

BOGOMOLETS NATIONAL MEDICAL UNIVERSITY

Department of human anatomy

GUIDELINES

Student's independent work during the preparation to practical lesson

<i>Academic discipline</i>	HUMAN ANATOMY
<i>Module №</i>	1
<i>Content module №</i>	4
<i>The topic of the lesson</i>	Muscles of the upper limb
<i>Course</i>	Medical 1,2,3,4, military,dental
<i>Number of hours</i>	3

1. Specific objectives:

After completing the course, the student must know and be able to:

- 1.1 Classify muscles of the upper limb.
- 1.2 Demonstrate the muscles of the upper limb, the place where they begin and attach, and determine their functions.
- 1.3 Determine the participation of individual muscles of the lower limb in the implementation of certain types of movements.

2. Basic level of training:

Students must know and be able to:

- 2.1. Know lectures on general osteology, arthrology and myology.
- 2.2. Demonstrate areas of the upper limb.
- 2.3. Demonstrate and describe individual upper limb bones.
- 2.4. Describe the joints, movements in which provide the muscles of the upper limb.
- 2.5. Describe possible movements in the joints of the upper limb.

3. Organization of the content of educational material:

Study material is studied in a logical sequence from the central to the peripheral parts of the upper limb with the involvement of structural and logical schemes, tables, drawings, which reflect the content of the main issues of the theme, using anatomical drugs and dummies.

4. Content of educational material:

Muscles of the upper limb (musculi membri superioris) are divided into muscles of the thoracic belt and muscles of the free upper limb (mm membri superioris liberi).

M.deltoideus

It has three parts, which are called according to their origin: pars clavicularis, pars acromialis, pars spinalis.

Beginning: from the side of the collarbone, the shoulder process and the shoulder blades. Attachment: to the humerus.

Function: removes the hand from the trunk to the horizontal level; the clavicle folds the shoulder, rotating it in the middle, pushes the raised arm; the abdomen extends the shoulder, rotating it externally, lifting the raised arm.

M. supraspinatus

Beginning: from the entire surface of the periosteum fossa.

Attachment: to the top of the large humpback of the humerus.

Function: diverts the hand to the horizontal .Blood supply:
umbilical artery of the shoulder blade.

M. Infraspinatus

Beginning: from the entire surface of the maxillary lobe of the scapula and the glandular fascia.

Attachment: to the middle of the posterior surface of the large tuberosity of the humerus.

Function: rotates the outside shoulder and leads it to the body.

M. teres minor

Beginning: from the lateral edge of the shoulder blade.

Attachment: to the lower part of the posterior surface of the large tuberosity of the humerus.

Function: rotates the outside of the shoulder and leads it to the body (synergist of the glandular muscle).

M. teres major

Beginning: from the lower part of the lateral edge and the lower angle of the shoulder blade.

Attachment: to the crest of the small tubercle of the pelvic bone, lower than the attachment of the widest muscle to the back.

Function: Extends and brings the shoulder to the body, turns it inwards.

M. subscapularis

Beginning: from the ventricular fossa of the shoulder blade and its medial margin.

Attachment: to the crest of the small hump of the humerus.

Function: rotates the shoulder inwards and leads it to the body.

M. brachii

In the shoulder region (regio brachialis), the anterior and posterior shoulder segments are allocated, which have respectively the front and back muscle groups of the shoulder. The front group of muscles of the shoulder, which are flexors, include: bee-shoulder muscle, shoulder-headed muscle and shoulder muscle. To the back group of muscles, which are extensors, belong to the head muscles of the shoulder and elbow muscles.

Front muscle group of shoulder:

M. biceps brachii

The muscle has two heads: a long head (caput longum) and a short head (caput breve).

Beginning: the long head begins from the hump of the shoulder blade.

The tendons of the long head are in the shoulder cavity.

The short head begins with a beak-shaped blade prosthesis.

Attachment: Long and short heads are connected to the general abdomen.

