

MINISTRY OF PUBLIC HEALTH OF UKRAINE

UKRAINIAN MEDICAL STOMATOLOGICAL ACADEMY

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ANATOMY OF THE LOCOMOTOR SYSTEM



STUDY VISUAL GUIDE

Poltava 2020

UDC 611.9

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Study visual guide in the discipline "Human Anatomy" from the section "Anatomy of the locomotor system" is intended to improve and more accessible assimilation of knowledge by students of higher educational institutions of medical education of Ukraine in the specialty "Medicine". The manual contains Latin anatomical terminology, includes questions on osteology, arthrosindesmology, myology, to the extent provided by the working curricula, a typical working curriculum in the discipline "Human Anatomy". Presented drawings for visual study of the material, contribute to the assimilation of acquired knowledge and practical skills. At the end of each practical lesson there are questions for self-training, situational tasks for the corresponding lesson from the database of the licensed exam "Krok-1. General Medicine".

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Topic 1. Anatomic nomenclature and terminology. Axes and planes of the human body.

Anatomical nomenclature.

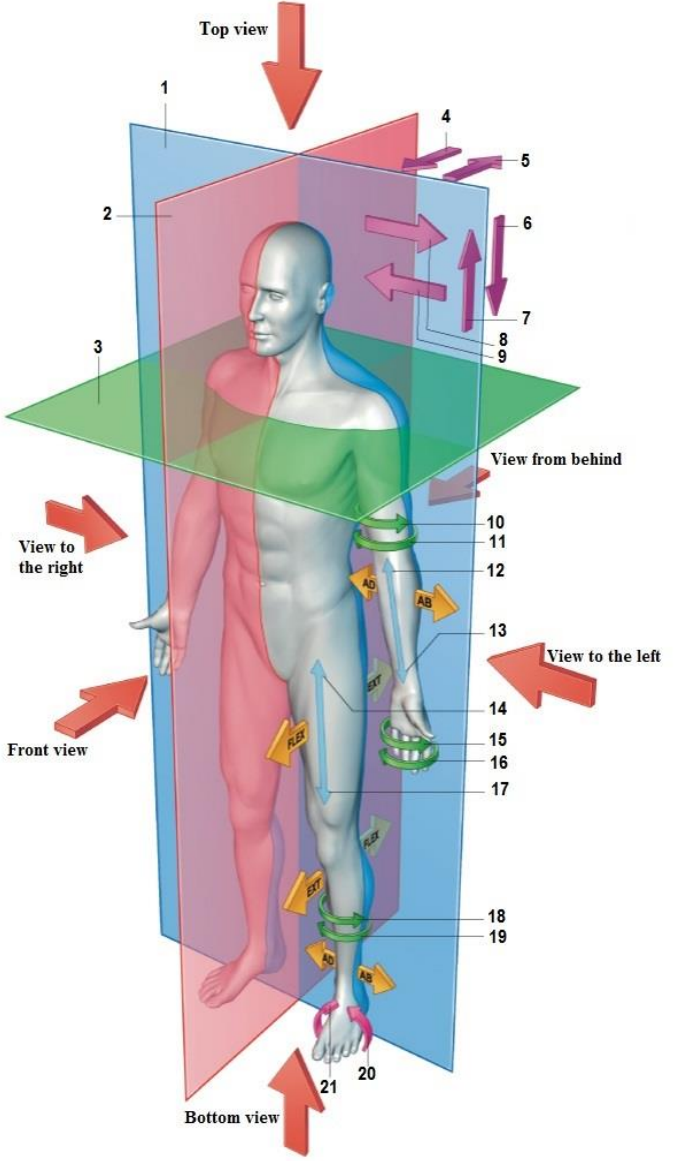
The nomenclature abbreviation	Year and city
1. BNA	
2. PNA	
3. S-PNA	

General anatomical terms.

Complete the table.

Term in Latin	Term in English	Term in Latin	Term in English
1. Medianus		14. Sinister	
2. Sagittalis		15. Longitudinalis	
3. Frontalis		16. Cranialis	
4. Transversalis		17. Caudalis	
5. Medialis		18. Superior	
6. Lateralis		19. Inferior	
7. Intermedins		20. Superficial	
8. Medius		21. Profundus	
9. Anterior		22. Proximalis	
10. Posterior		23. Distalis	
11. Ventralis		24. Externus	
12. Dorsalis		25. Dexter	
13. Internus			

Axes and planes of the human body.

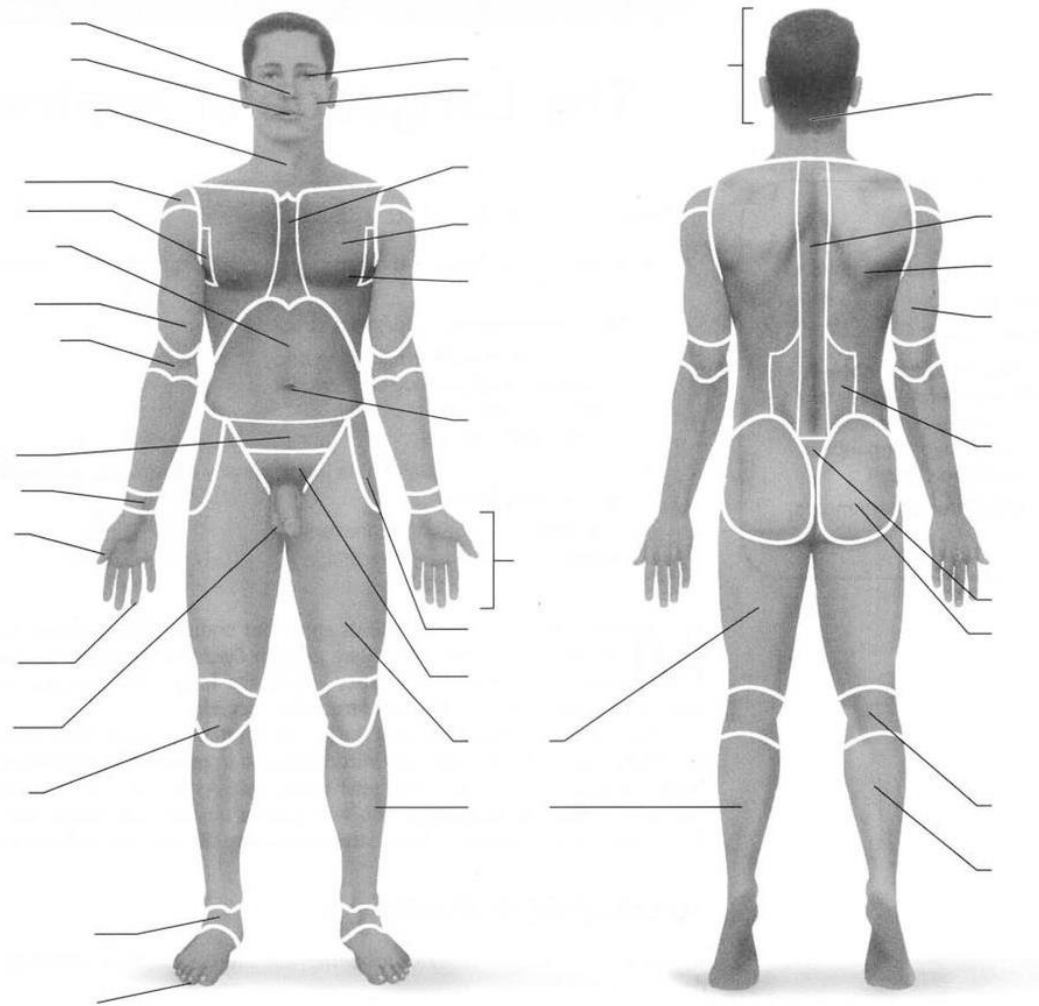


Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____

Topographic lines of the chest (trunk)

Complete the table.	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	



Write all regions of anatomy surfaces.

