

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ
МЕДИЧНИЙ ІНСТИТУТ

STUDY GUIDE FOR INDEPENDENT WORK OF STUDENTS OF MEDICAL INSTITUTE ORTHOPEDICS AND TRAUMATOLOGY

*Методичні рекомендації для самостійної роботи
студентів медичного інституту зі спеціальності
«Ортопедія і травматологія»*



Суми 2015

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TOPIC 1.1 Features a survey of orthopedic and trauma patient. The scheme of writing of a case history of orthopedic and trauma patients

Objective: to acquaint students with the peculiarities of a survey of orthopedic and trauma patients, the scheme of writing of a case history; to teach how to conduct an inspection, measuring, determining of joint movement.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: wards of orthopedic and traumatology department, training room.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) a scheme of survey of orthopedic and trauma patients;
- 2) chapters of a case history;
- 3) main lines and points used in the process of examination of the patient;
- 4) main visible bend axis of the upper and lower extremities;
- 5) types of the shortening of limb;
- 6) methods of the measurement of the limbs;
- 7) clinical features of the long bone fracture.

BE ABLE TO:

1. Perform a survey, examination and palpation of the patient in order to detect the pathology of musculoskeletal (locomotors) system.
2. Perform measurements of musculoskeletal system for detecting the length of limbs.
3. Identify the amplitude of the active and passive movements of limb joints.
4. Determine the presence of the main symptoms of fracture of bones: "stuck heel" sign, pathological mobility, bony crepitus, local tenderness of the axle load.

The content of the issues

Methods of examination of a patient: complaints (at the moment of examination and at the moment of injury), anamnesis (mechanogenesis) of disease or injury of musculoskeletal system. Previously treatment (by injuries - help on pre-hospital phase). Anamnesis of life. Somatic status. Inspection, palpation, measurement of musculoskeletal

system, checking the main symptoms. Determination of the length of the segments and the whole limb, circumference of segments, the determination of volume of movements and discovery of excess movements in the large joints. Statics and dynamics. Additional methods of examination.

Checklist

1. What are the main complaints of the patient with fractures of limb bones, spine and pelvis?
2. Basic anatomical data with injury of musculoskeletal system?
4. What are the main anatomical data with inflammatory musculoskeletal system diseases?
5. What should we pay attention to while examine of orthopedic trauma patient?
6. The main types of bending of the axis of the upper and lower limbs.
 7. Landmarks and lines of musculoskeletal system determination.
 8. The main symptoms determined with knee joints injuries.
 9. Comparative measurement of length of the upper and lower limbs hold with injuries and diseases.
10. What are the main types of shortening of limb?
11. How is the amplitude of active and passive limb movements determined?
12. The main types of joint mobility restrictions.
13. What should we pay attention to with examination in statics and dynamics?
14. Main additional surveys of patients with musculoskeletal system injuries and diseases.

Literature for self-preparation

Practical guide for students (department publication): "Transport immobilization with limb bones fractures, spinal column and pelvis", "Plaster technique". "Permanent skeletal extension", "Treatment of limb bones fractures ", «Survey of orthopedic trauma patients»

2. Reparative regeneration of bone tissue. Modern principles of fracture treatment

Objective: to acquaint students with common laws and terms of reparative regeneration of bone tissue; to teach students the diagnosis of fractures (clinical and X-ray).

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of orthopedic and traumatology department, training room, plaster room, operating room, manipulation room.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) classification of fractures;
- 2) genesis of fracture;
- 3) clinical symptoms of long bones fracture;
- 4) radiological diagnostic of fracture;
- 5) methods of fracture treatment;
- 6) treatment principles of closed [subcutaneous] fracture;
- 7) treatment principles of open [compound] fracture;
- 8) indications for treatment of fracture in outpatient department;
- 9) indications for inpatient treatment of fracture;
- 10) stages and periods of reparative regeneration of bone tissue;
- 11) volume of aid for fractures in the pre-hospital phase.

BE ABLE TO:

1. Diagnose a shaft (diaphyseal) fracture (based on clinical and radiological symptoms).
2. Determine the indications for inpatient treatment of fractures or treatment in outpatient department.
3. Choose a method of treatment.
4. Make reposition of the fracture of the radial (spoke) bone in the typical place.
5. Apply the plaster circular bandage or splint.
6. Apply the splint and put a permanent skeletal traction system.
7. Reset dislocated shoulder bone (humerus) and immobilize the thoracic

(superior) limb with Dessault's bandage or wedge cushion.

8. Discard a plaster cast.

The content of the issues

Genesis of typical kinds of fractures. Classification of fractures. Diagnosis of fractures of limb bones, chest, spine and pelvis. Providing emergency medical and first medical aid with fractures. General laws of reparative regeneration process. •Basic principles of treatment. Fixation, extension, operative and compression distraction methods of treatment. Indications for inpatient treatment of fractures or treatment in outpatient department. The concept of synostosis, limb functional recovery and rehabilitation.

Checklist

1. Definition of fracture.
2. Types of fractures.
3. Genesis of long tubular bones and short tubular bones fractures.
4. Main symptoms of fracture.
5. Main clinical symptoms of shaft long tubular bones fracture.
6. Main clinical symptoms of intra- and juxta-articular fracture.
7. Main clinical symptoms of spine fracture.
8. Main clinical symptoms of pelvis fracture.
9. Diagnostic value of bone fracture radiological survey method.
10. Formula and record of fracture diagnosis in a case history.
11. Processes of reparative regeneration of bone tissue with fractures.
12. Basic principles of treatment of fractures.
13. Indications and principles of fixation method of treatment of fractures.
14. Indications and principles of extension treatment of bone fractures.
15. Indications and principles of operative treatment of fractures.
16. Nature of compression distraction methods of treatment of fracture.

