

**MINISTRY OF HEALTH OF UKRAINE
ODESSA NATIONAL MEDICAL UNIVERSITY**

**Medical Faculty
Department Traumatology, Orthopedics and Battlefield surgery**

I APPROVE

Vice Rector for scientific and pedagogical work

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**METHODOLOGICAL RECOMMENDATIONS
FOR LECTURES ON THE DISCIPLINE**

**5th COURSE OF THE INTERNATIONAL FACULTY
EDUCATIONAL DISCIPLINE «TRAUMATOLOGY AND ORTHOPEDICS»**

Approved:

At the meeting of Traumatology, Orthopedics
and Battlefield surgery department
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Lecture 1.

Topic: "TRAUMATIC DISEASE. POLYTRAUMA"- 2 hours

Background: Persistent regional conflicts occurring in the world, natural disasters, repeated saturation of our lives a lot of cars and mechanisms, improving weapons leads to the steady growth of complex and serious injuries in the general structure of the injury. Therefore, the doctor is very important to have knowledge about the basic principles of diagnosis and treatment of poly trauma. In addition, the urgency of the problem is determined by the fact that mortality in poly trauma is - 25,0-59,2%, and disability - 15,3-30,0%.

Goal: To acquaint students with modern ideas about the concept of "poly trauma" and for traumatic disease. To give an idea of the methods of treatment used in orthopedics, traumatology and basic principles of their use. To acquaint students with modern ideas about the organization of the treatment of poly trauma in foreign countries and development department staff over the years. Learn to navigate in the possibilities offered by modern science and practice.

3. Plan and organizational structure of the lecture.

№.	The main stages of lectures and their contents	Objectives for the levels of abstraction	Type lecture, lecture equipment.	Distribution of time.			
1.	<i>Preparatory stage</i> Key learning objectives.	I	According to the publication, "Guidelines for the planning, preparation and analysis of the lecture."	6%			
2.	Providing positive motivation.	II			85%		
3.	<i>The main stage</i> Plan of the lecture material: 1.Travmaticheskaya disease. 2.Politravma. 3. The classification of fractures. 4. The classification of existing methods of treatment of injuries of the musculoskeletal system. 5.Harakteristika modern methods of treatment and the basic principles and methods of their application.					III	References, questions, tasks.
4.	<i>The final stage</i>						
5.	Summary of the lecture, the general conclusions. Answers to possible questions of the lecturer. Tasks for self-study students.						

Content of the lecture.

Analysis of the unsatisfactory results of fracture treatment has shown that the main causes of failure are:

- The steady increase in the number of severe injuries.
- Excessive clinicians technical side of fracture treatment.
- Entrenched tendency to treat pathological processes caused by trauma, isolated as specific problems in isolation from the general laws of development of the body's reaction to severe trauma.

Practice has also shown that the removal of the victim from the shock is not the end of treatment. injury caused by a breach of important functions and homeostasis parameters are prolonged in nature, they have a specific pathogenesis, clinical forms, and some do not fit into the framework of the doctrine of traumatic shock and injuries. Thus there was a need to formulate a doctrine of traumatic disease.

Traumatic illness is a collection of pathological and adaptive changes coming in the body after an injury. These changes occur in a certain sequence and determine the nature of threatening complications for each of the series of successive periods.

First period - the period of acute response to injury, corresponds to a period of traumatic shock and, early period (first two days), is characterized by severe blood loss, reaching 30-40% of predicted bcc, and perfusion deficit.

The second period (multiple organ failure) (14 days) - the period of the earliest manifestations of traumatic disease. It is characterized by impaired or instability of the functions of individual organs and systems and stable. In this period of traumatic disease multiple organ failure is the result of a generalized systemic response to injury.

The third period (recovery) - the period of the late manifestations of traumatic disease (over 14 days). With a favorable course of traumatic disease this period is characterized by the development of regenerative processes in damaged organs.

The fourth period - the period of rehabilitation. The period is characterized by complete or incomplete recovery.

Polytrauma.

Mechanical trauma systems and organs is divided into isolated and poly trauma. The term "poly trauma" is a collective term that includes the following types of mechanical damage: multiple, mix and match.

For multiple mechanical injuries include damage to two or more bodies in one cavity, as well as two or more anatomical and functional entities (segments) of the musculoskeletal system, such as the liver and intestine, fracture of the femur and the forearm.

Associated injuries considered simultaneous damage to internal organs in two or more planes or damage to internal organs and the musculoskeletal system, for example, damage to the spleen and bladder, damage to organs of the chest cavity and fractured limbs, traumatic brain injury and damage to the pelvic bones.

Combined injuries called defeat, obtained as a result of action of various damaging factors. Mechanical, thermal, radiation, etc. For example, hip fracture and burns any area of the body is called a combined lesion. Perhaps a greater number of options for the combined effects of damaging factors.

Poly trauma is characterized by the following features:

1. There is a so-called syndrome of mutual burdening. For example, blood loss, because the poly trauma it is more or less important, contributes to the development of shock, and in more severe that worsens the injury and the prognosis.

2. Often, the combination therapy of damage creates a situation of incompatibility. For example, the trauma of the musculoskeletal system for the care and treatment shown narcotic analgesics, but with a combination of limb damage to the brain injury their introduction contraindicated. Or, for example, a combination of damage to the chest and shoulder fracture does not allow to impose abductor bus or a plaster cast.

3. quickens the development of serious complications, resulting in a critical state as massive blood loss, shock, toxemia, acute renal insufficiency, fat embolism, thromboembolism.

4. There effacement of clinical symptoms of abdominal injury, damage to the spine and abdomen, and other associated trauma. This leads to a view diagnostic errors and damages internal organs of the abdomen.

It is impossible to shift on a stretcher and left alone without supervision Prior examination of the patient doctor hospital with multiple injuries. Since the severity of associated trauma damaged areas of the body is different, the treatment in the hospital reveal the dominant injury, defining the currently severity of the condition. It is important for medical tactics and consistent execution of surgical interventions. In severe concomitant injury treatment can be divided into three periods:

1. Resuscitation; 2. Therapy; 3. Rehabilitation.

The first (resuscitation) period. During this period, immediately begin to struggle with the shock. The intensive care unit is necessary to conduct a comprehensive therapy: the stabilization of circulation, complete anesthesia, secure immobilization, oxygen therapy, early surgical intervention, correction of the disturbed functions of the organism. The victim prior to inspection should be completely stripped. Pay attention to the general appearance of the patient, coloring and mucous membranes, heart condition, localization of wounds, abrasions, hematomas, position (forced, passive, active), allowing to identify the estimated damage. Explore percussion and auscultation chest, palpate the abdomen. Clarify diagnosis by X-rays in the intensive care unit without shifting the patient.

If difficulty breathing need to examine your mouth and remove mucus, blood, vomit, dentures, fix the sink down into the cavity of the larynx language. On examination of the chest determines its tour in breathing, retraction and protrusion of the chest, the air suction to the wound, swelling of the neck veins. Increasing deafness heart sounds on auscultation can induce the physician to think about heart damage and tamponade, especially in cases where there is a wound in the chest at the heart projection. If diagnosed, remove fluid and suck air from the pleural cavity of the syringe, put the rubber drain. This will eliminate respiratory failure and complete examination of the patient. If a patient with concomitant injury found wounded heart or major blood vessels, lung damage and tension pneumothorax, open pneumothorax with

progressive deterioration of general condition, it is necessary as it is possible to start the operation soon, in spite of the associated injuries to other body regions. When closed abdominal trauma should be performed paracentesis and laparoscopy.

The second (therapeutic) time. The main problem in poly trauma is a selection of the optimal timing and extent of surgery. According to the degree of urgency of the operation and its volume is divided into four groups of victims.

The first group consists of patients with lesions that rapidly lead to death if not rendered first aid. This massive bleeding at rupture of organs (liver, spleen), cardiac tamponade, extensive lung injury, dual "fenestrated" or "valve" rib fractures and others. Typically, these victims come in serious, sometimes terminal condition with blood pressure below critical level. For external arterial bleeding is performed only temporary hemostasis: clipping, harness. If found broken limbs, performed a transport immobilization.

The second group includes patients with poly trauma without breakthrough bleeding and deep breathing disorders with damage to the hollow organs of the abdomen, pneumothorax, intracranial hematomas, severe injuries of extremities closed. Operations typically carried out in the first hours after admission. In the presence of fractures of the limbs or ribs perform anesthesia fractures places blockade and impose plaster bandages or skeletal traction.

The third group consists of patients with severe, dominant injuries of the musculoskeletal system without massive bleeding. Surgery is carried out only after the removal of the victims of traumatic shock. Due to the risk of operations are shown only in open fractures of limbs in the form of a thorough primary surgical treatment of wounds, amputation with extensive crush limbs and signs of frailty.

The fourth group consists of patients with multiple injuries of limb segments, without the traumatic shock. In the presence of open lesions conducted primary surgical treatment of wounds, healing limb immobilization. As a rule, osteon synthesis is carried out under the threat of compression of the neurovascular structures, the fragments of skin perforation. Where indicated osteon synthesis produce the most gentle manner using distraction device.

When choosing tactics of treatment of multiple fractures should strive not only to restore the anatomical and functional relationships, but also to facilitate the care of victims, provide perhaps an earlier its activation. More than 40% of patients with closed multiple fractures conducted conservative treatment: skeletal traction, application of casts.

Osteon synthesis using - distraction devices facilitates care operated, it allows for the early activation of the limb and the load. In case of damage of two adjacent segments generally use a combination of several methods for stable osteon synthesis. For example, at the turn of the femur and the tibia is carried stable intramedullary osteon synthesis of femoral pin massive and imposing compression apparatus shin.

The third (rehabilitation) period. During this period, after the cessation of therapy immobilization is necessary to persevere in the restoration of joint function through exercise therapy, physiotherapy and spa treatment, swimming. In addition, carry out treatment of complications associated with poly trauma.

Traumatic shock

Delorez wrote: "shock - it is easier to recognize and describe than to define it" Systematizing the diversity of these groups can be distinguished shock types.

- Allergic shock
- Anaphylaxis
- Hemorrhagic Shock
- Cardiogenic shock
- Septic shock
- Traumatic shock

We dwell on the etiology and pathogenesis of traumatic shock. There are many theories to explain the phenomenology of shock. Almost all these theories have left at least one pathophysiological link, which over time have been proven and are included in the general scheme of the modern understanding of shock. If you refuse to detail and explore how the concept has changed a shock in terms of the major theories can distinguish several stages.

The present stage is marked tendency to introduce the study of shock along with the existing notions of cybernetics elements, in particular the government of the endocrine system and the intracellular exchange system, development of so-called "shock cell". Thus, it had the modern "neuro-endocrine and vascular-metabolic 'understanding of the pathophysiology of shock.

According to this view can result in the following definition of shock. *Shock* - a syndrome disorders critical functions of the organism, resulting tissue blood flow inconsistencies low metabolic needs of the tissues.

It should be assumed that the end point in the determination of shock following the violation of central hemodynamics and tissue will perfusion violation of tissue metabolism.

Intensive care patients in the prehospital (problems):

1. Stop the bleeding.
2. Catheterization of the veins: the linear brigade produces 1-3 catheterization, of peripheral veins, and a special team of central venous catheterization.
3. Anesthesia and sedation.
4. Transport immobilization.
5. Reimbursement bcc deficiency and correction of metabolic disorders.
6. Hormone.
7. Cardiac therapy.
8. Hemostatic therapy.
9. Respiratory Therapy.

Surgical interventions in traumatic shock.

First performed emergency (CPR) operation, which should begin no later than 20-30 minutes from the time of admission. They are aimed directly at the elimination of the threat to life: tracheostomy asphyxia, with tension pneumothorax, thoracotomy or laparotomy with profuse bleeding, surgical treatment of wounds.

Secondarily conduct emergency operations, which are also aimed at saving lives. For the diagnosis and preoperative preparation (hemodynamic stabilization is achieved

at Assist indicators. Above 80 mm Hg and central venous pressure of not less than 5-7 sm.vod.st.) allow time ranging from 30 minutes to 2 hours. These include decompressive craniotomy, laparotomy in case of damage of the hollow organs of the abdominal cavity, bypass surgery or plastic vessels in the trunk of their injury, thoracotomy with open pneumothorax, etc. If it is impossible to stabilize the hemodynamic data operations are conducted within 2 - 6 hours from the time of receipt and are considered delayed emergency.

