OD, the	Chondral lesion
(OD)	explains the	OD in the early	necessity for proper	Cartilage defect
,	pathomechanics of	phase and	diagnostics and	Arthroscopy
	OD and possible risk	afterwards	therefore adequate	Loose body
	factors.	conservatively.	indications for	,
	Lists the diagnostic	Expects the trainee	treatment.	
	algorithms of clinical	to be able to		
	and imaging	supervise		
	investigations, as	conservative		
	well as the	treatment like		
	indications for	intraarticular or oral		
	conservative and	cortisone		
	operative treatment,	medication - if		
	according to the	indicated. Expects		
	available literature.	the trainee to		
		perform		
		arthroscopic procedures like		
		arthrolysis to		
		address the		
		pathology.		
Osteochondrosis	Teaches the	Expects the surgeon	Appreciates the	Joint mouse
dissecans proximal	epidemiology of and	to be able to treat	relevance of OD, the	Chondral lesion
humerus (OD)	explains the	OD in the early	necessity for proper	Cartilage defect
	pathomechanics of	phase and	diagnostics and	Arthroscopy
	OD and possible risk	afterwards	therefore adequate	Loose body
	factors.	conservatively.	indications for	
	Lists the diagnostic	Expects the trainee	treatment.	
	algorithms of clinical	to be able to		
	and imaging	supervise		
	investigations, as well as the	conservative		
	indications for	treatment like intraarticular or oral		
	conservative and	cortisone		
	operative treatment,	medication - if		
	according to the	indicated. Expects		
	available literature.	the trainee to		
		perform		
		arthroscopic		
		procedures like		
		arthrolysis to		
		address the		
		pathology.		
3.8 Caused by medica				
Chondral lesion	Lists medical	Expects the surgeon	Appreciates the	Osteoarthritis
	interventions that	to be able to	relevance of	shoulder
	may damage the	recognize possible	cartilage damage	Loose bodies
	cartilage and may	causes of cartilage	and the necessity for	Osteophytes
	cause chondrolysis, diagnostic work-up	damage due to medical	proper intraoperative	Surgery
	to exclude other	intervention, avoid	manipulation and	
	to exclude other	ca. vericion, avoia	aparacion ana	

	pathologies, precautions, and treatment options.	them, and treat cartilage damage with joint preservation and cartilage restoration procedures or open surgical approaches.	skills to avoid them, diagnostics and therewith indications for treatment.	
Infection	Teaches the epidemiology, and etiology of postoperative infections and possible causes. Lists the diagnostic algorithms of clinical, laboratory and imaging investigations assessing postoperative infections (acute and chronic). Lists the exams, and culture analysis needed to identify the pathogen microorganism of the infection. Knows the indications and the time for operative treatment, the steps for the surgical procedure and the devices available (spacer, cement, prosthesis) according to the available literature.	Expects the surgeon to be able to treat the postoperative infection in the early phase and afterwards conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment - if indicated. Expects the trainee to perform arthroscopic and open surgical approaches and procedures articular debridement, capsular release, synovectomy and other soft tissue procedures.	Appreciates the relevance of post-op infection, the necessity for proper diagnostics and therefore adequate indications for treatment.	CRP Surgery Antibiotics Bacteria
Osteonecrosis	Lists medical interventions that may cause osteonecrosis, clinical evaluation and diagnosis, classifications and treatment options.	Expects the surgeon to be able to avoid medical interventions that may cause osteonecrosis, and perform surgical approaches for the treatment of osteonecrosis.	Appreciates the relevance of osteonecrosis, the necessity for proper diagnostics and therefore adequate indications for treatment.	Avascular necrosis Cruess classification Humeral Head Collapse Shoulder Arthroplasty

Non-Unions	Lists possible causes of fracture-non-union after conservative or operative treatment. Lists possible risk factors. Lists the diagnostic algorithms of clinical and imaging investigations. Recognizes septic non-union, precautions, and treatment options.	Expects the surgeon to be able to predict factors that may lead to non-union or septic non-union, and to be able to treat non-union.	Appreciates the relevance of non-union, the necessity for proper diagnostics and therewith adequate indications for treatment.	Pseudarthrosis Non-healing Revision surgery Infection
3.9 Inflammatory/ Sys	stemic diseases/ bone r	metabolism		
Rheumatoid diseases (RA)	Teaches the diagnostic criteria for RA as well as the pathomechanism of the disease. Explains the pharmacologic treatment of RA. Explains how the shoulder joint may be involved in this condition with its characteristics and the prognosis. Lists the indications of surgical and nonsurgical treatment.	Expects the trainee to be able to treat rheumatoid arthritic conditions of the shoulder and surrounding structures conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment - if indicated. Expects the trainee to perform arthroscopic and open procedures to address the pathology.	Appreciates the relevance of RA, the necessity for proper diagnostics and therefore adequate indications for treatment.	Rheumatoid arthritis Rheumatoid shoulder Shoulder arthroplasty Synovialitis Joint destruction
Pigmented villonodular synovitis (PVNS)	Teaches the diagnostic criteria for PVNS as well as the pathomechanism of the disease. Explains how the shoulder joint may be involved in this condition with its characteristics and the prognosis. Lists the indications of surgical and	Expects the trainee to be able to treat PVNS of the shoulder conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment - if indicated. Expects the trainee to perform arthroscopic and	Appreciates the relevance of PVNS, the necessity for proper diagnostics and therefore adequate indications for treatment.	Shoulder tumor PVNS Synovialitis Joint destruction

	noncurgical	onon procedures to		
	nonsurgical treatment.	open procedures to address the		
	u eatillelit.			
		pathology.		
Synovitis	Teaches the	Expects the trainee	Appreciates the	Synovitis
•	diagnostic criteria	to be able to treat	relevance of	Joint inflammation
	for synovitis as well	synovitis of the	synovitis, the	Joint destruction
	as the	shoulder	necessity for proper	
	pathomechanism of	conservatively as	diagnostics and	
	the disease. Explains	well as operatively.	therefore adequate	
	how the shoulder	Expects the trainee	indications for	
	joint may be	to be able to	treatment.	
	involved in this	supervise non-		
	condition with its	operative treatment		
	characteristics and	- if indicated.		
	the prognosis. Lists	Expects the trainee		
	the indications of	to perform		
	surgical and	arthroscopic and		
	nonsurgical	open procedures to		
	treatment.	address the		
		pathology.		
Bursitis	Teaches the	Expects the trainee	Appreciates the	Subacromial space
	diagnostic criteria	to be able to treat	relevance of bursitis,	Shoulder pain
	for bursitis as well as	bursitis of the	the necessity for	Subacromial
	the	shoulder	proper diagnostics	injection
	pathomechanism of	conservatively as	and therefore	
	the disease. Explains	well as operatively.	adequate indications	
	how the shoulder	Expects the trainee	for treatment.	
	joint may be	to be able to		
	involved in this	supervise		
	condition with its	conservative		
	characteristics and	treatment - if		
	the prognosis. Lists	indicated. Expects		
	the indications of	the trainee to		
	surgical and	perform		
	nonsurgical	arthroscopic and		
	treatment.	open procedures to		
		address the		
		pathology.		
3.10 Degenerative				

Osteoarthritis	Defines the pathology with its multiple pathogenesis and epidemiologies. Lists the currently available classification systems such as the classifications according to: • Kellgren and Lawrence • Samilson and Pietro • Gerber • Guyet and Allain. Teaches the treatment algorithms for osteoarthritis of the	Expects the surgeon to be able to treat osteoarthritis of the shoulder joint conservatively with physiotherapy, injections and others. Expects the surgeon to perform arthroscopic and open surgical approaches and procedures to the shoulder joint to treat the condition these include arthroscopic CAM procedures up to shoulder replacement surgery.	Appreciates the relevance of osteoarthritis of the shoulder joint and the necessity for proper diagnostics and there with adequate indications for treatment.	OA shoulder Arthroplasty shoulder joint Kellgrence and Lawrence Painful shoulder Limited ROM
Logsahadias	shoulder joint. Presents the common indications, based on the present literature.		Appropriates the	Octoparthritis
Loose bodies	Teaches the diagnostic criteria for loose bodies as well as the pathomechanism of the disease. Explains how the shoulder joint may be involved in this condition with its characteristics and the prognosis. Lists the indications of surgical and nonsurgical treatment.	Expects the trainee to be able to treat loose bodies of the shoulder conservatively as well as operatively. Expects the trainee to be able to supervise conservative treatment - if indicated. Expects the trainee to perform arthroscopic and open procedures to address the pathology.	Appreciates the relevance of loose bodies, the necessity for proper diagnostics and therewith adequate indications for treatment.	Osteoarthritis shoulder Arthroscopy Cartilage wear
Stiffness	Teaches the diagnostic criteria for shoulder stiffness based on degenerative conditions as well as the pathomechanism of the disease. Explains	Expects the trainee to be able to treat degenerative stiffness of the shoulder conservatively as well as operatively. Expects the trainee to be able to	Appreciates the relevance of degenerative stiffness, the necessity for proper diagnostics and therewith adequate indications for treatment.	Painful shoulder Frozen shoulder Adhesive capsulitis

		Ι .	T	
	how the shoulder	supervise		
	joint may be	conservative		
	involved in this	treatment - if		
	condition with its	indicated. Expects		
	characteristics and	the trainee to		
	the prognosis. Lists	perform		
	the indications of	arthroscopic and		
	surgical and	open procedures to		
	nonsurgical	address the		
	treatment.	pathology.		
Chondromalacia	Defines the	Expects the surgeon	Appreciates the	Loose bodies
humeral head	pathology with its	to be able to treat	relevance of	Osteoarthritis
	multiple	chondral lesions	osteochondral	CAM Procedure
	pathogenesis and	conservatively with	lesions of the	Shoulder
	epidemiologies. Lists	Physiotherapy and	humeral head and	arthroscopy
	the currently	Injections. Expects	the necessity for	Shoulder
	available	the surgeon to	proper diagnostics	arthroplasty
	classification	perform	and there with	
	systems such as the	arthroscopic and	adequate indications	
	classifications	open surgical	for treatment.	
	according to:	approaches and	Tor treatment.	
	_	procedures to the		
	Kellgren and	shoulder joint to		
	Lawrence	treat chondral		
	• Samilson and			
	Pietro	lesions - these		
	• Gerber	include		
	 Guyet and Allain. 	debridement,		
	Teaches the	microfracture,		
	treatment	chondrocyte		
	algorithms for	transplantation and		
	chondromalacia of	other procedures		
	the humeral head.	like AMIC.		
	Presents the			
	common indications,			
	based on the			
	present literature.			
Chondromalacia	Defines the	Expects the surgeon	Appreciates the	Loose bodies
glenoid	pathology with its	to be able to treat	relevance of	Osteoarthritis
0.0.1014	multiple	chondral lesions	osteochondral	CAM Procedure
	pathogenesis and	conservatively with	lesions of the	Shoulder
	epidemiologies. Lists	Physiotherapy and	humeral head and	arthroscopy
	the currently	Injections. Expects	the necessity for	Shoulder
	available		•	
		the surgeon to	proper diagnostics	arthroplasty
	classification	perform	and there with	
	systems such as the	arthroscopic and	adequate indications	
	classifications	open surgical	for treatment.	
	according to:	approaches and		
	Kellgren and	procedures to the		
	Lawrence	shoulder joint to		
	Samilson and	treat chondral		
	Pietro	lesions - these		
	• Gerber	include		
	 Guyet and Allain. 	debridement,		
	on Shoulder and Elbow 9		•	

	Teaches the treatment algorithms for chondromalacia on the glenoid. Presents the common indications, based on the present literature.	microfracture, chondrocyte transplantation and other procedures like AMIC.		
	4.	Shoulder Non-Operati	ve	
4.1 Physical Therapy				
Physiotherapy	Teaches the trainee the principles of physiotherapy for the different shoulder conditions including the effect on the different soft tissues (tendons and ligaments, muscles), bones and neurovascular structures. The trainee should be aware of the different indications and techniques of physiotherapy.	Expects the trainee to be able to refer patients to physiotherapy - if indicated.	Appreciates the relevance of the potential positive impact of physiotherapy on different shoulder pathologies.	Physiotherapy shoulder joint Shoulder Mobilisation Shoulder Stretching
Ergotherapy	Teaches the trainee the principles of ergotherapy for the different shoulder conditions including the effect on the different soft tissues (tendons and ligaments, muscles), bones and neurovascular structures. The trainee should be aware of the different indications and techniques of ergotherapy.	Expects the trainee to be able to refer patients to ergotherapy - if indicated.	Appreciates the relevance of the potential positive impact of ergotherapy on different shoulder pathologies.	Ergotherapy shoulder Shoulder training Upper limb rehab
Massage	Teaches the trainee the principles of massage for the different shoulder conditions including the effect on the different soft tissues (tendons and	Expects the trainee to be able to refer patients to massage - if indicated.	Appreciates the relevance of the potential positive impact of massage on different shoulder pathologies.	Massage shoulder joint Shoulder Mobilization Muscle relaxation

	ligaments, muscles),			
	bones and neuro-			
	vascular structures.			
	The trainee should			
	be aware of the			
	different indications			
	and techniques of			
	massage.			
Manual therapy	Teaches the trainee	Expects the trainee	Appreciates the	Manual therapy
	the principles of	to be able to refer	relevance of the	shoulder
	manual therapy for	patients to manual	potential positive	Shoulder training
	the different	therapy - if	impact of manual	Upper limb rehab
	shoulder conditions	indicated.	therapy on different	
	including the effect		shoulder	
	on the different soft		pathologies.	
	tissues (tendons and			
	ligaments, muscles),			
	bones and neuro-			
	vascular structures.			
	The trainee should			
	be aware of the			
	different indications			
	and techniques of			
Lucanh duaine ao	manual therapy. Teaches the trainee	Cyronata tha tuainan	A mara ainta a tha	Lucenh ducinoso
Lymph drainage		Expects the trainee to be able to refer	Appreciates the relevance of the	Lymph drainage shoulder
	the principles of			
	lymph drainage for the different	patients to lymph drainage - if	potential positive	Swelling upper limp Venous insufficiency
	shoulder conditions	indicated.	impact of lymph drainage on	verious insumciency
	including the effect	illuicateu.	different shoulder	
	on the different soft		pathologies.	
	tissues (tendons and		patriologies.	
	ligaments, muscles),			
	bones and neuro-			
	vascular structures.			
	The trainee should			
	be aware of the			
	different indications			
	and techniques of			
	lymph drainage.			
4.2 Physical Immobilis	sation/ Orthoses, Prost	hesis etc.		
Splints	Teaches the surgeon	Expects the surgeon	Is aware of the	Splinting upper limb
Spinits	the principles	to be able to	relevance of splints	Conservative
	behind the correct	perform a correct	in the acute and	treatment
	use of splints for	placement of	chronic treatment of	Additional post-op
	immobilisation and	shoulder splints	shoulder	procedure
	assisted mobilization	understanding the	pathologies.	F. 5555.01.0
	techniques. The	importance of	1, 200.000	
	surgeon should be	adequate padding to		
	aware of different	avoid pressure		
	protocols, length of	sores.		
	Processis, length of		1	