1. Name the indications for treatment of fractures in outpatient department (fracture clinic).

Literature for self-preparation

TOPIC 2. *Traumatic dislocation*

Objective: to acquaint students with pathomorphological changes in joints with dislocations; to teach clinical and radiological diagnosis of shoulder dislocations and principles of treatment.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: admission department of emergency hospital, training room, plaster room, operating room.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) classification of dislocations;
- 2) genesis of dislocation;
- 3) pathomorphological changes in joints and tissues;
- 4) possible complications;
- 5) clinical and radiological diagnosis;
- 6) basic principles of treatment of dislocations;
- 7) terms and means of fixation of limb;
- 8) indications for open (surgical) treatment of dislocations;
- 9) volume of pre-medical aid for joint dislocations.

BE ABLE TO:

1. Diagnose a dislocation of segment (based on clinical-ray and X-ray data).
2. Select (and implement) the type of anesthesia.
3. Set a shoulder bone.
4. Immobilize the thoracic (superior) limb with Dessault's bandage.

The content of the issues

Definition, classification and genesis of dislocation. The main pathomorphological changes in joints and juxta-articular tissues. Providing the first medical aid with dislocations of the most spread locations. Modern principles of traumatic dislocation treatment of large joints - shoulder, elbow, pelvis and knee. The duration of immobilization. Restorative therapy. Terms of temporary disability.

Checklist

1. Definition of dislocation.
2. Frequency of trauma dislocations.
3. Genesis of dislocation.
4. Pathomorphological changes of joints and juxtaarticular tissues with dislocation.
5. Clinical symptoms and diagnosis of dislocation.
6. Basic principles of treatment of dislocations.
7. Diagnosis and treatment of shoulder joint dislocation.
8. Diagnosis and treatment of elbow joint dislocations.
9. Diagnosis and treatment of hip joint dislocations.
10. Diagnosis and treatment of knee joint dislocations.

Literature for self-preparation

TOPIC 3. *Injury of the chest and shoulder*

Objective: to acquaint students with injuries of the chest and possible complications, injuries of the shoulder, to teach diagnosis of fracture of ribs, and principles of treatment.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology and surgical departments, training room.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) classification and genesis of injuries of chest;
- 2) complications developing with chest injuries; hemothorax, pneumothorax, pleuropulmonary shock;
- 3) volume of pre-medical and first medical aid for injury of the chest;
- 4) basic principles of treatment of solitary rib fracture and different complications;
- 5) principles of treatment of chest fracture;
- 6) clinical picture, diagnostics and treatment principles of fracture of collar bone (clavicula);
- 7) indications for open (surgical) treatment of fracture of collar bone;
- 8) clinical picture, diagnostics and treatment principles of acromial extremity of clavicle

(extremitas acromialis claviculae) dislocation;

- 9) classification of dislocations of bladebone and principles of treatment.

BE ABLE TO:

1. Diagnose a fracture of collar bone.
2. Apply occlusive dressing with wounds of the chest.
3. Apply Sherashenidze's figure-of-eight (cross) bandage and Delbet's splint with a fracture of collar bone.
4. Fixate a superior limb using the wedge cushion.

The content of the issues

Genesis of fracture of chest. Typical displacement. Complications of chest fracture - mediastinal trauma. Clinical picture, diagnostics and treatment principles of fracture of chest. Treatment of contusion and cardiac rupture.

Injuries of the ribs - solitary, multiple and fenestrated. Genesis, diagnostics and treatment. Complicated rib fractures - injury of pleura and lungs for chest trauma. Pneumothorax with closed chest injury - valvular pneumothorax, closed pneumothorax. Hemothorax. Mechanism of disturbance of external respiration. Pleuropulmonary shock. The first medical aid. Principles of treatment.

Acromial extremity of clavicle dislocations- classification, diagnostics, clinical picture, conservative and operative treatment modes. Sternal extremity of clavicle dislocations - injury genesis, diagnostics, treatment. Acromial extremity of clavicle fracture - diagnostics, treatment. Collar bone diaphysis — genesis of fracture, typical displacements, diagnostics, treatment.

Bladebone fracture - classification, injury genesis, diagnostics, treatment.

Checklist

1. Injury genesis, clinical picture, diagnostics, treatment of solitary rib fractures.
2. Genesis, clinical picture, diagnostics, treatment of multiple rib fractures.
3. Fenestrated rib fractures. Basic principles of treatment.
4. Collar bone fractures - injury genesis, clinical picture, diagnostics and treatment.
5. Chest fractures - clinical picture, diagnostics and treatment.
6. Acromial extremity of clavicle dislocation — injury genesis, clinical picture, diagnostics and treatment.
7. Bladebone fracture - injury genesis, diagnostics, treatment.

TOPIC 4.1. Injuries of shoulder bones

Objective: to acquaint students with various types of injuries of shoulder joints, the principles of treatment; to teach clinical diagnosis and emergency medical and first medical aid.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, training room, plaster room, operating room, handling room, admission department of emergency hospital.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) classification of shoulder joints injuries;
- 2) clinic, the diagnosis of fractures of the proximal part of humerus;
- 3) treatment of fractures of the proximal part of humerus;
- 4) indications for operative treatment;
- 5) clinic diagnosis of diaphyseal fractures of the shoulder;
- 6) complications developing with diaphyseal fractures of the shoulder;
- 7) clinical signs of complications;
- 8) treatment of diaphyseal fractures - conservative and open (surgical) methods;
- 9) volume of the first medical aid for fractures of the shoulder joints.

BE ABLE TO:

1. Diagnose the fracture of proximal, distal parts and diaphysis of shoulder (based on clinical data and radiological examinations).
2. Identify the indications for conservative or open (surgical) methods.
3. Fix the superior limb on a wedge cushion with Dessault's bandage fractures of the proximal section without displacement.

The content of the issues

Injuries of soft tissues of shoulder - muscles, tendons, nerves. Clinic, diagnosis and treatment.