Questions:

1. Name planes, which divide the body into right and left halves? _____

2. Name movements that occur around the frontal axis. _____

3. How do you understand the difference between the birth defect and anomaly? _____
4. What is its morphology _____
5. Name movements that occur around the sagittal axis. _____
6. The bone grows in length due to: _____
7. The bone grows in width due to: _____
8. Translate into Greek the term «the vertebral column»: _____

Topic 2. Vertebrae. General features, signs of vertebrae in different parts of vertebral column. Sacrum, coccyx. Anomalies.

Complete the table.

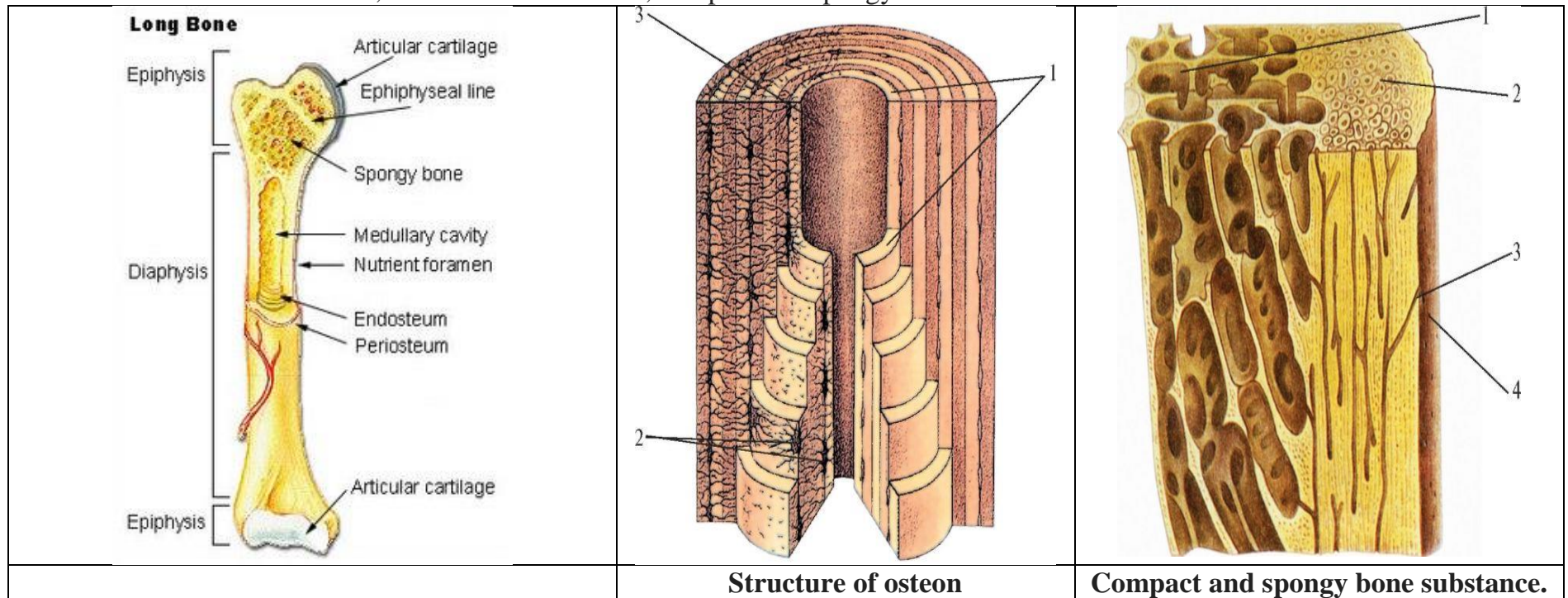
Term in English	Term in Latin
Bone marrow cavity	
Metaphysis	
Red bone marrow	
Epiphyseal cartilage	
Vertebral arch	
Vertebral column	
	Atlas
	Arcus anterior atlantis
	Sulcus a. vertebralis
	Fovea costalis superior
	Facies pelvina
	Crista sacralis mediana

Complete the table

Part	Characteristics
Body	
Vertebral	
Transverse	Slender and long, accessory process on posterior surface of base of each transverse process.
Articular processes	Superior articular facets directed posteromedially, inferior articular facets directed anterolaterally, mammillary process on posterior surface of each superior articular process.
Spinous process	

The structure of the tubular bone.

The structure of the tubular bone, the structure of osteon, compact and spongy bone substance



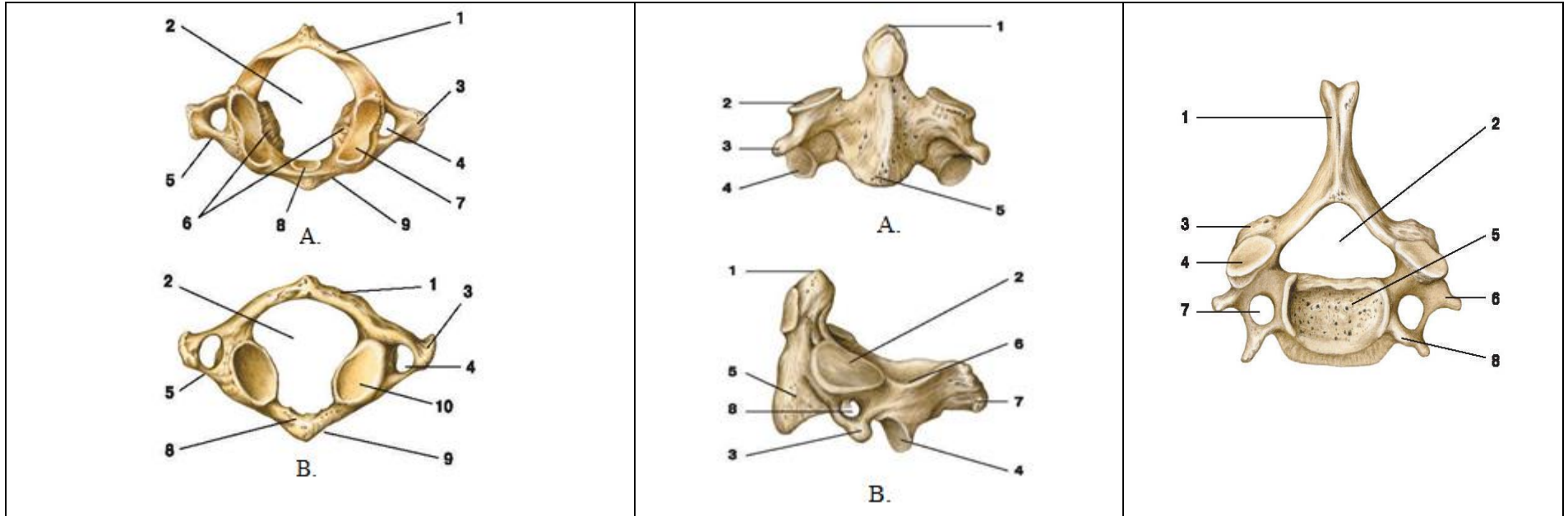
<p>The structure of the tubular bone.</p>	<p>1. _____</p> <p>2. _____</p> <p>3. _____</p>	<p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p>
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General signs of vertebrae.