	I.,	T	T	T
	therapy and possible			
	complications.			
Orthoses	Teaches the surgeon	Expects the surgeon	Is aware of the	Orthoses upper limb
	the principles	to be able to	relevance of	Conservative
	behind the correct	perform a correct	orthoses in the	treatment
	use of orthoses for	placement of	acute and chronic	Additional post-op
	immobilisation and	shoulder orthoses	treatment of	procedure
	assisted	understanding the	shoulder	, , , , , , , , , , , , , , , , , , ,
	mobilization. The	importance of	pathologies.	
	surgeon should be	adequate padding to	, , , , , ,	
	aware of different	avoid pressure		
	protocols, length of	sores.		
	therapy and possible			
	complications.			
Casts	Teaches the surgeon	Expects the surgeon	Is aware of the	Casts upper limb
	the principles	to be able to	relevance of casts in	Conservative
	behind the correct	perform a correct	the acute and	treatment
	use of casts for	placement of	chronic treatment of	Additional post-op
	immobilisation. The	shoulder casts	shoulder	procedure
	surgeon should be	understanding the	pathologies.	, , , , , , , , , , , , , , , , , , ,
	aware of different	importance of	, , , , , ,	
	protocols, length of	adequate padding to		
	therapy and possible	avoid pressure		
	complications.	sores.		
Braces	Teaches the surgeon	Expects the surgeon	Is aware of the	Braces upper limb
	the principles	to be able to	relevance of braces	Conservative
	behind the correct	perform a correct	in the acute and	treatment
	use of braces for	placement of	chronic treatment of	Additional post-op
	immobilisation. The	shoulder braces	shoulder	procedure
	surgeon should be	understanding the	pathologies.	'
	aware of different	importance of		
	protocols, length of	adequate padding to		
	therapy and possible	avoid pressure		
	complications.	sores.		
4.3 Pain Relief Therap				
Systemic pain	Teaches the surgeon	Expects the surgeon	Is aware of the high	Pain killer
therapy (oral)	about the different	to adequately treat	relevance of oral	Pain medication
Character (Oral)	available oral pain	shoulder pain for	systemic pain	Morphine
	medications.	different conditions	therapy in the acute	NSAR
	Surgeon should be	with or without	and chronic	Cortisone
	aware of the	surgery.	treatment of	WHO scheme
	analgesic ladder to		shoulder	TTTO SCHOOL
	support different		pathologies.	
	degrees of pain level		Patrio1081601	
	according to WHO			
	standards. The			
	surgeon should			
i	I Jai Scoil Jiloulu	İ	1	I
	_			
	understand the			
	_			

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	interactions and side			
	effects of different			
	pain medications			
	including but not			
	limited to non-			
	opioid analgesics			
	(aspirin,			
	acetaminophen,			
	NSAIDs -selective			
	and non-selective),			
	weak opioids, strong			
	opioids and the use			
	of adjuvants with			
	opioid therapy.			
Systemic pain	Teaches the surgeon	Expects the surgeon	Is aware of the high	Pain killer
therapy	about the different	to adequately treat	relevance of	Pain medication
(intravenous)	available	shoulder pain for	intravenous systemic	Morphine
(intravenous pain	different conditions	pain therapy in the	NSAR
	medications.	with or without	acute and chronic	Steroids
	Surgeon should be	surgery.	treatment of	WHO scheme
	aware of the	2018c1 1.	shoulder	
	analgesic ladder to		pathologies.	
	support different		patriologics.	
	degrees of pain level			
	· ·			
	according to WHO standards. The			
	surgeon should understand the			
	basics of			
	pharmacology,			
	interactions and side			
	effects of different			
	pain medications			
	including but not			
	limited to non-			
	opioid analgesics			
	(aspirin,			
	acetaminophen,			
	NSAIDs -selective			
	and non-selective),			
	weak opioids, strong			
	opioids and the use			
	of adjuvants with			
	opioid therapy.			
Injections	Teaches the surgeon	Expects the surgeon	Is aware of the high	Shoulder injection
	the principles	to be able to	relevance of	subacromial
	behind injections.	perform a safe	injections in the	Shoulder injection
	This should include	injection around the	acute and chronic	capsule
	understanding the	shoulder,	treatment of	Shoulder injection
	pharmaceutical	emphasizing the use	shoulder	subacromial
	knowledge of the	of a sterile	pathologies.	
	injected products	technique and		
	medication, the	understanding the		
			l .	l .

	indications, contraindications and management of possible adverse reactions and complications. Surgeon should be aware of the specific techniques for injection including the importance of appropriate sterility techniques and the use of adjuvant	availability of imaging techniques to increase the precision of the injection.		
Pain catheters	imaging techniques. Teaches the surgeon the principles behind the safe use of pain catheters, including care of catheters, the different medications used and existing pain protocols. The surgeon should be knowledgeable about the possible complications of catheter therapy.	Expects the surgeon to be able to safely use pain catheters for pain management.	Is aware of the high relevance of pain catheters in the acute and chronic treatment of shoulder pathologies.	Interscalene catheter Pain therapy Post-op pain management
4.4 Non-Operative Fra	acture Treatment			
Immobilization	Teaches the surgeon the principles behind immobilisation techniques. The surgeon needs to understand the possible complications and how to avoid and detect them.	Expects the surgeon to be able to adequately immobilize a shoulder joint understanding the importance of adequate padding to avoid pressure sores.	Is aware of the high relevance of immobilization in the acute and chronic treatment of shoulder pathologies.	Postoperative therapy Splinting, bracing, orthoses
Physiotherapy	Teaches the trainee the principles of physiotherapy for conservative treatment of shoulder fractures. The trainee should be aware of the different indications	Expects the trainee to be able to refer patients to physiotherapy.	Appreciates the relevance of the potential positive impact of physiotherapy on conservative fracture treatment of the shoulder.	Physiotherapy shoulder joint Mobilisation shoulder Stretching shoulder

	and techniques of physiotherapy.			
		5. Shoulder Operative		
5.1 Arthroscopy				
Diagnostic arthroscopy	Teaches the indications for Diagnostic arthroscopy and explains the principles of doing it Lists the anatomical landmarks, the position of the patient, standard portals, and normal steps to evaluate the anatomical structures recognizing the normal or the pathologic one	Expects the surgeon to be able to perform the arthroscopically evaluation of all the structures in the subacromial space and the intraarticular area.	Appreciates the normal anatomy and structures, the anatomical variants and the pathologic	Arthroscopy shoulder Diagnosis shoulder Arthroscopic treatment shoulder
Ligament repair	Teaches the indications for ligament repair and explain the principles. List the normal structures and the pathologic anatomy of the shoulder ligaments and the techniques to repair them	Expects the surgeon to be able to perform the most common techniques to repair the ligaments arthroscopically. Patient positioning, portals and techniques to repair the capsulolabral lesions	Appreciates the labrum tears, the ligament lesions of the anteroinferior glenohumeral ligament, and how to repair them	Repair of ligamentous structures Direct ligament repair Indirect ligament repair
Tendon repair	Teaches the indications for rotator cuff tears and explains the different types of them. List the normal and pathologic anatomy of the shoulder tendons and the techniques to repair the tendons arthroscopically	Expects the surgeon to be able to perform the technique to repair anatomically or partially the tendon tears arthroscopically. Patient positioning, portals and techniques to repair the cuff tears	Appreciates the cuff tears, all the different types of tears degenerative, traumatic, how and when to treat them	Rotator cuff repair Suture anchors Sutures Repair techniques

Removal of loose bodies	Teaches the indications for loose bodies removal. List the cause and the type of loose bodies	Expects the surgeon to be able to perform the removal of all the loose bodies arthroscopically	Appreciates the normal arthroscopically anatomy of the shoulder, The intraarticular space, the inferior recess and the subscapularis recess where the loose bodies frequently are	Arthroscopy Open surgery Arthritis
Cartilage treatment	Teaches the indications for treatment of chondral lesions of the glenoid and the humeral head and explain them related to the ICRS classification. List the techniques to treat them.	Expects the surgeon to be able to perform the basic treatments of the chondral lesions	Appreciates the normal arthroscopically anatomy of the shoulder, The evaluation of the integrity of the joint surface and the normal cartilage	CAM procedure AMIC Minced cartilage
Removal of osteophytes	Teaches the indications for removal of the osteophytes in osteoarthritis.	Expects the surgeon to be able to perform the resection of the osteophytes arthroscopically	Appreciates the osteophytes inferiorly to the humeral head and the degree of osteoarthritis	CAM procedure Arthroscopy Arthritis
Arthrolysis	Teaches the indications for arthrolysis in case of stiffness of the joint, case of capsulitis / frozen shoulder, and posttraumatic stiffness/arthrofibrosis.	Expects the surgeon to be able to perform the circumferential arthrolysis resection of the capsule, starting from the rotator cuff interval.	Appreciates the capsulitis, arthrofibrosis,	Arthroscopy Open surgery Inflammation Stiffness
Synovectomy	Teaches the indications for synovectomy, knowledge of the most important pathology that involves the synovia	Expects the surgeon to be able to perform the synovectomy arthroscopically assisted, using standard portals or accessories portals to reach all the areas of the joint and perform a complete synovectomy	Appreciates the different types of synovia, normal and pathological	Arthroscopy Open surgery Synovialectomy

Fracture treatment	Teaches the indications for treating the intraarticular fractures of the glenoid, and of the humeral head. Teaches the indication also of extraarticular fractures like Greater tuberosity avulsion,	Expects the surgeon to be able to perform the reduction and fixation of the most common fractures of the anteroinferior posteroinferior of the glenoid, and the fractures involving the greater tuberosity	Appreciates the different types of glenoid fractures and classifications. The different types of fractures of the tuberosities	Open surgery Arthroscopy Conservative treatment Nail Plate Arthroplasty
5.2 Reconstructive Pr	ocedures			
Open fracture treatment	Teaches the candidate the possibilities and limitations of open fracture treatment. Teaches the different techniques that can be used to fix fractures - pinning, screw fixation, plate and screw fixation, osteosuturing	Expects the surgeon to be able to perform the commonly available open surgical approaches to the shoulder joint, that are necessary for adequate open fracture repair.	Is aware of the high relevance of adequate open fracture treatment for patients' quality of life and its high impact on socioeconomic costs.	Shoulder fracture Osteosynthesis shoulder Shoulder replacement
Open ligament repair	Teaches the candidate the possibilities and limitations of open ligament repair. Teaches the different techniques that can be used for ligament repair: transosseus fixation, ligament-to-ligament repair, and anchor treatment. Knowledge of the location of the ligaments around the shoulder joint.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the shoulder joint, that are necessary for adequate open ligament repair.	Is aware of the high relevance of adequate open ligament repair for patients' quality of life and its high impact on socioeconomic costs.	Open reconstruction shoulder Open ligament surgery Ligament repair
Open tendon repair	Teaches the candidate the possibilities and limitations of open tendon repair or partial repair. Teaches the different techniques that can be used for tendon repair: transosseus	Expects the surgeon to be able to perform the commonly available open surgical approaches to the shoulder joint, that are necessary for adequate open tendon repair.	Is aware of the high relevance of adequate open tendon repair for patients' quality of life and its high impact on socioeconomic costs.	Open reconstruction tendon Open rotator cuff repair Rotator cuff

Open stabilization procedures	fixation, tendon-to- bone fixation, tendon-to-tendon repair, and anchor treatment. Knowledge of the location of the tendons around the shoulder joint. Teaches the candidate the possibilities and limitations of open	Expects the surgeon to be able to perform the commonly available	Is aware of the high relevance of adequate open stabilization	Open Bankart repair Open capsule shift Latarjet Bone block
	stabilization procedures. Teaches the different approaches (anterior and posterior) and procedures that can be used for tendon repair: e.g. soft- tissue reconstruction (Bankart-repair, capsular shift, remplissage) and bone reconstruction (Latarjet, iliac crest, allografts).	open surgical approaches and procedures to address instability of the shoulder joint.	procedures for patients' quality of life and its high impact on socioeconomic costs.	
Open arthrolysis	Teaches the candidate the possibilities and limitations of open arthrolysis procedures. Teaches the different techniques and approaches (anterior-posterior).	Expects the candidate to be able to perform the commonly available open surgical approaches and techniques to the shoulder joint, that are necessary for adequate open joint arthrolysis.	Is aware of the high relevance of adequate open joint release for patients' quality of life and its high impact on socioeconomic costs.	Open capsulectomy Capsule release Capsule incision
5.3 Osteotomies				
Corrective Osteotomy prox. humerus	Teaches the surgeon the possibilities and limitations of corrective osteotomies of the proximal humerus. Teaches the surgeon how to make a preop planning (with or without 3D measurements) different techniques	Expects the surgeon to be able to perform the commonly available open surgical approaches to the shoulder joint, that are necessary for adequate corrective humerus osteotomies.	Is aware of the potentially high relevance of adequate corrective osteotomy of the proximal humerus for patients' quality of life.	Rotational osteotomy Open wedge osteotomy Closing wedge osteotomy

	(open wedge, closing wedge) (with or without a 3D guide), approaches and fixation techniques.			
Corrective Osteotomy dist. humerus	Teaches the surgeon the possibilities and limitations of corrective osteotomies of the distal humerus. Teaches the surgeon how to make a preop planning (with or without 3D measurements) different techniques (open wedge, closing wedge) (with or without a 3D guide), approaches and fixation techniques.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the shoulder joint, that are necessary for adequate corrective humerus osteotomies.	Is aware of the potentially high relevance of adequate corrective osteotomy of the distal humerus for patients' quality of life.	Rotational osteotomy Open wedge osteotomy Closing wedge osteotomy
Corrective osteotomy glenoid	Teaches the surgeon the possibilities and limitations of corrective osteotomies of the glenoid. Teaches the surgeon how to make a pre-op planning (with or without 3D measurements) different techniques (open wedge, closing wedge) (with or without a 3D guide), approaches and fixation techniques.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the shoulder joint, that are necessary for adequate corrective glenoid osteotomies.	Is aware of the potentially high relevance of adequate corrective osteotomy of the glenoid for patients' quality of life.	Corrective anterior osteotomy glenoid Corrective posterior osteotomy glenoid Open wedge osteotomy Closing wedge osteotomy
5.4 Osteosyntheses				