Classification of proximal metaepifisis injuries. The mechanism of fracturing. Diagnosis, treatment. Fractures of shoulder dialysis (features, diagnosis and treatment). Supracondylar (epicondylar) fractures of the shoulder, the types of displacement, possible complications, diagnosis of extensor and flexor fractures of the shoulder. Fractures of epicondyle of the shoulder.

Treatment. Intraarticular fractures of the distal part of the humerus - classification, diagnosis and treatment.

Checklist

1. Classification of fractures of the humerus.
2. The mechanism of fractures of the humerus.
3. Fractures of the proximal humerus - clinic, diagnosis and treatment.
4. Fractures of diaphysis of shoulder - clinic, diagnosis and treatment.
5. Supracondylar (epicondylar) fractures of the shoulder - clinic, diagnosis and treatment.
6. Fractures of epicondyle of the shoulder.

Literature for self-preparation

4.2. Injuries of elbow joints

Objective: to acquaint students with various types of injuries of elbow joints, the principles of treatment; to teach clinical diagnosis and emergency medical and first medical aid.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, training room, plaster room, operating room, handling room, admission department of emergency hospital.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) classification of elbow joints injuries;
- 2) clinic, diagnosis and treatment of intraarticular fractures of the elbow joint;
- 3) indications for operative treatment;
- 4) clinical signs of complications;
- 5) volume of the first medical aid for fractures of the elbow joints.

BE ABLE TO:

1. Diagnose the fracture of elbow joint (based on clinical data and radiological examinations).
2. Identify the indications for conservative or open (surgical) methods.
3. Fix the superior limb with the plaster bandage of fractured or dislocated elbow joint without displacement.

The content of the issues

Injuries of soft tissues of elbow - muscles, tendons, nerves. Clinic, diagnosis and treatment.

Mechanism of the injuring.

Intraarticular fractures of the distal part of the humerus - classification, diagnosis and treatment.

Fractures of the olecranon - mechanism and variants of the fracture, diagnosis, indications and methods of conservative and surgical treatment. Fractures of the coronoid of the ulna - diagnosis, treatment. Fractures of the caput and column of the radius - the mechanism of injury, clinical features, diagnosis, treatment.

Checklist

1. Classification of fractures of elbow joint.
2. The mechanism of fractures of elbow joint.
3. Fractures of the elbow joint bones. Clinical diagnosis and treatment transcondylar T- and Y-shaped fractures and fractures of the condyles of humerus.
4. Fractures of the olecranon of ulna. Clinic, diagnosis, conservative and surgical treatment.

Literature for self-preparation

4.3. Forearm injuries

Objective: to acquaint students with various injuries of the forearm; to teach student to diagnose diaphyseal fractures of the forearm and a fracture of the radius in a typical location, emergency medical, first medical aid and treatment.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, training room, plaster room, operating room, handling room, admission department of emergency hospital.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) classification of fractures of the forearm;
- 2) clinic, diagnosis of diaphyseal fractures of the forearm;
- 3) clinic, diagnosis of fracture of the radius in a typical location;

- 4) treatment principles of fractures of the forearm;
- 5) indications for surgical treatment of forearm fractures.

BE ABLE TO:

1. Diagnose the diaphyseal fractures of the forearm.
2. Diagnose the fracture of the radius in a typical location.
3. To do transport immobilization of forearm fracture.
4. To do local anesthesia and reposition of fragment of the radius fracture in typical location (with the supervision of doctor).
5. Apply the back plaster splint on the forearm.

The content of the issues

Fractures of forearm diaphysis -displacement features, diagnosis, treatment. Solitary fracture of the diaphysis of the radius. Fracture of the ulna with dislocation of the caput of the radius (Monteggia's fracture). Fracture of the radius with dislocation of ulna (Galeazzi's fracture). of extensor and flexor variant of the fracture, diagnosis, treatment. Fracture of the radius in a typical location (silver-fork (Colles')and Smith's fractures). Fracture mechanism, diagnosis, treatment.

Checklist

1. Classification of fractures of the forearm bones.
2. The mechanism of occurrence and characteristics of displacement of the fragments in diaphyseal fractures of the forearm.
3. Solitary diaphyseal fractures of the forearm bones - clinical picture, diagnosis and treatment.
4. Diaphyseal fractures of both bones of the forearm - clinic, diagnosis and treatment.
5. Monteggia's and Galeazzi's fractures. Clinic, diagnosis and treatment.
6. Classification, mechanism and diagnosis of fractures radius in typical location.
7. Treatment of fractures of the radius in typical location.

4.4. Injuries in the wrist and hand

Objective: to acquaint students with various fractures of the wrist and hand, tendon injuries; to teach student to diagnose these fractures and principles of the treatment.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, training room, operating room, admission

department of emergency hospital.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) clinic and a diagnosis and treatment of carpal and metacarpal bones;
- 2) clinic, diagnosis semilunaris luxation and dislocation of the wrist, their treatment;
- 3) clinic and diagnosis of the tendons, fingers flexors and extensors injuries, principles of treatment.

BE ABLE TO:

1. Diagnose the dislocation of the wrist.
2. Diagnose the metacarpal bones fracture.
3. Diagnose the tendons injuries.
4. Provide first medical aid for injuries and fractures of the wrist tendons.

The content of the issues

Dislocations of wrist bones (lunate, navicular, pisiform), semilunaris dislocations, dislocated wrist - diagnosis and treatment. Fractures of the wrist bones (navicular, lunate). Clinic, conservative and operative treatment. Wrist ligament injuries. Hygroma of the wrist joints. Fingers flexors and extensors injuries. Diagnosis, conservative treatment. Fingers extensor injuries. Principles of operative treatment of injuries of tendons within the bone. Tendon sutures. Tactics with injuries of the tendons of superficial and profound flexor within the finger. Fractures of the metacarpals and phalanges - diagnosis, treatment. Bennett's fracture - diagnosis and treatment. Metacarpal bones and phalanges dislocation.