The abdominal two-headed muscle continues in the long tendons .It attaches to the neck of the radial bone. A thin and wide aponeurosis of the shoulder head muscle (aponeurosis musculi bicipitis brachii) is fascia of Pirogov from the tendon of the two-head muscle of the shoulder. It covers the elbow hole

ahead into the fascia of the forearm. Function: folds the forearm in the elbow joint and turns it away (supinates) if the forearm was previously pronated (penetrated); folds shoulder in the shoulder joint m. coracobrachialis.

Beginning: from the top of the beak-shaped blade appendix.

Attachment: to the anterior-mediating surface of the pelvic bone, starting from the crest of a small tubercle up to the middle of this bone.

Function: flexes the shoulder in the shoulder joint and pulls it to the body, turns out the shoulder if it is turned to the middle.

M. brachialis

Beginning: from the front surface of the lower two thirds of the body of the humerus below the deltoid mountain.

Attachment: to the humpiness of the elbow bone.

Function: flexes the forearm in the elbow joint.

Back muscle group of the shoulder

M. triceps brachii

The muscle has three heads: a long capillary capum (caput longum), a caput laterale and a caput medialis. Start of muscle heads: the long head starts from the hypothyroid hump of the scapula. The lateral head begins on the posterior side of the shoulder bone laterally and above the spine of the radius nerve.

The lateral head goes down and covers the furrow of the radial nerve.

Medium head begins on the back of the humerus medially and below the spine of the spinal nerve. Most of the middle head is covered by the side head, with which it partially grows. Between the interstices of the medial and lateral heads and the furrow nerve, a narrow shoulder muscle canal (canalis humeromuscularis), in which the radial nerve and blood vessels pass, appear.

Attachment: approximately the middle of the back of the upper shoulder, the three muscle heads are united and form the general abdomen. It passes into a flat broad tendon and attaches to the elbow process of the elbow.

Function: Extends the forearm in the elbow joint, and the long head extends the shoulder in the shoulder joint and leads it to the trunk.

M. anconeus

Beginning: from the back surface of the lateral hypertrophy of the humerus.

Attachment: to the backbone surface of the elbow appendix, the proximal part of the elbow.

Function: Extends forearm in elbow.

M. antebrachii

Muscles of the forearm are divided into two groups: the anterior and posterior.

Front forearm muscle group

Most of the forearm muscles of the forearm starts from the medial hypertrophy of the humerus. The first (superficial) layer of forearm muscles of the forearm

M. brachioradialis

Beginning: from the lateral hypertrophy of the humerus and its crest.
Attachment: to the lateral surface of the distal end of the radial bone over its styloid appendix. Function: bends the forearm in the elbow joint, sets it to the middle position between the attraction and the turning away.

M. pronator teres

Has shoulder and elbow heads (caput humerale et caput ulnare).
Beginning: shoulder head - from the medial superficial humerus; elbow head - from the median edge of the hilum of the elbow and from its crown appendix.
Attachment: Both heads are immediately connected to one another. It attaches to the middle of the lateral surface of the radial bone.
Function: attracts (promotes) the forearm and flexes it in the elbow joint.

M. Flexor carpi radialis

Beginning: from the medial superficial of the shoulder bone.
Attachment: to the palmar surface of the base of the II metacarpal bone.
Function: bends and moves the brush in the radial wrist, bends the forearm in the elbow joint.

M. palmaris longus

Beginning: from the medial hypertrophy of the humerus.
Attachment: pass into palmar aponeurosis (aponeurosis palmaris).
Function: tenses palmar aponeurosis, folds the brush and forearm.

M. Flexor carpi ulnaris

Has shoulder and elbow heads (caput humerale et caput ulnare).
Beginning: shoulder head - from the medial hypertrophy of the shoulder bone; Elliptical head - from the top two thirds of the medial surface of the elbow and elbow appendix.
Attachment: to the pectoral bone and hook of the hook bone.
Function: bends and brushes the radial wrist joint.

The second layer of the muscles of the forearm

M. flexor digitorum superficialis

It starts with two heads - the shoulder-elbow head (caput humeroulnare) and the head of the bone marrow (caput radiale).
Beginning: the shoulder-elbow head starts from the medial hypertrophy of the humerus and from the medial edge of the crown appendix of the elbow bone; the head of the radial bone starts from the upper two thirds of the anterior edge of the radius bone.
Both heads are connected to the general abdomen. Distally, this abdomen is divided into 4 long tendons.
Attachment: The muscle tendons are divided into 2 legs, which are attached on both sides to the bases of the middle phalanges II-V of the fingers. Due to the split between the legs of each tendon, the corresponding tendon of deep flexor runs.
Function: folds the middle and proximal phalanges II-V of the fingers, the brush, and the forearm.

