MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
EDUCATIONAL INSTITUTION
BELARUSIAN STATE MEDICAL UNIVERSITY

APPROVED
by First Vice-Rector, Professor
_____ S.V. Gubkin
31.08.2016
Reg. # УД-2.557aa/1617/уч.

TRAUMATOLOGY AND ORTHOPEDICS

Curriculum of higher educational institution in the educational discipline for the specialty:

1-79 01 07 Dentistry

Minsk, BSMU 2016

Curriculum is based on the standard educational program "Traumatology" approved 31.08.2016 registration # ТО-н.557/тип

COMPILERS:

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RECOMMENDED FOR APPROVAL:

by the Department of Traumatology and Orthopedics of the Educational Institution "Belarusian State Medical University"
(protocol # 13 of 14 April 2016);

by the Methodological Commission of Surgical disciplines of the Educational Institution "Belarusian State Medical University"
(protocol # 14 of 18.05.2016).

EXPLANATORY NOTE

"Traumatology and orthopedics" is the educational discipline containing systematized scientific knowledge and techniques about the etiology, pathogenesis, mechanism of injury, clinical manifestations, methods of X-ray, laboratory, radionuclide, ultrasound, morphological diagnostics, computed tomography, magnetic resonance imaging, differential diagnosis, complex conservative and operative treatment, rehabilitation and prevention of congenital and acquired diseases and injuries of the musculoskeletal system.

The curriculum for the academic discipline "Traumatology and Orthopedics" aims to explore the latest scientific knowledge about pathologic features of the most common diseases and injuries of the musculoskeletal system, the methods of computer tomography and ultrasound diagnostics, methods of fixation, arthroscopy, arthroplasty of large joints, rehabilitation of patients after injury.

The aim of the teaching and learning of educational discipline "Traumatology and Orthopedics" is to provide the students with the scientific knowledge about the scientific knowledge and skills about diagnosis, victim assistance and treatment of injuries of the musculoskeletal system and the most common orthopedic diseases.

The tasks of studying the discipline are to develop the students' academic competences, based on the ability to self-search educational and information resources, as well as acquire and understand the knowledge of:

- stages of becoming a specialty as a scientific discipline;
- reasons for the high level of injuries and possible ways to prevent it;
- the basic concepts of trauma, orthopedic injuries and diseases;
- the major early and late, local and general complications of traumatic disease;
- clinical and radiological manifestations of typical injuries and diseases of the musculoskeletal system;
- the causes and mechanisms of typical lesions of the musculoskeletal system;
- most important manifestations of the typical and most common orthopedic diseases;
- the most important methods of conservative and surgical treatment of patients with injuries of the musculoskeletal system and orthopedic diseases;
- factors affecting the outcome of the treatment and prevention of disability;
- etc.

The tasks of teaching the discipline include the formation of students' social, personal and professional competences, based on the knowledge and application of:

- diagnosis and treatment of fractures and dislocations;
- patients examination;
- diagnosis of orthopedic disorders in children and adults, contributing to the formation of clinical thinking according to medical ethics and deontology rules;
- the methods of carrying out diagnostic and therapeutic procedures;

- conservative methods of staged treatment of congenital orthopedic pathology;
- methods of rehabilitation;
- medical documentation;
- etc.

Teaching and successful learning of the discipline "Traumatology and Orthopedics" is carried out on the basis of students' knowledge and skills previously acquired by the students in the following disciplines:

The General Chemistry. The chemical elements and their compounds. Chemical reactions.

Medical and biological physics. Devices and appointment of medical devices used in traumatology and orthopedics. Safety rules when working with electrical appliances. X-rays and biophysical mechanisms of action. Fundamentals of Medical Statistics and Informatics.

Bioorganic chemistry. Inorganic and organic chemicals. Rheological properties of biological tissues and fluids. Exchange of organic substances in the bone tissue. Elements of analytical chemistry, synthesis and modification of useful chemical compounds.

Biological Chemistry. Structure, function and exchange of amino acids, nucleic acids, proteins, carbohydrates and lipids. The biosynthesis of nucleic acids and proteins. Energy metabolism in the cell. Cell membranes. Passive and active transport of substances through the cell membrane structure. Fundamentals of Molecular Genetics.