Checklist

1. The mechanism of wrist, hand and fingers bone fractures.
 2. Clinic and diagnosis of wrist and hand fractures.
 3. Treatment of fractures of the wrist bones.
 4. Treatment of fractures of the metacarpals and phalanges.
-
1. Diagnosis and treatment of carpal dislocations.
 2. Diagnosis and treatment of dislocations of the metacarpals and phalanges.
 3. Bennett's fracture-the mechanism, clinical picture, diagnosis and treatment.
 4. Wrist ligament injuries - clinical picture, diagnosis and treatment.

5. Microtraumas of fingers and wrist, preventing measures of suppurative processes.
6. Fingers flexors and extensors injuries - clinical picture, diagnosis and treatment.
7. Open wrist polytraumas and their treatment.

Literature for self-preparation

Note: After studying the subjects of 1 -7 topics attestation lesson is held (method for carrying out - see the topic № 17).

TOPIC 5. Spinal injury

Objective: to acquaint students with spinal injuries (complicated, simple):to teach student to diagnose these injuries and principles of the treatment.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, training room.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) classification of spinal cord injuries;
- 2) mechanism of injuring;
- 3) role of the musculoskeletal system (front and back supportive complex);
- 4) complications of spine fractures;
- 5) clinic and diagnosis of spine injuries;
- 6) volume of pre-medical care;
- 7) functional treatment of spine injuries;
- 8) indications for surgical treatment

- 9) treatment of complications with complicated fractures.

BE ABLE TO:

1. Diagnose the vertebral compression fracture (based on clinical and X-ray data).
2. Provide pre-medical and first medical aid.

The content of the issues

The concept of spine front and back supportive complex. Features of unstable spine injuries. Solitary injuries of supraspinal and interspinous ligaments (the mechanism of injuring, diagnosis and treatment). Fractures of the transverse and spinous processes of vertebra, arches and articular processes (the diagnosis, treatment).

Injuries of the vertebral bodies (the mechanism of injury, of the most spread locations of injuries, diagnosis, conservative (functional, one-stage reposition, gradually reposition) and operational (posterior fixation, the replacement of vertebrae, spinal fusion) treatment methods. Treatment of complicated fractures of vertebral bodies (the indications for decompressive spinal surgery, prevention of bedsores, contractures and ascending urinary infection, orthopedic treatment, rehabilitation and prosthetics).

Checklist

1. The concept of spine front and back supportive complex.
2. Mechanogenesis of spine injuries.
3. The concept of stable and unstable injuries of the spine.
4. Classification of spine injuries.
5. Clinic, diagnosis and treatment of ligamentous injuries of spine apparatus.
6. Clinic, diagnosis and treatment of injuries of intervertebral discs.
7. Clinic, diagnosis and treatment of fractures of the vertebrae (spinous processes, transverse, articulate) and arches.
8. Clinic, diagnosis and treatment of complicated dislocation, fracture-dislocations of the vertebrae.
9. Clinic, diagnosis and treatment of simple compression fractures of the wedge-shaped vertebrae.
10. Clinic, diagnosis and treatment of uncomplicated (simple) dislocations and fracture-dislocations of the vertebrae.
11. Prevention of complications with complicated fractures of the spine. **Literature for self-preparation**

TOPIC 6. *Pelvic fracture*

Objective: to acquaint students with various injuries of the pelvis (complicated, simple); to teach student to diagnose these injuries, principles of the treatment and pre-medical and first medical aid.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, training room, operating room, plaster room, handling room.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) pelvic anatomy;
- 2) classification of injuries;
- 3) complications, shock features and treatment;
- 4) clinic, diagnosis of pelvic injuries;
- 5) modern methods of conservative and operational treatment;
- 6) method of intrapelvic procaine (novocaine) block.

BE ABLE TO:

1. Diagnose (based on clinical and X-ray data).
2. Apply the pelvic traction (extension) system.
3. Check the "stuck heel" sign, Larrey's and Warneif s symptoms.
4. Proceed the catheterization with subsequent urethra- or cystography .

The content of the issues

Classification of pelvis injuries. The mechanism of the various injuries. The clinical picture of the pelvis fractures without disrupting the continuity of the pelvic ring, with pelvic ring continuity damage and with fractures of the pelvic bones with pelvis genitals injury. Modern methods of diagnosis. Help on the pre-hospital stage. Features of pelvic trauma shock and its treatment. Conservative and operative treatment of patients with different types of pelvis fractures. The duration of disability and rehabilitation.

Checklist

1. The frequency of the pelvis fractures.
2. Mechanogenesis and classification of the pelvis fractures.

3. Features of pelvic trauma shock and tissue hemorrhage of pelvic fractures and their treatment.
4. Intrapelvic novocaine blockade on Shkolnikov, Selivanov technique.
5. Clinic, diagnosis and treatment of the pelvis fractures without disrupting the continuity of the pelvic ring.
6. Clinic, diagnosis and treatment of the pelvis fractures with pelvic ring continuity damage.
7. Clinic, diagnosis and treatment of acetabulum (cotyloid [cup-like] cavity) fractures.
8. Clinic, diagnosis and treatment of the pelvis fractures.

Literature for self-preparation

TOPIC 7.1. *Hip injuries*

Objective: to acquaint students with various injuries of the hip; to teach student to diagnose these injuries, principles of the treatment and pre-medical and first medical aid.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, operating room, plaster room.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) classification of hip injuries;
- 2) features of blood supply and fusion pattern of the proximal part fracture;
- 3) typical fragment displacements of hip fractures on different levels;
- 4) volume of the first medical aid;
- 5) clinic, diagnosis and treatment of the hip fracture;
- 6) indications of the operational treatment;
- 7) methodic of intramedullary osteosynthesis in case of hip diaphysis fracture and nail-plate fixation in case of femoral neck fracture.

BE ABLE TO:

1. Proceed transport immobilization with Ditench's splint.
2. Diagnose based on clinical and X-ray data).
3. Apply the skeletal extension system.