In third place are carried out delayed operations aimed at the prevention of serious complications that threaten life, and are made after complete stabilization of vital functions: primary surgical treatment of severe traumatic brain injury and open thoracotomy if you can not straighten a slight conservative methods, etc.

The fourth priority is carried out all other corrective surgery, which are aimed at preventing complications, creation of favorable conditions for wound healing and preservation of function of damaged organs and systems. How to calculate the volume and quality of transfusion therapy of shock? For a start, you should determine the amount of blood loss. After this is determined by the total amount of transfusion - it has a 2 - 2.5 times the amount of blood loss. The number of transfused blood should be one third of the blood loss. The rest of the amount reimbursed colloid and crystalloid, which is poured at a ratio of 1 to 2.

Modern methods of treatment of fractures.

Therapies used in orthopedics and traumatology, can be divided into two main groups: conservative and operative.

Conservative treatment of patients with injuries and diseases of the musculoskeletal system are diverse, they are used in everyday practice of traumatologist orthopedists much more frequently than operational. If we trace the historical development of orthopedics, it should be noted that at the beginning of the treatment of orthopedic patients used exclusively conservative methods in the future gradually began to resort to surgery. Over time, of specialty, to use only bloodless techniques, orthopedics, including more surgical techniques has reached a high perfection in the use

of conservative methods, combined with the most advanced surgical procedures. Modern orthopedics and traumatology is used to perfection a wide range of different therapeutic interventions designed directly in orthopedics and borrowed in surgery, physiotherapy, balneology and other. Skillful comprehensive use of various conservative methods, in most cases, it gives good results in restoring damaged forms and patient functions authority. In cases where conservative methods are not sufficiently effective to cure the patient, it is widely used surgical interventions, the development of which has now reached a high level and perfection.

Operational techniques are almost always used in combination with conservative, they complement each other. Thus, in orthopedics and traumatology operating method should not be opposed to the conservative, it must be considered as part of an integrated treatment of orthopedic and trauma patients. The complex of therapeutic measures along with special techniques specific to orthopedics and traumatology, also includes drug therapy: antibiotics, hormones, drugs, etc.

There are four types of osteon synthesis in the treatment of fractures:

1. Simultaneous manual repositioning (skeletal traction) with subsequent fixation of plaster bandage.
2. Intraosseous fixation (a means of achieving - pins, rods, etc.).
3. osteon synthesis (means of achieving - plate, screws).
4. Trans osseous (extra focal) osteon synthesis (means of achieving - external fixation devices: spoke, rod or rod-spoke).

Clearly we must understand that the goal of any treatment is not only to achieve fusion, but also to restore the function of the affected limb. Therefore, treatment of fractures, ensuring early recovery limb function called function. The same techniques that provide fracture healing due to the immobility of joints closest to the fracture (and regenerating treatment is carried out after termination of fusion and immobilization) are non-functional methods.

Plaster bandages, in the form as we now use them for the treatment of fractures have been suggested Dutch doctors and Matissenom Vanderloo in 1852. NI Pirogov, referring to the work of Dutch colleagues, in 1854 published an article on the use of

plaster casts in the military field. Thus, the history of the use of plaster casts goes back about 150 years. Over the years, they are widely used in both outpatient and inpatient, both in peacetime and in wartime, in the treatment of both closed and open fractures. Of particular significance were casts in wartime in the treatment of gunshot fractures of both the cheapest and the easiest method to use. After World War II has been more than 50 years, but now the plaster bandages are widely used as an independent method of treatment of fractures (especially in the outpatient setting), and how to receive primary medical immobilization before osteon synthesis operation.

An indispensable condition for the treatment of fresh fractures plaster immobilization bandages considered two adjacent to the damaged joints. If a broken femur, it is necessary to immobilize the knee and hip joints, so the cast captures the leg from the ankle joint at the top of the entire leg and ends with pelvic girdle. This dressing is called "gonit". It is applied with injuries and diseases of the knee joint and the treatment of fractures of the proximal end b / tibia.

When hip injuries, hip fractures, fractures of the trochanteric area and sub trochanteric fractures cast extends from the top to the costal arches on the injured ankle and leg to the knee on the affected leg until the knee joint on the healthy.

In the treatment of injuries of the ankle in a plaster cast is applied from the fingertips to the knee "boot."

In the treatment of fractures of the hummers plaster cast must be immobilized first and second joints. Impose so-called thorax cast. The hand must be in the position - assigned to of 60 °, withdrawn forward - 30 °, elbow flexion - 90 °, dorsiflexion brush - 30 °.

In the treatment of fractures of the forearm plaster cast is applied from the base of the toes to the upper third of the shoulder. In the treatment of fractures of the radial bone in a typical place, fractures of metacarpal bones from plaster cast is applied to the proximal interphalangeal joints of the upper third of the forearm.

Plaster bandages can be circular (deaf), fenestrated, bridges. On the forearm after simultaneous repositioning never superimposed circular plaster bandages.

Traction refers to the ancient healing methods. Hippocrates (460-377 BC) described several methods of stretching. It was carried out in one stage belt loop on devices using blocks, levers, winches. In 1939, James in America for permanent extension proposed a rubber patch. Since that time traction is widespread. The credit for this belongs to the German scientist. In the Russian edition of his book "Treatment constant traction" (1889) formulated the rules of the method.

1. Traction should be imposed as early as possible after the fracture (warning resistant muscle retraction).
2. Traction sticky patch should be applied to the entire limb.
3. Along with the longitudinal traction is necessary to use the side, suspended and rotating rods.
4. The distal fragment is mounted on the proximal axis.
5. The joints must be free of active movements with strict immobility of the fracture site.
6. Must be carried out daily monitoring of the treatment.

Development of the issue of middle position in the treatment of limb fracture traction associated with the name Henschen (1908). They entered and the term "middle position" - the middle position the limb joints, in which the joints move towards equal flexion and extension. Power of all muscles should be minimal and evenly, and their own weight is balanced by external power limbs. Thus, he formulated the principle of peace, which is still a major in the treatment of fractures of the constant traction.

Internal fixation is used in three ways: intramedullary, extra medullary, Trans osseous (focal). Intraosseous (intramedullary) fixation using rods of different design: Kyuncher, Tsigo, Bogdanova et al osteon synthesis plates and screws - it implants to perform osteon synthesis, that is, a type of surgical treatment, in which construction the locking fragments are placed on the bone surface. .

The materials of which are made of screws and plates must have the strength and ductility to hold the fragments before the seam and modeled on the bone contour. At the same time necessary and good biocompatibility with body tissues. Therefore, as industrial materials for the production of plates and screws are used: stainless steel,

titanium-aluminum-vanadium alloy and, more rarely, chrome-cobalt. The most important property that combines the design of plate is their high resistance to corrosion. Titanium and its destruction products behave passively and do not cause any toxic or allergic reactions.

It is generally known that the presence of diastasis between fragments bone main load falls to their locking implant. Closing the fracture gap by applying a compression inter recreates the structural integrity of the bones. Physiological load is transferred from fragment to fragment, the implant is subjected to less deformation fixation strength increases. Thus, the most stable way to fix a compression osteon synthesis. To create inter fragmentary compression using screws need to be thread wedged in one fragment, then when tightening increases the compression between the screw head and the subject fragments and fragments opposite attracts threaded screw. Such tightening screws called.

Transosseous extrafocal osteonsynthesis - this method has a long history since the nineteenth century (the first devices Schantz, Andersen, Belair). And in the first apparatus of external fixation pins were used to secure them to the bone. Later, in the Soviet Union, spoke machines (Sivash Gudushauri, Hovhannisyan) have been proposed.

The most significant contribution to the development of this method has made GA Ilizarov, who suggested in 1951 "method of matching bones in fractures, and apparatus for carrying out this process." The basic principle of this device - two crossed spokes held in the perpendicular plane of the axis of the segment attached to the ring. Such rings may be multiple (e.g., two at the central fragment, at two peripheral). The rings are interconnected rods. Bringing together the rings can achieve compression, pushing - distraction. Similarly, we can eliminate the angular displacement. At present, widely used in our country and abroad have found the spoke-core devices, design combines the principles of spoke and rod attachment to the bone structure of basic elements.

Materials activate students during a lecture presentation.

Questions to control absorption material

1. Definition of the concept of poly trauma
2. The stages of traumatic disease
3. Classification of shock
4. Classification of osteon synthesis
5. Principles osteon synthesis
6. What is the internal fixation.

Total financial and methodological support of the lecture.

- Training room - *conference room of the Department;*
- Equipment - *computer, multimedia projector;*
- Illustrative material - *multimedia presentation.*

Literature, which is used in preparing of the lecture.

Basic:

1. V.F.Venger, V.V.Serdyuk Rashed Mochammad Traumatology and orthopedics: Compilation of methodical developments to the practical studies on traumatology and orthopedics including the materials for self-training of students of medical institutes of higher education. – Odessa: Print, 2004. – 248 p.
2. Golka G.G., Burianov O.A., Klimovitskiy V.G. Traumatology and orthopedics: textbook for students of higher medical educational institutions : transl. from. ukr. lang. – Vinnytsia : Nova Knyha, 2018. – 400 p.

Lecture 2.

Topic: "GUNSHOT, CLOSED AND OPEN INJURIES OF BONES AND JOINTS
EXTREMITIES OF MODERN PRINCIPLES OF FRACTURE TREATMENT" – **2 hours**

Background: Diagnosis of injuries and diseases of the musculoskeletal system is based on the principles and methods of clinical medicine: a careful study of complaints, medical history, mechanism of injury, the symptomatology. The main method of diagnosis of injuries and diseases of the musculoskeletal system is clinical, providing certain system of sequential actions of the student.

Goal: To acquaint students with modern classification and clinical symptoms of injuries and diseases of the musculoskeletal system in order to establish a correct diagnosis. The development of students' modern professional thinking; ensuring assimilation leading domestic clinical value of students and scientific and pedagogical schools. To be able to explain to the patient the need for consistent and thorough its survey to establish the diagnosis and first aid in case of damage.

3. Plan and organizational structure of the lecture.

№. Nu mb er	The main stages of lectures and their contents	Objectives for the levels of abstraction	Type lecture, lecture equipment.	Distribution of time.
1.	Preparatory stage Key learning objectives.	I	According to the publication,	6%
2.	Providing positive motivation.		"Guidelines for the planning,	
3.	The main stage Plan of the lecture material: The plan of the main stage	II	preparation and analysis of the lecture."	85%
	1. Traumatic dislocations 2. Damage to the upper limb 3. Damage to the lower limb 4. spine injuries 5. pelvic injuries 6. Principles of treatment of fractures			
4.	The final stage Summary of the lecture, the general conclusions.	III	References, questions, tasks.	9%
5.	Answers to possible questions of the lecturer.			

Content of the lecture.

Dislocations can be acquired as a result of an injury or because of a pathological process in the joint and congenital.

Traumatic dislocation - a persistent confusion of articular ends of bones, leading to a complete or partial disruption of their normal relationship. Distinguish complete and incomplete dislocations; fresh (first 1-3 days), intermediates (up to 3 weeks) and long-standing. Dislocations can be uncomplicated and complicated, as well as open, close and familiar. The name given by name dislocation of the bone that the joint is located distally. The exception is the spine, which is considered a dislocated proximal vertebra.

By frequency dislocations of the shoulder make up 40-58% of all traumatic dislocations and ranks first among all the injuries. Depending on the direction of the mixing dislocated segment distinguish dislocations "front", "rear", "rear", "palm", "central" and so on. N.