<p>The image contains two anatomical diagrams of the human spine. The left diagram is a 'Posterior View' showing the vertebrae from the back. It has four groups of labels: 1 and 2 point to the upper cervical region; 3 points to the thoracic region; 4 points to the lumbar region; and 5, 6, 7, 8, and 9 point to the sacrum and coccyx. The right diagram is a 'Lateral View' showing the spine from the side, with labels 5, 6, 7, 8, and 9 pointing to the cervical, thoracic, lumbar, sacral, and coccygeal regions respectively.</p>	<p>Sing all names of structures</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p>
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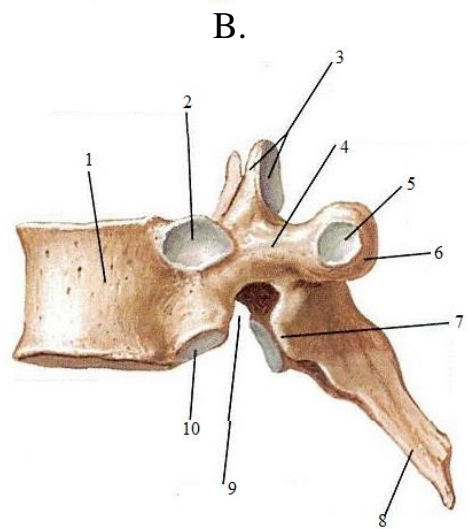
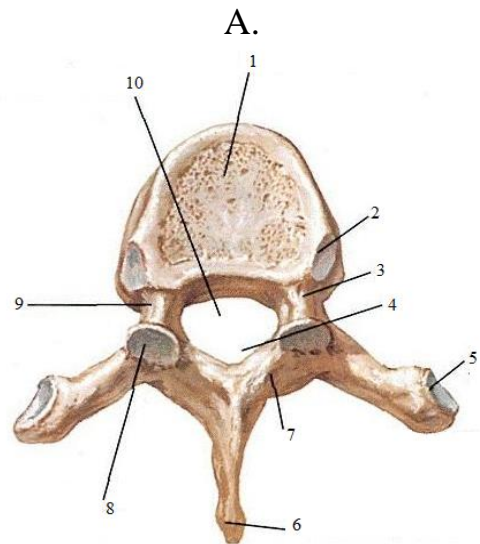
Cervical, thoracic, lumbar vertebrae.

Write all anatomical structures.



Differences in the structure of the vertebrae of the cervical group.

First cervical vertebra (atlant, atlas)	Second cervical vertebra (axis)	Cervical vertebrae (3-7)
1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____



The structure of the vertebra of the thoracic spine (IV).

A. Superior view.

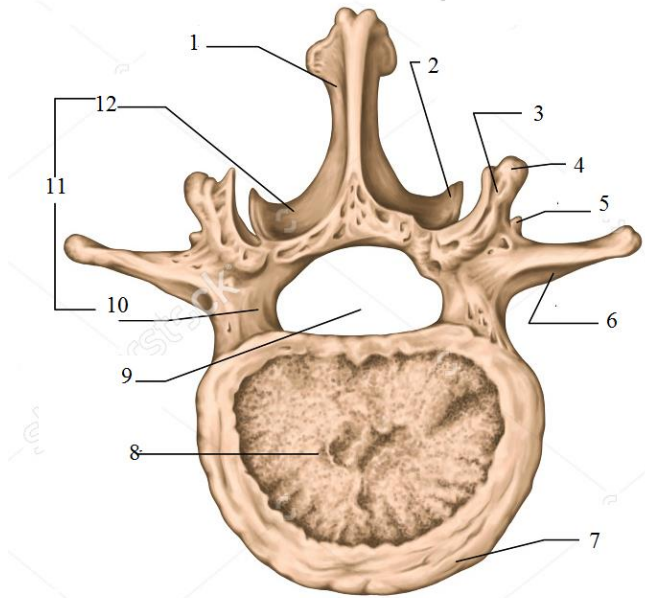
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

B. Lateral view.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

The structure of the lumbar vertebra.

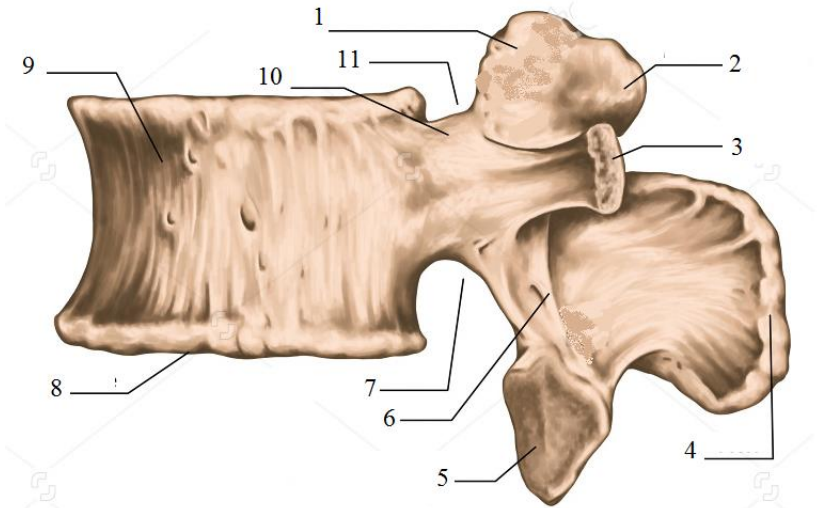
A. Superior view.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Write all anatomical structure.

B. Lateral view.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

Write all anatomical structures.

CR!:

There are several clinical syndromes resulting from an abnormal curvature of the spine:

Kyphosis – excessive thoracic curvature, causing a hunchback deformity.

Lordosis – excessive lumbar curvature, causing a swayback deformity.

Scoliosis – lateral curvature of the spine, usually of unknown cause.

Cervical spondylosis – decrease in the size of the intervertebral foramina, usually due to degeneration of the joints of the spine. The smaller size of the intervertebral foramina puts pressure on the exiting nerves, causing pain.

Cervical vertebrae : degenerative changes cause narrowing of intervertebral foramina that may cause cervical radiculopathy.

Bilateral fracture of pars interarticularis of C2 (spondylolysis) results from hyperextension of head on neck and results in spondylolisthesis of C2 (hangman’s fracture); fractures (common) are due to motor vehicle, snowmobile, and all terrain vehicle accidents.

Spinous process :Palpable landmarks used to assess spinal curvatures and determine location of spinal cord for procedures such as lumbar puncture and injection of spinal anesthesia.

Intervertebral foramen :May become narrowed by age-related changes (e.g., osteophyte formation) or changes in intervertebral disc height , producing compression of its contents.

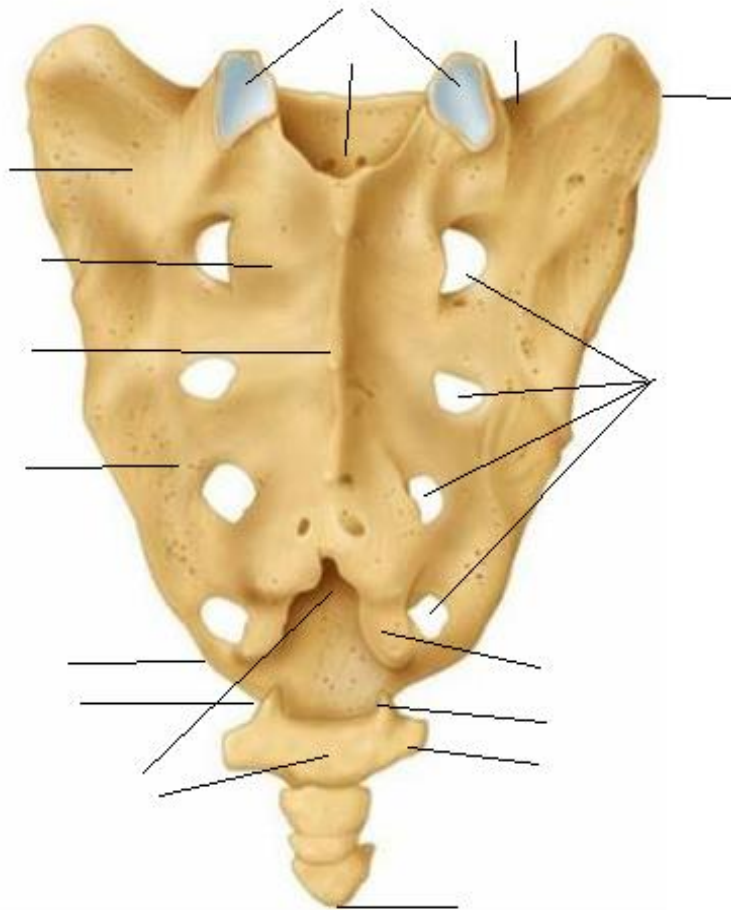
Questions:

- 1 .Name the anatomical features that are typical for the first cervical vertebrae. _____
2. Name the anatomical features that are typical for the lumbar vertebrae. _____
3. As a result of injuries of the cervical part of the vertebral column the patient got fractures of the transverse processes of the 4th and the 5th of the cervical vertebrae. What complication can occur in the patient? _____
4. The patient has a bleeding from a head's wound. At what point should press the carotid artery temporarily stop the bleeding? _____
5. The patient has fracture processes of the cervical vertebrae, which have foramens for the passage of vessels. What are the processes of cervical vertebrae have holes: _____
6. Name the anatomical feature that is typical for the sixth cervical vertebra. _____

Topic 3: The sacrum. The Coccyx. Structure of vertebral column. Anomalies of development.