The content of the issues

Classification of injuries of the proximal part of the hip. Medial femoral neck fracture (valgus and varus fractures). Features of the reparative regeneration. Clinical diagnosis of the proximal part fractures. The first medical aid. Modern treatment methods: operative mode of varus fractures. Valgus fractures treatment (conservative and operative).

Intertrochanteric and pertrochanteric hip fractures (mechanism of injury, diagnosis, conservative and operative treatment). Fractures of the trochanters (diagnosis, treatment). Fractures of the diaphysis (bone fragments displacement of the upper, middle and lower one-third of the femur, clinic, diagnosis). The first medical aid. Conservative and operative treatment of fractures of the diaphysis of the femur.

Checklist

1. Classification of the femur fractures.
2. Mechanism of the proximal part fractures.
3. Clinic, diagnosis and treatment of femoral neck fractures.
4. Clinic, diagnosis and treatment of fractures of the trochanteric, intertrochanteric and pertrochanteric hip fractures.
5. Clinic, diagnosis of diaphysis fractures. Typical displacement of fragments.
6. Traumatic shock and tissue hemorrhage in diaphysis fractures.
7. Indications and use of intraosseous (intramedullary) osteosynthesis in case of transverse fractures.
8. Indications and principles of treatment of comminuted (splintered) fractures of the diaphysis using skeletal traction.

Literature for self-preparation

7.2 Knee injuries

Objective: to acquaint students with various injuries of the knee; to teach student to diagnose some of the injuries (contusion, hemarthrosis and kneecap fracture), principles of the treatment.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, training room, plaster room, admission

department of emergency hospital.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) knee joint anatomy;
- 2) clinic, diagnosis and treatment of the collateral and crucial ligaments;
- 3) clinic, diagnosis and treatment of meniscus injury;
- 4) arthropneurotomography in meniscus injury diagnostics;
- 5) clinic, diagnosis and treatment of the kneecap fracture;
- 6) clinic, diagnosis and treatment of the hip and shin bone(tibia) epicondyles

fractures:

- 7) technique of Dults's operation in case of kneecap fracture.

BE ABLE TO:

1. Diagnose the contusion and hemarthrosis of the knee joint.
2. Check the "kneecap ballotement" symptom.
3. Diagnose kneecap fracture.
4. Proceed knee joint puncture.
5. Apply posterior (dorsal) plaster cast.

The content of the issues

Contusion and hemarthrosis. Clinic, treatment. Collateral and crucial ligaments injuries, their clinical diagnosis and modern treatment methods. Knee joint meniscus injuries, their diagnosis and treatment. Hoffa's disease. Rectus muscle of thigh and kneecap tendon tears. Fractures of the patella (options of the fracture and mechanism of injury, clinical picture, diagnosis, methods of conservative and operative treatment). Intraarticular fractures (hip and shin bone (tibia) epicondyles fractures) and their treatment.

Checklist

1. Clinic, diagnosis and treatment of contusion and hemarthrosis of the knee joint.
2. Clinic, diagnosis and treatment of collateral ligaments.
3. Clinic, diagnosis and treatment of crucial ligaments.
4. Clinic, diagnosis and treatment of rectus muscle of thigh and kneecap tendon

tears.

5. Clinic, diagnosis and treatment of meniscus injuries.
6. Clinic, diagnosis and treatment, fractures of the hip and shin bone (tibia) epicondyles fractures.
7. Clinic, diagnosis and treatment of the kneecap fractures without lateral extensor mechanism injuries.
8. Clinic, diagnosis and treatment of the kneecap fractures with lateral extensor mechanism injuries.
9. Clinic, diagnosis and treatment of Hoffa's disease.

Literature for self-preparation

7.3 Crus injuries

Objective: to acquaint students with various injuries of the shin; to teach student to diagnose the injuries, principles of the treatment and pre-medical and first medical aid.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, operating room, plaster room, handling room, admission department of emergency hospital.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) shin soft tissues injuries, clinic, diagnosis and treatment;
- 2) crus fractures, clinic, diagnosis and treatment;
- 3) volume of pre-medical and first medical aid.

BE ABLE TO:

1. Diagnose the diaphyseal shin fracture.
 2. Proceed transport immobilization.
 3. Proceed the local anesthesia and manual reposition in case of diaphyseal shin fracture (with the supervision of doctor).
1. Apply cylinder (circular, circumferential) plaster cast.

The content of the issues

Shin soft tissues injuries (muscles, Achilles (calcaneal, heel) tendon, peroneal (fibular) and tibial nerves). Clinic, diagnostics, methods of treatment. Solitary diaphyseal

fractures of leg bones (mechanism of injuring, diagnosis).Providing of the first medical aid, treatment. Fractures of both bones of the lower leg (clinic, diagnostic features). Providing of the first medical aid. Conservative and operational methods of treatment.

Checklist

1. Frequency and mechanogenesis of the diaphyseal fractures of the shin bone.
2. Anatomical and physiological features of the shin affecting regenerative process of the fractures.
3. Indication and technique of treatment of closed diaphyseal shin fractures with fixation method.
4. Indication and technique of treatment of closed diaphyseal shin fractures with extension method.
5. Indication and technique of treatment of closed diaphyseal shin fractures with operational method.
6. Basic principles of treatment of open diaphyseal shin fractures.
7. Achilles tendon injuries and their treatment.

Literature for self-preparation

7.4 Ankle joint and foot injuries

Objective: to acquaint students with various injuries of the ankle area; to teach student to diagnose the injuries, principles of the treatment and pre-medical and first medical aid.

Time: 2 hours.

Forms of the lesson: independent work of students.

Place: Wards of traumatology department, operating room, plaster room, handling room, admission department of emergency hospital.

List of necessary knowledge and skills

As a result of independent work on the topic, students must:

KNOW:

- 1) types of the ankle area injuries;
- 2) clinic, diagnosis and treatment of the ligamentous apparatus and anklebone;
- 3) treatment principles;
- 4) indications of the operation treatment.