Proximal humerus	Teaches the surgeon	Expects the surgeon	Is aware of the high	Osteosyntheses
fractures	the possibilities and	to be able to	relevance of	Proximal Humerus
	limitations of	perform the	adequate proximal	Fractures
	osteosynthesis of	commonly available	humerus fractures	Plate
	proximal humerus	open surgical	repair for patients'	Nail
	fractures. The	approaches to the	quality of life and its	Arthroplasty
	surgeon is taught	proximal humerus,	high impact on	Approach
	the different	that are necessary	socioeconomic	Fixation
	techniques (plate	for adequate	costs.	
	and screw fixation,	fracture repair.		
	screw fixation, nail	Tractare repair.		
	fixation, sutures			
	fixation or k-wires			
	depending on the			
	type of fracture. The			
	surgeon is taught			
	the step-by-step			
	approach how to			
	reconstruct the			
	intra-articular			
	fragments in case of			
	intra-articular			
	fractures. The			
	surgeon is taught			
	the advantages and			
	disadvantages of			
	different surgical			
	approaches			
	(deltopectoral,			
	deltoid split, MIPO,			
	posterior approach).			
Glenoid fractures	Teaches the surgeon	Expects the surgeon	Is aware of the high	Osteosyntheses
	the possibilities and	to be	relevance of	Glenoid Fractures
	limitations of	able to perform the	adequate glenoid	Indication
	osteosynthesis of	commonly available	fractures repair for	Plate
	glenoid fractures.	open surgical	patients' quality of	Arthroplasty
	The surgeon is	approaches to the	life and its high	Approach
	taught the different	glenoid, that are	impact on	Fixation
	techniques (plate	necessary for	socioeconomic	
	and screw fixation or	adequate dislocation	costs.	
	screws fixation). The	fracture repair.		
	surgeon is taught	<u>'</u>		
	the step-by-step			
	approach how to			
	reconstruct the			
	intra-articular			
	fragments in case of			
	intra-articular			
	fractures. The			
	surgeon is taught			
	the advantages and			
	disadvantages of			
	different surgical			
L				

	Τ .	T	T	T
	approaches			
	(deltopectoral and			
	posterior approach).			
Scapula fractures	Teaches the surgeon	Expects the surgeon	Is aware of the high	Osteosyntheses
'	the possibilities and	to be	relevance of	Scapula Fractures
	limitations of	able to perform the	adequate scapula	Indication
	osteosynthesis of	commonly available	fractures repair for	Approach
	scapula fractures.	open surgical	patients' quality of	Fixation
	The surgeon is	approaches to the	life and its high	
	taught the different	scapula joint, that	impact on	
	techniques (plate	are necessary for	socioeconomic	
	and screw fixation,	adequate fracture	costs.	
	plate contouring and	repair.		
	plate position)			
	depending on the			
	type of fracture. The			
	surgeon is taught			
	the advantages and			
	disadvantages of			
	different surgical			
	approaches (Judet,			
	Modified Judet,			
	posterior approach).			
Clavicle fractures	Teaches the surgeon	Expects the surgeon	Is aware of the high	Osteosyntheses
	the possibilities and	to be	relevance of	Clavicle Fractures
	limitations of	able to perform the	adequate clavicle	Indication
	osteosynthesis of	commonly available	fractures repair for	Plate
	clavicle fractures.	open surgical	patients' quality of	Intramedullary pin
	The surgeon is	approaches to the	life and its high	Approach
	taught the different	clavicle, that are	impact on	Fixation
	techniques (plate	necessary for	socioeconomic	
	and screw fixation,	adequate fracture	costs.	
	tension band,	repair.		
	intramedullary nails			
	or suture fixation)			
	and their different			
Dielo estima functions	indications.	Even a ata tha a constant	le avvore efth - Liel	Ostoogyathassa
Dislocation fractures	Teaches the surgeon	Expects the surgeon	Is aware of the high	Osteosyntheses
	the possibilities and	to be	relevance of	Dislocation Fractures
	limitations of	able to perform the	adequate dislocation	Plate Nail
	osteosynthesis of dislocation fractures.	commonly available open surgical	fracture repair for patients' quality of	Arthroplasty
	Teaches the surgeon	approaches to the	life and its high	Approach
	closed and open	shoulder joint, that	impact on	Fixation
	reduction	are necessary for	socioeconomic	ιλαιιστί
	techniques for the	adequate dislocation	costs.	
	dislocation. Teaches	fracture repair.		
1	aisiocation. Teaches	macture repail.	1	1

	the surgeon a step-			
	by-step approach to stabilize the glenohumeral joint with different osteosynthesis techniques.			
5.5 Resections				
AC-Joint resection	Teaches the candidate the indications and contra-indications for AC joint resection. Teaches pre-operative assessment both clinical and radiological. Teaches the candidate open surgical and arthroscopic techniques. Teaches post-operative treatment. Teaches complications related to the procedure	Expects the surgeon to be able to perform adequate preoperative assessment and planning. Be competent in open and arthroscopic techniques. Be aware of complications and prevention of same.	Appreciates the relevance of AC joint resection the necessity for proper diagnostics, adequate assessment and the importance of careful surgical technique and rehabilitation.	Mumford AC resection Arthroscopy AC joint Open AC resection
SC-Joint resection	Teaches the candidate the indications and contra-indications for SC joint resection. Teaches pre-operative assessment both clinical and radiological. Teaches the candidate open surgical technique and the importance of adjacent vascular structures. Teaches post-operative treatment. Teaches complications related to the procedure	Expects the surgeon to be able to perform adequate preoperative assessment and planning. Be aware of surgical technique. Be aware of complications and prevention of same.	Appreciates the relevance of SC joint resection the necessity for proper diagnostics, adequate assessment and the importance of careful surgical technique and rehabilitation.	SC resection Open AC resection

	Ι	Τ	Ι	T
Humeral Head	Teaches the	Expects the surgeon	Appreciates the	Necrosis
resection	candidate the	to be	relevance of	Infection
	indications and	able to perform	humeral head	Replacement
	contra-indications	adequate pre-	resection the	Girdle stone
	for humeral head	operative	necessity for proper	Sine-sine situation
	resection. Teaches	assessment and	diagnostics,	
	pre-operative	planning. Be aware	adequate	
	assessment both	of surgical	assessment and the	
	clinical and	technique. Be aware	importance of	
	radiological. Teaches	of complications and	careful surgical	
	the candidate open	prevention of same.	technique and	
	surgical techniques.		rehabilitation.	
	Teaches post-			
	operative treatment.			
	Teaches			
	complications			
	related to the			
	procedure			
Proximal Humerus	Teaches the	Expects the surgeon	Appreciates the	Necrosis
resection	candidate the	to be	relevance of	Infection
	indications and	able to perform	proximal humerus	Replacement
	contra-indications	adequate pre-	resection. The	Girdlestone
	for proximal	operative	necessity for proper	Resection
	humerus resection.	assessment and	diagnostics,	arthroplasty
	Teaches pre-	planning. Be aware	adequate	
	operative	of surgical	assessment and the	
	assessment both	technique. Be aware	importance of	
	clinical and	of complications and	careful surgical	
	radiological. Teaches	prevention of same.	technique and	
	the candidate open		rehabilitation.	
	surgical techniques.			
	Teaches post-			
	operative treatment.			
	Teaches			
	complications			
	related to the			
	procedure			

5.6 Endoprosthetics					
Anatomic Total	Understands the	Expects the surgeon	Appreciates the	Shoulder	
shoulder	history of the	to be able to	indications and	replacement	
arthroplasty	development of the	understand the	contraindications for	shoulder	
	design of anatomical	indications and	ATSA. Appreciates	arthroplasty	
	TSR. Understands	limitations of	the importance of	Glenoid	
	material properties	Anatomical TSA.	preoperative	Anatomic	
	of components	Understand	planning and		
	including stem,	limitations and	component		
	humeral head	contraindications.	selection.		
	bearing surfaces,	Perform adequate	Appreciates		
	and glenoid	shoulder	common		
	component.	examination with	complications and		
	Understand	particular reference	their management		
	concepts and the	to range of motion.			
	effect of design on	Interpreted			
	biomechanics	advanced imaging			
	including humeral	and use operative			
	head size, offset,	planning software.			
	and version. Be	Execute appropriate			
	proficient in	surgical approach			
	preoperative	and select			
	assessment	appropriate			
	including necessary	components.			
	radiological	Execute careful soft			
	assessment and	tissue management.			
	preoperative	Supervise			
	planning.	appropriate rehabilitation and			
		follow-up.			
Hemiarthroplasty	Understands the	Expects the surgeon	Appreciates the	Humeral head	
Tiermartinoplasty	history of the	to be able to	indications and	replacement	
	development of the	understand the	contraindications for	Resurfacing	
	design of	indications and	Hemiarthroplasty.	Hemiarthroplasty	
	hemiarthroplasty.	limitations of	Appreciates the	Treimarem opiasty	
	Understands	hemiarthroplasty.	importance of		
	material properties	Understand	preoperative		
	of components	limitations and	planning and		
	including stem,	contraindications.	component		
	humeral head	Perform adequate	selection.		
	bearing surfaces,	shoulder	Appreciates		
	and soft tissue	examination with	common		
	balancing.	particular reference	complications and		
	Understand	to range of motion.	their management		
	concepts and the	Interpreted			
	effect of design on	advanced imaging			
	biomechanics	and use operative			
	including humeral	planning software.			
	head size, offset,	Execute appropriate			
	and version. Be	surgical approach			
	proficient in	and select			
	preoperative	appropriate			
050500000000000000000000000000000000000	assessment on Shoulder and Flbow	components.			

	including necessary radiological assessment and preoperative planning. Be aware of potential Contraindications.	Execute careful soft tissue management. Supervise appropriate rehabilitation and follow-up;		
Reverse shoulder arthroplasty	Understands the history of the development of the design of reverse TSR. Understands material properties of components including stem, humeral head bearing surfaces, and glenoid component. Understand biomechanical differences between commercially available implant systems. Understand concepts including lateralisation, deltoid wrap, and scapular notching. Understand the risks and benefits of different implant philosophies. Be proficient in preoperative assessment including necessary radiological assessment and preoperative planning	Expects the surgeon to be able to understand the indications and limitations of Reverse TSA. Understand limitations and contraindications. Perform adequate shoulder examination with particular reference to range of motion. Interpreted advanced imaging and use operative planning software. Execute appropriate surgical approach and select appropriate components. Execute careful soft tissue management. Supervise appropriate rehabilitation and follow-up;	Appreciates the indications and contraindications for RTSA. Appreciates the importance of preoperative planning and component selection. Appreciates common complications and their management	Grammont Reverse arthroplasty Reverse replacement

Resurfacing	Understands the	Expects the surgeon	Appreciates the	Humeral surface
arthroplasty	history of the	to be able to	indications and	replacement
artinoplasty	development of the	understand the	contraindications for	Arthroplasty
	design of anatomical	indications and	Resurfacing	Resurfacing
	TSR. Understands	limitations of	arthroplasty.	Resurracing
	material properties	resurfacing.	Appreciates the	
	of components	Understand	importance of	
	including stem,	limitations and	preoperative	
	humeral head	contraindications.	planning and	
	bearing surfaces,	Perform adequate	component	
	and glenoid	shoulder	selection.	
	component.	examination with	Appreciates	
	Understand	particular reference	common	
	concepts and the	to range of motion.	complications and	
	effect of design on	Interpreted	their management	
	biomechanics	advanced imaging		
	including humeral	and use operative		
	head size, offset,	planning software.		
	and version. Be	Execute appropriate		
	proficient in	surgical approach		
	preoperative	and select		
	assessment	appropriate		
	including necessary	components.		
	radiological	Execute careful soft		
	assessment and	tissue management.		
	preoperative	Supervise		
	planning	appropriate		
		rehabilitation and		
		follow up;		
Partial resurfacing	Understands the	Expects the surgeon	Appreciates the	Hemi-resurfacing
arthroplasty	history of the	to be able to	indications and	Partial head
	development of the	understand the	contraindications for	replacement
	design of partial	indications and	Partial Resurfacing	Surface replacement
	resurfacing TSR.	limitations of partial	Arthroplasty.	
	Understands	surface arthroplasty.	Appreciates the	
	material properties	Understand	importance of	
	of components	limitations and	preoperative	
	including stem, humeral head	contraindications. Perform adequate	planning and	
	bearing surfaces,	shoulder	component selection.	
	and glenoid	examination with	Appreciates	
	component.	particular reference	common	
	Understand	to range of motion.	complications and	
	concepts and the	Interpreted	their management	
	effect of design on	advanced imaging		
	biomechanics	and use operative		
	including humeral	planning software.		
	head size, offset,	Execute appropriate		
1	and version. Be	surgical approach		
1	proficient in	and select		
	preoperative	appropriate		
	assessment	components.		

	radiological assessment and preoperative planning	tissue management. Supervise appropriate rehabilitation and follow-up;		
Revision arthroplasty	Understands the history of the development of the design of Revision Shoulder arthroplasty. Understand modes of failure on both glenoid and humeral components. Understand the classification and challenges of types of glenoid bone defects. Understand the classification and challenges of types of humeral loosening. Understand issues in terms of implant removal i.e. humeral osteotomies and other techniques. Understand both biological and prosthetic replacement of bone defects. Understand the complication profile associated with various revision options	Expects the surgeon to be able to understand the indications and limitations of Revision TSA. Understand limitations and contraindications. Perform adequate shoulder examination with particular reference to range of motion. Interpret advanced imaging and use operative planning software. Anticipate requirement for advanced instrumentation, necessary prosthetic equipment and possible use of biological material. Execute workup for infection. Execute appropriate surgical approach and select appropriate components. Execute careful soft tissue management. Supervise appropriate rehabilitation and follow-up;	Appreciates the indications and contraindications for Revision Total Shoulder Replacement. Appreciates all components of preoperative planning. Appreciates the importance of preoperative planning and component selection. Appreciates common complications and their management	Revision shoulder arthroplasty Revision surgery Infection Loosening Periprosthetic fracture