Third layer of muscles of the forearm

M. flexor digitorum profundus

Beginning: from the proximal two thirds of the front surface of the elbow bone below its hump and from the interstitial peritoneum of the forearm.

Attachment: The abdomen of the muscle passes into four tendons. They are attached to the basis of distal phalanx II-V fingers.

At the level of proximal phalanges, each tendon of the deep muscle - the folding finger passes through the gap between the legs of the corresponding tendon of the surface muscle - the flexor of the fingers.

Function: folds the end, middle and proximal phalanges of the II-V fingers, as well as the brush in the radial wrist joint.

M. flexor pollicis longus

Beginning: from the upper two thirds of the anterior surface of the radial bone, the interstitial membrane of the forearm and the medial perineum of the humerus.

Attachment: to the base of the final phalanx of the thumb.

Function: bends the final and proximal phalanges of the thumb, takes part in bending the brush.

Fourth (deep) layer of muscles of the forearm

M. pronator quadratus

Beginning: from the anterior margin and the anterior surface of the lower third of the elbow.

Attachment: to the front surface and the anterior edge of the lower third of the radius.

Function: rotates inside the radius bone around the elbow - attracts (promotes) the forearm and the brush.

Back muscle group of the forearm

The muscles of the back of the forearm by function are extensors.

Form two layers - superficial and deep.

The superficial layer of the muscles of the forearm

The muscles of the surface layer of the back group begin from the lateral hypertrophy of the humerus.

M. extensor carpi radialis longus

Beginning: from the lateral hypertrophy of the humerus.

Attachment: to the back surface of the base of the II heel bone.

Function: Extends wrist and brush in the radial wrist; Shrinking simultaneously with the radial muscle-bending wrist, remove the brush.

Short-limb muscle extension wrist (m extensor carpi radialis brevis)

Beginning: from the lateral hypertrophy of the humerus.

Attachment: to the back surface of the base of the third heel bone.

Function: Extends wrist and brush in the radial wrist; Shrinking simultaneously with the radial muscle-bending wrist, remove the brush.

M. extensor digitorum

Beginning: from the lateral hypertrophy of the humerus.

Distally, the muscle is divided into 4 tendons.

Attachment: Four tendons to the rear surface of the middle and end phalanx of II-V fingers.

Function: Extends II-V fingers, as well as a brush.

M. extensor digiti minimi

Beginning: from the lateral hypertrophy of the humerus.

Attachment: to the back surface of the base of the middle and end phalanx V Elbow muscle extensor wrist (m extensor carpi ulnaris)

Beginning: from the lateral superficial of the shoulder bone, the posterior surface of the elbow bone.

Attachment: to the back surface of the base V of the heel bone.

Function: Extends and brushes the radial wrist joint.

Deep layer of muscles of the forearm

M. supinator

Beginning: from the lateral hypertrophy of the humerus and from the crest of the muscle-opener on the elbow bone.

Attachment: to the anterolateral surface of the upper third of the radius bone from its rough surface to the point of attachment of the circular muscle - the grafters.

Function: Swings off (supine) the forearm, with the radius bone rotating outside around the elbow bone.

M. abductor pollicis longus

Beginning: from the posterior surface of the elbow and prominent bones, as well as from the interstitial membrane of the forearm.

Attachment: to the back surface of the base and the heel bone.

Function: draws a thumb and a brush.

M. extensor pollicis brevis

Beginning: from the posterior surface of the radius and the interstitial membrane of the forearm.

Attachment: to the base of the proximal phalanx of the thumb.

Function: Extends the proximal phalanx of the thumb and removes it.

M. extensor pollicis longus

Beginning: from the posterior surface of the middle third of the elbow and the interstitial membrane of the forearm.

Attachment: to the base of the final phalanx of the thumb.

Function: Extends thumb and brush.