BE ABLE TO:

1. Diagnose the injury (based on the X-ray data).
2. Proceed transport immobilization.
 1. Proceed the manual reposition in case of ankle fracture (with the supervision of doctor).
 1. Apply cylinder (circular, circumferential) plaster cast.

The content of the issues

Ankle ligamentous laxity and tear (differential diagnosis). Treatment. Ankle fractures: combined with fractures of the anterior or posterior edge of the tibial articular surface; combined with ankle ligamentous apparatus injuries and foot subluxation (clinic, diagnosis). Providing of the first medical aid. Modern methods of treatment. Providing of the orthopedic products for the period of rehabilitation.

Fractures of the astragaloid bone (talus): diagnosis, treatment. Fractures of heel bone - mechanism, clinic, diagnosis and treatment. Subtalar foot dislocation, diagnosis, treatment. Lisfranc joint. Chopart joint dislocations and their treatment. Instep (metatarsal) bone and toe phalange fractures: toe dislocations (clinic, diagnosis). Providing of the first medical aid and treatment.

Checklist

1. Mechanism, clinic, diagnosis and treatment of ankle ligamentous apparatus injuries.
2. Mechanism, classification, clinical features and treatment of solitary ankle fractures and Dupuytren injuries.
3. Mechanism, clinic, diagnosis and treatment of Desto's injuries and ankle fracture-dislocations.
4. Mechanism, clinic, diagnosis and treatment of talus fracture.
5. Mechanism, clinic, diagnosis and treatment of heel bone fracture.
6. Mechanism, clinic, diagnosis and treatment of Lisfranc joint, Chopart joint dislocations.
7. Mechanism, clinic, diagnosis and treatment of instep bone and toe phalange fractures.

Literature for self-preparation**TOPIC 8.1. Congenital deformations of musculoskeletal system**

Objective: to acquaint students with the most common congenital deformations of musculoskeletal system.

Time: 2 hours.

Forms of the lesson: doctor's round with students in infantile orthopedic department.

Place: Wards of infantile orthopedic department.

The content of the issues

Etiology of congenital deformities, frequency and prevention. The principles of detection and early treatment.

Congenital deformation of the neck - muscular osteal (osseous) torticollis, their diagnosis and treatment.

Syndactyly, polydactyly.

Congenital dislocation of the hip. Clinical diagnosis and treatment (different age groups).

Congenital clubfoot (clinical picture, diagnosis and treatment depending on the degree of deformity and age of the child).

Checklist

1. Classification of congenital deformities of musculoskeletal system.
1. Clinic, diagnosis and treatment of syndactylism.
2. Clinic, diagnosis and treatment of polydactyly.
3. Clinic, diagnosis and treatment of congenital hip in newborns and infants.
4. Clinic, diagnosis and treatment of congenital dislocation of the hip in children from one year to 3-4 years.
5. Clinic, diagnosis and treatment of congenital dislocation of the hip in older children and adolescents.
6. Clinic, diagnosis and treatment of congenital clubfoot.

Literature for self-preparation

8.2 Scoliosis

Objective: to acquaint students with the principles of development, diagnostic and treatment of the scoliosis.

Time: 2 hours.

Forms of the lesson: doctor's round and patient briefing with the supervisor.

Place: Wards of infantile orthopedic department, training room.

The content of the issues

The concept of "posture". Types of posture. The concepts of "lordosis", "kyphosis", "scoliosis".

Etiopathogenesis, pathomorphology of scoliosis. Changes of internals. Classification of scoliosis. Clinic of various degrees of scoliosis, clinical course, outcome and complications of

scoliosis. Diagnosis prognosis. Principles of treatment.

Checklist

1. The concept of "posture". Factors of formation.
2. Deformity of the posture and their preventing.
3. Etiopathogenesis, pathomorphology of scoliosis
4. Clinical and radiological classification of scoliosis.
5. Complex treatment of scoliosis.

Literature for self-preparation

8.3 Acquired foot deformities

Objective: to acquaint students with clinic and principles of treatment of acquired foot deformities.

Time: 2 hours.

Forms of the lesson: doctor's round and patient briefing with the supervisor.

Place: Wards of traumatology department, operating room, training room.

The content of the issues

Anatomic and physiologic features of the foot. Biomechanics .Foot and ankle muscles contribution in arch retention. Etiology and pathogenesis of development of the longitudinal, transverse platypodia and planovalgus deformity. Clinical, radiological and biomechanical methods of static foot deformities detection. Conservative and operational methods of treatment of arch flattening. Toe angulation. Etiopathogenesis. Clinical course. Clinic of the development of different deformation i stages. Conservative and operational treatment. Hammer toe deformation and its treatment. Types of orthopedic shoes and corrective insoles applied in case of static feet deformation.

Checklist

1. What anatomical and physiological foot features influence the static deformities?
2. Platypodia and planovalgus deformity (etiopathogenesis, clinic, diagnostic and treatment).
3. Toe acted deviation (etiology, clinic, conservative and operational treatment).
4. Hammer toe deformation (etiopathogenesis, clinic, diagnostic, conservative and operational treatment).

TOPIC 9. Prosthetics in Orthopedics and traumatology

Objective: to acquaint students with indications of amputation, techniques of proceeding, preventive measures and treatment of deformities and diseases of stump, principles of prosthetics.

Time: 2 hours.

Forms of the lesson: doctor's round and analyzing patients with the teacher.

Place: Prosthetics clinic.

The content of the issues

Extremities amputation. Concept of the rehabilitation. Concepts of the amputation and disarticulation (exarticulation). Rational stages and methods of amputation and disarticulation. Principles of formation of the stump for the rational prosthetics. Term of the prosthetics. Term of the prosthetics after the amputation of the upper and lower extremities.