Traumatic dislocations accompanied by rupture of the joint capsule surrounding the joint and damage to tissues (ligaments, vessels, nerves and so forth.). An exception is the dislocation of the mandible, in which only the joint capsule is stretched. As a result of rupture of the joint capsule and blood vessels form a significant bruise. Blood soaks the surrounding soft tissue and poured into the joint. As a result of mixing muscle attachment points there is a violation of muscle synergies. Rapidly developing retraction resistant mouse that with each passing day makes it difficult reduction of dislocation, as a dislocated straighten impossible without a mouse relaxation. Sometimes dislocation complicated by intra-articular fracture, then it is called a fracture-dislocation. Timely detection of the fracture with a test of the joint radiography in two projections helps the doctor to choose the right tactics for setting, as the reduction of dislocation when unrecognized fracture can cause serious additional damage.

The clinical picture of traumatic dislocations along with general symptoms (such as pain, deformity, dysfunction) has significant clinical signs, which are a kind of joint deformity and forced position of the limbs. If you have symptoms of a spring fixing

dislocated limb segment in the unusual position of diagnosis is no doubt. Crucial in the diagnosis is required X-ray examination.

Dislocation Treatment includes basic principles: 1) adequate analgesia (small joints with local anesthesia, large - under the common); 2) reduction to be dislocated backwards mechanism; 3) the period of immobilization of the affected limb is dependent on the joint; 4) restoration of function (corresponding rehabilitation).

Reduction of dislocation is considered emergency operation due to the fact that soon after the injury, when there came a pathological retraction muscles reposition manage easily. The basis is a way to reposition overcome muscle retraction, which is eliminated by using a local or general anesthesia. When general anesthesia during reposition for complete relaxation of muscle relaxants are administered. Reduction of dislocation without anesthesia is strictly prohibited, as rough overcome muscle retraction leads to new additional damage. Reduction is performed carefully, slowly, without coarse manipulation. Sprained end of the bone has to go the same way as it was at the time of dislocation (in the opposite direction only), and stand in his place. Full reduction of dislocation leads to restoration of joint configuration, the disappearance of pain and muscle retraction, to restore joint movement.

After reposition dislocated limb is immobilized in a plaster splint middle position for a period of seam torn tissue depending on joint. After removing the splints performed functional treatment aimed at restoring joint function and extremity (physical therapy, massage, physiotherapy).

Dislocation of the clavicle - distinguish between two types: acromion (usually) and sternal. The mechanism of dislocation of indirect and direct trauma (falling to the one shoulder, stroke). At full dislocation of the acromial end of the clavicle there is a break-clavicular acromial and clavicular-coracoid ligament. On examination, marked swelling, the presence of joint deformation, limiting shoulder function, local tenderness, step-like deformation of the acromion process. Running X-ray of both clavicles in the upright position of the patient. At full dislocation acromial end of the clavicle is displaced upward.

Treatment. By intraarticular analgesia with a 1% solution of Novocaine conduct pressure on the end of the clavicle dislocated downwards and anteriorly. It reduces a dislocation easily, but also can easily happen dislocation. To keep the acromial end of the clavicle in the reduction position, it is fixed or variable plaster bandage on the type of sword belts fastened under tension to the plaster corset, for 4 weeks. Then appointed massage, physical therapy, heat treatments. At relapse dislocation carried out surgical treatment, which is to fix the clavicle metal nail or a screw or in the creation of the torn ligaments of Mylar tape. After the surgery is needed shoulder immobilization bandage within 3-4 weeks.

Dislocated shoulder - most often caused by indirect trauma (falling allotted hand). In 80% of cases occurs front shoulder dislocation. Depending on the position dislocated head distinguished front, rear and bottom sprains.

The clinical picture - the patient complains of pain, supports the injured arm in a healthy position, abduction and external rotation; the head of the hummers is displaced forward. Anterior shoulder dislocation, which occurs most often characterized by the fact that the shoulders and tense. In the diagnosis of shoulder dislocation is very important definition of the head in the armpit. Rough joint deformation occurs due to the fact that the head of the hummers out of the glenoid cavity, deltoid muscle at the same time collapses, acromion process dramatically acts, the whole area step-shoulder takes shape. X-ray is done to confirm the diagnosis.

Treatment. Before treatment is necessary to prevent damage to the axillary nerve. In most cases it is possible Closed reduction of dislocation under local or general anesthesia intra-articular shoulder Immobilization after reduction is carried desalt bandage for 2-3 weeks. Chronic and habitual shoulder dislocation are subject to surgical treatment.

Dislocation of the forearm - found mainly in two versions - a posterior dislocation (usually) and the front, but they can be isolated and posterolateral dislocation of the radius and ulna, which give the greatest violation of the elbow joint configuration. They occur when falling on an outstretched hand.

Clinic. At the rear dislocation of forearm shortened and slightly bent, deformed elbow, olecranon posteriorly will stand. At the front shoulder dislocation marked shortening, elbow rounded, in the olecranon - ceasing. Significant deformation of the elbow joint is observed in dislocation of the radial head, which is often accompanied by fracture of the ulna (Montedzhi fracture).

Treatment of dislocation of the forearm is a timely and correct reposition under local or general anesthesia. In posterior dislocation Assistant produces traction and flexion of the forearm, and the doctor, grasped his shoulder with both hands and hold it with your thumbs, presses on the olecranon. After reposition dislocated forearm plaster splint fix the rear at an angle of 90 ° for 5-7 days, and then begin to exercise therapy; massage and physiotherapy treatments are not prescribed.

Hip dislocation - are rare, and only when a big traumatizing effect. Depending on the displacement of the head hip distinguish four types of sprains: low back, the anterior and inferior. Chalice occur neural sprains (80%).

The clinical picture neural dislocation: hip and bent a few shows, the whole leg is shortened, bent and rotated inwards. The greater trochanter is displaced upward while the head of the femur is behind from the acetabulum. Lumbar lordosis increased at the bottom and moves distally. Damage to the sciatic nerve.

Treatment: immediately anesthetized produce closed reduction of dislocation of the hip in a manner Dzhanlidze or Kocher-Kefer. Otherwise the possible ischemic necrosis of the femoral head. After reposition dislocated limb is fixed in the middle position on the physiological Belair bus via cutaneous extension for 3 weeks.

Traumatic fractures - is damage to the bone in violation of its integrity, which arose as a result of external mechanical factors. Fractures are accompanied by damage to the surrounding soft tissues: edema, bleeding into muscles and joints, tendon ruptures and sprains, bruises, wounds or complete intersection of nerves and major blood vessels.

Classification

Traumatic fractures arise from bending, shear, torsion, compression, and as a result of separation and categorized as follows:

I. Closed and open fractures:

- 1) Closed - fracture without disturbing the integrity of the skin;
- 2) Open - fracture to produce a wound extending to the bone fragments.

Open fractures require emergency surgery due to the high risk of infection. Early surgical treatment reduces the likelihood of infection. When providing first aid to the fracture impose a sterile bandage and bus.

II. Intra-articular and extra-articular:

- 1) Intra;
- 2) Extra auricular:
 - a) Epiphyseal;
 - b) Metaphyseal;
 - c) In upper, middle and lower third of the diaphysis.

III. Types of fractures:

- 1) Simple - to form two bone fragments;
- 2) The comminuted - to form three or more bone fragments;
- 3) Multiple - a bone fracture in two or more places.

IV. According to fracture line are distinguished bone fractures of the transverse, oblique, helical, longitudinal and comminuted.

V. Depending on the nature of traumatic muscle force and traction fragments can be displaced relative to each other in width, length, angle, or axis, rotationally or circumferentially.

VI. Fractures in children have their own characteristics and can be:

- 1) Sub preinstall of the type "green branches" - the bone fragments are held well-developed, flexible periosteum;
- 2) The growth zone line - there is a traumatic separation of the bone in the epiphysis (the so-called slipped capital femoral epiphysis).

Diagnosis and clinical picture

On examination, determined by local tenderness, subcutaneous hemorrhage, swelling, swelling, deformity segment extremity dysfunction. Palpation of the affected limb causes severe pain at the fracture site observed abnormal mobility, crepitation of

fragments, disturbance of sound conduction, painful axial load. To confirm the diagnosis performed radiography in two projections: frontal and lateral. For the diagnosis of pelvic fractures, spine fractures and complicated intra-articular use of CT.

Fracture of the clavicle - from 5 to 15% of fractures of bones. In men, they are observed in 2 times more often than women. Collarbone fracture occurs when a direct impact on the collarbone (direct trauma) or during a fall on the elbow or shoulder (indirect trauma). Often breaks collarbone in the middle third, there is the typical displacement of the fragments. The distal fragment is due to the gravity of the upper limb is displaced downward, anteriorly and medially, and under the influence of the proximal thrust sternocleidomastoid muscle - up and backwards.

Diagnosis is based on clinical signs, expressed in pain syndrome, swelling and deformation typical angulate in the collarbone area. At displacement of fragments marked upper omission and violation of shoulder function, palpation palpable under the skin of the end of the proximal fragment and identifies abnormal mobility and crepitus of fragments. On plain film revealed a violation of the integrity of the clavicle.

Treatment. For fractures of the clavicle with no mixing of superimposed fragments soft bandage for 3-4 weeks.

Repositioning the fragments is carried out after the pre-anesthesia area 20 mL fracture of 1% solution of Novocain. In the armpit laid cotton-gauze roll and the shoulder it is reduced to the chest to eliminate the offset distal fragment length. The entire shoulder girdle with the distal fragment is displaced upwards and backwards, eliminating the offset peripheral fragments downward and anteriorly. To keep the fragments in position offered a variety of bandages and tires, but they are rarely kept in fragments mapped position. After desalt bandage, immobilizing the shoulder joint for 4-5 weeks, it develops stiffness, on the elimination of which requires 3-4 weeks. However, trauma is often used this bandage, reinforcing its 2-3 rounds of plaster bandage.

In cases where the match and retain the fragments in position fails or there is a compression of the neurovascular bundle, operative treatment - intramedullary Osseo synthesis metal rod Bogdanova, which is removed after 3-4 months.

Shoulder Fractures - make up 2.2% of all fractures, and fractures are divided into upper, middle and lower third of the humerus. In turn, fractures in the upper and lower thirds of the fall in the intra-and extra-articular.

Fractures of the head and neck anatomical shoulder (intra-particular) are uncommon and are characterized by the occurrence of pathogenic contracture after intraarticular hemorrhage, which is an indication for joint puncture and early physical therapy (with 2-3 days after injury). Intra-displaced fractures require surgical treatment.

Fracture of the surgical neck of the shoulder usually occurs in older people at the drop of a hand, while there is impacted fracture or a displaced fracture fragments.

For fractures of the neck of the humerus are often extensive bruising found on the inner surface of the shoulder, extending to the chest area. It is important to find out whether the shoulder movements are transferred to the head. When not impacted fractures turn movement at the head will not be transmitted, the pressure on the axis will cause a sharp pain. Impacted fractures are accompanied by mild pain in the fracture and restricted shoulder movement.

Treatment of impacted fracture is to immobilize the shoulder joint plaster splint for Turner in 5-7 days. Hand is fixed to scarf with freely hanging elbow, and armpit laid triangular wedge pillow, which is suspended for the healthy shoulder girdle. From the 2nd day of LFK is appointed. After 4-5 weeks the fracture heals, the motion of the shoulder joint are restored.

Fractures of the surgical neck of the shoulder to the displacement of bone fragments are divided into the abduction and adduction. Abduction fractures occur when falling on the abducted hand, with a shoulder displaced fragments so as to form an angle between them open outwards. Add fractures occur in the fall of the reduced hand, and the angle between the fragments opens inwards.

Diagnosis is based on history, complaints of pain in the area of the fracture, the presence of swelling; inspection: the shoulder is not a spring, as in the dislocation and hangs freely; marked crepitus fragments and tenderness to axial load; sound conductivity broken. Displacement of fragments is determined by the X-ray performed in two projections.

Surgical neck fracture of the shoulder Treatment with displacement of bone fragments begins with local anesthesia and repositioning of bone fragments. When adduction the turn to eliminate displacement of bone fragments in length and in width and traction spend shoulder abduction to 70° , then go to the middle of the shoulder leads on to 35° . The hand is placed on the receding bus, followed by traction of the skin. If the fragments are displaced, superimposed skeletal traction for olecranon. Reposition of bone fragments during abduction fractures - distal fragment is placed on the central, but the hand on the tire does not fit, since the shoulder abduction takes place even greater displacement of the fragments. It hung on the headscarf or dressing-snake with a roller in the armpit. On the 2nd day appointed by hand massage, exercise therapy for Dreving-Gorinevskoy, UHF. By the end of the month the fracture heals, the hand function and the ability to work are reduced.