Bones of the vertebral/spinal column		
Name	Number	Description
Cervical vertebra	7	Vertebrae in the neck region

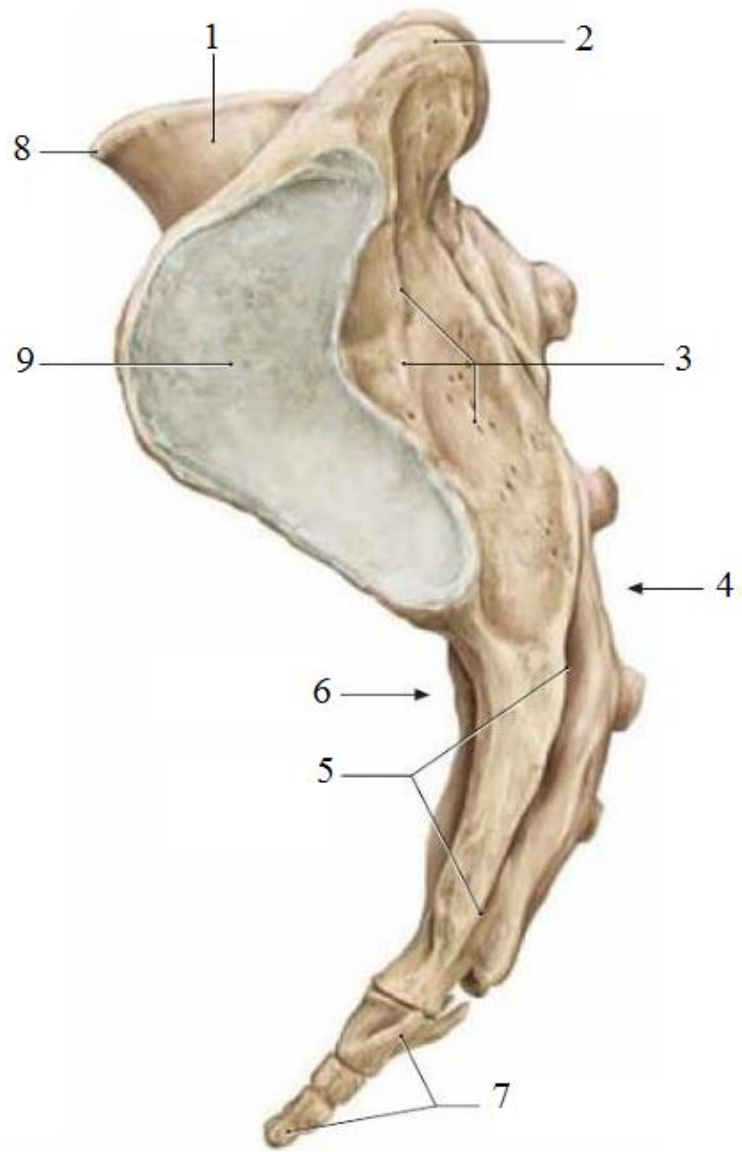
Thoracic vertebra	12	Vertebrae in the chest region wick ribs attached
Lumbar vertebra	5	Vertebrae in the small of the back, about waist level
Sacrum	1	Five vertebrae that become fused into one triangular-shaped flat bone at the base of the vertebral column
Coccyx	1	Three to five very small vertebrae attacheched to the sacrum, often become fused



The sacrum, posterior aspect.

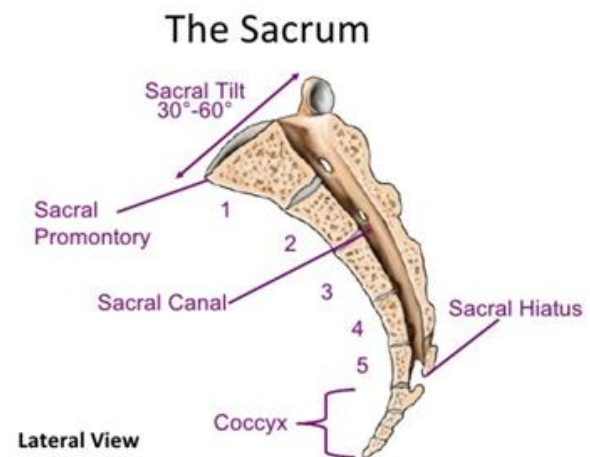
Find the anatomical structures of the sacrum:

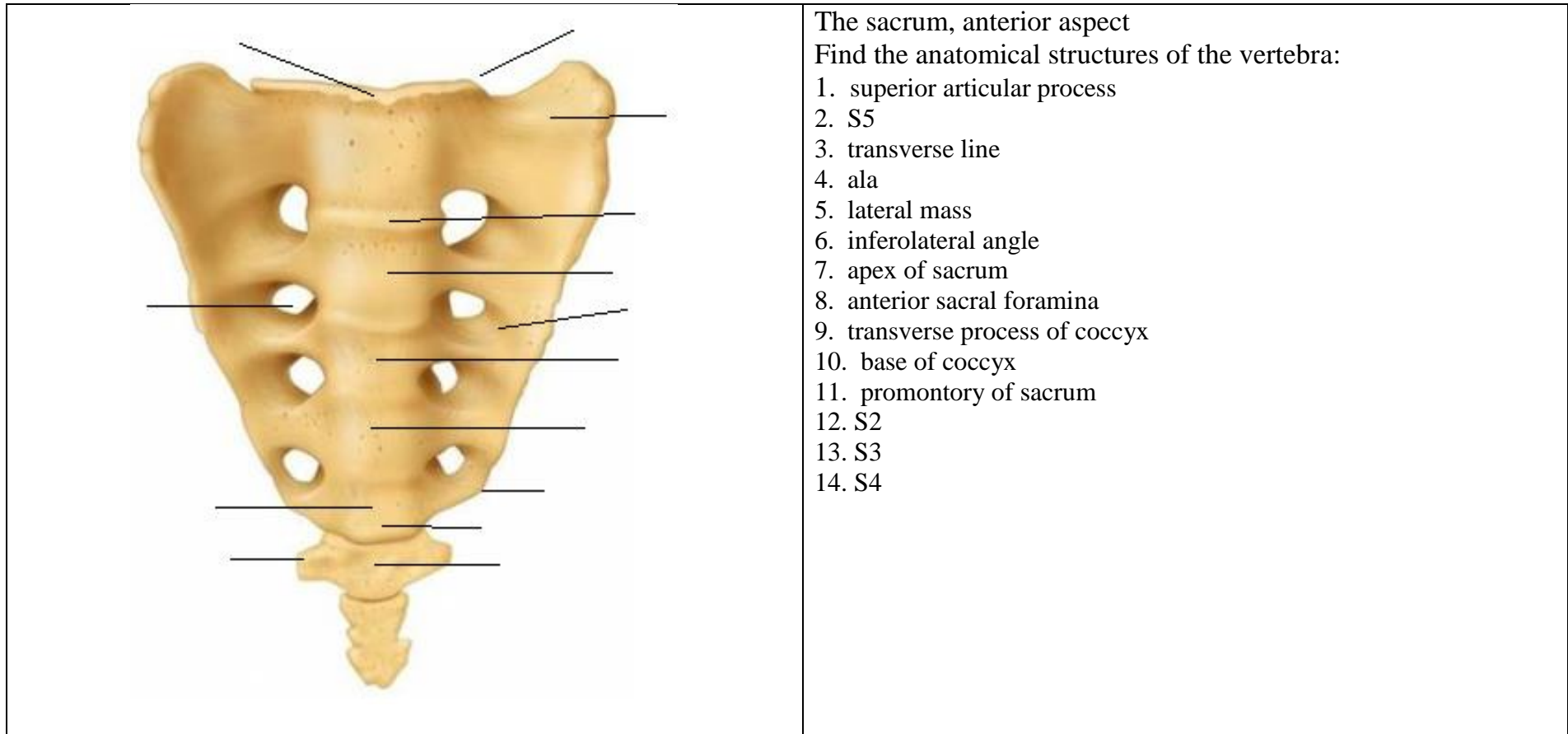
1. superior articular process
2. median sacral crest
3. sacral hiatus
4. apex
5. sacral cornua
6. lateral sacral crest
7. auricular surface
8. posterior sacral foramina
9. medial sacral crest
10. sacral tuberosity
11. auricular surface
12. inferolateral angle
13. cornua of sacrum and coccyx
14. transverse process of coccyx
15. sacrococcygeal notch
16. apex of notch
17. sacral canal