Allograft Prosthetic	Understands	Evnects the surgeon	Annreciates the	ΔΡΓ
Allograft Prosthetic Composite	Understands biological and biomechanical concepts of Allograft Prosthetic Composite. Understands material properties of components including stem, humeral head bearing surfaces, glenoid component. Understand the concept of the composite of allograft and prosthesis and the consequences of non-union /bone resorption and soft tissue failure.	Expects the surgeon to be able to understand the indications and limitations of Allograft Prosthetic Composite. Understand limitations and contraindications. Perform adequate shoulder examination with particular reference to range of motion. Interpret advanced imaging and use operative planning software. Execute appropriate surgical approach and select appropriate components. Execute careful soft tissue management. Supervise appropriate rehabilitation and follow-up;	Appreciates the indications and contraindications for Allograft Prosthetic Composite. Appreciates the importance of preoperative planning and component selection. Appreciates common complications and their management	APC Transplantation bone humerus Revision arthroplasty Bone loss humerus
Tumor prosthetics	Understands the design and biomechanics of tumour prosthesis including modularity, biomaterials and fixation techniques. Be proficient in preoperative assessment including necessary radiological assessment and preoperative planning.	Expects the surgeon to be able to understand the indications and limitations of Tumour prosthesis. Understand limitations and contraindications. Perform adequate shoulder examination with particular reference to range of motion. interpret advanced imaging and use operative planning software. Execute appropriate surgical approach and select appropriate components. Execute careful soft tissue management.	Appreciates the indications and contraindications for Tumour prosthesis. Appreciates importance of preoperative planning and component selection. Appreciates common complications and their management.	Replacement proximal humerus Replacement scapula Mega prosthesis

		Supervise appropriate rehabilitation and follow up.		
Ligament repair	ons/ Nerves/ Vessels et Teaches the	Expects the	Is aware of the high	Reconstruction
	candidate the possibilities and limitations of ligament repair. The candidate is taught when there is an indication for ligament repair or when conservative treatment should be proposed. The candidate is taught on the anatomical landmarks of the attachment of the ligaments and the rehabilitation program after ligament repair.	candidate to be able to perform the commonly available surgical approaches to the shoulder joint, that are necessary for stable ligament repair and to be capable of various techniques for ligament fixation.	relevance of ligament repair for patients' quality of life and its potentially high impact on socioeconomic costs.	shoulder Ligament surgery Ligament repair
Tendon Repair	Teaches the candidate the possibilities and limitations of tendon repair. The candidate is taught when there is an indication for tendon repair or when conservative treatment should be proposed. The candidate is taught on the anatomical landmarks of the attachment of the ligaments and the rehabilitation program after ligament repair.	Expects the candidate to be able to perform the commonly available surgical approaches to the shoulder joint, that are necessary for stable tendon repair and to be capable of various techniques for tendon fixation.	Is aware of the high relevance of tendon repair for patients' quality of life and its potentially high impact on socioeconomic costs.	Reconstruction tendon Rotator cuff repair Rotator cuff

Dankart ranair	Toachas tha	Evposts tha	le aware of the bick	Dankart Danair
Bankart repair	Teaches the candidate the	Expects the candidate to be	Is aware of the high relevance of Bankart	Bankart Repair Bankart lesion
	possibilities and	able to perform the	repairs for patients'	Labrum repair
	limitations of a	commonly available	quality of life and its	Labrum repair
	Bankart repair. The		l ' '	
	•	surgical approaches to the shoulder	potentially high	
	candidate is taught when there is an		impact on socioeconomic	
	indication for this	joint, that are	costs.	
		necessary for doing	costs.	
	operation or when	a Bankart repair. The		
	conservative	candidate should be		
	treatment should be	capable of various		
	proposed. The	techniques how to		
	candidate is taught	perform a Bankart		
	on the anatomical	repair (arthroscopic,		
	landmarks of the	open, with anchors,		
	attachment of the	etc.).		
	labrum and its			
	associated lesions			
	and the			
	rehabilitation			
	program after the repair.			
Capsular shift	Teaches the	Expects the	Is aware of the high	T-shift
	candidate the	candidate to be	relevance of	Shoulder instability
	possibilities and	able to perform the	capsular shifts for	Capsular shift
	limitations of	commonly available	patients' quality of	Capsule
	capsular shifts. The	surgical approaches	life and its	reconstruction
	candidate is taught	to the shoulder	potentially high	
	when there is an	joint, that are	impact on	
	indication for this	necessary for doing	socioeconomic	
	operation or when	a capsular shift. The	costs.	
	conservative	candidate should be		
	treatment should be	capable of various		
	proposed. The	techniques how to		
	candidate is taught	perform a capsular		
	on the anatomy of	shift (arthroscopic,		
	the capsule and its	open, etc.).		
	associated lesions			
	and the			
	rehabilitation			
	program after the			
	operation.			
Tendon transfer	Teaches the	Expects the	Is aware of the high	Latissimus dorsi
	candidate the	candidate to be	relevance of tendon	transfer
	possibilities and	able to perform the	transfers on the	Lower trapezius
	limitations of tendon	commonly available	shoulder for	transfer
	transfers. The	surgical approaches	patients' quality of	Pectoralis major
	candidate is taught	to the shoulder	life and its	transfer
	when there is an	joint, that are	potentially high	
	indication for this	necessary for doing	impact on	
	indication for this operation or when	tendon transfers.	impact on socioeconomic	
	indication for this	,	•	

proposed. The	the various muscles
candidate is taugh	t and tendons that
which muscles and	can be used for a
tendons may be	transfer and which
useful for a transfe	er techniques may be
in different	applicable
conditions. The	(arthroscopic, open,
candidate should	pe etc.).
aware of the	
rehabilitation	
program after the	
operation.	

5.8 Amputations				
Arm amputation	Teaches the candidates about the possibilities of arm amputations. The candidate is taught the rare indications for this invasive and definitive procedure. Also, the candidate is taught to share help and support for patients during the aftercare, especially focusing on neurogenic pain as well as psychological help for the mental consequences of the loss of limb. The candidate must know about prosthetic options (traditional and modern as well as experimental) to offer the patient options for the future.	Expects the candidate to know the key anatomical structures and to be able to dissect them safely. Also expects the candidate to be able to ligate major vessels of the upper extremity and to handle nerves during amputation surgery.	Appreciates the high relevance of profound understanding and knowledge of arm amputations.	Amputation upper limp Salvage surgery Exarticulation
Shoulder exarticulation	Teaches the candidate the possibilities of shoulder exarticulations. The candidate is taught about the rare indications for this invasive and definitive procedure. Also, the candidate is taught to share help and support for patients during the aftercare, especially focusing on neurogenic pain as well as psychological help for the mental consequences of the loss of limb. The candidate must know about on Shoulder and Flbows	Expects the candidate to know the key anatomical structures and to be able to dissect them safely. Also expects the candidate to be able to ligate major vessels of the upper extremity and to handle nerves during amputation surgery.	Appreciates the high relevance of profound understanding and knowledge of shoulder exarticulations.	Amputation upper limp Salvage surgery Exarticulation

	prosthetic options (traditional and modern as well as experimental) to offer the patient options for the future.			
4-Quarter Amputation	Teaches the candidate the possibilities of 4-quarter-amputations. The candidate is taught about the rare indications for this invasive and definitive procedure. Also, the candidate is taught to share help and support for patients during the aftercare, especially focusing on neurogenic pain as well as psychological help for the mental consequences of the loss of limb. The candidate has to know about prosthetic options (traditional and modern as well as experimental) to offer the patient options for the future.	Expects the candidate to know the key anatomical structures and to be able to dissect them safely. Also expects the candidate to be able to ligate major vessels of the upper extremity and to handle nerves during amputation surgery.	Appreciates the high relevance of profound understanding and knowledge of shoulder exarticulations.	Amputation upper limp Salvage surgery Exarticulation
5.9 Arthrodesis	T		T	
Glenohumeral arthrodesis	Teaches the candidate the possibilities and limitations of shoulder arthrodesis. The candidate is taught on the correct position of fixation. The candidate is taught the use of	Expects the candidate to know the key anatomical structures around the shoulder and to be able to dissect them safely. Also expects the candidate to be able to perform stable osteosynthetic	Is aware of the significant implications of glenohumeral arthrodesis on the quality of life of the patient and is aware of the rarity of the indications for glenohumeral arthrodesis.	Arthrodesis Glenohumeral Function Impairment Indication Fusion

techniques, to gain	internal and external
stable fusion of the	fixation
joint.	
joint.	

BASIC LEARNING OBJECTIVES - ELBOW					
	Knowledge	Skill	Attitude	Key Words	
		1. Basic Science			
1.1 Basic Science					
Anatomy	Teaches basic and detailed anatomy of the elbow and its surrounding structures. Particular emphasis shall be laid on the neuro-anatomy around the elbow (Radial, ulnar and median nerves).	Expects the surgeon to be able to apply basic and profound anatomical knowledge to the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of elbow anatomy for proper diagnostics and non-operative as well as operative treatment of elbow pathologies.	Elbow Anatomy Structure	
Biomechanics	Teaches basic and detailed biomechanics of the elbow. Particular emphasis shall be laid on instability patterns: • Posterolateral rotatory instability • Posteromedial instability • Varus / valgus instability • Longitudinal instability of the forearm	Expects the surgeon to be able to apply basic and profound biomechanical knowledge to the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of elbow biomechanics for proper diagnostics and treatment of elbow pathologies.	Elbow Biomechanics Function Structure	
Surgical approaches	Teaches basic and detailed knowledge on the available approaches to the elbow joint, which can be separated into medial, lateral, dorsal and ventral approaches. The approaches are learned with particular respect for the position and course of the	Expects the surgeon to be able to apply basic and profound knowledge of surgical approaches to the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of elbow surgical approaches for proper surgical treatment of elbow pathologies.	Elbow Surgery Dissection Approach	

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Embryology/ Growth	major neurovascular structures at the elbow. • Medial approaches (Hotchkiss, Sulcus-splitting) • Lateral approaches (Kocher, EDC-split, Kaplan) • Dorsal approaches (Tricepspreserving, Triceps-off, Triceps-peel) • Ventral approaches Teaches basic and detailed knowledge on the epidemiology of	Expects the surgeon to be able to apply basic and profound	Appreciates the high relevance of profound	Elbow Epidemiology Patients
	epidemiology of	profound	understanding and	Cases
	elbow pathologies.	knowledge of epidemiology to	knowledge of elbow pathology	
	pathologies.	the treatment of	epidemiologics.	
		elbow pathologies.		
		2. Diagnostics		
2.1 Imaging		2. Diagnostics		
Sonography / Ultrasound	Teaches basic and detailed knowledge on the theoretical basics of ultrasound and its application in the diagnostics and treatment of elbow pathologies. Key structures: Radial head Olecranon fossa Ulno-humeral joint gap Medial and lateral joint gap Medial and lateral ligament complex Ulnar nerve	Expects the surgeon to be able to display the mentioned key structures via ultrasound and to be able to differentiate physiologic and pathologic findings.	Appreciates the high relevance of profound understanding and knowledge of elbow ultrasound investigations.	Ultrasound Anatomical landmarks Elbow diagnostics

	Radial nerveMedian nerveBrachial artery			
Nuclear medicine / Scintigraphy	Teaches basic and detailed knowledge on the theoretical basics of nuclear medicine and its application in the diagnostics and treatment of elbow pathologies.	Expects the surgeon to be able to apply basic and profound knowledge of Nuclear medicine onto the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of nuclear medicine for diagnostics and treatment of elbow pathologies.	Bone Scintigraphy Osteochondritis Dissecans Lateral Epicondylitis Total Elbow Arthroplasty Septic Loosening
MRI/ MR Arthrography	Teaches basic and detailed knowledge on the theoretical basics of MRI and MR Arthrography and its application in the diagnostics and treatment of elbow pathologies.	Expects the surgeon to be able to apply basic and profound knowledge of MRI Imaging onto the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of MRI and MR Arthrography for diagnostics and treatment of elbow pathologies.	MRI MR Arthrography Inflammation Soft Tissues
CT/ CT Arthrography	Teaches basic and detailed knowledge on the theoretical basics of CT and CT Arthrography and its application in the diagnostics and treatment of elbow pathologies.	Expects the surgeon to be able to apply basic and profound knowledge of CT Imaging onto the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of CT and CT Arthrography for diagnostics and treatment of elbow pathologies.	CT CT Arthrography Bone Fracture
DEXA	Teaches basic and detailed knowledge on the theoretical basics of Bone Density Measurements and its application in the diagnostics and treatment of elbow pathologies.	Expects the surgeon to be able to apply basic and profound knowledge of Bone Density Measurements onto the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of Bone Density Measurements for diagnostics and treatment of elbow pathologies.	Bone mineral density children and adolescents dual-energy X-ray absorptiometry elbow

2.2 Laboratory				
Blood parameters	Teaches basic and detailed knowledge on the theoretical basics of Blood Parameters and their application in the diagnostics and treatment of elbow pathologies. • CRP • WBC • PCT • IL-6 • Rheumatoid factors • Anti-CCP • ESR	Expects the surgeon to be able to apply basic and profound knowledge of blood diagnostics onto the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of Blood Parameters for diagnostics and treatment of elbow pathologies.	CRP Cytokine ESR Inflammatory marker Rheumatic disease WBC
Blood cultures	Lists the possibilities and value of Blood Cultures in the diagnosis of systemic infections accompanying elbow pathologies.	Expects the surgeon to be able to apply basic and profound knowledge of microbiological blood diagnostics onto the treatment of elbow pathologies.	Appreciates the high relevance of profound understanding and knowledge of Blood Cultures for diagnostics and treatment of systemic infections accompanying elbow pathologies.	Microbiology Resistance Organism Antibiotics Evasion
2.3 Puncture and l	Biopsy		\mathcal{L}	
Histology	Teaches the basic knowledge of the use of histology for the identification of elbow pathologies, in differentiating infectious and inflammatory diseases.	Expects the surgeon to be able to gather the relevant samples via open, miniopen and minimally-invasive techniques while complying with necessary rules of hygiene and infecundity.	Appreciates the high relevance of profound understanding and knowledge of histology for diagnostics and treatment of systemic infections accompanying elbow pathologies.	Histology Histopathology Synovium Sectioning

