

MINISTRY OF HEALTH OF UKRAINE
O.O. BOHOMOLETS NATIONAL MEDICAL UNIVERSITY

**Multiple and associated injuries of skeletal system.
Modern aspects, clinical features, diagnosis and treatment**

WORK BOOK

For independent work of students of 5th course
Study discipline "Traumatology and Orthopedics"
direction "Medicine"
specialty "Curative care"
Department of Traumatology and Orthopedics

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Introduction

One of the effective means of organizing an independent work of students on topics of disciplines assigned for independent study is the work of a student with his/her workbook. Work with the workbook should begin with the acquaintance with the key issues on the topic. The next step includes the acquaintance with the list of sources from which the student can find the answers to the posed questions. For more deep study of the problem students can visit professional websites.

Having become acquainted with the theory, the student needs to assess his/her degree of mastering the material. In this regard, he/she resolves the proposed tasks; answers test questions on the topic. Students should pay particular attention in preparing for classes to the required minimum of practical skills to be mastered. In the relevant sections of textbooks, manuals, he must glean the information that he needs for mastering further practical skills.

Arrangement of independent work with the use of workbook is conducted as follows: tutor provides the workbook to a student in digital format (to be downloaded from website of the Department), or in printed version; later the students do the tasks at their extra-curricular time, whereupon the tutor checks and assesses them **at the initial stage of practical classes**.

Criteria for assessing the tasks in the workbook

Each task requires a separate approach when assessing the quality of its implementation under particular criteria. And yet, with a 5-point evaluation ranking for each type of tasks, one should observe the general didactic criteria, namely:

“5” is graded when the student:

1. Executed the work w/o errors and deficiencies.
2. maximum one deficiency.

“4” is graded when the student executed the work in full but made:

1. maximum one gross error and one deficiency.
2. maximum two deficiencies.

“4” is graded when the student executed at least one half of a work correctly or made:

1. maximum two gross errors or one gross and one mild errors and one deficiency.
2. maximum two mild errors or one mild error and three deficiencies.
3. In the lack of errors but when four or five deficiencies are available.

“2” is graded when the student made:

1. number of errors (deficiencies) exceeding the limit when grade “3” could be applied.
2. In case less than half of work is completed.
3. Failed to start the work.

Subject. "Multiple and associated damage of skeletal system. Modern aspects of classification, clinic, diagnosis and treatment"

Learning objectives:

1. Topicality of the problem of multiple and associated injuries of skeletal system
2. Determine the factors of multiple and associated trauma.
3. Identify the factors that contribute to the strengthening of the effect of the traumatic factor.
4. Features of the structure of bone and cartilage of skeletal system.
5. Radiological laboratory analysis and other studies in multiple and combined injuries.
6. Justify the medication treatment of multiple and associated injuries.
7. Justify the use of surgical methods for the treatment of multiple and associated injuries.
8. Demonstrate possession of the moral and deontological principles of health workers and the principles of professional subordination.

The student should know:

1. The definition of "trauma".
2. The definition of "polytrauma".
3. The definition of "combined trauma", "multiple trauma", "combined trauma", "polytrauma".
4. Mutual burdening syndrome.
5. Mono- and polyfocal trauma.
6. Anesthesia of the fracture.
7. Stop the bleeding, stop bleeding methods and tools
 - base - first aid (tourniquet/compression bandage)
 - the first level - the first medical care;
 - second - qualified medical aid;
 - third - specialized medical care.
8. Imposition of a plaster cast, splints.
9. Principles of transport immobilization.
11. The definition of "traumatic disease"; periods "of traumatic disease."
12. Stages of polytrauma treatment.
13. Know points of compression of major vessels to stop bleeding; method of skeletal traction

The student should be able to:

1. Analyze the typical clinical picture in polytrauma.
2. Analyze X-rays for fractures
3. Perform anesthesia for bone fractures.
4. Splints and their usage(Kramer Dieterichs).
5. Perform stop arterial, venous, capillary bleeding.
6. Administered medications subcutaneously, intramuscularly, intravenously.
7. To measure blood pressure and pulse.
8. Finger compression to stop bleeding in case of damage of the main vessels.
9. To be able to hold the spokes and apply skeletal traction for fractures of the bones.
10. Plaster casts bandages.
11. Justify the most effective way to treat bone fractures

Key terms threads.