Latin. Practical knowledge of the principles of grammar and word formation. Knowledge of the meanings of the Latin word-building elements and a certain minimum medical terminology in Latin.

Human anatomy. The structure of the human body, its constituent systems, organs, tissue, sex and age characteristics of the organism. Methods of histological and cytological studies. International anatomical and histological terminology.

Histology, cytology, embryology. Methods of histological and cytological studies. International histological terminology. Basics of reparative osteogenesis. Normal physiology. Organism and its safety systems. Basic principles of regulation and physiological functions.

Pathological anatomy. Inflammation, degeneration, oncogenesis - concept and biological essence.

Pathological physiology. Doctrine of pathogenesis. Role in the pathology of reactivity. The mechanism of pain. Allergic reactivity. Pathological physiology of infectious, neoplastic process.

Microbiology, virology, immunology. Human microbial flora, specific and nonspecific protection factors.

Pharmacology. Pharmacodynamics of drugs. Basic principles of action of drugs. Adverse and toxic effects of drugs. Substances that affect the processes of inflammation and allergies. Antimicrobial and antiparasitic agents: antiseptic, disinfectant, chemotherapeutics.

Internal Medicine. Physical examination of the patient and the basic principles of diagnosis. The clinic, diagnosis and emergency care to patients with life-threatening conditions.

Surgical diseases. Principles and rules of transport immobilization. During the wound healing process. Principles of surgical treatment of purulent wounds. Surgical patients care.

Radiodiagnostics and radiotherapy. Radiation diagnosis of injuries and diseases of the musculoskeletal system, its complications. Differential diagnosis based on radiological methods. Radiological semiotics. Basic principles of radiotherapy.

As a result of studying the discipline Traumatology and Orthopedics the student should

know:

- classification, etiology, pathogenesis, clinical picture, diagnosis and differential diagnosis, methods of treatment and prevention of the most common orthopedic diseases and injuries of patients of different ages;
- frequency, causes and socio-economic problems of injuries and diseases of the musculoskeletal system;
- types of injuries and their characteristics, the modern methods of examination and diagnosis of the musculoskeletal system, the volume of emergency medical care for injuries of the musculoskeletal system;
- modern methods of conservative and surgical treatment of diseases of the musculoskeletal system;

be able to:

- identify the mechanism of injury and detect typical lesions of the musculoskeletal system, to carry out a clinical examination of patients;
- diagnose common skeletal injuries, to provide emergency medical care for injuries of the musculoskeletal system;
- perform Novocain blockade of the fracture site;
- treat fractures with conservative methods;
- identify congenital diseases and deformations of the musculoskeletal system and refer patients to a specialized hospital for health advice;

master:

- the methods of clinical examination of the musculoskeletal system;
- the methods of providing emergency medical care for injuries of musculoskeletal system and polytrauma;
- the skills of identifying patients in need of medical rehabilitation and methods of determining the severity of the condition of patients with polytrauma;
- the methods of diagnostics of injuries, degenerative, inflammatory and metabolic diseases of the joints.

The structure of the curriculum in the educational discipline Traumatology and Orthopedics is formed by three section.

Total number of hours for the study of the discipline is 40 academic hours. Classroom hours according to the types of studies: lectures - 10 hours, practical classes - 15 hours, student independent work (self-study) - 15 hours.

Current assessment is carried out according to the syllabus of the specialty in the form of a credit (7th semester).

Form of higher education – full-time.

THEMATIC PLAN

Section (topic) name	Number of class hours	
	lectures	practical *(laboratory or seminars)*
1. General traumatology	**6**	**10**
1.1. Introduction in Traumatology and Orthopedics	1	-
1.2. Principles and methods for the treatment of patients	1	5
1.3. Diaphyseal fractures of the long tubular bones	2	-
1.4 Open fractures	2	-
1.5 Providing emergency medical care to victims at the prehospital stage	-	5
2. Clinical traumatology	**-**	**3**
2.1. Injuries of upper extremity	-	1
2.2. Injuries of lower extremity	-	1
2.3. Injuries of spine and pelvis	-	1
3. Orthopedics	**4**	**2**
3.1. Congenital limb disease. Torticollis	-	1
3.2. Osteoarthritis. Spinal osteochondrosis.	1	-
3.3. Posture and types of its disorders. Scoliosis.	1	-
3.4. Bone tumors	1	-
3.5. Osteochondropathies	1	
3.6. Static foot deformities	-	1
Total hours	**10**	**15**

CONTENT OF THE EDUCATIONAL MATERIAL

1. General traumatology

1.1. Introduction in Traumatology and Orthopedics.

The concept of traumatology and orthopedics. History of its development. The emblem of orthopedics. Organization of traumatological medical care in Belarus.