M. extensor indicis

Beginning: from the posterior surface of the lower third of the elbow and the interstitial membrane of the forearm.

Attachment: to the back of the proximal phalanx of the index finger.

Function: expands the index finger, helps to expand the brush.

The muscles of the brush

The muscles of the brush are divided into 3 groups.

M. abductor pollicis brevis

Function: draws a big toe of the brush.

Opposite muscle of the thumb (m orro nens pollicis)

Function: contrasts the thumb with the little finger and the other fingers of the brush.

Short fingernail muscle (m.flexor pollicis brevis)

Squatted on the medial side of the enlargement of the thumb, partly covered by a short thumb pull of the muscle. It has a superficial and gl-side head (caput superficiale et caput profundum).

Function: bends the proximal phalanx of the thumb.

M. adductor pollicis

It has a braid and a transverse head (caput obliquum et caput transversum).

Function: brings the thumb to the index.

The muscles increase the little finger

M. palmaris brevis

It has the appearance of a thin plate. Located transversely in the subcutaneous basis, raising the little finger.

Function: wrinkles the skin to increase the thumb.

M. abductor digiti minimi

Function: removes the little finger.

M. opponens digiti minimi

Located on the side of the short muscle-flexor of the little finger and under the removable muscle of the little finger.

Function: Opposes the little finger to the big finger of the brush.

M. flexor digiti minimis brevis

Arranged on the side of the muscle of the little finger.

Function: bends the little finger.

Middle group of muscles of the brush

The middle group muscles are located in the interstitial intervals of the heel (palm and posterior interbody muscles) at the level of the deep muscle flexion of the fingers (the scrotum muscles).

M. lumbricales are four thin spindle-shaped muscles that lie indisputably under the palmar aponeurosis between the tendons of the flexor muscles.

Beginning: from the tendons of the deep muscle flexing the fingers.

Attachment: their tendons are woven into the tendons of the muscle-extensor of the fingers.

Function: bending proximal phalanges and bending the middle and end phalanges of the II-V fingers.

M. Interossei palmares

Presented by three muscles. They lie in the second, third and fourth intercutaneous passages, closing them from the palm of the hand.

Beginning: from the II, IV and V hemopoiesis.

Attachment: Proximal Phalanges I, IV and V Fingers.

Function: Brings II, IV and V fingers to III (sore) fingers.

M.interossei dorsales

They are located in the back of all four interpositions.

Beginning: each muscle begins with two heads from the reversed surfaces of the I-V hemopoies.

Attachment: to the basis of Proximal Phalanx II-V Fingers.

Function: remove the II and IV fingers from the III (middle) finger, hold the third finger or remove and lead it.

5. Methods of organization of educational process in practical lesson

5.1. Preparatory stage

5.1.1 Formation of motivation for the purposeful study of anatomy of the muscles of the upper limb for the purpose of professional activity: knowledge of the anatomy of the muscles of the lower limb is the basis for the formation of the clinical thinking of surgeons, orthopedic traumatologists and doctors of sports medicine.

5.1.2 Conduct standardized control of the initial level of students' training:

- by tests of the educational theme "Anatomy of muscles of the upper extremity".

- on questions of control of the basic and initial levels of knowledge.

5.2. The main stage

The practical work of students with the use of the anatomical preparation of a corpse of a person, drawings, drawings on "muscles of the upper limb" is carried out. Self-study by students of the topic is controlled by a teacher.

During this control, the individual techniques of the teacher are implemented to facilitate the study of complex anatomical components, as well as the necessary consultations are carried out.

5.3. The final stage

Evaluates the current activity of each student during the class.

Standardized final control is carried out.

An analysis of student activity is conducted.

Announced evaluation of the activities of each student and recorded in the journal of attendance records and student success.

An adult group at the same time puts the marks in the record of the record of success and visits of studies by students, the teacher assures them with their signature.

The teacher informs the students about the topic of the next lesson and methodical methods for preparing for it.