Synovial analysis	Teaches the basic knowledge of the use of synovia analysis for the identification of elbow pathologies, in differentiating infectious and inflammatory diseases.	Expects the surgeon to be able to gather the relevant samples via open, miniopen and minimally-invasive techniques while complying with necessary rules of hygiene and infecundity.	Appreciates the high relevance of synovia analysis for diagnostics and treatment of infectious and inflammatory elbow pathologies.	Arthrocentesis Synovium Analysis Inflammation Rheumatic disease
Microbiology	Lists the possibilities and limitations of the essential diagnostic tool of microbiology when dealing with pathologies around the elbow.	Expects the surgeon to be able to gather the relevant samples via open, miniopen and minimally-invasive techniques while complying with necessary rules of hygiene and infecundity.	Appreciates the high relevance of microbiology for the diagnosis of pathogens and antibiotic resistance in the treatment of infectious elbow pathologies.	Microbiology Resistance Organism Antibiotics
2.4 Investigation T	'echniques			
Arthroscopy	Teaches the surgeon the possibilities and limitations of arthroscopy in the diagnosis of elbow pathologies. The surgeon is taught how to respect the critical role of sterility and hygiene when applying arthroscopy to the elbow joint.	Expects the surgeon to be able to perform diagnostic elbow arthroscopy safely while respecting the complex anatomy of the elbow joint and its surrounding neurovascular structures.	Appreciates the relevance of diagnostic arthroscopy for diagnosis of elbow pathologies, guiding the according treatment.	Elbow Arthroscopy Diagnosis Visualization Hygiene
Nanoscope	Teaches the surgeon the possibilities and limitations of nano arthroscopy	Expects the surgeon to be able to perform diagnostic elbow nano arthroscopy	Appreciates the relevance of diagnostic Nano arthroscopy for diagnosis of	Elbow Nanoscope Nano Arthroscopy Diagnosis Visualization

				<u></u>
	how to respect the critical role of sterility and hygiene when applying Nano arthroscopy to the elbow joint.	and its surrounding neurovascular structures.	according treatment.	
Open surgical exploration	Teaches the possibilities and limitations of open surgical exploration as a diagnostic tool for elbow pathologies. The surgeon is taught how to respect the critical role of sterility and hygiene when applying arthroscopy to the shoulder joint.	Expects the surgeon to be able to perform open diagnostic elbow exploration while respecting the complex anatomy of the shoulder joint and its surrounding neurovascular structures.	Appreciates the relevance of open diagnostic surgical exploration and the appropriate treatment for elbow pathologies.	Elbow Open surgical exploration Diagnosis Visualization Hygiene
2.1 Infections		3. Elbow Pathologie	<u>s</u>	
3.1 Infections	T	D (1		G : 4 :::
Primary/Secondar y Empyema	Lists the causes for empyema of the elbow joint and differentiates in primary and secondary causes. Teaches the available techniques for correct diagnosis and efficient treatment of such infectious pathologies.	Expects the surgeon to be able to perform minimally-invasive procedures or to do open surgical approaches to the elbow joint to evacuate empyema, rinsing the joint sufficiently, debriding it and to take samples for diagnostic measures.	Appreciates the relevance of the correct diagnosis and treatment of primary and secondary empyema of the elbow.	Septic arthritis Elbow empyema Osteomyelitis Elbow Infection

Peri-prosthetic	Teaches the	Expects the	Appreciates the	Elbow
Infection	profound	surgeon to be able	relevance of	infection
	knowledge of this	to perform	thorough revision	periprosthetic
	potentially	revision	techniques and	joint infection
	devastating	maneuvers to	therapeutic	total elbow
	complication of	explant prostheses	protocols for the	arthroplasty
	prosthetic	while preserving	correct diagnosis and treatment of	
	replacement around the elbow.	bone stock,	peri-prosthetic	
	Lists the different	evacuate empyema, rinsing	infections around	
	causes, risks and	the joint	the elbow.	
	predispositions for	sufficiently,	the cloow.	
	peri-prosthetic	debriding it and to		
	joint infections.	take samples for		
	Gives insight into	diagnostic		
	common rei-	measures.		
	prosthetic			
	infection			
	treatment			
	protocols.			
	Differentiates in the different			
	underlying			
	prostheses:			
	• Total Elbow			
	Arthroplasty			
	(TEA)			
	• Hemi			
	Arthroplasty			
	(HA)			
	• Radial Head			
	Arthroplasty			
	(RHA)			
	• Capitulum			
	Replacement			
	Arthroplasyt			
Infaction of	(CRA)	Even a ota tla a	A mmmo ai at = 2 +1= =	Infaction offer
Infection of Osteosynthesis	Teaches the profound	Expects the surgeon to be able	Appreciates the relevance of	Infection after fracture fixation
Osteosymmesis	knowledge of this	to perform	thorough revision	Implant-related
	potentially	revision	techniques and	infection
	devastating	maneuvers of	therapeutic	Infected non-
	complication of	elbow	protocols for the	union
	osteosynthetic	osteosynthesis, to	correct diagnosis	Complications
	reconstruction	know the different	and treatment of	Biofilm
	around the elbow.	implants, to be	peri-	Antibiotic therapy
	Lists the different	able to explant	osteosynthetic	
	causes, risks and	these implants	infections around	
	predispositions for	while preserving	the elbow.	
	peri-	bone stock,		
	osteosynthetic	evacuate		
	joint infections.	empyema, rinsing		

	Clarifies on how to diagnose infected pseudarthrosis.	the joint sufficiently, debriding it and to take samples for diagnostic measures.		
3.2 Nerve Patholog	gies			
Ulnar Nerve Syndrome	Lists the multitude of causes for ulnar nerve syndrome. Differentiates in primary and secondary causes, as well as iatrogenic causes of ulnar nerve pathologies.	Expects the surgeon to be able to perform neurolysis of the ulnar nerve. Expects the surgeon to be able to perform revision maneuvers of the ulnar nerve and to be able to perform transposition techniques. Demands the surgeon to be able to perform thorough coagulation of blood vessels at the medial intermuscular sentum.	Appreciates the relevance of ulnar nerve syndrome and thorough surgical techniques and therapeutic protocols for the correct diagnosis and treatment of ulnar nerve syndrome at the elbow.	Ulnar nerve Ulnar tunnel syndrome Compressive neuropathy

Snapping Ulnaris	Teaches the	Expects the	Appreciates the	Cubital tunnel
Syndrome	background of snapping ulnaris	surgeon to be able to perform	relevance of snapping ulnaris	cubitus varus operative
	syndrome, by	neurolysis of the	syndrome and of	technique
	looking into its	ulnar nerve.	thorough surgical	snapping triceps
	etiology. Differentiates in	Expects the	techniques and	syndrome
	constitutional	surgeon to be able to perform	therapeutic protocols for the	ulnar neuritis
	causes and	revision	correct diagnosis	
	explains the role	maneuvers of the	and treatment of	
	of the triceps	ulnar nerve and to	snapping ulnaris	
	muscle in that context.	be able to perform transposition	syndrome.	
	context.	techniques.		
		Demands the		
		surgeon to be able		
		to perform thorough		
		coagulation of		
		blood vessels at		
		the medial		
		intermuscular		
		septum. Expects the surgeon to be		
		able to perform		
		partial resection		
		of the medial head		
Radial Tunnel	Lists the causes of	of the triceps. Expects the	Appreciates the	Compression
Syndrome /	radial tunnel	surgeon to be able	relevance of ulnar	Diagnosis
Supinator	syndrome/supinat	to perform	nerve syndrome	Radial Tunnel
Syndrome	or syndrome.	neurolysis of the	and thorough	Syndrome
	Teaches its correct diagnosis and	radial nerve. Expects the	surgical techniques and	Treatment Nerve pathology
	treatment	surgeon to be able	therapeutic	Titel to passionegy
	possibilities.	to perform	protocols for the	
		revision	correct diagnosis and treatment of	
		maneuvers of the radial nerve.	ulnar nerve	
		Demands the	syndrome at the	
		surgeon to be able	elbow.	
		to dissect Frohe's arcade.		
Pronator Teres	Lists the causes of	Expects the	Appreciates the	decompression
Syndrome	pronator teres	surgeon to be able	relevance of	pronator teres
	syndrome.	to perform	pronator teres	syndrome
	Teaches its correct	neurolysis of the median nerve.	syndrome and	nerve
	diagnosis and treatment	Expects the	thorough surgical techniques and	compression nerve pathology
	possibilities and	surgeon to be able	therapeutic	Pamerogj
	how to	to perform	protocols for the	
	differentiate it	revision	correct diagnosis	

	from other median nerve syndromes.	maneuvers of the median nerve. Demands the surgeon to be able to dissect the pronator muscle.	and treatment of pronator teres syndrome.	
3.3 Tumors				
Benign Bone Tumors / Osteoid osteoma	Teaches the etiology and epidemiology of this very rare benign tumor. Lists the diagnostic modalities to differentiate it from other lesions and other causes of non-traumatic pain.	Expects the surgeon to be able to perform minimally invasive and open approaches to get access to the sites of the lesions and how to remove them while preserving intact bone.	Appreciates the relevance of osteoid osteoma at the elbow, the necessity for thorough diagnostics and careful surgical techniques for treatment.	osteoid osteoma elbow osteoblastic tumor neoplasia
Primary Malignant Tumors	Lists the rare primary malignant bone tumors at the elbow, and their diagnostic and treatment algorithms.	Expects the surgeon to be able to perform surgical approaches to get access to the sites of the lesions to either perform a diagnostic biopsy or to remove the lesions while preserving intact bone and soft tissues.	Appreciates the relevance of primary malignant tumors at the elbow, the necessity for thorough diagnostics and careful surgical techniques for treatment, while adhering to established treatment algorithms.	benign bone tumour elbow malignant
Metastatic Cancer	Lists the possible primary malignancies that may cause metastatic disease to the elbow rare and teaches their diagnostic and treatment algorithms.	Expects the surgeon to be able to perform surgical approaches to get access to the sites of the lesions to either perform a diagnostic biopsy or to remove the lesions while preserving intact bone and soft tissues.	Appreciates the relevance of metastatic cancer at the elbow, the necessity for thorough diagnostics and careful surgical techniques for treatment, while adhering to established treatment algorithms.	Metastasis carcinoma malignant tumor elbow

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Benign Soft Tissue Lesions	Lists the possible benign soft tissue lesions that may be encountered at the elbow rare and teaches their diagnostic and treatment algorithms.	Expects the surgeon to be able to perform surgical approaches to - if indicated - get access to the sites of the lesions to either perform a diagnostic biopsy or to remove the lesions while preserving intact bone and soft tissues.	Appreciates the relevance of benign soft tissue lesions at the elbow, the necessity for thorough diagnostics and careful surgical techniques for treatment, while adhering to established treatment algorithms.	benign elbow soft tissue tumors
3.4 Sports Injuries				
Ligamentous Dislocation	Teaches the epidemiology of ligamentous elbow dislocation and explains the pathobiomechanics. Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for nonoperative and operative treatment, according to the available literature.	Expects the surgeon to be able to perform surgical approaches to the elbow joint, its ligamentous stabilizers and the muscle origins to if indicated perform refixation of these structures in the acute setting or perform augmentation and repair in the chronic setting.	Appreciates the relevance of elbow instability after elbow dislocation, the necessity for proper diagnostics and, therefore adequate indications for treatment.	dislocation elbow epidemiology indications refixation physiotherapy overhead
Chronic Valgus Instability	Teaches the epidemiology of chronic valgus instability. Displays the etiology: • Trauma • Attrition/overuse Lists the diagnostic algorithms of clinical and imaging investigations, as well as the indications for nonoperative and operative treatment, according to the available literature.	Expects the surgeon to be able to perform surgical approaches to the elbow joint, its ligamentous stabilizers and the muscle origins to if indicated - perform ligament reconstruction in the chronic setting.	Appreciates the relevance of chronic valgus instability of the elbow, the necessity for proper diagnostics and therefore adequate indications for treatment.	Elbow Athletes Ligaments Joint instability Reconstructive surgery

Osteochondral Lesion	Defines the pathology with its pathogenesis and epidemiology. Lists the currently available classification systems and treatment algorithms for osteochondral lesions. Presents the common indications, based on the present literature.	Expects the surgeon to be able to perform surgical minimally-invasive, arthroscopic and open approaches to the elbow joint to - if indicated - perform osteochondral debridement or cartilage repair strategies.	Appreciates the relevance of osteochondral lesions of the elbow, the necessity for proper diagnostics and therefore adequate indications for treatment.	osteochondral lesions osteochondritis dissecans elbow arthritis
Medial Epicondylitis/ Medial Elbow Pain	Defines the pathology with its pathogenesis and epidemiology. Lists the currently available classification systems and treatment algorithms for medial epicondylitis. Presents the common indications for nonoperative/operative treatment, based on the present literature.	Expects the surgeon to be able to perform surgical minimally-invasive, arthroscopic and open approaches to the elbow joint to - if indicated - perform tendon debridement and refixation strategies.	Appreciates the relevance of medial epicondylitis of the elbow, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special challenges in correctly diagnosing epicondylitis and differentiating it from other causes of medial elbow pain.	lateral elbow pain lateral epicondylitis tendinitis golfer´s elbow
Lateral Epicondylitis/ Lateral Elbow Pain	Defines the pathology with its pathogenesis and epidemiology. Lists the currently available classification systems and treatment algorithms for lateral epicondylitis. Presents the common indications for nonoperative/operative treatment, based on the present literature.	Expects the surgeon to be able to perform surgical minimally-invasive, arthroscopic and open approaches to the elbow joint to - if indicated - perform tendon debridement and refixation strategies.	Appreciates the relevance of medial epicondylitis of the elbow, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special challenges in correctly diagnosing epicondylitis and differentiating it from other causes of lateral elbow pain.	lateral elbow pain lateral epicondylitis tendinitis tennis elbow