When combined with fracture of surgical neck dislocation shoulder head operative treatment, but in older people who have a contraindication to surgery, treatment is based on the formation of a false joint.

Fractures of the diaphysis of shoulder arise from direct and indirect injury. shoulder fracture Diagnosis is based on clinical data (such as pain, deformity, swelling, abnormal mobility, crepitation of fragments, the shortening of the shoulder) and X-ray examination. At the turn of the middle third of the adduction is sometimes damaged by the radial nerve.

Treatment of fractures of diaphysis of shoulder held on the outlet (abduction) bus. Leverage is given to a right angle (90°), and moves forward at an angle to 35° . When fractures without displacement of fragments superimposed cutaneous traction, offset - skeletal traction of the olecranon. From the 2nd day of LFK is appointed. Traction is removed after 4-5 weeks, and the bus - 6-8 weeks after fracture. In cases where it is impossible to impose abduction bus (old age, broken ribs, pneumonia and others.), Shoulder fragments immobilized in the bottom third of the U-shaped plaster splints and forearm suspended on the dressing-snake. From the first days of LFK is appointed. After 4-5 weeks of splint is removed and transferred to a hand kerchief.

Surgical treatment is carried out at the soft tissue interposition or damage the radial nerve. Open reposition fragments supplemented by intra- or extramedullary fixation using metal structures (rods, screws, bolts, plates, wire, metal strip). After surgery, a plaster splint is applied gymnastics performed with 2-3-th day. Fracture healing occurs in 3-6 months.

The lower end of hummers fractures are divided into Supracondylar (extra-articular) and trans condoler (intra). Supracondylar (extra-articular) fractures may be extensor or flexor. For intra-articular fractures are trans condoler, inter condoler (T and U-shaped), fractures of the condyles (indoor and outdoor), capitate eminence fractures supracondylar elevations.

Extensor shoulder supracondylar fractures occur more frequently in children when falling on an outstretched hand, and the fracture line goes upwards from front to back. The distal fragment is displaced posteriorly and laterally, and the proximal - anterior and medially. Olecranon posteriorly displaced, ceasing formed over it. Such a mixture of fragments can lead to compression of the neurovascular bundle and the subsequent development of ischemic contracture Volkmann. Signs of a developing contracture; severe pain, weakening or disappearance of the pulse at the radial artery (in the wrist), pale skin fingers. To confirm the diagnosis measured pressure in fascial compartment of the forearm. If the pressure reaches 30 mm Hg. Art., shows the urgent revision of the cubital fossa and broad fasciotomy. If the nerves and blood vessels are not damaged, shows the closed reduction, skeletal traction with the help of back Kirchner and the imposition of the cast. To prevent contractures need early diagnosis and treatment of injuries of nerves and blood vessels.

Flexor supracondylar fractures occur in the fall on a bent elbow, and the fracture line is a drill-down from front to back and distal fragment is displaced anteriorly.

Treatment of supracondylar fracture begins with local anesthesia and repositioning of bone fragments. Superimposed on the posterior plaster splint Turner at a right angle at the elbow. From the 2nd day of LFK is appointed. Movement of the shoulder joint start in 2 weeks, while in the elbow - 3 weeks, in children - a week

earlier. Massage is not assigned, because it leads to the ossification of the para-articular tissue and contracture of the elbow joint.

From the first hours after the application of a plaster splint held control of the blood supply to the forearm and hand. When edema, cyanosis, violation of sensitivity plaster splint divorce and if the swelling does not decrease, producing skin and fascia incision on the forearm to prevent the formation of ischemic contracture. In cases where the fracture reduction is not possible or in a plaster splint is a shift of fragments (X-ray inspection is carried out immediately after the imposition of gypsum splints), skeletal traction is carried on the bus or at the outlet of the Balkan frame. After 2 skeletal traction pedal action is removed and superimposed U-shaped plaster splint on his shoulder or back plaster splint on his shoulder, forearm and wrist.

Operative treatment of supracondylar fractures held when neither hand nor using skeletal traction fracture reduction is not possible. Fixation of bone fragments is carried out by nails or screws.

Trans condoler fracture is intra-articular fractures, and is more common in children. Since the fracture line passes through the area of the pineal gland, a fracture can be called epiphyses. Due to the fact that the distal fragment is displaced posteriorly, the clinical signs of fracture remind extensor fracture, but trans condoler fracture broken Gyutera isosceles triangle formed by projecting the points shoulder and the olecranon. Radiography clarifies the clinical diagnosis.

Treatment does not differ from the treatment of supracondylar fracture of the extensor.

Intercondylar fractures, or T and U-shaped fractures, occur when falling on his elbow, and the olecranon as a wedge is introduced between the shoulder condyles and mix them apart.

Clinically, T and U-shaped fractures appear massive intra- and extra-articular hemorrhage, joint deformity, severe morbidity. Radiography clarifies fragments displacement and determines treatment.

Treatment. If there is no displacement of bone fragments superimposed U-shaped plaster splints and back, locking the elbow at an angle of 90-100 °, for 2-3 weeks. On

the 2nd day appointed by the movement of the fingers and the shoulder joint. By moving the hand-made fragments reposition fragments or skeletal traction applied for olecranon. When failure of skeletal traction performed open reduction and fixation of bone fragments of their tie-bolts, needles or screws.

Fractures of the forearm bones - are common and account for about 25% of all fractures.

There are intra, extra-articular (diphase) fractures and fracture-dislocations of the forearm bones. For intra-articular fractures of the forearm bones include:

Fractures of the olecranon, which occur when the cup falls on his elbow. fracture line penetrates into the joint. Due to the traction triceps fragment shoulder often mixed up.

Clinically fracture expressed local tenderness, swelling and bleeding, movement restriction. Radiography specifies the degree of divergence of fragments.

Treatment. When the divergence of fragments, not exceeding 2 mm, is conducted conservative treatment. Superimposed back plaster splint for 3 weeks. From the 2nd day of LFK is appointed. When di Astasia between the fragments of more than 2 mm is carried out the operation, which is to fix the bone fragments elongated pin. immobilization period after the operation the same as that of the turn without differences fragments.

Fracture of the coronoid process occurs when the posterior dislocation of the forearm and is accompanied by local pain and swelling in the elbow. The turning point is determined on the lateral radiograph.

Treatment of fractures of the coronoid process is carried out without bias or casting of splints on the elbow at an angle of 100° for 2-3 weeks. In cases of large displacement process is carried out step - stitching fragments to his bed catgut sutures.

Fracture of the head and neck of the radius occurs when falling on an outstretched hand.

The clinical picture. There have been local pain, swelling, bleeding and limiting functions. Radiography clarifies the nature of the fracture.

Treatment. Impacted fractures and fractures without mixing fragments are treated conservatively. Impose a plaster splint in flexion of the elbow at an angle of 90-100 ° for 2 weeks. Then he appointed LFK. At displacement of fragments held close or open reduction.

The operation ends or the removal of the head in the case of fragmentation (adults), or fixation of bone fragments needle percutaneously trans particular. Postoperative management is the same as in the conservative treatment.

Diphase forearm fractures can occur with direct trauma. Fragments are displaced in width, length, angle and the periphery. Particular attention is drawn to the rotation of the fragments of the radius.

Clinic pronounced local tenderness, deformity, swelling, abnormal mobility, crepitation of fragments and a violation of the functions of the forearm. In young children with fractures of the type "green branches" and sub parietal fractures clinical signs of fracture appear fuzzy. However, X-rays with the capture of adjacent joints will help to clarify the nature of the fracture.

Treatment is to compare the peripheral bone fragments on the central axis. Fractures without displacement of fragments, sub parietal, with angular or rotational mixing treated conservatively. Corrected axis and the position of the forearm, and two superimposed plaster splints (one on the back, the other - on the palmar surface) with the capture of adjacent joints for 1.5-2 months. The elbow joint is fixed flexion at an angle of 90 °, forearm - a position between supination and pronation, wrist - in light the rear extension. From the 2nd day of starting the movement of the fingers and wrist in the shoulder joint, is assigned to UHF.

With displaced fractures attempt is made to compare the fragments closed by hand on special machines or devices using external fixation rod or spoke-rod type. Control radiography performed immediately after the imposition of plaster languet or apparatus, and after the decay of edema. Appointed physiotherapy and exercise therapy.

Comminuted fractures, fractures, accompanied by damage to blood vessels and nerves, multiple fractures and fractures that can not be closed reduction, subject to surgical treatment. Open reposition ends intramedullary fixation of bone fragments with

metal rods and external plaster splint immobilization or extramedullary fixation of different plates for a period of 8-10 weeks.

Fracture-dislocation Montedzhi - a fracture of the ulna on the border of the upper and middle third and dislocation of the radial head, occurs when a direct injury.

Clinically, a marked deformity of the elbow joint and the upper third of the forearm. Forearm shortened the elbow movement impossible. The head of the radius is determined by subcutaneous injection. Radiography in two projections with the capture of the elbow determines the fracture and dislocation.

Treatment consists in the reduction of dislocation of the radial head and ulna reposition bone fragments. Forearm stored flexion angle 50-60 °. This position is fixed the back of a plaster splint or bandage for 4-6 weeks with the change it for another 4-6 weeks. Often under the bandage occur and secondary displacement of fragments. In this case, under local anesthesia produced by repeated reduction of dislocation and reposition of bone fragments. The head of the radius is fixed needle, percutaneous and trans particular. Dislocation and chronic fracture subject to surgical treatment. The ulna is fixed intramedullary metal rod conducted through the proximal fragment is retrograde, the head of the radius – trans particular needle. Spoke removed after 4 weeks, the plaster cast is removed after 2 months.

Fracture-dislocation Galeazzi - "reverse Montedzhi", since it is a fracture of the radius between the middle and lower third of the dislocation and the head of the ulna. There have deformation and shortening of the forearm at the wrist joint movement impossible. X-ray confirms the diagnosis.

Treatment is even more difficult than in Frakture Montedzhi. as the head of the ulna is very difficult to keep in position reduction. Declinator detected after removal of plaster cast. Therefore, when the diagnosis is assigned to the operation, the aim of which is durable fixation of fractures of the radius a metal rod and reposition the head of the ulna needle percutaneously. Plaster immobilization is carried out for 8-10 weeks. Conducted physical therapy and physiotherapy.

Fractures of the radial bone in a typical place occupied among fractures forearm first place and make up about 70%. There are at the drop of a straightened or bent brush.

Most often it occurs extensions fracture, or fracture Colles, - fracture of the distal end of the radius offset peripheral fragment in the back side and outwards, ie in the radial direction, and the central fragment is rejected in the palm-side of the elbow. If you fall on a bent wrist flexion occurring Smith fracture Colles fracture or reverse, while the peripheral fragment shifts in the palm side and is in the position of pronation.

Clinic at the turn extensions characterized deformity of the forearm and hand. Marked local tenderness. Movements at the wrist joint is limited. Sometimes Colles fracture is accompanied by damage interosseous branch of the radial nerve. There is traumatic neuritis Turner, in which develops a sharp swelling of the hands and fingers, which leads to osteoporosis, the bones of the wrist. X-rays confirmed the clinical diagnosis.

Treatment begins with anesthesia the fracture site. If the fracture without displacement or impacted, superimposed rear length plaster from the elbow to the fingertips for 2 weeks. On the 2nd day appointed gymnastics and physiotherapy. At the turn of Collis offset fragments produced reposition of bone fragments by traction on the unit or manually Sokolovsky. In this position, giving the brush a small rear extension, applied deep back longer from meta capo phalange joints to the elbow joint for 3-4 weeks. Then, a control X-rays in the case of re-mixing of fragments and crushed fractures produced secondary reposition with percutaneous fixation of bone fragments spokes. The right is considered to be a position of bone fragments, in which radio cubical angle equal to $+ 30^{\circ}$ in the "face" position and $+ 10^{\circ}$ - in the "Profile".