1.2. Principles and methods for the treatment of patients.

Conservative methods of treatment - fixation and extension. Types of plaster casts. Application technology of splint and circular plaster bandages. Indications for their use. Advantages and disadvantages of this type of treatment. Possible complications and their prevention.

Constant skeletal extension. Indications for use. Technique. Advantages of the method.

Operative treatment of fractures. Types of osteosynthesis (cortical, extramedullary, intramedullary, external fixation, transosseous, compression-distraction). Indications. Advantages of the method. Possible complications and their prevention.

1.3. Diaphyseal fractures of the long tubular bones.

The frequency of injury. The mechanism of injury (direct and indirect). Genesis of displacement of fragments. The absolute and relative clinical signs of

fracture. Types of displacement of bone fragments. Radiographic signs of fractures. The providing of primary health care. Specialized treatment.

1.4. Open fractures.

Frequency and characteristics of open fractures of the limbs. Classification of open fractures. The clinical signs, diagnosis. Complications. The principles of staged treatment of patients with open fractures. Primary surgical treatment of wounds in open fractures. Indications for osteosynthesis and skeletal traction. Complications. Features of gunshot fractures.

1.5. Providing emergency medical care to victims at the prehospital stage.

Emergency health care in trauma at the prehospital stage. Ways to temporarily stop bleeding, pain management, transport immobilization, protective bandage for open injuries.

2. Clinical traumatology.

2.1. Injuries of the upper extremity

Fractures and dislocations of the clavicle: clinical manifestations, methods of treatment and rehabilitation. Fractures of the diaphysis of the humerus: clinical manifestations, complications, emergency medical care and treatment.

Shoulder dislocations: mechanism of injury, clinical manifestations, treatment.

Fractures of the olecranon: the mechanism of injury, diagnosis, methods of conservative and operative treatment, indications for their use, terms of consolidation.

Fractures of the diaphysis of the forearm bones: the mechanism of injury, clinical manifestations, diagnosis, emergency medical care and treatment.

Distal radius fracture (typical place fracture, Colles and Smith fractures): mechanism of injury, diagnosis, terms of consolidation and rehabilitation.

Fractures of the scaphoid bone of the wrist: clinical manifestations, diagnosis, conservative and surgical treatment.

Injuries of the tendons of flexors and extensors of fingers: diagnostics, conservative and surgical treatment.

Fractures of the metacarpals and phalanges: diagnosis and treatment.

2.2. Injuries of the lower extremity

Fractures of the proximal femur (neck, trochanteric region) and diaphysis of the femur: features of the displacement of bone fragments, clinical manifestations and diagnosis, the provision of emergency medical care to victims, methods of conservative and surgical treatment.

Bruising, hemarthrosis of the knee: clinical manifestations, diagnosis, treatment.

Fractures of the patella: mechanism of injury, clinical manifestations, diagnosis, conservative and surgical methods of treatment.

Injuries of the menisci and ligaments of the knee: the mechanism of injury, clinical manifestations, diagnosis, treatment.

Fractures of the diaphysis of the tibia: the clinical manifestations, emergency medical care, methods o conservative and surgical treatment.

Fractures of the ankle: mechanism of injury, diagnosis, emergency medical care and treatment.

Fractures of the metatarsals and phalanges, dislocations of the toes: diagnosis and treatment.

Hip dislocation: classification, mechanism of injury, clinical manifestations, emergency medical care, treatment at a hospital stage and in the posttraumatic period.

2.3. Injuries of the spine, pelvis

The classification of spinal injuries, mechanisms of injury. Fractures of the transverse processes, arches and articular processes of the vertebrae: diagnosis, treatment, duration of treatment in the inpatient and outpatient departments.