The sacrum, lateral view.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____





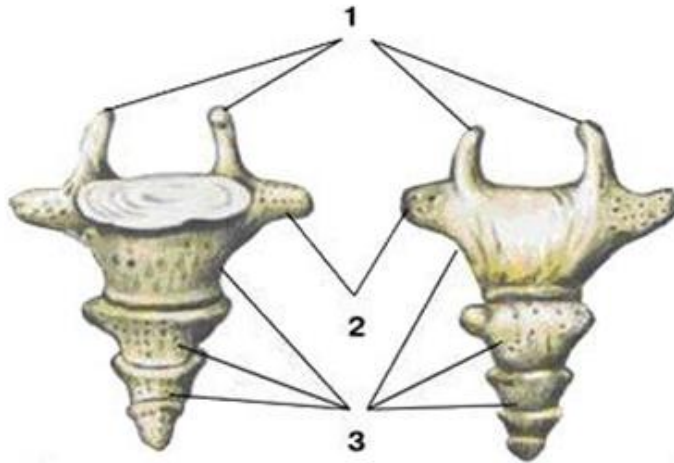
CR! Sacral hiatus: provides access to epidural space to administer caudal epidural anesthesia.

L5-S1 vertebrae: most common level of intervertebral disc herniation.

Coccydynia- its refers to a sensation of general discomfort around the coccyx, and has a wide range of causes. Childbirth may be a cause, as the stretching of pelvic floor muscles during labour puts pressure on their attachment to the coccyx, causing pain. Blunt trauma can contribute, as can poor posture when cycling or rowing, leading to irritation of the bone. Normally coccydynia is an acute condition, although if the pain lasts for more than 3 months it is considered chronic, and requires more specialized treatment.

Coccyx

Coccyx, pelvic and dorsal surface.



Write all anatomical structures.

1. _____
2. _____
3. _____

Questions:

1. Which anatomical structures are located at the points of fusion between vertebral bodies? _____
2. Which anatomical structures does the pelvic surface of the sacrum bear? _____
3. The patient has a fracture of the vertebral column, which consists of 5 vertebrae. What part of the vertebral column was damaged? _____
4. Which surface of the sacrum has the middle sacral crest? _____
5. What is the name of the junction between base of sacrum and body of the last lumbar vertebra? _____
6. Explain the term «sulcus»: _____
7. Which anatomical structures of the lateral part of the sacrum serve for the muscle and ligament attachment? _____
8. Which anatomical structures does the lateral part of the sacrum bear? _____
9. The patient has a fracture of the vertebral column, which consists of 1-3 vertebrae. What part of the vertebral column was damaged? _____

Topic 4. Ribs, sternum, clavicle, scapula.

Bones of the pectoral girdle and upper extremity		
Name	Number	Description
Pectoral girdle		
Clavicle	2	Collar bone
Scapula	2	Shoulder blade
Upper extremity		
Humerus	2	Upper arm bone
Radius	2	Forearm bone on thumb side of lower arm
Ulna	2	Forearm bone on little finger side of lower arm
Carpals	16	Bones of wrist
Metacarpals	10	Bones in palm of hand
Phalanges	28	Fing bones: three in each finger and two in each thumb

Complete the table

Term in English	Term in Latin
The ribs	
Costal bone	
True ribs	
False ribs	
Floating ribs	
Head of the rib	
The breastbone	

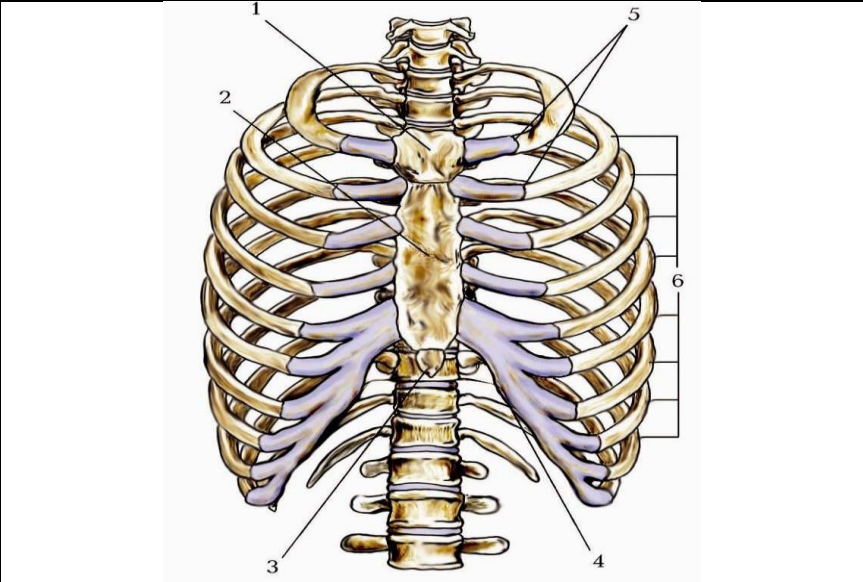
CR!

Sternal angle (of Louis)- surfacelandmark for counting ribs (2nd pair of ribs articulate here) and intercostal spaces; divides superior from inferior mediastinum.

Superior thoracic aperture- compression of neurovascular structures traversing superior thoracic aperture may produce thoracic outlet syndrome.