3.5 Trauma				
Radial Head Fracture	Defines the pathology with its pathogenesis and epidemiology. Lists the currently available classification systems and shows their limitations. Offers recommendations for treatment algorithms. Presents the common indications for non-operative/operative treatment, based on the present	Expects the surgeon to be able to perform minimally invasive, arthroscopic and open surgical approaches to the elbow joint to - if indicated - perform repositioning, fixation and replacement of the radial head.	Appreciates the relevance of radial head fractures and their implications on elbow biomechanics, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation or replacement.	Internal Fixation Radial Head Medial Collateral Ligament Radial Head Fracture
Proximal Ulna Fractures	literature. Defines the pathology with its pathogenesis and epidemiology. Lists the currently available classification systems and shows their limitations. Offers recommendations for treatment algorithms. Presents the common indications for non-operative/operative treatment, based on the present literature.	Expects the surgeon to be able to perform open approaches to the elbow joint to - if indicated - perform reduction and fixation.	Appreciates the relevance of olecranon fractures and its implications on elbow biomechanics, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation.	coronoid process elbow stability Monteggia fracture Monteggia-like lesion olecranon proximal ulna fracture radial head
Distal humerus fractures	Defines the pathology with its pathogenesis and epidemiology. Lists the currently available classification systems and shows their limitations. Offers recommendations for treatment	Expects the surgeon to be able to perform minimally invasive, arthroscopic and open surgical approaches to the elbow joint to - if indicated - perform repositioning, fixation and	Appreciates the relevance of distal humerus fractures and its implications on elbow biomechanics, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special	Distal humerus fracture Fracture fixation Open reduction internal fixation Total elbow arthroplasty Anatomy Elbow

	algorithms. Presents the common indications for non- operative/operative treatment, based on the present literature. Discusses the indications of nerve transposition. Teaches the high complication risks of elbow replacement surgery.	replacement of the distal humerus.	challenges in correctly choosing the method of fixation or replacement.	
Isolated Coronoid Fracture / PMRI	Defines the pathology with its implications on elbow biomechanics and lists its epidemiology. Displays the available classification systems and reports their limitations. Emphasizes the relevance of concomitant ligament injuries.	Expects the surgeon to be able to perform minimally-invasive, arthroscopic and open surgical approaches to the elbow joint to - if indicated - perform repositioning and fixation of the coronoid, as well as to perform refixation and reconstruction of the collateral ligaments.	Appreciates the relevance of coronoid fractures and its implications on elbow biomechanics, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation and reconstruction.	Isolated coronoid fracture lateral collateral ligament magnetic resonance imaging fracture ligaments
Terrible Triad	Defines the pathology with its relevance for elbow biomechanics. Underlines the difference in the fracture patterns of the coronoid regarding PMRI. Teaches the accompanying ligamentous injuries and the specific complications, like stiffness and heterotopic ossifications.	Expects the surgeon to be able to perform minimally-invasive, arthroscopic and open surgical approaches to the elbow joint to - if indicated - perform repositioning and fixation of the coronoid and the radial head, as well as to perform refixation and reconstruction of the collateral ligaments. Also, the surgeon must be able to deal with the ulnar nerve, which is to be	Appreciates the relevance of terrible triad injuries and its implications on elbow biomechanics, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation and reconstruction.	Radial Head Coronoid Dislocation Elbow Stiffness Heterotopic Ossification

		protected during		
		the procedure.		
Monteggia	Defines the pathology with its relevance for elbow biomechanics. Displays its epidemiology. Teaches the current classification system. Teaches the accompanying ligamentous injuries and the specific complications, like stiffness, joint malalignement and heterotopic ossifications.	Expects the surgeon to be able to perform minimally-invasive, and open surgical approaches to the elbow joint to - if indicated - perform repositioning and fixation of the olecranon and the radial head, as well as to perform refixation and reconstruction of the collateral ligaments. Also, the surgeon must be able to deal with the ulnar nerve, which is to be protected during the procedure.	Appreciates the relevance of monteggia triad injuries and its implications on elbow biomechanics, the necessity for proper diagnostics and therewith adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation and reconstruction.	dislocation fracture pediatric radial head prosthesis Monteggia forearm
Essex-Lopresti	Defines this rare Pathology and discusses ist complex biomechanics. Teaches the genesis of the three distinct pathologic components and the pathomechanics of longitudinal forearm instability. Teaches the epidemiology of this rare lesion and the diagnostic principles and how not to miss them on initial presentation.	Expects the surgeon to be able to perform open surgical approaches to the elbow joint to - if indicated - perform repositioning and fixation of the radial head or replacement surgery, as well as to perform refixation and reconstruction of the collateral ligaments, of the interosseous membrane and to stabilize the DRUJ.	Appreciates the high relevance of Essex-Lopresti injuries and its implications on elbow biomechanics, the necessity for proper diagnostics and therewith adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation and reconstruction.	Essex-Lopresti Forearm Instability Elbow Joint Radial Head Interosseous Membrane

	T	T	T	T
		Also, the surgeon		
		must be able to		
		deal with chronic		
		longitudinal		
		forearm instability		
		and how to restore		
		that with		
		reconstruction of		
		the interosseous		
		membrane.		
3.6 Developmental d	isorders			
Chronic Radial Head	Teaches the	Expects the surgeon	Appreciates the	Radial Head
Dislocation	etiology and	to be able to	relevance of Radial	Dislocation
	epidemiology of	perform surgical	Head Dislocation	Elbow
	this pathology.	planning for an	and its implications	Stiffness
	Differentiate	osteotomy and	on elbow	Heterotopic
	between congenital	perform open	biomechanics, the	Ossification
	dislocation and	surgical approaches	necessity for proper	
	developmental	to the elbow joint	diagnostics and	
	dislocation. Lists	to perform the	therefore adequate	
	the diagnostic	osteotomy and	indications for	
	modalities to	fixation. Also, the	treatment. Is aware	
	differentiate it from	surgeon must be	of the special	
	acute traumatic	able to deal with	challenges in	
	lesions.	the radial nerve,	correctly choosing	
	100101101	which is to be	the method of	
		protected during	fixation and	
		the procedure.	osteotomy	
		the procedure.	techniques.	
Cubitus Varus	Teaches the	Expects the surgeon	Appreciates the	Angulation
	etiology and	to be able to	relevance of cubitus	Deviation
	epidemiology of	perform surgical	varus and its	Elbow
	this pathology.	planning for an	implications on	Stiffness
	Offers	osteotomy and	elbow	Pain
	recommendations	perform open	biomechanics, the	Trauma
	for treatment	surgical approaches	necessity for proper	Hauma
	algorithms.	to the elbow joint	diagnostics and	
	aigui itillis.	_	_	
		to perform the	therefore adequate indications for	
		osteotomy and		
		fixation. Also, the	treatment. Is aware	
		surgeon must be	of the special	
		able to deal with	challenges in	
		the ulnar nerve,	correctly choosing	
		which is to be	the method of	
		protected during	fixation and	
		the procedure.	osteotomy	
			techniques.	

3.7 Inherent/growth	associated			
3.7 Inherent/growth Dysplasia Varus/ Valgus	associated Describes the causes of growth-associated dysplasia of the distal humerus Defines the symptomatology and significance. Defines the typical radiologic findings Lists surgical treatment indications and timing Lists possible complications and results of treatment.	Not every surgeon needs to be able to treat such complex pathologies surgically. However, he must be able to diagnose the pathology correctly. Also, he should be able to refer the patient to a centre specialized in the treatment of such pathologies.	Appreciates the relevance of varus/valgus malalignment and its implications on elbow biomechanics, the necessity for proper diagnostics and therewith adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of correction and osteotomy techniques.	Elbow Deviation Function Pain
Varus/ Valgus malalginement	Describes the causes of growth associated cubitus varus (fe after supracondylar fracture) of valgus (fe after lateral condyle fracture) Describe the normal variation in valgus alignment. Defines the symptomatology and significance. Defines the typical radiologic findings Lists surgical treatment indications and timing Lists possible complications and results of treatment.	Expects the surgeon to be able to perform a surgical planning for an osteotomy	Appreciates the relevance of varus/valgus malalignment and its implications on elbow biomechanics, the necessity for proper diagnostics and therewith adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation and osteotomy techniques.	Angulation Deviation Elbow Stiffness Pain Trauma

Radio-ulnar synostosis	Distinct between osteochondrosis of the capitellum (Panner's disease) and osteochondritis dissecans. Evaluate technical investigation to define the severity of the lesion. Offers recommendations for treatment algorithms.	Expects the surgeon to be able to perform a surgical planning for an osteotomy	Appreciates the relevance of radioulnar synostosis and its implications on elbow biomechanics, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of fixation and	Radial Head Dislocation Elbow Fracture Healing Stiffness Heterotopic Ossification
			osteotomy techniques.	
Osteochondrosis dissecans	Distinct between osteochondrosis of the capitellum (Panner's disease) and osteochondritis dissecans. Evaluate technical investigation to define the severity of the lesion. Offers recommendations for treatment algorithms.	Expects the surgeon to be able to perform surgical planning for arthroscopy or open treatment (debridement, fixation, grafting)	Appreciates the relevance of osteochondritis dissecans and its implications on elbow biomechanics, the necessity for proper diagnostics and therefore adequate indications for treatment. Is aware of the special challenges in correctly choosing the method of debridement or grafting	Cartilage Elbow Pain Overload Perfusion Necrosis
3.8 Caused by medical	al interventions			
Chondral lesions	Teach the different causes of iatrogenic cartilage damage (punction, a'scopic treatment, open treatment). Define the symptomatology and significance. Defines the typical radiologic findings Lists non-operative treatment indications. Lists surgical	Expects the surgeon to be able to perform arthroscopy or open treatment (debridement, osteocapsular arthroplasty, elbow arthroplasty)	Appreciates the high relevance of cartilage injuries for joint integrity and adequate functionality.	Cartilage Elbow Pain Overload Perfusion Necrosis Chondral lesions

	T		T	1
	treatment indications.			
	Lists possible			
	complications and			
	results of			
	treatment.			
				6 11:
Infection	Teach the different	Expects the surgeon to be able to	Appreciates the	Swelling
	causes of iatrogenic infection (punction,		catastrophic	Effusion Bacteria
	a'scopic treatment,	perform surgical planning for an	consequences of joint infection for	Redness
	open treatment).	a'scopy or open	joint integrity and	ineuriess
	Define the	treatment	functionality.	
	symptomatology	(debridement,	,	
	and significance.	synovectomy)		
	Defines the typical	, , , , , , , , , , , , , , , , , , , ,		
	radiologic findings			
	Lists non-operative			
	treatment			
	indications. Lists			
	surgical treatment			
	indications.			
	Lists possible			
	complications and results of			
	treatment.			
Osteonecrosis	Teach the different	Expects the surgeon	Appreciates the	Perfusion
Osteonecrosis	causes of	to be able to	potentially severe	Pain
	osteonecrosis	perform	consequences of	Bone loss
	(medication like	arthroscopy or	osteonecrosis of	Bone
	corticosteroids).	open treatment	the elbow, leading	
	Define the	(debridement,	to secondary	
	symptomatology	osteocapsular	arthritis, stiffness	
	and significance.	arthroplasty, elbow	and pain.	
	Defines the typical	arthroplasty)		
	radiologic findings			
	Lists non-operative			
	treatment			
	indications. Lists surgical treatment			
	indications.			
	Lists possible			
	complications and			
	results of			
	treatment.			
3.9 Inflammatory/ Sy	ystemic diseases/ Bone	e metabolism		
Rheumatoid	Lists the diagnostic	Refers the patient	Become aware of	Chronic
diseases	criteria for RA.	to a rheumatologist	the significance of	inflammatory
	Diagnoses RA.	when necessary.	giving disease-	pain
	Explains the	Performs surgical	related information	Biologicals
	pharmacologic	treatment as	to the patient and	Treatment
	treatment of RA.	indicated	relatives.	
	Explains the elbow			
	involvement in RA,			

		T	T	T
	its characteristics and the prognosis. Lists the indications of surgical and nonsurgical treatment.			
PVNS	Diagnoses PVNS (nodular - diffuse) Explains the elbow involvement in PVNS, its characteristics and the prognosis. Lists the indications of surgical treatment and the risks of recurrence	Expects the surgeon to be able to perform minimally-invasive, arthroscopic and open surgical approaches to the elbow joint to - if indicated - perform synovectomy.	Become aware of the significance of giving disease-related information to the patient and relatives, specifically on the recurrence rate of the disease.	Swelling Joint Pain Chronic Malignoma
Olecranon Bursitis	Teaches the etiology and epidemiology of this pathology. Differentiate between septic and non-septic bursitis. Evaluate etiology (traumatic - nontraumatic). Lists the indications of nonsurgical and surgical treatment and the risks of recurrence.	Expects the surgeon to be able to perform a correct punction of the bursa, drainage of pus and resection of the bursa in a non-septic condition	Is aware of the correct indications for when to perform punction, acute and delayed resection of the olecranon bursa, and when to treat it non-operatively.	Bursa Swelling Pain Inflammatory traumatic
3.10 Degenerative				
Osteoarthritis	Describes the natural course. Defines the etiology (traumaticatraumatic) Defines the symptomatology and significance. Defines the typical radiologic findings Lists non-operative treatment indications. Lists surgical treatment indications. Lists possible complications and results of treatment.	Is able to perform the standard surgical treatment alternatives for joint osteoarthritis, like arthroscopic debridement, resection arthroplasty and arthroplasty.	Is aware of the high relevance of osteoarthritis for patients' quality of life and its high impact on socioeconomic costs.	Degeneration posttraumatic Pain Crepitus Cartilage

Loose bodies	Describes the natural course. Defines the etiology (traumaticatraumatic) Defines the symptomatology and significance. Defines the typical radiologic findings Lists non-operative treatment indications. Lists surgical treatment indications. Lists possible complications and results of treatment.	Is able to perform the common surgical treatment options for loose bodies, like open and arthroscopic loose body removal.	Is aware of possible effects of loose bodies on joint function and quality of life.	Locking Pain Effusion Removal Treatment
Stiffness	Defines the etiology (traumatic-atraumatic) (extrinsic - intrinsic causes) Defines the symptomatology and significance. Lists non-operative treatment indications. Lists surgical treatment indications. Lists possible complications and results of treatment.	Is able to perform the common surgical treatment options for elbow stiffness, like open and arthroscopic surgery and is able to perform neurovascula release procedures.	Is aware of the severe effects of elbow stiffness on joint functionality and quality of life and knows about the possible improvements that can be gained by non-operative and surgical treatment	Quality of Life Chronic Pain Functionality
	4	I. Elbow Non-operative	e	
4.1 Physical Therapy				
Physiotherapy	Teaches the surgeon the principles behind physiotherapy for the different elbow conditions including the effect on the different tissues around the elbow, including bone, muscle, tendon, ligaments, and neurological	Is able to convey the common concepts of physiotherapy in the treatment of elbow pathologies.	Is aware of the immense positive impact that physiotherapy can have in the treatment of elbow pathologies.	Non-operative Treatment Motion Intervention

	structures. The			
	structures. The surgeon should be knowledgeable about the different indications and techniques.			
Ergotherapy	Teaches the surgeon the principles behind ergo therapy including the promotion of selfcare and promotion of the use of the upper limb in the activities of daily living	Is able to convey the common concepts of Ergotherapy in the treatment of elbow pathologies.	Is aware of the immense positive impact that ergotherapy can have in the treatment of elbow pathologies.	Non-operative Treatment Motion Intervention
Massage	Teaches the surgeon the principles behind massage techniques. The surgeon is taught the basic massage techniques for the safe mobilization of tissue and should be knowledgeable about the indications for its use.	Is able to convey the common concepts of Massage Therapy in the treatment of elbow pathologies.	Is aware of the immense positive impact that massage can have in the treatment of elbow pathologies.	Non-operative Treatment Motion Intervention
Manual therapy	Teaches the surgeon the principles behind manual therapy techniques. The surgeon should be knowledgeable on the effect of hand movements and skilled passive movement of the joint and the indications for its use.	Is able to convey the common concepts of Manual Therapy in the treatment of elbow pathologies.	Is aware of the immense positive impact that manual therapy can have in the treatment of elbow pathologies.	Non-operative Treatment Mobilization Intervention
Lymphatic drainage	Teaches the surgeon the principles behind lymph drainage techniques. The surgeon should be knowledgeable about the different application	Is able to convey the common concepts of Lymphatic drainage in the treatment of elbow pathologies.	Is aware of the immense positive impact that lymph drainage can have in the treatment of elbow pathologies.	Non-operative Treatment Swelling Mobilization Intervention