6. Attachments. Means for control:

- practical tasks concerning illustrations in the manual "Anatomy of a person. Control of independent preparation of students for practical classes »

- questions for controlling the basic level of knowledge of students
- A question for controlling the initial level of knowledge of students
- A question for controlling the final level of student knowledge
- test tasks of format A (CRIC-1)

1. **Practical tasks** regarding illustrations in the manual "Anatomy of man. Control of independent preparation of students for practical classes »:
 - to work out in the manual different colors of the scheme and drawings in accordance with the subject of the lesson.

2. Questions for controlling the basic level of knowledge of students

- 2.1. Name and show the upper limbs.
- 2.2. Name and demonstrate the sacrum and caudal, bones of the upper limb.
- 2.3. Name and demonstrate joints of the upper limb bones.
- 2.4. Describe the overall structure of the skeletal muscle as an organ.
- 2.5. Determine what is referring to the auxiliary apparatus of skeletal muscles.
- 2.6. Classify the muscles in shape, position, fiber direction, joints and functions.
- 2.7. Identify the following main characteristics of the skeletal muscles, such as the concept of the onset and attachment of muscles and their action on the joints.

3. Questions for controlling the entry level knowledge of students

- 3.1. Name the muscles of the thumb.
- 3.2. Name the deep back muscles of the forearm.
- 3.3. Name the place of attachment of the shoulder muscle.
- 3.4. Name the place of the beginning of the long head of the trapezius muscle of the shoulder.
- 3.5. Name the muscles of the increase of a small finger.
- 3.6. Name the superficial back muscles of the forearm.
- 3.7. Name the place of attachment of the two-headed shoulder muscle.
- 3.8. Name the place of the middle head of the trapezius muscle of the shoulder.
- 3.9. What are the forearm muscles of the forearm?
- 3.10. What is the function of palmar intercostal muscles?
- 3.11. Name the place of attachment of the elbow muscle.
- 3.12. Name the place of the beginning of the side head of the trapezius muscle of the shoulder.
- 3.13. What is the function of the rectal musculoskeletal muscles of the brush.
- 3.14. Name the place of the beginning of the elbow muscle.
- 3.15. Name the function of the scrotum muscles.

4. Questions to control the final level of student knowledge

- 4.1. Classify muscles of the upper limb.

- 4.2. Name and demonstrate the muscles of the thoracic belt. Describe the deltoid, abdominal and glandular muscles. Demonstrate the places where they are to begin and attach, and identify the moves that can be done with their help.
- 4.3. Demonstrate small and large round muscles and subcutaneous muscle. Demonstrate the places where they are to begin and attach, and identify the moves that can be done with their help.
- 4.4. Classify shoulder muscles. Name the front shoulder muscles. Demonstrate the places where they are to begin and attach, and identify the moves that can be done with their help.
- 4.5. Name the back muscles of the shoulder. Demonstrate the places where they are to begin and attach, and identify the moves that can be done with their help.
- 4.6. Classify the muscles of the forearm. What are the forearm muscles of the forearm? Demonstrate the places where they are to begin and attach, and identify the moves that can be done with their help.
- 4.7. Name the back muscles of the forearm. Demonstrate the places where they are to begin and attach, and identify the moves that can be done with their help.
- 4.8. Classify the muscles of the brush. Name the muscles of the thumb. Identify the moves that can be done with their help.
- 4.9. Name the muscles of the increase of a small finger. Identify the moves that can be done with their help.
- 4.10. What are the muscles that belong to the middle group of muscles of the brush. Identify the moves that can be done with their help?
- 4.11. What are the muscles that make flexion and extension in the shoulder joint?
- 4.12. What are the muscles that drive and pull off the shoulder joint?
- 4.13. What are the muscles that rotate in the shoulder joint outside and to the middle?
- 4.14. What are the muscles that flex and flex in the elbow?
- 4.15. What are the muscles that make the radius of the radius and the brush out and the middle to the elbow?
- 4.16. What are the muscles that perform flexion and extension in the radial wrist joint?
- 4.17. What are the muscles that carry and bring to the wrist?
- 4.18. What are the muscles that perform flexion and extension in the phytic-phalangeal and interphalangeal joints?
- 4.19. What are the muscles that carry the reduction and removal in the phytic-phalangeal joints?
- 4.20. What are the muscles that make flexion and extension, the removal and removal in the wrist of the tooth joint of the thumb, and which muscle contributes this finger to the little finger?