Term	Definition
Fracture / lat. fractura /	Fracture - a violation of the anatomical integrity of bone when affected by physical (mechanical) factors exceeding the strength of the bone.
polytrauma	severe or extremely severe condition of the victim, which is accompanied by a breach of vital important functions in the form of traumatic shock, traumatic coma, acute respiratory and cardiovascular disease or terminal condition and requires intensive care and surgical intensive care measures
multiple injuries	Consider damage of two or more organs in one cavity (liver rupture and spleen) injury within two or more segments (fractured femur and tibia) damage to major vessels and nerves in different segments may be mono- or polyfocal.
combined damage	Damage to internal organs in various cavities (damage to the lungs and liver), while the injury of the musculoskeletal system and great vessels and nerves.
combined lesions	Simultaneous damage of two or more etiologic factors (burn + fracture, frostbite fracture + radiation injury)
traumatic disease	Clinical manifestation is traumatic polytrauma disease that is a complex of pathological reactions of an organism in response to the damage and (or) the further development traumatic process. during the traumatic disease are 4 periods: 1st acute, 2nd unstable adaptation, 3rd period maximum possible complications, 4th full stabilization of vital function
traumatic shock	Pathophysiological condition that occurs in response to mechanical damage and characterized by impaired vital functions of the body. Without hypotension shock cant be

	diagnosed
treatment of polytrauma	Full assistance to victims polytrauma be maximally effective subject to the general principle: "fast, carefully, at the same time. " treatment process victims can be divided into 5 stages. Stage 1 pre-hospital, 2nd hospital reanimation, intensive care 3, Stage 4 expert care

Literature.

Summary:

1. Golka G.S., A.A. Buryanov, Klimovitskiy V.G. "Traumatology and Orthopedics" (National textbook). Vinnitsa, Nova Knyga, 2015.
2. Sklyarenko E.T. Traumatology and orthopedics. . - By: Health 2005 328s.
3. Vasyuk V.L., Buryanov A.A., Kovalchuk P.E. etc. Algorithms diagnosis and treatment and the clinical problem of orthopedics and traumatology (manual Chernovci, 2014, 268).
4. Bitchuk D.D., Istomin A.G., Khimenko M.F., Maryuhnich A.A. Traumatology and orthopedics. Collection of tests for extracurricular preparation of students for licensing examinations Step-2. - Kharkov: HGMU, NTU "HPI", 2004. - 224p.
5. Buryanov A.A., Sklyarenko E.T., A.I. Voloshin, Zadnichenko N.A., Kvasha V.P., V.P. Grek Traumatology and orthopedics. Handbook for practical training. Kiev. Book a plus.

Additional:

1. Alex A.P. Traumatology and orthopedics. M.: High School, 1999.-511s.
2. Trubnikov V.F. Diseases and injuries of the musculoskeletal system. - M.: Health, 1984. - 328s.
3. Ankin L.N. The practice of osteosynthesis and prosthetics. Kyiv, 1994. - 304c.
4. Trubnikov V.F., Istomin G.N. The first medical aid to victims of road accidents. Kharkov: Basis, 1991-121s.

Tasks for independent work.

To be answered in written.

Variant 1

Task 1

The hospital ambulance patients hospitalized from the car accident scene with a diagnosis of polytrauma, multiple opened fractures of the right tibia, in the $\frac{1}{3}$ of the left femur, compressive fracture of the L1. Traumatic shock III st.

question:

1. Specify the sequence of care given to the patient?
2. Determine the total volume of blood loss?
3. What operative treatment it is advisable to apply in this case?

Task №2

The burn unit hospitalized patient with burns to 1-2 a torso, which constitute 37% of the area of the body, and left fracture of the humerus surgical cervix without displacement of bone fragments.

question:

1. Specify the type of victim in polytrauma?
2. Specify the order of medical care?
3. Specify pre-clinical diagnosis?

Task №3

The patient was injured after falling from a height of 4-th floor. At the admission room diagnosed with a fracture of the pelvis, rupture of the bladder and brain contusion, traumatic shock III st.

question:

1. Specify the type of damage (multiply, combined, associated) in this patient?
2. In what department the patient must be hospitalized?
3. Determine the extent of medical care?