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	techniques and					
	understand the					
	possible					
	complications and					
	how to avoid and					
	detect them.					
4.2 Immobilization/ Orthoses, Prosthesis etc.						
Splints	Teaches the	Expects the surgeon	Is aware of the high	Stabilization		
	surgeon the	to be able to	relevance of splints	Treatment		
	principles behind	perform a correct	in the acute and	Healing		
	the correct use of	placement of elbow	chronic treatment	Protection		
	splints for	casting,	of elbow			
	immobilization and	understanding the	pathologies.			
	assisted	importance of				
	mobilization	adequate padding				
	techniques. The	to avoid pressure				
	patient should	sores				
	understand the					
	principles behind					
	the use of, but not					
	limited, to dynamic					
	splinting and static					
	progressive					
	splinting. The					
	surgeon should be					
	knowledgeable					
	about the different					
	protocols, the					
	length of therapy					
	and how to detect					
	and treat possible					
	complications.					
Orthoses	Teaches the	Expects the surgeon	Is aware of the high			
	surgeon the	to be able to	relevance of splints	Treatment		
	principles behind	perform a correct	in the acute and	Healing		
	orthotic treatment.	placement of	chronic treatment	Protection		
	The surgeon should	orthoses,	of elbow			
	be knowledgeable	understanding the	pathologies.			
	of the appropriate	importance of				
	indications, correct	adequate padding				
	use and	to avoid pressure				
	identification of	sores				
Cooks	complications	F the control	la accessa a Cabacata d	Crabilization		
Casts	Teaches the	Expects the surgeon	Is aware of the high	Stabilization		
	surgeon the	to be able to	relevance	Treatment		
	principles behind	perform a correct	of splints in the	Healing		
	casting techniques.	placement of elbow	acute and chronic	Protection		
	The surgeon is	casting	treatment of elbow			
	taught the	understanding the	pathologies.			
	technique to apply	importance of				
	plaster of paris	adequate padding				
	correctly and	to avoid pressure				
	alternatives like	sores				

	T	T	T	T
	fiberglass. The			
	surgeon should be			
	knowledgeable of			
	the appropriate indications, correct			
	use and			
	identification of			
	complications			
Braces	Teaches the	Expects the surgeon	Is aware of the high	Stabilization
Diaces	surgeon the	to be able to	relevance	Treatment
	principles behind	perform the correct	of braces in the	Healing
	bracing techniques.	placement of elbow	acute and chronic	Protection
	The surgeon should	braces	treatment of elbow	Trotection
	be knowledgeable	understanding the	pathologies.	
	of the appropriate	importance of	patriologies.	
	indications, correct	adequate padding		
	use and	to avoid pressure		
	identification of	sores		
	complications			
4.3 Pain Relief Thera				
Systemic pain	Teaches the	Expects the surgeon	Is aware of the high	Medication
therapy (oral)	surgeon on the	to be able to design	relevance	Pills
	different available	an appropriate	of systemic pain	Pain
	oral pain	initial pain	therapy in the	Treatment
	medications and	treatment plan and	acute and chronic	Alleviation
	should be	adequately manage	treatment of elbow	
	knowledgeable on	residual pain	pathologies.	
	the analgesic ladder			
	to support various			
	degrees of pain			
	level. The surgeon			
	should understand			
	the basics of			
	pharmacology,			
	interactions and			
	side effects of the			
	different pain			
	medications			
	including but not limited to non-			
	opioid analgesics			
	(aspirin, acetaminophen,			
	NSAIDs -selective			
	and non-selective),			
	weak opioids,			
	strong opioids and			
	the use of			
	adjuvants with			
	opioid therapy and			
	how to switch up			
	and down the			
	analgesia ladder.			

Systemic pain	Teaches the	Expects the surgeon	Is aware of the high	Medication
therapy	surgeon on the	to be able to design	relevance	Line
(intravenous)	different available	an appropriate	of systemic pain	Pain
	intravenous pain	initial pain	therapy in the	Treatment
	medications and	treatment plan and	acute and chronic	Alleviation
	should be	adequately manage	treatment of elbow	
	knowledgeable on	residual pain	pathologies.	
	the different			
	intravenous pain			
	medications			
	including but not			
	limited to			
	multimodal pain			
	medication			
	treatment. The			
	surgeon should			
	understand the			
	basics of			
	pharmacology, interactions and			
	side effects of the			
	different			
	intravenous pain			
	medications,			
	including but not			
	limited to non-			
	opioid analgesics			
	(acetaminophen,			
	NSAIDs -selective			
	and non-selective),			
	weak opioids,			
	potent opioids and			
	the use of			
	adjuvants with			
	opioid therapy and			
	how to switch up			
	and down the			
	analgesia ladder.			
Injections	Teaches the	Expects the surgeon	Is aware of the high	Medication
	surgeon the	to be able to	relevance	Puncture
	principles behind	perform a safe	of injections in the	Pain
	injections. This	injection around	acute and chronic	Treatment
	should include	the elbow,	treatment of elbow	Alleviation
	understanding the	emphasizing the	pathologies.	
	pharmaceutical	use of a sterile		
	knowledge of the	technique and		
	injected products	understanding the		
	including the	availability of		
	indications,	imaging techniques		
	contraindications	to increase the		
	and management	precision of the		
	of possible adverse	injection		
	reactions and			
	complications. They			

	1			
Pain catheters	should be knowledgeable on the specific techniques for injection including the importance of appropriate sterility techniques and the use of adjuvant imaging techniques. Teaches the surgeon the principles behind the safe use of pain catheters, including care of catheters, the different medications used and existing pain protocols. The surgeon should be knowledgeable about the possible complications of	Is able to convey the common concepts of Pain Catheters in the treatment of elbow pathologies.	Is aware of the high relevance of pain catheters in the acute and chronic treatment of elbow pathologies.	Medication Catheter Pain Treatment Alleviation
	complications of			
	catheter therapy.			
4.4 Non-operative fra	1			l
Physiotherapy	Teaches the surgeon the principles behind immobilization techniques. The surgeon is taught the technique to apply plaster of paris correctly and alternative materials. The surgeon must understand the possible complications and how to avoid and detect them. Teaches the	Expects the surgeon to be able to perform a correct placement of elbow casting, understanding the importance of adequate padding to avoid pressure sores	Is aware of the high relevance of immobilization in the acute and chronic treatment of elbow pathologies.	Pain Healing Stabilization Rest
Physiotherapy	surgeon the principles of physiotherapy for the treatment of elbow fractures. The surgeon is taught the basics of the different treatment	Is able to convey the common concepts of Physiotherapy in the treatment of elbow pathologies.	immense positive impact that physiotherapy can have in the treatment of elbow pathologies.	Non-operative Treatment Motion Intervention

	modalities of the immobilized and adjacent joints during fracture treatment			
		5. Elbow operative		
5.1 Arthroscopy				
Diagnostic arthroscopy	Teaches the surgeon the possibilities and limitations of arthroscopy in the diagnosis of elbow pathologies. The surgeon is taught how to respect the critical role of sterility and hygiene when applying arthroscopy to the elbow joint. The surgeon is taught the correlation between the different portals and the nerves around the elbow.	Expects the surgeon to be able to perform arthroscopic approaches to the elbow joint	Is aware of the significant role of elbow arthroscopy in the treatment of acute and chronic elbow pathologies. Is aware of the high relevance that the procedure can have for patient outcomes.	Overview Diagnosis Intervention Planning
Ligament repair	Teaches the surgeon the possibilities and limitations of arthroscopy in the treatment of ligament lesion around the elbow (PLRI).	Expects the surgeon to be able to perform arthroscopic surgical approaches to the elbow joint, and its ligamentous stabilizers and - if indicated - perform refixation of these structures in the acute setting, or plication in the chronic setting.	Is aware of the importance of stable joint functionality and therefore appreciates the necessity to be able to perform acute and late stabilization procedures.	Fixation Stabilization Ligament Anchor Repair
Tendon repair	Teaches the surgeon the possibilities and limitations of endoscopy in the treatment of tendon repair	Expects the surgeon to be able to perform endoscopic approaches to the elbow joint and the muscle origins to - if indicated - perform refixation of these structures in the acute setting.	Is aware of the importance of stable joint functionality and therefore appreciates the necessity to be able to perform acute and late tendon repair procedures.	Fixation Strength Tendon Anchor Repair

Removal of loose bodies	Teaches the surgeon the possibilities and limitations of arthroscopy in the removal of loose bodies. The surgeon is taught how to respect the critical role of sterility and hygiene when applying arthroscopy to the elbow joint.	Expects the surgeon to be able to perform surgical minimally-invasive, arthroscopic and open approaches to the elbow joint to - if indicated - remove loose bodies.	Is aware of possible effects of loose bodies on joint function and quality of life.	Locking Pain Effusion Removal Treatment
Cartilage treatment	Teaches the surgeon the possibilities and limitations of arthroscopy in cartilage treatment.	Expects the surgeon to be able to perform open and arthroscopic approaches to the elbow joint to - if indicated - remove loose bodies.	Is aware of the high relevance of osteoarthritis for patients' quality of life and its high impact on socioeconomic costs.	Arthritis Pain crepitus Lesion Stiffness
Removal of osteophytes	Teaches the surgeon the possibilities and limitations of arthroscopy of the most common locations of and the removal of osteophytes. Teaches the surgeon how to differentiate between osteophytes and normal bone	Expects the surgeon to be able to perform open and arthroscopic approaches to the elbow joint to - if indicated - remove osteophytes.	Is aware of the high relevance of osteophytes for patients' quality of life and its high impact on socioeconomic costs.	Motion Mobility Arthroscopic open
Arthrolysis	Teaches the surgeon the possibilities and limitations of arthrolysis (anterior, posterior, posterolateral) of the elbow. Teaches how to use extra retraction portals that can help to provide a better view. The surgeon is taught the correlation between the	Expects the surgeon to be able to perform open and arthroscopic approaches to the elbow joint to - if indicated - perform elbow arthrolysis.	Is aware of the high relevance of stiffness for patients' quality of life and its high impact on socioeconomic costs.	Stiffness Function Quality of Live Arthroscopic open

	1:00			
	different portals			
	and the nerves			
	around the elbow.			
	teaches the			
	difference between			
	capsulectomy and			
	capsulotomy			
Synovectomy	Teaches the	Expects the surgeon	Is aware of the high	Pain
, ,	surgeon the	to be able to	relevance of	Inflammation
	possibilities and	perform open and	synovitis	Joint
	limitations of	arthroscopic	for patients' quality	Capsule
	synovectomy	approaches to the	of life.	Capsuic
	(anterior, posterior,	elbow joint to - if	of file.	
	•	_		
	posterolateral) of	indicated - perform		
	the elbow. The	synovectomy.		
	surgeon is taught			
	the correlation			
	between the			
	different portals			
	and the nerves			
	around the elbow.			
Fracture treatment	Teaches the	Expects the surgeon	Is aware of the high	Stability
	surgeon the	to be able to	relevance of	Pain
	possibilities and	perform open and	fractures	Function
	limitations of	arthroscopic	for patients' quality	Reposition
	arthroscopic	approaches to the	of life and its high	Plate
	fracture treatment	elbow joint to - if	impact on	Screw
	of the elbow. The	indicated - perform	socioeconomic	30.011
	surgeon is taught	fracture repair.	costs.	
	the removal of	macture repair.	costs.	
	bony fragments,			
	the arthroscopic			
	reduction and			
	fixation techniques			
	of the elbow (radial			
	head fixation,			
	coronoid fracture,			
	capitellum fracture,			
)			
5.2 Reconstructive pr	rocedures			
Open fracture	Teaches the	Expects the surgeon	Is aware of the high	Approach
treatment	surgeon the	to be able to	relevance of	Surgery
a cathlene	possibilities and	perform the	adequate open	Reduction
	limitations of open	commonly available	fracture treatment	Fixation
	•	•		i ixatiUil
	fracture treatment.	open surgical	for patients' quality	
	Teaches the	approaches to the	of life and its high	
	different	elbow joint that are	impact on	
	techniques that can	necessary for	socioeconomic	
	be used to fix	adequate open	costs.	
	fractures - pinning,	fracture repair.		
	fractures - pinning,			

Open ligament repair	Teaches the surgeon the possibilities and limitations of ligament repair. Teaches the different techniques that can be used for ligament repair: transosseus fixation, and anchor treatment. Knowledge of the location of the proximal and distal attachment of the ligaments around the elbow	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint that are necessary for adequate open ligament repair.	Is aware of the high relevance of adequate open ligament repair for patients' quality of life and its high impact on socioeconomic costs.	Fixation Stabilization Ligament Anchor Repair
Open tendon repair	Teaches the surgeon the possibilities and limitations of tendon repair (biceps, triceps) Teaches the different techniques and approaches (single or double incision) that can be used for tendon repair. Transosseus, endobutton, anchors, screw fixation,	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for adequate open tendon repair.	Is aware of the high relevance of adequate open tendon repair for patients' quality of life and its high impact on socioeconomic costs.	Fixation Strength Tendon Anchor Repair
Open stabilization procedures	Teaches the surgeon the possibilities and limitations of open stabilization procedures. Teaches the different techniques and approaches (medial-lateral)	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for adequate open stabilization procedures.	Is aware of the high relevance of adequate open joint stabilization procedures for patients' quality of life and its high impact on socioeconomic costs.	Fixation Stabilization Ligament Anchor Repair

Open arthrolysis	Teaches the surgeon the possibilities and limitations of open artholysis procedures. Teaches the different techniques and approaches (medial-lateral, anterior-posterior).	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for adequate open joint arthrolysis.	Is aware of the high relevance of adequate open joint release for patients' quality of life and its high impact on socioeconomic costs.	Stiffness Function Quality of Life open
5.3 Osteotomies				
Corrective osteotomies of the humerus	Teaches the surgeon the possibilities and limitations of corrective osteotomy humerus. Teaches the surgeon how to make a pre-op planning (with or without 3D measurements) different techniques (open wedge, closing wedge) (with or without a 3D guide), approaches and fixation techniques.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for adequate corrective humerus osteotomies.	Is aware of the potentially high relevance of adequate corrective osteotomy of the humerus for patients' quality of life.	Deviation Saw bone Osteotomy
Corrective osteotomies of ulna	Teaches the surgeon the possibilities and limitations of corrective osteotomy ulna. Teaches the surgeon how to make a pre-op planning (with or without 3D measurements) different techniques (open wedge, closing wedge) (with or without a 3D guide), approaches and fixation techniques.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for adequate corrective ulna osteotomies.	Is aware of the potentially high relevance of adequate corrective osteotomy of the ulna for patients' quality of life.	Deviation Saw Ulna Planning Osteotomy