Fractures of the vertebral bodies: the mechanism of injury, the typical localization of lesions, diagnostic principles. Methods of treatment of uncomplicated fractures of the vertebral bodies. Terms of consolidation of fractures of the vertebral bodies. Features of the treatment of patients with uncomplicated fractures of vertebral bodies in an outpatient department.

Diagnosis of complicated spinal injuries. The volume of emergency medical care for patients with complicated spinal injuries. Modern methods of treatment of complicated fractures of the spine. Social and professional rehabilitation of patients with spinal injury.

Classification of injuries to the pelvis, the mechanism of the various injuries. Clinical manifestations and diagnosis of complicated and uncomplicated fractures of the pelvis. Emergency medical care at the pelvis fractures. Conservative and surgical treatment of patients with different types of pelvic fractures.

3. Orthopedics.

3.1. Congenital limb diseases. Torticollis

The frequency and the prevalence of congenital limb diseases. The reasons that contribute to congenital orthopedic pathology (endogenous, exogenous, genetic).

Classification of congenital orthopedic pathology. Congenital hypoplasia of limbs, amniotic constrictions, congenital limb shortening, congenital false joints: clinical manifestations and specialized treatment.

Developmental Dysplasia of the hip: etiology, pathogenesis, pathological anatomy. Grades of dysplasia of the hip joint and their characteristics. Clinical symptoms of congenital hip dislocation in infants and older children. X-ray and ultrasound diagnostics of various degrees of hip dysplasia. Conservative and surgical treatment of congenital dislocation of the hip in children and adolescents.

Congenital Clubfoot: incidence, etiology, pathogenesis, pathological anatomy, clinical symptoms in different age groups, the treatment options depending on the severity of disease and the age of the child, rehabilitation.

Torticollis: frequency, classification, etiology, pathology of different types of torticollis, clinical signs, treatment options depending on the severity, type of disease, age of the child, rehabilitation.

3.2. Osteoarthritis. Spinal Osteochondrosis

Classification, etiology and pathogenesis of osteoarthritis. Clinical manifestations and diagnosis of arthritis. Hip osteoarthritis. Knee osteoarthritis. Principles and methods of the treatment of osteoarthritis according to the etiology and the stage of the disease. Conservative treatment of osteoarthritis and the indications for surgical treatment. Arthroplasty. Medical and vocational rehabilitation of patients.

Etiology, pathogenesis, clinical manifestations and diagnosis of osteochondrosis. Principles and methods of treatment of spinal osteochondrosis. Rehabilitation of patients.

3.3. Posture and types of its disorders. Scoliosis

The definition of "posture", types of its disorders. Diagnosis and prevention of posture disorders.

Scoliosis: definition, classification, etiopathogenesis, pathological anatomy, clinical manifestations, diagnosis. Maxillo-facial deformity in scoliosis patients. Signs of a possible progression of scoliosis. The modern conservative and surgical treatment of scoliosis.

3.4. Bone tumors

The incidence and prevalence of bone tumors, according to the classification of M.V. Volkov. Characteristics of malignant and benign bone tumors. Clinical manifestations of bone tumors. Additional methods in the diagnosis of tumors (X-ray, clinical laboratory, a computed tomography and nuclear magnetic resonance imaging). Treatment of bone tumors. Medical and social rehabilitation of patients.

3.5. Osteochondropathies

Etiology, pathogenesis, pathological anatomy of the osteochondropathies. Clinical manifestations of Legg–Calvé–Perthes disease, Osgood-Schlatter disease, Keller I and II disease, the Scheuermann-Mau disease. X-ray diagnostics of the osteochondropathies, treatment and prevention.

3.6. Static foot deformities

Classification, etiology, pathogenesis of the static foot deformities. The etiology and pathogenesis of the longitudinal and transverse flatfoot. Clinical manifestations and methods of identifying of static foot deformities. Methods of treatment of a flattened arch. The etiology and pathogenesis of lateral deviation of the big toe, treatment options. The reasons for the development of clinical manifestations of hammer toes deformity, principles of treatment, indications for conservative and surgical treatment methods.