Hip fractures localization are divided into three groups:

- 1) fractures of the proximal end of the femur - intra-articular and extra-articular fractures of the femoral neck;
- 2) diphasic fractures - fractures of the sub fractures in the upper, middle and lower third;
- 3) fractures of the distal end of the femur - intra-articular and extra-articular.

Fractures of the proximal end of the femur is approximately half of all hip fractures.

Intra (medial), hip fractures are divided into , trans cervical and basal. Sub capital, trans cervical and basal. Depending on the mechanism of injury all medial hip fractures can be abduction (more likely to be impacted) or adduct - the divergence of fragments and reduced neck-shaft angle.

Abduct fractures hip fractures are more common in middle age and occurs during the fall in the allotted foot or trochanteric region. Traumatic force coincides with the direction of the femoral neck, and impacted fracture occurs. With such a fracture patients continue to walk, complaining of pain in the hip or knee joints. Even X-ray reveals no fracture. Only the X-ray control, produced in 10-14 days, reveals the fracture line. Often, by this time there is wedging fracture, the foot loses its reference and there are clinical signs of fracture fragments to the discrepancy.

Treatment of femoral neck fracture impacted reduced to prevent wedging and divergence of fragments. The foot is placed on the bus Belair with cutaneous or skeletal traction with a load of 2-3 kg for 2-3 months, after which the patient decreases solvable walk with crutches without a load on the injured leg. The load is allowed after 5-6 months. By this time impacted fracture must grow together. However, we can not exclude the occurrence of avascular necrosis of the femoral head.

Adduct fractures of the femoral neck are more common in older people, and there at the drop of the reduced leg. the fracture line may extend sub, trans capital - at the base of the femoral neck. The distal fragment is displaced upward, deflecting in the same direction of the proximal fragment is, so that the neck-shaft angle decreases.

Clinically determined rotation of the thigh outwards, the outer edge of the foot lies on a bed plane with respect to the limb is shortened to 2-3 cm, broken-line Roser - Nelatona, marked positive symptom "stuck heel" tenderness to palpation of the axial load and under occlusive disease. X-rays confirmed the clinical diagnosis.

Treatment begins with intra-articular analgesia. Superimposed skeletal traction behind the tuberosity of the tibia, the patient is prepared for surgery. Patients with severe diabetes, cardiovascular failure, weakened and exhausted, in a state of senility surgery is contraindicated, and treatment is aimed at the formation of pseudo arthritis. Skeletal traction is removed after 2-3 weeks, and the patient learns to walk on crutches.

In some cases, when patients need to be rotated from the first day until the pain subsided (2-3 weeks) imposed disciplinary denotation plaster boot with a cotton lining.

Adduct hip fractures are treated promptly. two types of surgery have been developed outdoor fixation of intra-articular and extra-articular Osseo synthesis of closed three-blade nail with the help of the guide, BA Petrova and EF Yasnova. Repositioning the fragments is carried out on the table before orthopedic surgery. Walking on crutches, with no load on the affected leg begins in 4 weeks, with the load - after 5-6 months after surgery.

Periodically control radiography. The nail is removed 1-1.5 years after surgery. Some elderly patients with hip fractures sub capital held arthroplasty. When non-united fractures and false joints of the femoral neck and the absence of contraindications for surgery are applied extra-articular Osseo synthesis with three-blade nail and bone grafting autograft or high oblique sub McMurray, hip arthrodesis, joint replacement and reconstructive surgery.

Extra-articular fractures of the femoral neck or trochanteric fractures are fractures of the hip localized base to sub line. They arise when falling on the greater trochanter, more common in the elderly due to the development of senile osteoporosis.

Clinically, these fractures are characterized by severe general condition associated with massive damage and a large blood loss. Significantly pronounced swelling and hematoma. Other symptoms trochanteric fractures are similar to the symptoms of cervical fractures.

Treatment of patients with resuscitation begins (good anesthesia, blood transfusions and blood products) and the imposition of skeletal traction with a load of 4-6 kg. After 5-6 weeks (and with displacement of bone fragments - after 7-8 weeks) skeletal traction is removed and the patient is preparing to walking with crutches. Conducted LFK. massage, physiotherapy. The load on the affected limb is allowed after 3-4 months. Other treatments include Osseo synthesis metal clamps, an indication for which a young age.

Diphase fractures of the femur occur as a result of exposure to direct or indirect injury.

Clinically diphasic femur fractures are characterized by severe general condition of the patient, the supporting leg function is impaired, hip deformed. There have abnormal mobility and crepitus of fragments, limb shortening and external rotation of the peripheral limbs, local tenderness and axial load, violation of sound conduction. The X-ray in two projections indicated violation of the integrity of the femur.

Treatment of patients with hip fracture begins with immobilization and transport anti shock measures. Then superimposed skeletal traction of the tuberosity of the tibia or femur epicondyles and gauze- shin traction. Sometimes after removal of skeletal traction applied hip cast for 2-3 months. Radiographic testing is carried out one month after the reduction. Conducted LFK. and massage. After 2.5-3 months the patient begins to walk with crutches.

Operative treatment of femoral diphasic fractures is open reduction and fixation of bone fragments of a metal rod, plate, or external fixation device. Low fractures of the femoral shaft due to the difficulty repositioning of bone fragments are treated by operative.

Diphasic fractures of the tibia fractures are divided into the upper, middle and lower thirds. Fractures in the upper one-third more likely to occur with direct trauma (bumps) in the bottom third - with indirect (bending, torsion). Often the tibia fracture in the lower third is accompanied by fracture of the fibula in the upper third.

Clinical fractures of the tibia: deformation, abnormal mobility, crepitation of fragments, local pain and axial load, violation of sound conduction. Radiography in two projections clarify the diagnosis and displacement of bone fragments.

Treatment. The hematoma introduced 20 ml of a 2% Novocain solution. If the fracture is not accompanied by the displacement of bone fragments, a plaster cast is applied or performed skeletal traction of calcaneus or distal metaphysis in the field with a load up to 6-8 kg for 3-4 weeks, followed by repositioning the displaced bone fragments on the bus Belair in the House. After the X-ray skeletal traction control is replaced by a plaster cast. At low fractures plaster cast is applied to the mid-thigh, with fractures of the upper third - to the gluteal fold.

With easily displaced fractures of the tibia, with interposition of soft tissue or bone fragments, with double fractures, non-united fractures and false joints made open (surgical) reduction followed by internal fixation of bone fragments with various metal structures. After fixation periods of immobilization plaster cast remains the same. Currently, the treatment of fractures of long bones are spreading compression-distraction by Ilizarov.

Fractures of the ankle account for about half of all fractures of the tibia. The mechanism of injury often indirect - when tucking of foot outwards or inwards. According to the mechanism of injury distinguish pronation-abduction and sup fractures.

Pronation-abduction fractures occur when the foot pronation and abduction. Torn deltoid ligament or torn medial ankle and foot moves outwards. This breaks down the external oblique ankle slightly above the ankle, often torn tibiofibular joint and foot mixed outwards (fracture Dupuytren).

Fractures occur when the displacement of the foot inwards. When it first breaks down the outer ankle at the level of the joint space, and then breaks down the inner ankle inwards under the influence of the shifting of the talus (fracture Malgouy).

Fractures of the ankle can occur when excessive rotation of the foot inwards or outwards, while the foot is in the folding position, the rear edge of the fracture of the tibia can occur, and the talus is displaced posteriorly (back fracture Destin); extensions at the foot breaks off the front edge of the tibia and the talus, mixed anterior (front fracture Destin).

Clinic. There have been local pain, joint deformity, swelling, bruising, abnormal function. The X-ray visible fractures ankle.

Treatment. One ankle fracture without displacement of bone fragments is treated on an outpatient basis. Before applying plaster splint for 4 weeks produced analgesia fracture site by introducing a 2% Novocain solution in an amount of 10-20 ml. Treatment of ankle fractures with a mixture of fragments is reduced to fragments repositioning under local or general anesthesia and immobilization of a limb plaster cast for 6 weeks - with two broken ankles, 8 weeks - three at the turn of the ankle, 10 weeks

- at fractures with subluxation of the foot. After removing the plaster cast foot and leg bandaged with an elastic bandage. Held physiotherapy and functional therapy. Appointed wearing arch supports. Skeletal traction and surgical treatment of ankle fractures are used when manual reposition does not eliminate the displacement of bone fragments.

Spine injuries - occur both in direct and indirect injury and at frequent in patients with multiple injuries. Particular attention is paid to transport immobilization: the victim gently placed face up on the board or rigid stretcher, thus avoiding secondary spinal cord injury. For the diagnosis may be necessary radiography, CT, MRI. Displaying a full neurological examination to rule out spinal cord injuries.

Spine Injuries are divided into fractures, fracture, dislocations, subluxations, damaged discs and distortion. These types of injuries can be combined, such as a fracture and dislocation, fracture and distortion. More often than not accompanied by spinal cord injuries spinal cord injury, but sometimes they are complicated concussion, contusion, compression or anatomic rupture of the spinal cord.

Fractures of the cervical vertebrae most often occur when indirect injury. Often the trauma of the cervical spine is prepared divers or fighters. There are four types of spinal injury mechanism: flexor, extensor, flexor-rotational and compression.

Clinic. There are local pain, forced position of the head (sometimes victims keep head in his hands), the tension of the neck muscles, restricted and painful movement. For fractures, followed by vertebral subluxation or dislocation, there is compression of the spinal cord with the phenomena tetra paresis or tetraplegia, thus violated the act of urination and defecation. X-rays - a compression fracture of the vertebral body or arch.

Treatment of fractures and fracture without spinal cord damage is done in the hospital traction using Glisson loops or zygomatic arches with a load of 6-8 kg in a month. When flexion fractures of the vertebral bodies of the cervical traction is carried out by the head, thrown back backwards, with fractures of extension - his head tilted. After reposition that is controlled by the profile spindly grams impose crania thorax plaster bandage or plaster Schantz collar for 2-3 months, in more severe injuries - for 4-6 months.

Damage to the cervical spine, followed by neurological disorders, not eliminated during skeletal traction and single-step closed reduction, subject to surgical treatment, aimed at eliminating the compression of the spinal cord. Note that a closed reduction of dislocation of the vertebral arch fracture in the presence of (unstable damage) associated with a certain risk, since it is impossible to exclude additional spinal cord injury during reduction.

Decompressive laminectomy performed after the pre-imposed skeletal traction or zygomatic arch, or bones of the cranial vault. Audit of the spinal cord. The operation should be completed by the stabilization of the spine. With the help of the cortical bone grafts taken from the crest of the tibia, posterior spinal fusion is performed. Failure to stabilize the spine following laminectomy usually leads to a deterioration of the affected states. Immediately after the injury is difficult to determine the degree of spinal cord injury: whether it's a concussion, injury or spinal cord compression, or its partial or complete rupture. However, neurological symptomatology with concussion, contusion or not hemmer increases and decreases when the full break of the spinal cord neurological status remains unchanged, pressure sores are formed quickly. If disturbed urination, should promptly apply suprapubic fistula. The intestine is emptied or enema, or by mechanical means - manually. In those cases, when the diagnosis of "spinal cord compression" neurologically and radiologically confirmed, decompressive laminectomy performed.

Fractures bodies thoracic and lumbar vertebrae compression and more often have a flexion or compression mechanism fractures. These lesions are divided into the volatile and stable, as well as complicated and uncomplicated. In recognition of spinal injury, be aware that an injury can suffer both the front and the back of his department to help choose the most rational method of treatment of various types of damage.

Clinic. Pains in the area of damage, spinouts process overlying vertebra and an increase inter spinouts gap, kyphosis severity, depending on the degree of compression of the vertebral wedge. There is a strain of the back muscles. Sometimes there are pains in the chest or in the abdomen, which can be so intense that they resemble a picture of

"acute abdomen". X-rays performed in two or three dimensions, revealed bony spine pathology.

In the treatment of uncomplicated compression fractures of the thoracic and lumbar vertebrae following techniques:

- 1) single-stage reduction is followed by immobilization with a plaster corset;
- 2) gradual (stage care) reduction and the imposition of a plaster corset;
- 3) functional method;
- 4) operational methods.