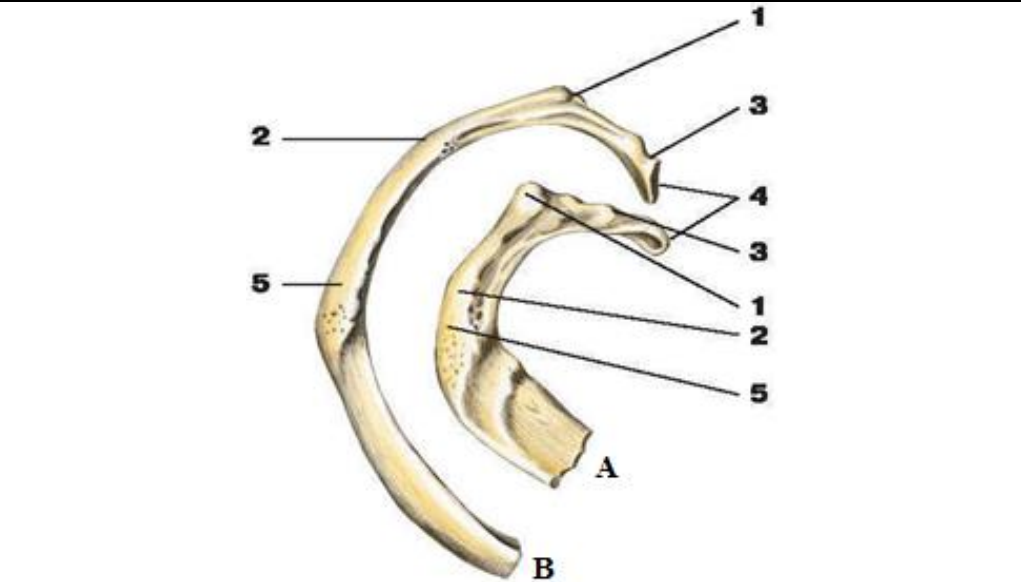
Bone marrow biopsy. The sternum is used as the site for bone marrow biopsy in obese or overweight patients, where access to the iliac crest is limited.

Write all anatomical structures.



Thoracic cage.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____



The main parts of the ribs.

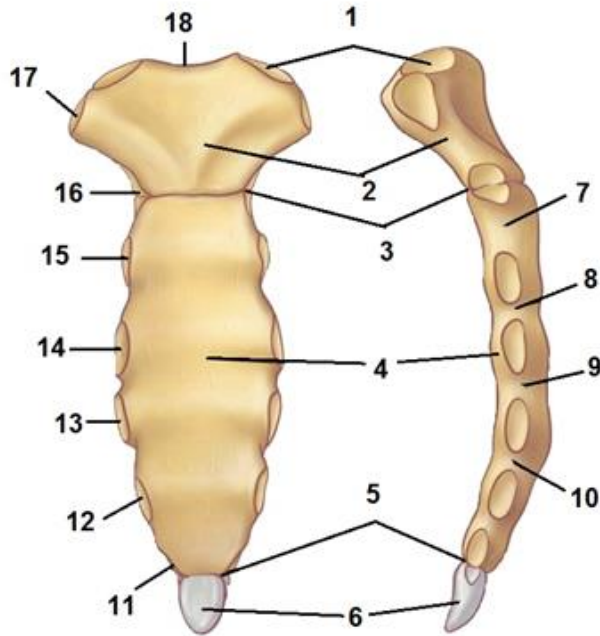
- A.** 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- B.** 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

CR:

Ribs – rib fractures may breach pleural space and cause pneumothorax; flail chest occurs when multiple rib fractures lead to thoracic cage instability.

Sternum

Sternum (front view and lateral).

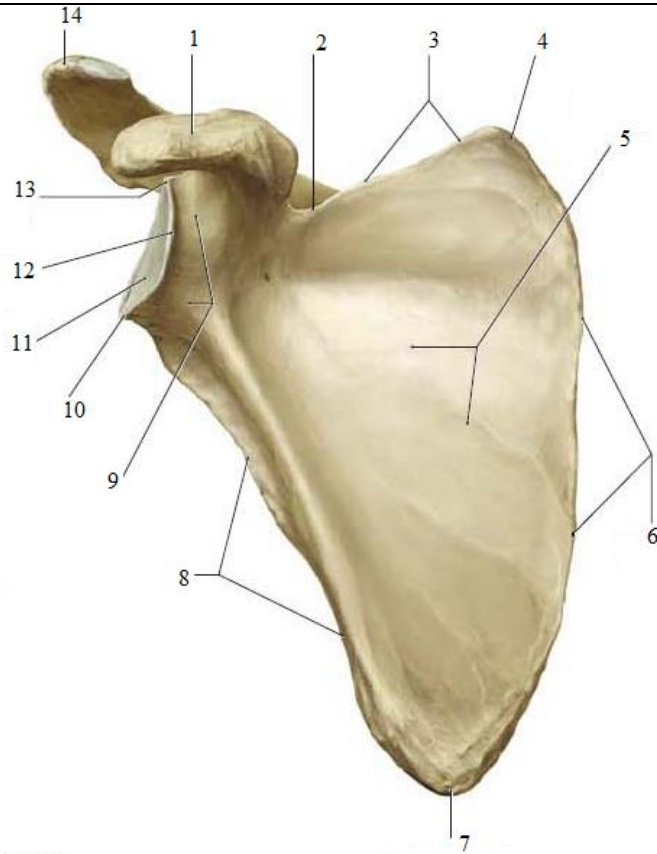


Write all anatomical structures:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____

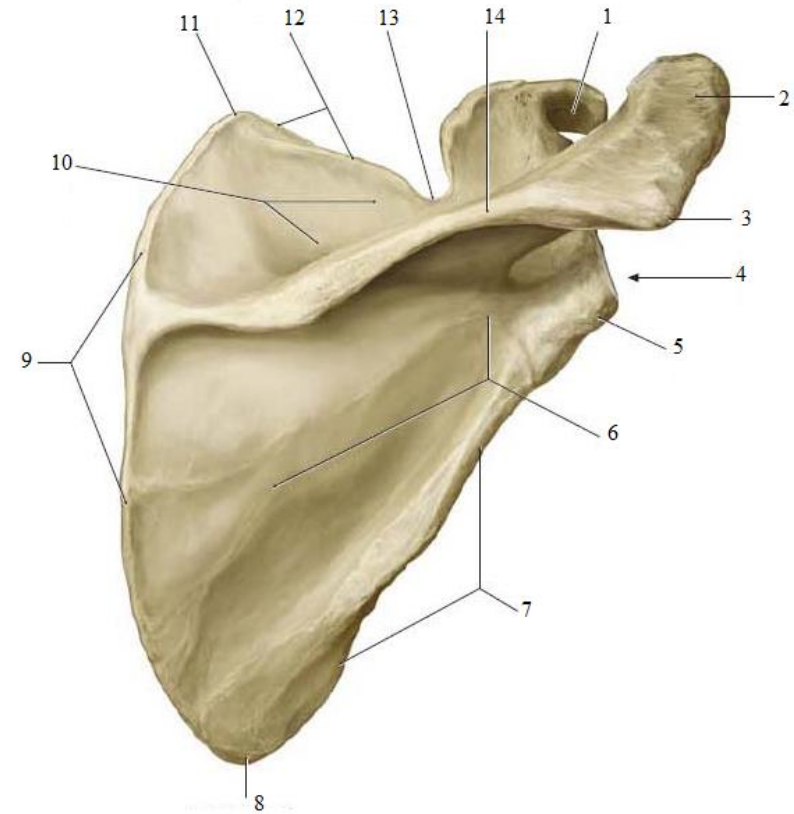
Scapula

Write all anatomical structures:



Scapula, ventral (anterior surface).

1. _____
2. _____
3. _____
4. _____
5. _____

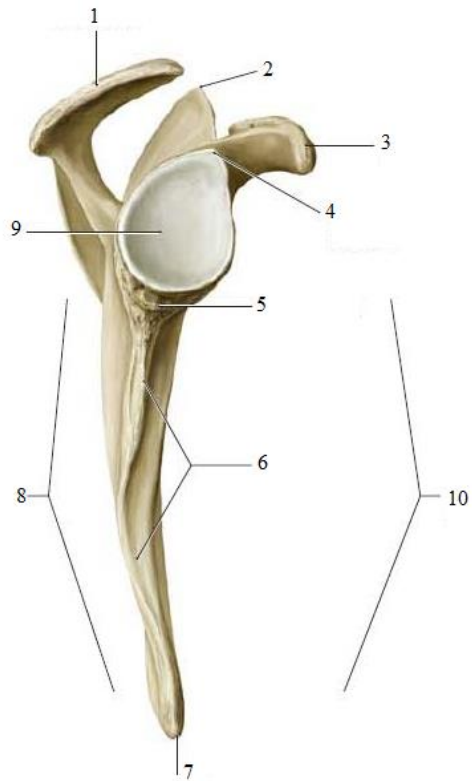


Scapula, dorsal (posterior surface).