EDUCATIONAL DISCIPLINE CURRICULAR CHART

Section, topic #	Section (topic) name	number of hours		Self-studies	Other (literature, manuals etc.)	Form of control
		lectures	practical (*laboratory or seminars*)			
1	**General traumatology**	**6**	**10**	**6**		
1.1	Introduction in Traumatology and Orthopedics	1	-	-		Oral interview
1.2	Principles and methods for the treatment of patients	1	5	2		Oral interview, tests
1.3	Diaphyseal fractures of the long tubular bones	2	-	2		Oral interview, tests
1.4	Open fractures	2	-	1		Oral interview, tests
1.5	Providing emergency medical care to victims at the prehospital stage	-	5	1		Oral interview, tests
2	**Clinical traumatology**	**-**	**3**	**5**		
2.1	Injuries of upper extremity	-	1	1		Oral interview, tests
2.2	Injuries of lower extremity	-	1	2		Oral interview, tests
2.3	Injuries of spine and pelvis	-	1	2		Oral interview, tests
3	**Orthopedics**	**4**	**2**	**5**		
3.1	Congenital limb disease. Torticollis	-	1	1		Oral interview, tests
3.2	Osteoarthritis. Spinal osteochondrosis.	1	-	1		Oral interview, tests
3.3	Posture and types of its disorders. Scoliosis.	1	-	1		Oral interview, tests
3.4	Bone tumors	1	-	1		Oral interview, tests
3.5	Osteochondropathies	1	-	1		Oral interview, tests
	Static foot deformities	-	1	-		Oral interview, credit
	Total hours	**10**	**15**	**15**		

INFORMATION AND INSTRUCTIONAL UNIT

LITERATURE

Basic:

1. Godwin Iwegbu. Orthopedics and trauma for medical students and junior residents. AuthorHouse. Indiana, US. 2012. 389 p.

Additional:

2. Martha M. Murray, Patrick Vavken, Braden Fleming. Selected References in Trauma and Orthopedics. Springer New York Heidelberg Dordrecht London, 2013, 330 p.
3. Rajesh Malhotra. Mastering orthopedic techniques. Intra-articular fractures. Jaypee Brothers Medical Publishers. New Delhi. 2013. 526 p.
4. Peter V. Giannoudis. Practical procedures in orthopedic surgery. Springer London Dordrecht Heidelberg New York. 2012. 103 p.

LIST OF AVAILABLE DIAGNOSTIC TOOLS

The following forms are used for competences assessment:

1. Oral form:
- interviews;
- seminar reports;
- situational tasks and tests;
2. Written form:
- tests;
- case based evaluation;
3. Oral-written form:
- credits;
- evaluation based on cooperative teaching method.

LIST OF LECTURES (7th semester)

1. Introduction to the discipline "Traumatology and Orthopedics". Principles and methods of the treatment of patients with injuries and diseases of musculoskeletal system.
2. Diaphyseal fractures of long bones.
3. Open fractures.
4. Incorrect posture. Scoliosis.
5. Osteoarthritis.

LIST OF PRACTICAL STUDIES (7th semester)

1. Features of the examination of patients with injuries of musculoskeletal system. Survey affected with trauma of the musculoskeletal system. Principles and

methods of treatment of patients with injuries and diseases of the musculoskeletal system.

2. Emergency medical care to the victims on the pre-hospital phase.

3. Injuries of the upper and lower extremities, spine, pelvis. Congenital limb diseases. Torticollis. Static foot deformities.

PROTOCOL OF THE CURRICULUM APPROVAL BY OTHER DEPARTMENTS

Title of the discipline requiring approval	Department	Amendments to the curriculum of the academic discipline	Decision of the department, which designed the curriculum (date, protocol #)
1. Human Anatomy	Normal anatomy	Osteology, Myology and syndesmology of the limbs	11 April 2016, #13
2. Internal Medicine	Internal Medicine	Basic principles of diagnosis of diseases	11 April 2016, #13
3. General Surgery	General Surgery	Wounds. Fractures and dislocations. General characteristics. Clinic. First-aid	11 April 2016, #13
4. Radiodiagnosis	Radiology and radiotherapy	X-ray semiotics of fractures and dislocations, orthopedic diseases	11 April 2016, #13

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Curriculum content, composition and accompanying documents comply with established requirements.

Dean of the Medical Faculty of International Students V.V.Davydov
31.08 2016

Methodologist of Educational Institution "Belarusian State medical University" S.A.Kharytonava
31.08 2016

Head of the Foreign Languages Department M.N.Petrova

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