Immediate reposition wedge compressed vertebral body is performed under local anesthesia on the auger (hematoma in the body of the damaged vertebra injected 5 ml of 1% solution of Novocain). The patient is placed on two tables in the hyperextension position for 15-20 minutes. In this position, is superimposed plaster corset for 2-3 months, which is replaced by a removable another 10-12 months.

A milestone reduction is carried out gradually over a period of 1-2 weeks by placing under the waist- gauze or other dense rolls of different heights -. 2-3 to 10 cm Sometimes this method is combined with the simultaneous traction of the armpits on an inclined plane. After 1-2 weeks of superimposed plaster corset.

Functional method. In the process of stretching on the ramp and under the influence of therapeutic exercises for 2-2.5 months creates a "muscular corset" that holds the spine in the position of a hyperextension. After creating a good "muscular corset" plaster corset is not imposed. With significant compression of one or two or three of the vertebral bodies is made detachable unloading brace that fits over while walking throughout the year.

By the operative methods of treatment of uncomplicated fractures of vertebral bodies include:

- 1) An integrated functional method using fixture- "tie" (in uncomplicated compression fractures of the wedge-shaped body of the lower thoracic and lumbar vertebrae);
- 2) Front fusion (closed uncomplicated fractures of vertebral bodies of the thoracic injury with end plate);

3) operation of the partial replacement of a vertebral body (with compression comminuted fractures of the vertebral body).

Fractures of the pelvic bones make up 5-6% of fractures of the musculoskeletal system, the most common cause of which is road accidents. Fractures of the pelvis are severe damage and occur when compression of the pelvis in the sagittal and frontal direction during car accidents or a fall from a height. Most break the most delicate bones of the pelvis - ischial pubic and. A more significant injuries or torn Pubic sacroiliac joints. Heavy blood loss and related injury, especially urinary tract and sexual organs, require emergency care.

Clinic. In fractures with significant displacement, a change in the configuration of the pelvis. When double fractures of the pelvic ring, you can find the typical position of "frog". At the site of the fracture occurs widespread hemorrhage. On palpation determined the fracture line and the places where it is possible to palpate bone. Are revealed crepitus and abnormal mobility of free fragments.

Damage to the deep-seated pelvic structures determined by special techniques, such as:

- 1) identification of soreness in transverse compression of the pelvis;
- 2) the symptom of eccentric compression of the pelvis (made grasping hands iliac crest near the anterior spines). Hands make while trying to expand the pelvis, pulling the front of the crest of the midline of the body;
- 3) vertical pressure in the direction of the ischium tuberosity to the iliac crest provides additional information about the localization of deeply located pelvic bone fracture;
- 4) The study of the pelvis through the rectum is extremely valuable, especially in cases of fracture of the bottom of the acetabulum with central dislocation of the hip and lateral fracture of the sacrum and coccyx.

To verify the location and nature of injury in the pelvic region are used in conventional X-ray projections and special techniques for fine diagnosis: computed tomography and magnetic resonance imaging.

Classification, clinical picture and treatment of pelvic fractures

All the bones of the pelvis fractures are divided into four groups.

I group. Isolated fractures of the pelvis.

1. Chunking front upper and lower iliac spines occur with direct impact and a sharp reduction m. Sartorius, m. tensor fascia late. Fragments will mix down.

Clinic: local pain and swelling, a symptom of "reverse".

Treatment: bed rest for 2-3 weeks.

2. Fractures of the wing and the iliac crest occur when falling from a height or car accidents.

Clinic: fractures cause pain and hematoma formation.

Treatment: hip shin traction bus Belair for 4 weeks.

3. Fracture of one of the branches of the pubic and ischial bone.

Clinic: local pain and swelling, a symptom of "heel stuck."

Treatment: bed rest for 4-6 weeks.

4. Fracture of the sacrum below the sacroiliac joint.

Clinic: local pain and bruising.

Treatment: bed rest is up to 6 weeks.

5. Fracture of the coccyx.

Clinic: local pain, worse when changing position. X-rays - a mixture of the coccyx.

Treatment: fresh fractures repositioned in under local anesthesia, chronic treated Pre sacral alcohol-Novocain blockades or quickly.

Group II. Fractures of the pelvic ring without breaking the continuity of it.

1. Unilateral or bilateral fracture of one and the same branch of the pubic and ischial bone.

Clinic. This change is characterized by local pain, intensifying when turning on its side, a positive sign of "stuck heel."

Treatment: bed rest in the "frog" position for 3-4 weeks.

2. Fractures pubic branches on one side and the ischial - other. With this type of fracture of the pelvic ring integrity is not broken, clinic and treatment are similar to those in the previous form of the fracture.

3 Group. Fractures of the pelvic ring in violation of its continuity

1) front card:

- a) unilateral and bilateral fractures of both branches of the pubic bone;
- b) unilateral and bilateral fractures of the pubic and ischial bones (for "butterfly" type);
- c) break the symphysis.

Clinic. These types of fractures of pelvic anterior half rings are characterized by pain in the symphysis pubis and the perineum, the forced position - the position of "frog" (Volkovich symptom) and positive symptoms "heel stuck." Compression enhances pelvic pain at the fracture site.

Treatment: in fractures without displacement of bone fragments the patient is placed on the board to "frog" for 5-6 weeks. Conducted physical therapy, physiotherapy. For fractures of the type "butterfly" with a displacement of bone fragments described complementary treatment or adhesive skeletal traction for the feet. bed rest period of 8-12 weeks. When you break the symphysis treatment is carried out on a hammock for 2-3 months.

2) Rear of the department:

- a) longitudinal fracture of the ilium;
- b) rupture of the sacroiliac joint.

Clinic. Such fractures are rare. There local pain on palpation.

Treatment - in a hammock on board within 2-3 months.

3) Combined fractures of the anterior and posterior sections:

- a) single-sided and double-sided vertical fractures (fractures type Malgenya);
- b) a diagonal fracture;
- c) multiple fractures.

Clinic. As a rule, these fractures in patients with traumatic shock develops, local tenderness, limitation of active movements of the lower extremities. When one-sided vertical fracture half pelvis moves upwards. At the bilateral vertical fracture occurs extensive retroperitoneal hematoma and often - damage of hollow organs.

Treatment: anti-shock measures, including intra pelvic blockade by LG Shkolnikov and VP Selivanov with 0.25% Novocain solution of 300 ml on each side, skeletal extension of the lower limb in flexion and abduction for 8-10 weeks. Walking is allowed after 3 months.

Group IV. Fractures of the acetabulum.

1. Chunking the rear edge of the acetabulum.
2. Fractures of the bottom of the acetabulum.

Clinic. For fractures of the acetabulum without displacement of fragments of active movement in the hip joints are limited due to pain.

Treatment: Continuous skeletal traction for the femoral condyle on the bus with a load of 3-4 kg.

For fractures of the posterior edge of the acetabulum with an offset occurs rear upper hip dislocation. *Treatment:* anesthesia by intra-articular administration of 20 mL of 2% solution of Novocain, reduction in the skeletal traction or during an operation aimed at open reduction and fixation of acetabular fragment.

When the central dislocation of the hip performed reposition of bone fragments and the reduction of dislocation by skeletal traction for the femoral condyle and the greater trochanter with a load of 8-10 kg for 3 months. Walking is permitted after 3.5 months on crutches.

Materials activate students during a lecture presentation.

Questions to control absorption material

1. The classification of fractures
2. Common signs of fracture
3. Classification of treatment methods
4. Principles of simultaneous reduction and subsequent fixation plaster cast
5. Principles of treatment of skeletal traction
6. Functional and non-functional Osseo synthesis.

Total financial and methodological support of the lecture.

- Training room - *conference room of the Department;*
- Equipment - *computer, multimedia projector;*
- Illustrative material - *multimedia presentation.*

Literature, which is used in preparing of the lecture.Basic:

1. V.F. Venger, V.V. Serdyuk, Rashed Mochammad. Traumatology and orthopedics: Compilation of methodical developments to the practical studies on traumatology and orthopedics including the materials for self-training of students of medical institutes of higher education. – Odessa: Print, 2004. – 248 p.
2. Golka G.G., Burianov O.A., Klimovitskiy V.G. Traumatology and orthopedics: textbook for students of higher medical educational institutions : transl. from. ukr. lang. – Vinnytsia : Nova Knyha, 2018. – 400 p.

Lecture 3.

Topic: "DEGENERATIVE DISEASE OF THE JOINTS AND SPINE" - 2 hours

Background: Degenerative-dystrophic lesions of the spine and large joints - a common disease of the musculoskeletal system mainly in middle-aged persons. Despite the presence of a number of fundamental works are far from being solved the problem and the cause of long-term disability in 20-45% of patients.

Goal: To acquaint students with modern principles of understanding the etiology, pathogenesis, diagnosis and treatment of degenerative diseases of the musculoskeletal system. The development of students' modern professional thinking; providing students mastering the leading values of domestic clinical and scientific-pedagogical schools; have an understanding of deontological principles of communication with patients suffering from degenerative-dystrophic diseases of the joints.

3. Plan and organizational structure of the lecture

№. Number	The main stages of lectures and their contents	Objectives for the levels of abstraction	Type lecture, lecture equipment.	Distribution of time.
1.	Preparatory stage Key learning objectives.	I	According to the publication,	6%
2.	Providing positive motivation.		"Guidelines for the planning,	
	The main stage Plan of the lecture material:	II	preparation and analysis of the lecture."	85%
3.	1. Determine the nature of the pathological changes in the joints and spine			
	2. Classification of degenerative diseases			
	3. Clinic and diagnostics of arthrosis and osteochondrosis			
	4. Basic principles and methods of treatment of arthrosis and osteochondrosis			
	The final stage	III	References, questions, tasks.	9%
4.	Summary of the lecture, the general conclusions.			
5.	Answers to possible questions of the lecturer.			

Content of the lecture.

Osteoarthritis - a disease of man as a biological species. This is the most severe form of degenerative changes of the spine, caused primarily pathology of intervertebral discs. Later in the process involves the small joints of the spine and vertebral bodies. The degree of change is determined by morphological and functional features of the intervertebral discs.

Osteoarthritis - a disease that affects millions of people. Especially, it is spreading rapidly in recent decades, and not without reason considered to be one of the most common diseases of modern man. Since then, as osteoarthritis was first described by experts and selected as an illness, it took only 70 years. Unfortunately, to date, the only known factors that contribute to the disease, as the final judgments about its causes essentially hypothetical case. Mass morbidity associated primarily with human vertical position at which the load on the spine and the intervertebral discs is significantly higher than in animals. Scientists estimate the world is suffering from osteoarthritis at least a quarter of the population, that is almost half a billion (!) people.

In Ukraine, the situation is even more difficult - a victim of the disease is considered to be one in three. It should be noted that every year the incidence of osteoarthritis is growing, he "younger". Radiographic studies reveal clinical symptoms of the disease even in children 12-15 years (and according to some foreign authors, in particular the German, there are cases such detection and 3-year-olds). This is due, above all, with increased urbanization, and, as a consequence, low physical activity, change of regime and quality of food. The probability of development of osteoarthritis proportional to age: the older the person, the more real it is.

The risk factor of lumbar degenerative disc disease is a chronic inflammatory disease. For inspection of patients 30-40 years of age showed that screening was preceded by chronic tonsillitis, sinusitis, dental diseases and oral cavity. The disease is more common in men than in women (as a percentage of 60:40).

Localization distinguish cervical, thoracic, lumbar, sacral and common low back pain. Most often diagnosed lumbar osteoarthritis (over 50% of cases), cervical (25%) and common (about 12%).

The risk of lumbar degenerative disc disease is greater in people with different disabilities in the constitutional structure of the spine, especially the lumbar department. This and the presence of transitional vertebrae - mostly 1st sacral in the 6th lumbar hidden cleft vertebra, spondylolisthesis (slippage of the vertebrae innate), fusion of several vertebrae. Above such people and the risk of neurological complications of the disease.

When asked about the role of heredity in the development of osteoarthritis should be answered categorically: not transmitted genetically. However, it is known that certain inferiority of the musculoskeletal system of systems, and in particular the spine, may be inherited, and thereby contribute to the development of the disease and its neurological manifestations. Congenital anomalies of the spine - especially since they are often inherited.