1. _____
2. _____
3. _____
4. _____
5. _____

- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____
- 11. _____
- 12. _____
- 13. _____
- 14. _____

- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____
- 11. _____
- 12. _____
- 13. _____
- 14. _____

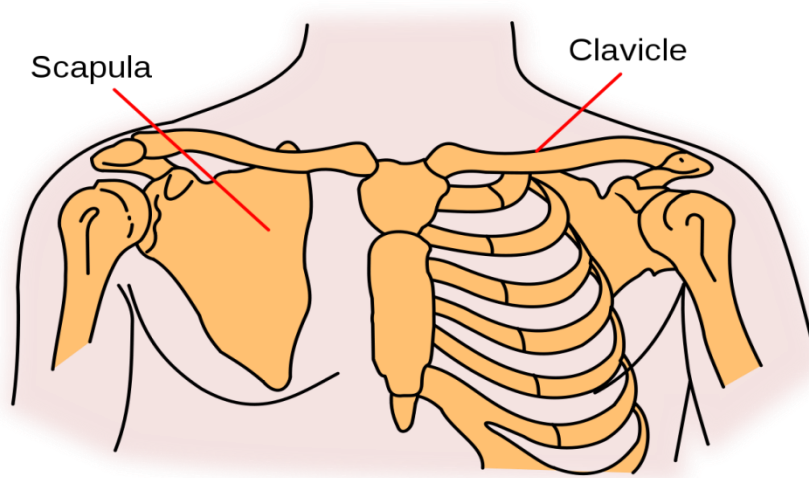
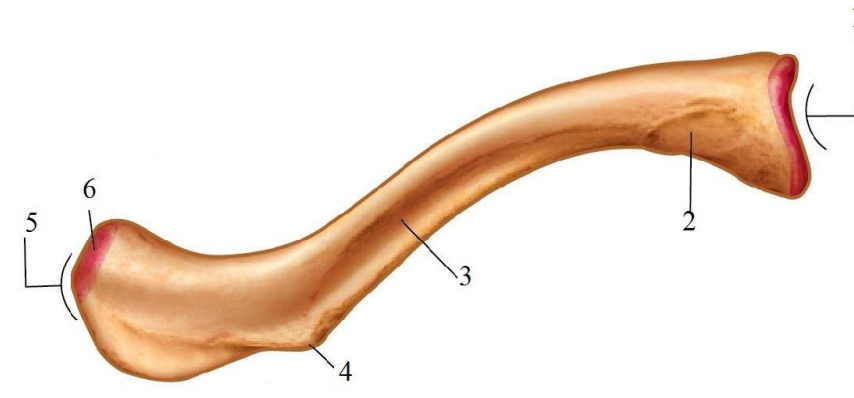


Scapula. Right lateral view.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____

Clavicle

Write all anatomical structures:

 <p>The diagram shows the upper limb girdle in a frontal view. The scapula is on the left, and the clavicle is on the right. Red lines point from the labels 'Scapula' and 'Clavicle' to their respective bones.</p>	 <p>The diagram shows a single clavicle bone with six numbered labels: 1. Acromioclavicular joint, 2. Coracoclavicular ligament, 3. Shaft, 4. Costal tubercle, 5. Coracoclavicular ligament, 6. Acromioclavicular joint.</p>
<p>Clavicle in the upper limb girdle.</p>	<p>The clavicle.</p> <ol style="list-style-type: none">1. _____2. _____3. _____4. _____5. _____6. _____

CR:

Clavicle- most clavicular fractures are caused from a fall on an outstretched arm or direct trauma delivered to the lateral side of the shoulder. Middle third of the clavicle is most commonly fractured due to the changing bony morphology of the clavicle, its strutlike function, and ligament attachments.

Questions:

1. Explain the term «sulcus»: _____
2. Why is the sternum widely used for the red bone marrow puncture? _____

3. Explain the term «facet»: _____

4. According Re-program the patient identified cracks of the ribs, which belong to floating ribs. Determine the level of damage: _____
5. According Re-program the patient identified cracks of the ribs, which belong to false ribs. Determine the level of damage: _____
6. Where on the first rib is located the groove for subclavian artery? _____
7. What anatomical structure is located on the dorsal surface of the scapulae? _____

Topic 5. Bones of shoulder and forearm: humerus, ulna, radius.

Humerus

Complete the table

Term in English	Term in Latin
The free bones of upper limb	
Anatomic neck	
Surgical neck	
Greater and lesser tubercles	
Ulnar notch	
Articular facet	
Body of the humerus	

CR! Endangered structures.

The following nerves are located on the following aspects of the humerus:

- 1)The axillary nerve- surgical neck.
- 2)The radial nerve- radial groove
- 3)The median nerve- distal humerus.
- 4)The ulnar nerve- medial epicondyle.

If any of these aspects of the humerus are fractured, there may be damaged to these nerves.

The humerus, humerus (lat.) view

Write all anatomical structures:

<p>The diagram shows two views of a human humerus. The left view is the anterior view, and the right view is the posterior view. Labels 1 through 15 point to various anatomical features. Labels 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 are distributed across both views, with some labels pointing to the same structure from different angles. Labels 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 are distributed across both views, with some labels pointing to the same structure from different angles.</p>	<p>A. Anterior View</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____ 13. _____ 14. _____ 15. _____ 	<p>B. Posterior View</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____ 13. _____ 14. _____ 15. _____
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Ulna



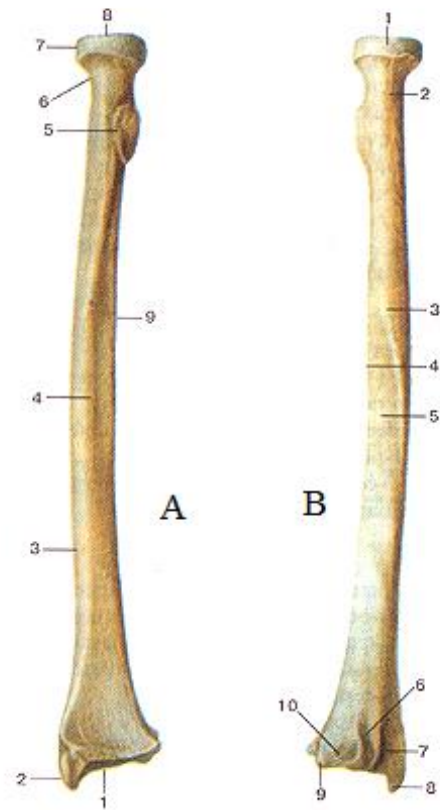
Write all anatomical structures:

A. Anterior View; B Posterior View; C Lateral View;

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
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22. _____
23. _____
24. _____

CR! Ulna- subcutaneous location of olecranon makes it vulnerable to fracture by direct trauma, especially when elbow is flexed; ulnar styloid process may also be fractured in distal radial fractures.

Radius



Write all anatomical structures:

A.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

B.