Corrective	Teaches the	Expects the surgeon	Is aware of the	Deviation
osteotomies of radius	surgeon the possibilities and limitations of corrective osteotomy radius. Teaches the surgeon how to make a pre-op planning (with or without 3D measurements) different techniques (open wedge, closing wedge) (with or without a 3D guide), approaches and fixation	to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for adequate corrective radius osteotomies.	potentially high relevance of adequate corrective osteotomy of the radius for patients' quality of life.	Saw Radius Correction Planning Osteotomy
	techniques.			
5.4 Osteosyntheses				
Distal humerus fractures	Teaches the surgeon the possibilities and limitations of osteosynthesis of the distal humerus fracture. The surgeon is taught the different techniques (plate and screw fixation> 90-90, perpendicular, one plate, external fixator) depending on the type of fracture. The surgeon is taught the step-by-step approach how to reconstruct the intra-articular fragments in case of intra-articular fractures. The surgeon is taught the advantages and disadvantages of different surgical approaches (triceps-sparing,	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for adequate distal humerus fracture repair.	Is aware of the high relevance of adequate distal humerus fracture repair for patients' quality of life and its high impact on socioeconomic costs.	fracture Fixation ORIF Plate Screw Ulnar nerve

Ulna fractures Teaches the surgeon the possibilities and limitations of osteosynthesis of the proximal ulna fracture. The surgeon is taught the different techniques (plate and screw fixation, screw fixation, screw fixation, and swiring, and suture fixation) and its different indications. The surgeon is taught the approach for olecranon, proximal ulna and/or coronoid fractures. Radius fractures Teaches the surgeon is sware of the high relevance of adequate ulna fracture repair for patients' quality of pati	Ina fractures	Teaches the surgeon the possibilities and limitations of osteosynthesis of the proximal ulna	to be able to perform the	relevance of	
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osteosynthesis of open surgical patients' quality of Plate		· ·			
the radial head approaches to the life and its high Screw			' '	~	
fractures. The elbow joint, that impact on Radial nerve			•	·	Radiai nerve
surgeon is taught are necessary for socioeconomic the different adequate radius costs.		_			
the different adequate radius costs. techniques (plate fracture repair.			· ·	costs.	
and screw fixation,			macture repail.		
screw fixation		•			
(tripod technique),					
suture fixation and		` '			
its different					
indications.					
		i iiiuicatiUIIS.		Is aware of the biel	Bones
	acture	Teaches the	Expects the surgeon	i is aware of the high	
		Teaches the	Expects the surgeon to be able to		fracture
		Teaches the surgeon the	to be able to	relevance of	fracture Fixation
osteosynthesis of open surgical for patients' quality Plate		Teaches the surgeon the possibilities and	to be able to perform the	relevance of adequate fracture	Fixation
fracture approaches to the of life and its high Screw		Teaches the surgeon the possibilities and limitations of	to be able to perform the commonly available	relevance of adequate fracture dislocation repair	Fixation ORIF
dislocations. elbow joint, that impact on nerve		Teaches the surgeon the possibilities and limitations of osteosynthesis of	to be able to perform the commonly available open surgical	relevance of adequate fracture dislocation repair for patients' quality	Fixation ORIF Plate
Teaches the are necessary for		Teaches the surgeon the possibilities and limitations of osteosynthesis of fracture	to be able to perform the commonly available open surgical approaches to the	relevance of adequate fracture dislocation repair for patients' quality of life and its high	Fixation ORIF Plate Screw

	surgeon closed and open reduction techniques for the dislocation. Teaches the surgeon a step-by-step approach to stabilize the elbow with different osteosynthesis techniques. Learn how to correctly	adequate dislocation fracture repair.	socioeconomic costs.	
	apply an external fixator in case of remaining instability.			
5.5 Resections				
Joint resection	Teaches the surgeon the possibilities and limitations of joint resection. Teach the surgeon the different indications (degenerative, traumatic, septic).	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for ajoint resection procedures.	Is aware of the potentially high relevance of joint resection for patients' quality of life.	Salvage Degeneration Bone loss Pain
Radial head resection	Teaches the surgeon the possibilities and limitations of radial head resection. Teach the surgeon the different indications (degenerative, traumatic) Teach the surgeon to evaluate the longitudinale of varus/valgus instability after resection and teach to handle these cases.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for radial head resection.	Is aware of the potentially high relevance of radial head resection for patients' quality of life.	Salvage Degeneration Bone loss Pain
5.6 Endoprosthetics				

Total elbow	Teaches the	Expects the surgeon	Is aware of the high	Replacement
arthroplasty	surgeon the possibilities and limitations of total elbow arthroplasty. The surgeon is taught the different types of total elbow arthroplasty (linked, unlinked or linkable) and its indications. The surgeon is taught the five different types of approaches used during TEA (each comes with its unique advantages and disadvantages).	to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for correct implantation of TEA. Also expects the surgeon to be able to achieve safe implant fixation and stable implant mechanics.	relevance of the high relevance of adequate TEA for patients' quality of life and its high impact on socioeconomic costs.	Defect Bone Pain Complication Loosening Planning
Hemiarthroplasty	Teaches the surgeon the possibilities and limitations of hemiarthroplasty. The surgeon is taught the type(s) of hemi elbow arthroplasty and its indications. The surgeon is taught the different types of approaches used during hemiarthroplasty.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for correct implantation of elbow Hemiarthroplasty. Also expects the surgeon to be able to achieve safe implant fixation and stable implant mechanics.	Is aware of the high relevance of adequate Hemiarthroplasty for patients' quality of life and its high impact on socioeconomic costs.	Replacement Defect Humerus Fracture Pain Complication Loosening Planning
Radial head replacement	Teaches the surgeon the possibilities and limitations of radial head arthroplasty. The surgeon is taught the different types of radial head arthroplasty (anatomic vs nonanatomic, loose fitted vs press fitted stem, bipolar, pyrocarbon) and its indications. The surgeon is taught	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for correct implantation of radial head arthroplasty. Also expects the surgeon to be able to achieve safe implant fixation and	Is aware of the high relevance of adequate radial head arthroplasty for patients' quality of life and its high impact on socioeconomic costs.	Replacement Defect Radius Fracture Pain Complication Loosening Planning

	the different types of approaches used during radial head arthroplasty and the advantages and disadvantages relative to the indication of the surgery	stable implant mechanics and prevent overstuffing.		
Interposition arthroplasty	Teaches the surgeon the possibilities and limitations of interposition arthroplasty. The surgeon is taught about different grafts that can be used, how to fix them and the use of an external fixator in this indication.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for interposition arthroplasty.	Is aware of the potentially high relevance of interposition arthroplasty for patients' quality of life.	Salvage Degeneration Bone loss Pain
5.7 Soft Tissues (Tend	dons/Nerves/Vessels)			
Direct ligament repair	Teaches the surgeon the possibilities and limitations of direct ligament repair. The surgeon is taught when there is an indication for direct ligament repair or when nonoperative treatment should be proposed. The surgeon is taught the anatomical landmarks of the attachment of the MCL and LCL. The surgeon is taught rehabilitation program after direct ligament repair.	Expects the surgeon to be able to perform the commonly available open surgical approaches to the elbow joint, that are necessary for stable ligament repair and to be capable of various techniques for ligament fixation.	Is aware of the high relevance of ligament repair for patients' quality of life and its potentially high impact on socioeconomic costs.	Fixation Stabilization Ligament Anchor Repair

Ligamont	Toochos the	Evacets the surgoon	Is aware of the high	raconstructions
Ligament reconstruction	Teaches the	Expects the surgeon to be able to	Is aware of the high relevance of	reconstructions
reconstruction	surgeon the			surgery Stabilization
	possibilities and limitations of	perform the commonly available	ligament reconstruction for	
		•		Ligament Anchor
	ligament reconstruction. The	open surgical	patients' quality of life and its	
		approaches to the		Repair
	surgeon is taught	elbow joint, that	potentially high	
	when there is an	are necessary for	impact on	
	indication for	stable ligament	socioeconomic	
	ligament	reconstruction and	costs.	
	reconstruction and	to be capable of		
	which grafts	various techniques		
	(allograft-autograft	for ligament		
	can be used). The	reconstruction.		
	surgeon is taught the anatomical			
	landmarks of the			
	attachment of the			
	MCL and LCL. The			
	surgeon is taught			
	rehabilitation			
	program after			
	ligament			
	reconstruction			
Internal bracing	Teaches the	Expects the surgeon	Is aware of the high	reconstructions
meerial bracing	surgeon the	to be able to	relevance of	surgery
	possibilities and	perform the	internal bracing for	Stabilization
	limitations of	commonly available	patients' quality of	Ligament
	internal bracing.	open surgical	life.	Anchor
	The surgeon is	approaches to the		Repair
	taught when there	elbow joint, that		'
	is an indication for	are necessary for		
	internal bracing and	internal bracing and		
	which internal	to be capable of		
	braces are currently	surgical techniques		
	on the market The	in the field of		
	surgeon is taught	internal bracing.		
	on the anatomical			
	landmarks of the			
	attachment of the			
	MCL and LCL. The			
	surgeon is taught			
	rehabilitation			
	program after			
	internal bracing			

Direct tendon	Teaches the	Expects the surgeon	Is aware of the high	Fixation
repair	surgeon the	to be able to	relevance of tendon	Strength
Tepaii	possibilities and	perform the	repair for patients'	Tendon
	limitations of	commonly available	quality of life and	Anchor
	tendon repair. The	open surgical	its potentially high	Repair
	surgeon is taught	approaches to the	impact on	Перин
	when there is an	elbow joint,	socioeconomic	
	indication for	necessary for stable	costs.	
	operative	tendon repair and	000101	
	treatment and	to be capable of		
	when non-	various techniques		
	operative	for tendon fixation.		
	treatment can be			
	advised. The			
	surgeon is taught			
	the anatomical			
	landmarks of the			
	attachment of the			
	biceps and triceps			
	and the several			
	approaches and			
	techniques. The			
	surgeon is taught			
	rehabilitation			
	program after			
	direct tendon repair			
Tendon transfer	Teaches the	Expects the surgeon	Is aware of the high	Insufficiency
	surgeon the	to be able to	relevance of tendon	Tendon
	possibilities and	perform the	transfer for	Strength
	limitations of	commonly available	patients' quality of	Healing
	tendon repair. The	open surgical	life and its	Biology
	surgeon is taught	approaches to the	potentially high	Graft
	when there is an	elbow joint, that	impact on	
	indication for	are necessary for tendon transfer	socioeconomic	
	operative treatment with a	surgery and to be	costs.	
	tendon transfer and	capable of various		
	with allograft and	techniques for		
	autograft can be	tendon fixation.		
	used. The surgeon	tendon nadion.		
	is taught the			
	anatomical			
	landmarks of the			
	attachment of the			
	biceps and triceps			
	and the several			
	approaches and			
	techniques. The			
	surgeon is taught			
	rehabilitation			
	program after			
	tendon transfer			
5.8 Amputations				

Forearm	Teaches the	Expects the surgeon	Appreciates the	Forearm
amputation	surgeon the	to know the key	high relevance of	Amputation
·	possibilities of	anatomical	profound	Neurovascular
	forearm	structures and to	understanding and	anatomy
	amputations. The	be able to dissect	knowledge of	Salvage
	surgeon is taught	them safely.	forearm	Pain
	the rare indications	Also expects the	amputations.	infection
	for this invasive and	surgeon to be able		
	definitive	to ligate major		
	procedure. Also,	vessels of the upper		
	the surgeon is	extremity and to		
	taught to share	handle nerves		
	help and support	during amputation		
	for patients during	surgery.		
	the aftercare,			
	especially focusing			
	on neurogenic pain			
	as well as			
	psychological help			
	for the mental			
	consequences of			
	the loss of limb.			
	The surgeon has to			
	know about			
	prosthetic options (traditional and			
	modern as well as			
	experimental) to			
	offer the patient			
	options for the			
	future.			
Elbow	Teaches the	Expects the surgeon	Appreciates the	Elbow
exarticulation	surgeon the	to know the key	high relevance of	Exarticulation
	possibilities of	anatomical	profound	Neurovascular
	forearm	structures and to	understanding and	anatomy
	amputations. The	be able to dissect	knowledge of	Salvage
	surgeon is taught	them safely.	elbow	Pain
	the rare indications	Also expects the	exarticulation.	infection
	for this invasive and	surgeon to be able		
	definitive	to ligate major		
	procedure. Also,	vessels of the upper		
	the surgeon is	extremity and to		
	taught to share	handle nerves		
	help and support	during amputation		
	for patients during	surgery.		
	the aftercare,			
	especially focusing			
	on neurogenic pain as well as			
	psychological help			
	for the mental			
	consequences of			
	the loss of limb.			
	The surgeon has to			
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	know about prosthetic options (traditional and modern as well as experimental) to offer the patient options for the future.			
Distal humerus amputation	Teaches the surgeon the possibilities of forearm amputations. The surgeon is taught the rare indications for this invasive and definitive procedure. Also, the surgeon is taught to share help and support for patients during the aftercare, especially focusing on neurogenic pain as well as psychological help for the mental consequences of the loss of limb. The surgeon has to know about prosthetic options (traditional and modern as well as experimental) to offer the patient options for the future.	Expects the surgeon to know the key anatomical structures and to be able to dissect them safely. Also expects the surgeon to be able to ligate major vessels of the upper extremity and to handle nerves during amputation surgery.	Appreciates the high relevance of profound understanding and knowledge of distal humerus amputations.	Distal Humerus Amputation Neurovascular anatomy Salvage Pain infection
5.9 Arthrodesis				
Elbow arthrodesis	Teaches the surgeon the possibilities and limitations of elbow arthrodesis. The surgeon is taught the advantages and disadvantages of the several positions of fixation. The	Expects the surgeon to know the key anatomical structures around the elbow and to be able to dissect them safely. Also expects the surgeon to be able to perform stable osteosynthetic	Is aware of the significant implications of elbow arthrodesis on the quality of life of the patient, and is aware of the rarity of the indications for elbow arthrodesis.	Arthrodesis Elbow Function Impairment Indication

surgeon is taught the use of internal and external fixation	techniques, to gain stable fusion of the joint.	