Task №4

Patient N. diagnosed fragmented closed fracture of both calcaneus (after unsuccessful landing). He complains of pain in the feet, chest and abdomen. 2 hours passed from the injury. Excited, can't move by himself. BP - 90 \ 60 mm, Pulse - 96 beats \ min. Abdomen sensitive to palpation in the left upper quadrant, the chest is involved in the act of breathing, painful on palpation of mid-clavicular line at 5-6-7 from left ribs.

question:

1. Formulate a pre-clinical diagnosis?
2. Specify what studies it is advisable to perform further diagnosis?
4. Determine the extent of medical care?

Task №5

Patient K., 35 years old, hospitalized in the intensive care unit after a road accident with a diagnosis of open fractures of both femurs in the middle third, and an open fracture of the left tibia. Traumatic shock III st. The patient's general condition is severe, unconscious. Pale skin, cold sweat. BP - 75 \ 20 mm Hg Pulse - 160 \ min. Limb immobilized by Cramer's splints, wound are closed by aseptic dressing.

Question:

1. What are the severity of traumatic shock?
2. Give the definition of "Algovver's shock index"?
3. What treatment tactics used in multiple open fractures of limbs?

task №6

Patient S., 42 years old, hospitalized in a traumatological department with a diagnosis of open fracture of mid $\frac{1}{3}$ of right humerus and a closed transverse fracture of the left femur. The general condition of moderate severity patient. The patient is conscious, there is a moderate motor retardation. BP 95 $\frac{1}{60}$ mm.hg; pulse 120 $\frac{1}{\text{min}}$. with satisfactory filling. Breathing (respiratory) rate = 25 $\frac{1}{\text{minutes}}$.

question:

1. Determine the degree of traumatic shock and blood loss?
2. What are the phases of traumatic shock?
3. What are the methods to temporarily stopping the bleeding?

Task №7

Patient R., 54 years old, examined by ambulance at the site a traffic accident. On examination, the patient diagnosed with an open fracture of the left forearm, and an open fracture of the mid left tibia with arterial bleeding. Patient first aid: tourniquet, transport immobilization of limbs and the introduction of painkillers. After helping a patient hospitalized in the trauma department of the district hospital.

question:

1. What are the classification of bleeding?
2. Specify the indications, contraindications and rules tourniquet?
3. What kind of osteosynthesis used in open fractures of limbs?

Task №8

In the intensive care unit hospitalized patient K. with a diagnosis of closed fractures of both pubic and ischial bones, lacerations of the lower limbs (size of 10 x 15 cm), moderate bleeding from wounds.

The general condition of moderate severity. BP= 90 $\frac{1}{60}$ mm Pulse -140 beats $\frac{1}{\text{min}}$.

question:

1. How to determine the size of blood loss on the localization of damage and wound size?
2. Define the degree of severity of the traumatic shock of shock index?
3. List the methods of the final stop bleeding?

Tests

1. What group of injuries are fractures of both hip and leg bones?
 - A. Polytrauma
 - B. Combined trauma
 - C. Combination trauma
2. To which group of polytrauma is determined fracture of tibia and injury of the peroneal nerve?
 - A. Multiple trauma
 - B. The combined trauma
 - C. Associated trauma

3. Arterial bleeding, your actions?
 - A compressive bandage
 - B. Ligation of vessels
 - S. tourniquet

4. The patient has a fracture of the forearm. Which method of anesthesia is appropriate?
 - A. Oral pain medication
 - B. intramuscular injection of painkillers
 - C. Introduction of anesthetic in the fracture zone

5. What kind of immobilization is used after femur fracture:
 - A Coxae gypsum bandage
 - B. Kramer splint
 - C. Diterichs splint

6. For local anesthesia with a fractured bone is used
 - A. Analgin + Dimedrol
 - B. 10% lidocaine
 - C. 1% lidocaine
 - D. Omnopon with Sibazonum

7. Tourniquet is applied to:
 - A. 1.5 hours
 - B. 2.5 hours
 - C. 1 hour