Checklist

1. Rehabilitation of the orthopedic-trauma patients. Its components. Role of the prosthetics in rehabilitation system.
2. Main indications of urgent and routine amputations.
3. Modern methods of prosthetics.
4. Requirements to stump with the view of prosthetics.
5. Classification of orthopedic prosthetic appliances. Brief characteristics of upper and lower extremities prostheses.

Literature for self-preparation

Guidelines for students (department publication) "Lower extremities amputations and preparation to prosthetics".

TOPIC 10.1. Work in the first-aid station and outpatient reception hours for orthopedic patients

Objective: work at the first-aid station.

Time: 1 hour.

Forms of the lesson: outpatient reception hours for orthopedic patients with the supervisor.

Place: first-aid station.

Recommended preparation for the lesson in first-aid station and during the outpatient reception hours of orthopedic patients differs from the preparation of the previous lessons. Taking to the account that students have already studied the theoretical course and that it's almost impossible to predict the kinds of patients' injuries, it's recommended to consult the book and anatomic and X-ray

atlases with the materials received while working at the first-aid station after the lesson.

Literature for self-preparation

10.2. Supervising of the patients

Objective: to acquaint students with patient examination methods and tilling in the case histories, diagnostics and treatment of the patients with musculoskeletal system injuries.

Time: 4 hours.

Forms of the lesson: independent work of students, analysis of the patients supervising with the teacher.

Place: Wards of traumatology department, studying room.

The content of the issues

Brief repeating of the orthopedic patient examination methods and chapters of the case history. Independent work with the patients. Looking through students' drafts and X-ray sketches. Subsidiary literature recommendation to each supervisor.

Case history sketch. Notice: trauma genesis, pre-hospital medical aid, treatment form the hospitalization to supervising and results obtained. Orthopedic status at the moment of supervising. X-ray sketch and diagnosis laconism; treatment scheme, including drug treatment.

The supervisor gives a report on the case history, state of health at the moment of supervising, demonstrates the X-ray and its sketch at the patient's bed. The diagnosis, prognosis and treatment scheme are formulated at the end of examining.

Checklist

1. Main complaints in case of extremity bone, spinal and pelvis fracture.
2. External inspection of orthopedic trauma patient.
3. Main visible bend axis of the upper and lower extremities.
4. Recognition points and lines detected while musculoskeletal system examination.
5. Main symptoms detected in case of knee joint injury.
6. Comparative measuring of the upper and lower extremity length.
7. Main types of restriction of joint movement.
8. Concept of "anterior support complex" and "posterior support complex" of the spine.

1. Mechanogenesis of spine injuries.
2. Concept of “stable” and “unstable” spine in injuries.
3. Spine injury classification.
4. Clinic, diagnosis and treatment of spine ligamentous apparatus.
5. Clinic, diagnosis and treatment of intervertebral disk injury.
6. Clinic, diagnosis and treatment of process of vertebra fracture (spinous/acantha/, transverse, inferior articular and occulta).
7. Clinic, diagnosis and treatment of simple compression wedge-shaped vertebra fracture.
8. Clinic, diagnosis and treatment of simple vertebra dislocation and fracture dislocation.
9. Clinic, diagnosis and treatment of complicated vertebra dislocation, fracture dislocation and fracture.
10. Prevention of complications in case of complicated vertebra fracture.
11. Frequency of pelvis fracture.
12. Mechanogenesis and classification of pelvis fracture.
13. Features of shock and tissue hemorrhage in case of pelvis fracture and its treatment.
14. Shkolnikov-Selivanov intrapelvic block technique.
15. Clinic, diagnosis and treatment of the pelvis fractures without disrupting the continuity of the pelvic ring.
16. Clinic, diagnosis and treatment of the pelvis fractures with pelvic ring continuity damage.
17. Clinic, diagnosis and treatment of acetabulum (cotyloid [cup-like] cavity) fractures.
18. Clinic, diagnosis and treatment of the pelvis fractures.
19. Classification of the femur fractures.
20. Mechanism of the proximal part fractures.
21. Clinic, diagnosis and treatment of femoral neck fractures.
22. Clinic, diagnosis and treatment of fractures of the trochanteric, intertrochanteric and pertrochanteric fractures.
23. Clinic, diagnosis of diaphysis fractures. Typical displacement of fragments.
24. Traumatic shock and tissue hemorrhage in diaphysis fractures.
25. Indications and use of intraosseous (intramedullary) osteosynthesis in case of transverse fractures.

26. Indications and principles of treatment of comminuted (splintered) fractures of the diaphysis using skeletal traction.
27. Clinic, diagnosis and treatment of contusion and hemarthrosis of the knee joint.
36. Clinic, diagnosis and treatment of collateral ligaments of knee joint.
37. Clinic, diagnosis and treatment of crucial ligaments of knee joint.
38. Clinic, diagnosis and treatment of rectus muscle of thigh and kneecap tendon tears.
39. Clinic, diagnosis and treatment of meniscus of the hip and shin bone(tibia) injuries.
40. Clinic, diagnosis and treatment of the kneecap fractures with lateral extensor mechanism injuries.
41. Clinic, diagnosis and treatment of Hoffa's disease.
42. Frequency and mechanogenesis of the diaphyseal fractures of the shin bone.
43. Anatomical and physiological features of the shin affecting regenerative process of the fractures.
44. Indication and technique of treatment of closed diaphyseal shin fractures with fixation method.
45. Indication and technique of treatment of closed diaphyseal shin fractures with extension method.
46. Indication and technique of treatment of closed diaphyseal shin fractures with operational method.
47. Basic principles of treatment of open diaphyseal shin fractures.
48. Achilles tendon injuries and their treatment.
49. Mechanism, clinic, diagnosis and treatment of ankle ligamentous apparatus injuries.
50. Mechanism, classification, clinical features and treatment of solitary ankle fractures.
51. Mechanism, clinic, diagnosis and treatment of isolated ankle fractures and Dupuytren injuries.
52. Mechanism, clinic, diagnosis and treatment of Desto's injuries and ankle fracture-dislocations.
53. Mechanism, clinic, diagnosis and treatment of heel bone fracture.
54. Mechanism, clinic, diagnosis and treatment of Lisfranc joint, Shopar joint dislocations.
55. Mechanism, clinic, diagnosis and treatment of instep bone and toe phalange fractures.