Osteoarthritis of the spine is more common in obese people, who are overweight. As a result of incorrect posture increases the load on the intervertebral discs. Typically, obese people differ insufficient physical activity that contributes to disease susceptibility. Undoubtedly, the risk of its development have increased. Due to the fact that the disease affects the discs in the spine, having the highest mobility (lumbar, cervical), suggests that the reason for her to "wear" drive. However, it is not confirmed in real life. If this were so, then all the people who do heavy physical work, all athletes would have a lumbar osteoarthritis But this is not observed.

Disease susceptible to the representatives of different professions. Yet often those whose work involves prolonged forced position of the spine, mainly bending, prolonged load on the lumbar spine. The central axis of the body, the musculoskeletal system and the protective "case" for the spinal cord - all combined in the spine, formed as a mobile chain 33-34 bony vertebrae, each of which is connected to the adjacent three points: two of them - between the joint processes, one (central) - between the vertebral bodies. It, first of all, we have to stop the attention, talking about violations in osteoarthritis.

This is the area of the intervertebral disc - cartilaginous elastic layer, a pathology that underlies the disease. Naturally, the disc is smaller than the vertebrae (there are 23), and the whole spine cartilage is a quarter of the length of the column. Intervertebral disc

consists of a nucleus pulposus (gelatinous mass of cartilage cells, interwoven fibers) and limiting the annulus. The disc has three functions: serves to connect the vertebral bodies of the spine provides flexibility, prevents the vertebrae from traumatic exercise.

Resistance to compressive forces surprising: normal height of the disc under a load of 100 kg is decreased by only 1.4 mm, while it is increased in width at only 0.75 mm. From state drives flexibility and elasticity of the spine depends, varies in different periods of life. The elasticity of the disc depends on the tissue of nucleus pulposus, and with age, the amount of water in it in the adult (83%) is reduced to 70% (in the elderly), as early as 50 years of age nucleus pulposus loses its viscosity slows down the metabolism in it. If 13 to 12 years of age the blood supply to the disc is due to vertebral vessels, then to 23-27 years it ceases completely on the disk is powered only by diffusion through the hyaline plates of vertebrae under the influence of changing load.

Under the influence of physical activity a part of the water with the accumulated decay products of substances out of the core, and with a decrease in load gelatinous tissue again a water together with nutrients. This is how "pump" the kernel, providing metabolism and mechanical operation of the disc. With the aging of the core worse it retains water during compression that does not allow the elderly to withstand the load on the spine above the average intensity.

Another conclusion that can understand the essential role of the active motor mode, gymnastics for the metabolic processes in the gelatinous tissue. During prolonged physical effort and even during prolonged posture spine becomes shorter, as the intervertebral discs are compressed, although each of them slightly. Differences in positions lying and standing can reach 2-3 cm. Consequently, there is an increase of human growth after prolonged bed rest, even for a few hours in the horizontal position leads to the fact that due to increase turgor occurs nucleus pulposus of the spine at 2 Elongation -3 cm. Reduced body length of up to 7 cm in the elderly by reducing the height of the drive and due to loss of disk capacity to hold water. It is noteworthy that the length of the spine of the same age in humans is usually almost identical with the difference in height, the difference is mainly in the leg length. The length of the backbone, in addition to individual differences, it depends on the load, increasing

curves, it is finally formed in age (average) from 23 to 25 years and in women maximum growth spine ends, usually one year earlier than men.

The pressure on the intervertebral discs, in turn, causes pressure on the gelatinous nucleus changed hyaline degenerative disc plate and leads to the fact that pathologically altered hyaline plates are broken. In places such discontinuities introduced gelatinous core material. It penetrates into the body of the adjacent vertebral endplates which in the central part does not differ a great strength. Such an introduction substance gelatinous nucleus in the bone tissue of the vertebrae at the degeneration of hyaline plates called nodes Shmorglya. When osteoarthritis is a phenomenon often observed. Radiological Shmorglya nodes appear as rounded portions vacuum with a faint stripe sclerosis around them. Are defined at the level of the reflex-vertebral bone plate and a little above it.

More often an osteoarthritis intervertebral discs occur in men aged 35-50 years, develops mobile and most loads lumbar. And in the most mobile section of the spine - cervical. In the lumbar spine most often affects one, at least two drives. In the cervical Osteoarthritis is usually localized in the top of the cervical lordosis between C5-C6. However, other locations. The thoracic section of the spine is affected rarely, the process involved multiple disks. At the heart of osteoarthritis, as already noted, are degenerative-dystrophic changes of intervertebral disc.

Gelatinous nucleus loses its elasticity and can not resist the forces of the load. Under pressure from the gelatinous nucleus flattened disc bulges in all directions, and fibers, diseased fibrous ring bend outwards and, subsequently, are torn.

In places such discontinuities, in the following, under load prolapses or gelatinous substance disc nucleus. Loss of cushioning properties of gelatinous nucleus leads to the fact that the hyaline plate and the surrounding end surfaces of adjacent vertebrae are constantly injured. Hyaline cartilage is sometimes replaced by less durable fiber; under a load of small injuries and fractures and cracks appear. Degenerative changes and is subject to the vertebrae bone.

As you know, the spine has four bending: cervical and lumbar lordosis, thoracic and sacral kyphosis. In the lordosis zone of the front of the discs and the vertebral

bodies above the rear. And conversely kyphosis zone. curvature of the spine provide a springy motion in it that are very important to mitigate shocks and impacts transmitted by the length of the spine when walking, running, jumping. Spine center of gravity passes through 1st neck, body -6th cervical, 9th thoracic, lumbar 3rd and 3rd sacral vertebrae. Finally formed bends to 18-20 years of age. Hold the form of vertebrae, ligaments of the spine, muscles active force.

Nature is wise - double crimp (8-shape) of the spine like an elastic spring softens bumps and shocks when driving, it gives it greater strength. But the most loaded part of the spring in a bipedal locomotion is the lumbar region, and therefore it suffers most other parts of the spine. Normally displaced relative to each other can not vertebrae. This happens only when a pathological fracture of the fibrous ring of the disc, and the vertebrae over the ring is displaced posteriorly by muscle tension rods and yellow ligaments. This means a deformation of the spinal canal, which leads to compression of the nerve roots with the attendant consequences.

The greatest mobility of the spine in the cervical region - between the 4th, 5th and 6th vertebrae. And when bending in the cervical region each of them stands for 2-3 mm in relation to the underlying vertebra. The same happens when bent. Hence, a physiological narrowing of the intervertebral foramen. It is no accident disease processes in the intervertebral discs affected early on nerve roots exiting through the lower intervertebral foramen: it is located closer to the disk than go through the upper intervertebral foramen.

Different parts of the vertebrae in the adult only represent a single entity: the first years of the life of his body is a cartilage formation, ossified over the years. The gradual merging of vertebral arches with vertebral bodies occurs between the ages of 3-6 years. Bone Connect the left and right halves of each vertebra arc occurs in the first year of life, although not in all parts of the spine at the same time. In the lumbar spine, it comes at the age of 4-5, in the sacral - in 10-11 years. And in some cases, cleft arches is forever - in any spine, but usually in the lumbosacral region. This preservation of the structure of infantile traits not considered a disease. This malformation. However, with the onset of adulthood (20-30 years), this lack of spine in some cases leads to the

painful manifestations of similar neurological complications of Osseo arthritis , if affected nerve roots and blood vessels.

By 35-40 years begins to change shape of the vertebrae: their bodies take shape, changing the height of the front part of those who are experiencing a heavy load. Lumbar vertebrae uniformly reduced height (decrease front camber - lumbar lordosis, also the neck), the average thoracic vertebrae wedge deformed due to static load, develops in the thoracic region the so-called senile kyphosis. And the less active human motor mode, the earlier these changes occur. Experiments show that the thickness of the disc in introduced radiopaque substance normally disappears from it for 20 minutes, and the active motor mode removing process is accelerated by several times. That's why it's important to exercise, not only to strengthen the musculoskeletal system, but also to ensure the normal life of the tissues of the spine and musculoskeletal function. This also applies to elderly and, especially, to old age.

Due to the physiological characteristics of the lumbar and cervical parts of the vertebral column (the presence of lordosis) rear sections of the intervertebral discs are loaded to a greater extent and therefore more injured. The front sections are loaded to a lesser extent. In addition, the fibrous ring are more powerful and have a greater resistance to stress and trauma. That is why a disc prolapse most often occurs in the posterior side of the anterior wall of the vertebral canal. If the disc prolapse is accompanied by rupture of the posterior longitudinal ligament, the disc assembly is compressed contents of the spinal canal: Dural sac (lumbar spine) or the membranes and spinal cord material (cervical vertebral column department). If the posterior longitudinal ligament of the vertebral column is not violated, the disk assembly can in posterior-lateral direction. Then squeezed the corresponding counterfoil, or nerve ganglia. The disc on either side of the posterior longitudinal ligament, as well as in other directions. In some cases, they are hyperplastic processes and grow in size. When Osseo arthritis of the spine, in some cases rupture of the fibrous ring may occur in the vertical direction. Broken disk or pathological changes gelatinous core of the fiber of the fibrous ring occupy a horizontal position. Over time, these fibers are damaged is a continuation

of the horizontal surfaces of the vertebral bodies, articulated with hyaline degenerative changes of intervertebral disc plates settled.

Thus, the cranial and caudal surfaces of the two adjacent vertebrae are increased at the expense of marginal bone growths on the front and back surfaces of the limbus. These bony growths are arranged perpendicular to the longitudinal axis of the vertebral body that sets them apart from bony growths due to ossification of the anterior longitudinal ligament, peculiar spondylosis and directed along the vertebrae towards each other. Ossification Osseo arthritis never connected with each other, as is the case with spondylosis, when two adjacent vertebrae are blocked. These bony growths in Osseo arthritis increase the size of the articular surfaces of the vertebrae, and therefore their area than reduce the impact of traumatic factors in the vertebrae.

This kind of compensatory reaction to the pathological process. Bony growths in Osseo arthritis of the inter vertebral discs can be defined in both the vertical and in the dorsal vertebrae departments at the same time, indicating that the disc prolapse both anteriorly and posteriorly. An important feature of the process of growing in Osseo arthritis is sclerosis or cystic degeneration of the cancellous bone (nodules), located near the reflex bony plates of adjacent vertebrae articulate with the hyaline cartilage of the intervertebral discs. Degenerative changes are subject to the vertebrae and the body as a whole. It is a well defined X-ray examination.

In advanced and the process of degeneration of the disc elements adjacent surfaces of the vertebral bodies closer together until they touch. Rubbing against each other vertebrae surfaces cause pain, limited mobility, especially in the anterior-posterior direction (tilting forward and back), the reflex contraction of muscles at the level of destruction of the intervertebral discs. This protective tension of muscles in the lumbar or cervical spine can be expressed unequally, depending on the severity of the changes and pain on each side. That is why asymmetric protective tension of muscles of the lumbar or cervical parts of the vertebral column is often accompanied posture - the displacement of the body or head towards the middle line of the human body, tilt, and violation of posture.

Impaired function of the spinal roots, due to their irritation disk or gelatinous nucleus is shown, in particular, symptoms of tension, namely Lassegue, Wasserman and others. When compression of the roots appear and sensitivity disorders in certain areas of the skin, changes in tendon reflexes, movement disorders and muscle atrophy corresponding innervation zone. the vertebral body with the progression of the process is rebuilt, gradually flattened, and sometimes takes an irregular shape. Along with this change in the relationship and facet joints of the affected segment. They are often a partial slippage of the overlying vertebra with respect to the longitudinal axis of the spine (vertebral subluxation symptom). This, in turn, causes the development of deforming arthrosis of facet joints of the spinal column in violation of its physiological curves. With the reduction of the height of a diseased intervertebral disc, and the convergence of the articular surfaces of the two adjacent vertebrae change the relationship of small facet joints, relaxes the longitudinal ligaments. All this leads to the development of the instability of the vertebral column.