Tests

1. After injury, the patient can not bend the upper limb in the elbow joint. Failure of the function of the main muscle can cause this condition?

- A. M. teres major.
- B. M. infraspinatus.
- C. M. levator scapulae.
- D. M. triceps brachii.
- E. M. subscapularis.

2. Patient - injury to the shoulder joint.

Radiologically, lesions of the hypohalamic mound of the shoulder blade were detected. The tendons of which muscle that begins in this place has been damaged?

- A. Caput longum m. tricipitis brachii
- B. Caput breve m. bicipitis brachii.
- C. Caput mediale m. tricipitis brachii
- D. Caput laterale m. tricipitis brachii
- E. Caput longum m. bicipitis brachii.

3. A traumatic point arrived at a man, 38 years old, with a trauma of his right hand. During examination, a cutaneous wound was found in the area of the right thumb enlargement. What muscle is damaged if the end phalanx and finger is not bent?

- A. M. opponens pollicis.
- B. M. flexor pollicis brevis.
- C. M. abductor pollicis brevis.
- D. M. flexor pollicis longus.
- E. M. adductor pollicis.

4. A person arrived at the emergency room, 39 years old, with a trauma of the left hand. During examination, the cut wound was detected in the area of the thumb enlargement. What muscle is damaged if the proximal phalanx of the thumb is not bent?

- A. M. adductor pollicis.
- B. M. flexor pollicis longus.
- C. M. abductor pollicis brevis.
- D. M. opponens pollicis.
- E. M. flexor pollicis brevis.

5. Having a shoulder injury, the patient complains about the impossibility of removing the shoulder. What muscles are injured?

- A. M. teres major et m. subscapularis
- B. M. deltoideus et m. suppressed
- C. M. supraspinatus et m. teres major
- D. M. teres minor et m. deltoid

E. M. subscapularis et m. coracobrachialis.

6. B as a result of an injury the patient can not raise his hand to the horizontal level. What muscle is affected?

A. M. biceps brachii.

B.M. deltoideus.

C. M. triceps brachii.

D.M. trapezius.

E.M. latissimus dorsi.

7. Injuries to the anterior shoulder area led to significant limitation of bending in the shoulder and elbow joints. What muscle is damaged?

A. M. triceps brachii.

B. M. brachialis.

C. M. anconeus.

D.M. biceps brachii.

E. M. brachioradialis.

8. The patient can not remove the upper limb from the trunk, which muscle does not perform its functions?

A. M. infraspinatus.

B. M. latissimus dorsi.

C. M. teres major

D.M. deltoideus.

E.M. coracobrachialis.

9. A man, 45 years old, was taken to a surgical department with a cut wound on the median edge of the forearm. The examination showed that the patient was cut two muscles of the forearm - elbow flexor muscle and elbow muscle extensor of the wrist. What movement is performed while simultaneously reducing these muscles?

A. Bending of the brush.

B. Extension and removal of the brush.

C. Brushing.

D. Disposal of the brush.

E. Extension of the brush.

10. At the husband, 26 years old, an industrial injury of the upper third of the shoulder. During examination at the injury point bone damage was not detected. The absence of active extension of the forearm is noted. Which muscle is most likely to be damaged?

A. M. triceps brachii.

B. M. coracobrachialis.

C. M. biceps brachii.

D.M. anconeus.

E. M. pronator teres.

11. A man, 35 years old, under working conditions received a cutaneous wound in the area of enlargement of the thumb. Restrictions on thumbnail of

the brush are detected. What muscle function is damaged?

- A. M. opponens pollicis.
- B. M. palmaris brevis.
- C. M. abductor pollicis brevis.
- D.M. flexor pollicis brevis.
- E.M. adductor pollicis.

12. When a 45-year-old female traumatologist was examined, small circular muscle damage was detected. Which shoulder movement will be limited?

- A. Deduction.
- B. Rejection, withdrawal.
- C. Engagement, bringing.
- D. Bringing, turning away.
- E. Bending.

Answers

1	2	3	4	5	6	7	8	9	10	11	12
D	A	D	E	B	B	D	D	C	A	C	D