Literature for self-preparation

Recommended: practical lessons notes.

Guidelines for students (department publications).

10.3. Final test lesson

Objective: to ascertain students' knowledge level.

Time: 2 hours.

Forms of the lesson: testing students using checklists and situational tasks.

Place: Wards of traumatology department, studying room.

The content of the issues

Each student is asked 3 questions, situational tasks and X-ray description.

Each student should be aware of the mechanism, clinic, diagnosis and treatment of the different musculoskeletal system fractures (injuries). Notice: students should know the features of pre-medical and the first medical aid and while transportation.

Each student should be able to plan the inspection and treatment, substantiating them.

REFERENCES

1. Alonso J. L. The Mangment of complex orthopedic Injuries / J L. Alonso, L. Jeckson, A. R. Burgess et al. // Clin. Orthop. North Am. - 1996. - Vol. 76. №4. - P. 879-903
2. Asher M. The reliability and concurrent validity of the SRS-22 patient questionnaire for idiopathic scoliosis / M. Asher. S. M. Lai, D. Burton, B. Manna //Spine. - 2003. - Vol. 28, N. 1, -P.63-69.
3. Ballmer F.T. Treatment of tibial plateau fractures with small fragment internal fixation: a preliminary report / F.T. Ballmer R. Hertel, H.P Notzli // J. Orhop Trauma - 2000. - Vol. 14. -P.467.
4. Barei D P. Complications associated with internal fixation of high-energy bicondylar tibial plateau fractures utilizing a two-incision technique / D P. Barei, S.E. Nork, W.J. Mills // J Orhop. Trauma - 2004. - Vol. 18. - P. 649.
5. Chapmen M.W. Operative orthopaedics. Volume 1-111 / M. W. Chapmen. - Philadelphia, 1993.
6. Dickman D. Assessment of Scoliosis with Ortelius Preliminary Results / D. Dickman, O. Caspi // Clinical Application Notes, April 2001 - P. 1-7.
7. Egol K.A. Staged management of high-energy proximal tibia fractures (OTA types 41): the results of a prospective, standardized protocol / K.A. Egol, N.C. Tejwani. E.L. Capla // J Orhop. Trauma - 2005. - Vol. 19. - P. 448.
8. Egol K.A. Treatment of complex tibial plateau fractures using the less invasive stabilization system plate: clinical experience and a laboratory comparison with double plating / K.A. Egol, E. Su, N.C. Tejwani //J. Trauma. -2004. - Vol. 57. - P. 340.
9. French B. High-energy tibial shaft fractures / B. French, P. Tometta // Orthop. Clin North Am. -2002.-Vol. 33.-P.211.
10. Jakob R. P. The knee and cruciate ligements / R. P. Jakob, H. U. Staubli. - Berlin Heidelberg, New York. Springer. 1992
11. Muller M. Manual of internal Fixation. Springer / Muller M., Allgover M , Schneiderl R., Willenegger H. - Verlag, 1990.-750 p.
12. Pohlemam T. The Hannover experience in management of pelvic fracture / Pohlemam T., Bosch U., Oansslen A., Tschemi H. // Clin. Onthop. - 1994. - Vol. 305. - P. 69-80
13. Poole G. V. Causes of mortality in patient with pelvic fractures / G. V. Poole, E. F. Ward // Ortopedics, 1994.-Vol. 17,№ 18.-P 691-696
14. Roerdink W.H. Arthroscopically assisted osteosynthesis of tibial plateau fractures in patients older than 55 years / W.H. Roerdink, J. Oskam, P.A. Vierhout // Arthroscopy. - 2001. - Vol 17, N 8,-P 826-831.
15. Schippinger, G. Case report HAGL lesion occurring after successful arthroscopic bankart repair /G. Schippinger [et al.]//Arthroscopy. - 2001.-Vol. 17, N2,-P. 206-208.
16. Tile M. Pelvic ring fractures : should they be fixed? / M. Tile // J. Bone Jt. Surg. 1988. -S'b'l.l. - P.188-196.
17. Villemure I. Progression of vertebral and spinal three-dimensional deformities in adolescent idiopathic scoliosis. A longitudinal study / Villemure I., Aubin C.-E., Grimand G., Dansereau J. , Labelle H. //Spine. -2001- Vol. 26, N 20. - P. 2244-2250.
18. Wood K. B. Thoracic volume changes in scoliosis surgery / K. B. Wood, M. J. Schendel, M. B Dekutoski //Spine - 1996.-Vol. 21,-P. 718-723.
19. Zindrick M. R. Pedicle morphology of the thoracolumbar spine / MR. Zindrick, G. W Knight M. J. Sartori, T. J. Camevale // Spine. - 2000. - Vol. 25, N 21. - P. 2726-2735.
20. Бабич Б. К. Травматические вывихи и переломы / Б. К. Бабич. - Киев : Здоровье. 1968. - 458 с.
21. Олекса А.П. Травматология / А. П. Олекса. - Львів, 1996. - 408 с.
22. Трубников В Ф. Травматология и ортопедия. - Киев : Высшая школа. Главное изд-во, 1986. - 591 с.
23. Юмашев Г. С. Травматология и ортопедия / Г. С. Юмашев. - М.: Медицина, 1983. - 576 с.

Навчальне видання

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**Study guide for independent work of students
of medical institute orthopedics and traumatology**

:nd

***Навчальний посібник для самостійної роботи студентів медичного
інституту спеціальності «Ортопедія і травматологія»***

(англійською мовою)

Переклад на англійську мову **Назбар Х.**
Комп'ютерна верстка