Secondary pain in the spine associated with degenerative-dystrophic processes can be divided into vertebral associated with irritation of the disc and inter and radicular compression (from compression of the spine hernia gelatinous nucleus marginal bone growths), and non-compressive (due to exposure to reactive epidural) character. These secondary radicular changes to be distinguished from true sciatica symptoms (post-infectious and catarrhal character, etc.).

In the initial phase of osteoarthritis inter vertebral discs seldom seen. Patients complain of discomfort in the affected area of the spine, fatigue by the end of the working day and the inability to do heavy physical work. Prolapse of the affected drive or gelatin posterior nucleus gives rise to secondary radicular phenomena violation liquor dynamics circulatory and vascular, and neurological disorders. Due to compression of the nerve roots of the spinal cord and its membranes, as well as the spinal ganglia, there is pain, which is often radiates character. This changes the physiological curvature of the affected vertebral column (decrease lordosis).

When the localization process in the cervical spine palpation causes pain in the area of the spinouts' processes, inversions ligaments and paravertebral areas. At the

same time may be determined by tender points: Erba, , occipital nerve and vertebral artery (the development of ossification in their area). Painful points there are in the places of attachment of tendons in the shoulder blade, shoulder and elbow joints. When lumbar Osseo arthritis pain points appear in the lumbosacral spinal column, hip, and in the gluteal region. The most characteristic radiographic signs are narrowing of the intervertebral gap, uneven contours and sclerosis of the vertebral end plates, sharp edges of the vertebral bodies through the development of horizontal jet bone growths. With the defeat of the cervical spinal column marked narrowing of the intervertebral foramen, lumbar - increased lumbosacral angle and subluxation symptom of one or more vertebrae , which is a sign of the instability of the spinal column.

As an additional radiographic contrast research methods used discography , which allow to diagnose hernia protrusion and specify the degree of degenerative changes of the disc and gelatinous nucleus. AF Kaptelin, AI Kazmin and G.A.Pavlova (1974) of all patients with pain in Osseo arthritis of the spine is divided into three groups.

By the 1st (the most severe) group includes patients with fixation (compression) of the nerve roots in the spinal canal, with a decrease or lack of reflexes, disturbance (decrease) of skin sensitivity in specific, clearly defined areas, and sometimes with a disorder of motor function, accompanied by muscle atrophy. Pain is radicular character, persistent, constant, without a clear localization and, most often one-sided. This leads to a reflex spasm of the muscles on the same side of the spine that causes its bending (patient posture) and limited mobility. With a discography, pneumatic and in pictures visible narrowing of the spinal canal due to prolapse disc matter or gelatinous nucleus and their gross morphological changes. Such patients require surgical treatment.

By the 2nd group includes patients with radicular pain radiate a permanent character without focal neurological symptoms. The level of pain localization corresponds to the place of destruction. If the disc prolapse has occurred, it is not very pronounced and is accompanied by a slight irritation of the spine. Sacral bristlecone muscle strained back. The mobility of the spinal column is limited. Due to the curvature of the spine patient takes a certain fixed position of the body or head. Such patients are

treated in a specialized hospital: they perform stretching of the spinal column for the purpose of unloading and then recommend wearing a support corset. If this treatment does not provide the desired result, to decide whether an operation.

Patients 3rd group complain about the limited impermanent pain localized in paravertebral areas in the transverse or spinous process, inter spinous ligament, etc. The voltage of the back muscles are not expressed sharply, although the flattening of the lumbar or cervical lordosis without significant incorrect posture often observed. Restricting the mobility of the spine is strictly localized and corresponds to the level of pain. Neurological symptoms in this group of patients did not reveal. Such patients are treated conservatively complex method using traction in hospital and outpatient settings.

Treatment of this disease should be aimed primarily at preventing the growth phenomena of degenerative disc disease of the spine: the correct mode of the day, the exclusion of a significant and prolonged load on the spine, as well as heavy physical labor. The basis of the treatment of degenerative disc disease is Heterogenic concept of secondary pain. It should be borne in mind that pain can be caused by not only the herniated disc and gelatinous nucleus with compression of the nerve root, but also occur due to irritation of the vertebral bodies of the ligamentous apparatus of the spine receptors capsule facet joints, the fibers of the fibrous ring, anterior and posterior longitudinal ligaments.

Usually in Osseo arthritis apply remedial gymnastics, swimming, massage, medication (analgesic, antispasmodic, anti-inflammatory, desensitizing agents, vitamins injection group-B protectors et al.), Traction on the special traction chair or table, stretching in warm water on an inclined or horizontal and vertical underwater traction afloat on special suspension settings. Assign well as physiotherapy. Thermal treatments in conjunction with massage promotes muscle relaxation, reduction of spasm, reduce the intensity of pain. In some cases, the lateral displacement of the body and forced stooping, as well as pain appoint supports removable corset. Sometimes they resort to closed manually reposition "dropped out" of the disc. This manipulation requires a certain skill.

The complex treatment is appointed based on the patient's age, state of internal organs, the severity of the pathological process and its localization. Some clinics are successfully used antiradical injection of papain. According to strict conditions and, in particular, with progressive neurological disorders, surgical treatment of degenerative disc disease of the intervertebral disc: Removal of the damaged drive and front or rear fusion. new approaches to the various departments of the spinal column, new diagnostic methods are in place now developed nuclear magnetic resonance, computed tomography, etc.) and treatment.

It is necessary to mention two types of degenerative lesions of the spine - for calcification of the intervertebral disc and the fixing ligament. If the isolation caused degenerative and dystrophic changes in the gelatinous nucleus are not prone to progression, it comes ossification. The X-ray visible postponed lime in the appropriate section of the disc. In such cases diagnosed disc calcification. In some cases, degenerative-dystrophic processes selectively affect mainly the anterior longitudinal ligament of the spine, which leads to the detachment on its considerable length and ossification. This disease has been called the fixing ligament or Forester's disease.

SPONDYLOSIS - a disease caused by degenerative-dystrophic changes of the fibrous ring of the intervertebral disc and anterior longitudinal ligament of the spine as a result of prolonged stress, frequent injuries and age-related pathology. The process may be localized in the cervical, thoracic and lumbar spine. The last two are the most common localization. When spondylosis with age (especially in metabolic disorders, and under the influence of enhanced load) is gradually developing moderate osteoporosis vertebral bodies, their height is reduced; the height of the intervertebral discs as well as vertebrae, gradually moderately reduced. This is particularly pronounced in most of loaded anterior regions of the bodies of the thoracic vertebrae: it is manifested clinically increased kyphosis and radiologically - wedge-shaped deformation of the vertebral bodies.

For the first time spondylosis Osseo arthritis described in 1844 by Carl von Rokitansky. These degenerative-dystrophic changes are the most typical of aging. drives

the aging process develops early. This is due to the lack of their ability to regenerate, the lack of supply and high load falling on them due to the vertical position of the human body. Over time, the hyaline cartilage is replaced by connective tissue formations, thereby reducing its resistance to stress and injury, even small. Reduced elasticity and gelatinous nucleus. All this affects the damping properties of the intervertebral disc. In the process involved and the fibrous ring.

Degenerative dystrophic changes in it are accompanied nicked (breaks) of the fibers, and the gaps do not arise only as a result of minor injuries, but also under the influence of the ordinary, but the longer the load on the spine. In the region of the fibrous ring strain shifts lost the strength of the peripheral tissue disc that injures the anterior or posterior longitudinal ligament of the spine. Gelatinous nucleus with mostly keeps its normal position. Due to continuous bulging disc injury of the anterior longitudinal ligament is peeled from the attachment points at the limbus of the vertebral body, and with a large rupture of the fibrous ring and a significant bulging disc and it is peeled from the vertebral body.

As to the vertebral body at the same time and the periosteum, the anterior longitudinal ligament of the spine responds to injury and the constant irritation. As a result of these processes occur spondylosis typical edge bone growths in form of "beak", "studs" and "antennae". These bony growths occur most often at the point of attachment of the anterior longitudinal ligament to the edge of the front and side surfaces of one or two lying next to the vertebrae (caudal edge of the overlying and cranial - underlying vertebrae). A characteristic feature of these is their symmetry of ossification (however, they may be formed asymmetrically), the mutual thrust them together. They gradually increase in size, converge and often coalesce to form a block of two or more adjacent vertebrae at the front or side surfaces. This osteophytes may grow beyond the limbus in the direction of the vertebral bodies.

These changes may occur in the rear drive department. They lead to protrusion of the fibrous ring, covered the posterior longitudinal ligament of the spine in the spinal canal or intervertebral foramen. Spondylosis often affects older men. The prevalence of the process may be different - from stand-alone and distributed to the total.

The clinical manifestations of the disease: the restriction of the mobility of the spinal column (but not to the same extent as in ankylosing spondylitis), tightness and discomfort, and in advanced cases - local pain and radicular neurological disorders. The majority of patients seen spondylosis changes characteristic of elderly people. The initial form of spondylosis occur, usually asymptomatic.

Osseo arthritis treatment is mainly conservative (physical therapy, massage, physiotherapy, underwater traction, vitamins injection B). At long reception of pain, surgical intervention at the spinal column (spinal fusion, etc.). In order to prevent physical training should be systematic regular. Only in this case we can expect a positive maximum effect. It is necessary to take into account their capabilities, state of health, level of fitness and the recommendation of the attending physician. In addition, everyone should know how to sit, stand, lie and how to lift weights. It is necessary to avoid too soft furnishings. The height of the chair should match the length of the lower leg (it is necessary that the foot rested on the floor) and a maximum depth of approximately 2/3 of the length of the thigh. Every 15-20 minutes. Try some exercise, change the position of the legs, make sure that your back is tight against the back of the chair. Prolonged standing posture change every 10-15 min., Building upon the one, then on the other foot, it will reduce the load on the spine. If possible, go to the place move.

The heavy burden not carry in one hand, especially on long distance, so as not to overload the spine, divide the load and carry it in both hands. But if you really have to lift heavy, observe the following guidelines:

1st - wear, if you have a belt lifter, or any other wide belt.

2nd - sit down on his haunches, and the back should be straight, the neck is straight.

3rd - two hands grasping the gravity, rise without bending your back.

Sleep better than a soft bed, but not on the boards. The bed should be semi-rigid to the body when a person is lying on his back, kept the physiological curves (cervical lordosis, thoracic kyphosis and lumbar lordosis). Lovers sleeping on your side, you can sleep, putting one leg over the other, and a hand - under his head. And another tip. Those who are chronically ill and loves bath, preferably dry steam (sauna), and during

the exacerbation of the sauna and have to give up. Good to go swimming, walking and physiotherapy (load is important to increase gradually). To avoid hypothermia, especially the lumbar region, you should not sit or lie on the ground, rock or metal surface, it is recommended to wear insulated belt.

The most important preventive measure is the treatment of chronic diseases, inflammatory lesions, and should be examined by an orthopedist and use its recommendations in congenital anomalies of the spine.

Materials activate students during a lecture presentation.

Questions to control absorption material

1. Anatomical and physiological features of the spine and joints
2. Modern views on the etiology and pathogenesis of deforming arthrosis and Osseo arthritis
3. Clinical symptoms of degenerative diseases of joints and spine.
4. Methods of diagnosis and differential diagnosis of crippling arthritis and spine.
5. Principles of treatment of degenerative diseases of joints and spine.
6. What is the tactics of treatment deforming osteoarthritis and degenerative disc disease, depending on the form of defeat
7. The main provisions of rehabilitation, disability time and cause of disability.

Total financial and methodological support of the lecture.

- Training room - *conference room of the Department;*
- Equipment - *computer, multimedia projector;*
- Illustrative material - *multimedia presentation.*

Literature, which is used in preparing of the lecture.

Basic:

- 1.V.F.Venger, V.V.Serdyuk Rashed Mochammad Traumatology and orthopedics: Compilation of methodical developments to the practical studies on traumatology and

orthopedics including the materials for self-training of students of medical institutes of higher education. – Odessa: Print, 2004. – 248 p.

2. Golka G.G., Burianov O.A., Klimovitskiy V.G. Traumatology and orthopedics: textbook for students of higher medical educational institutions : transl. from. ukr. lang. – Vinnytsia : Nova Knyha, 2018. – 400 p.