1. _____
2. _____
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10. _____

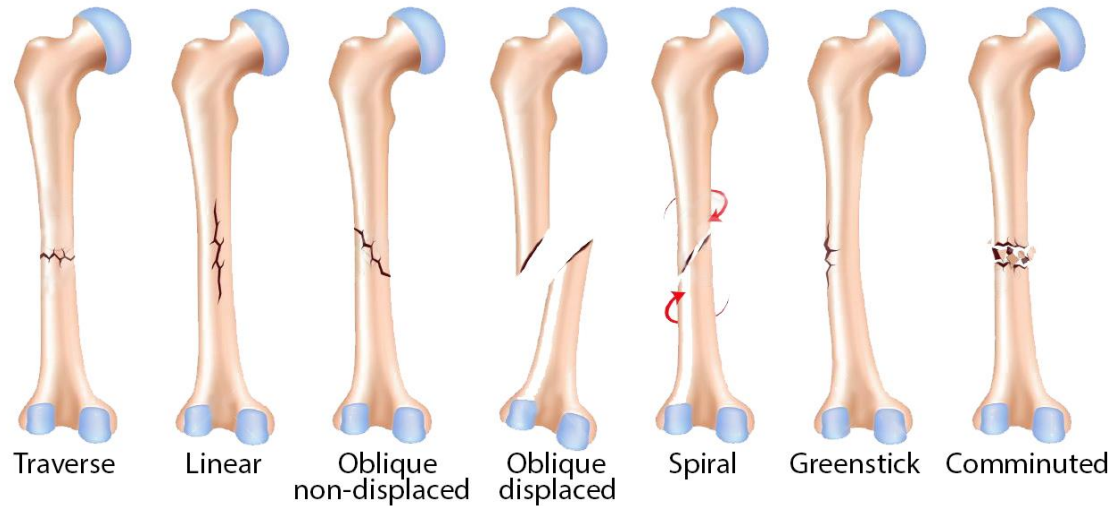
CR! Radius- Fractures of distal radius are most common fracture of upper extremity, typically caused by fall on outstretched hand.

Ulna fracture. *Monteggia fracture* occurs when the upper portion of the ulna fractures and is accompanied by the dislocation of the proximal radial head.

Galeazzi's fracture- fracture that directly affects the radius. It consists of a radial fracture along with the dislocation of the distal radioulnar joint.

Barton's fracture- intraarticular fracture of the distal radius that is accompanied by the dislocation of the radiocarpal joint.

Types of fractures



Questions:

1. After collision of two cars, a driver got deformation of the middle third of the left forearm, intensive pain, especially in attempt to move the left hand (on the side of the thumb). Ends of the tubular bone come out of the wound, hemorrhage is increasing. What bone can be injured? _____

2. On the radiological investigation in a patient was diagnosed fracture of humerus in the area of the intertubercular groove. Tendon which muscle can be injured in the first place? _____

3. What kind of anomalies bones of upper limb do you know? _____

4. The victim in the accident, the driver was taken to hospital with damaged to the medial epicondyle of the humerus. What nerve in this case may be damaged? _____

5. What bones form the skeleton of the forearm? _____
6. What anatomical structures are located at the proximal epiphysis of the ulna? _____
7. What anatomical structures are located at the distal epiphysis of the radius? _____
8. What anatomical formation does the humerus have? _____
9. Translate into Greek the term «elbow»: _____
10. According to statistics, bones fractures of young and elderly people most often happen in the surgical neck area. What bone has this formation? _____

Topic 6. Bones of the hand.

Bones of the hand.



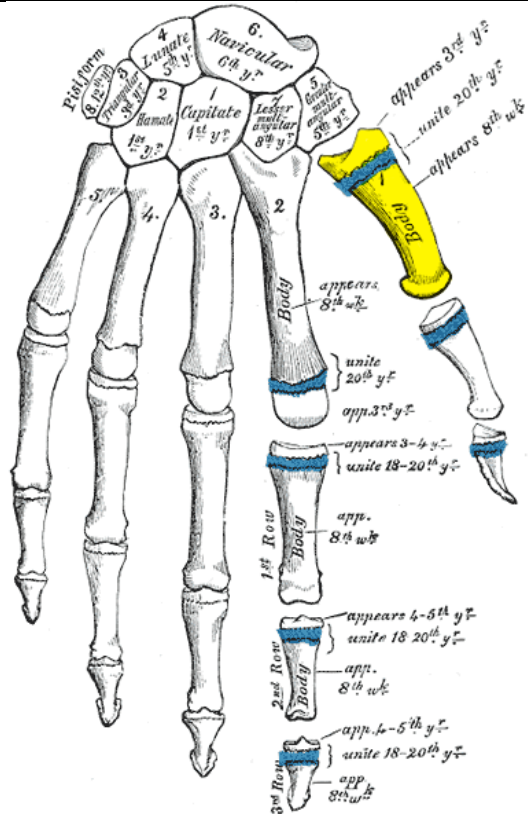
Write all anatomical structures:

- | | |
|-----------|-----------|
| 1. _____ | 21. _____ |
| 2. _____ | 22. _____ |
| 3. _____ | 23. _____ |
| 4. _____ | 24. _____ |
| 5. _____ | 25. _____ |
| 6. _____ | 26. _____ |
| 7. _____ | 27. _____ |
| 8. _____ | 28. _____ |
| 9. _____ | 29. _____ |
| 10. _____ | 30. _____ |
| 11. _____ | 31. _____ |
| 12. _____ | 32. _____ |
| 13. _____ | |
| 14. _____ | |
| 15. _____ | |
| 16. _____ | |
| 17. _____ | |
| 18. _____ | |
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| 20. _____ | |

CR!

Fractures of the Metacarpals bone;

Boxer's fracture- a fracture of the 5th metacarpal neck. It is usually caused by a clenched fist striking a hard object. The distal part of the fracture is displaced anteriorly, producing shortening of the affected finger.



Epiphyses.

The ends of the long bones are ossified by the formation of one or more secondary centers of ossification. These epiphyses develop from birth to approximately 20 years of age in the clavicle, humerus, radius, ulna, metacarpals and phalanges.



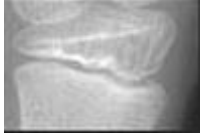




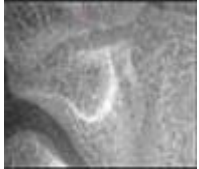
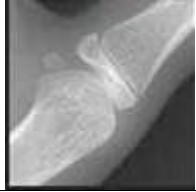





Without knowledge of bone growth and appearance of bones in radiographic and other diagnostic images at various ages, a displaced epiphyseal plate could be mistaken for a fracture, and separation of an epiphysis could be interpreted as a displaced piece of fracture bone. Knowledge of the patient's age can prevent these errors.

Bennet's fracture- a fracture of the 1st metacarpal base, caused by forced hyperabduction of the thumb. This fracture extends into the first carpometacarpal joint leading to instability and subluxation of the joint. As a result, it often needs surgical repair.

Complete the table.

Term in English	Term in Latin
Scaphoid	
Lunate	
Triquetrum	
Capitate	
Hamate	

Male Ages (in years)

<p align="center">12.5 Appearance of hook of hamate</p>	<p align="center">13 Appearance of MP thump sesamoid</p>	<p align="center">13.5 Proximal aspect of radial epiphysis has extended to meet the maximum width of the distal metaphysis, but neither radial-sided nor ulnar sided capping is completed</p>	<p align="center">14 Completion of capping of distal radius epiphysis</p>	<p align="center">15 Closure of thumb distal phalanx physis</p>	<p align="center">15.5 Closure of index finger distal phalanx physis and closure of thumb metacarpal</p>	<p align="center">16 Closure index finger proximal phalanx physis</p>
<p align="center">Before</p> 	<p align="center">Before</p> 	<p align="center">Before</p> 	<p align="center">Before</p> 	<p align="center">Before</p> 	<p align="center">Before</p> 	<p align="center">Before</p> 
<p align="center">After</p> 	<p align="center">After</p> 	<p align="center">After</p> 	<p align="center">After</p> 	<p align="center">After</p> 	<p align="center">After</p> 	<p align="center">After</p> 

Questions:

1. What regions are distinguished in the skeleton of the hand? _____
2. Specify function of the sesamoid bone. _____
3. How many phalanges are present in the fingers of the hand? _____
4. Hamate is classified as: _____
5. Pisiform is classified as: _____
6. Syndactyly it is _____
7. Specify functions of the spongy bone. _____

8. Because of emergency, a 70-year-old man had a hand's bone fracture. Bones of the carpus were damaged. The scaphoid bone is classified as: _____

Topic 7. Hip bone, femur.

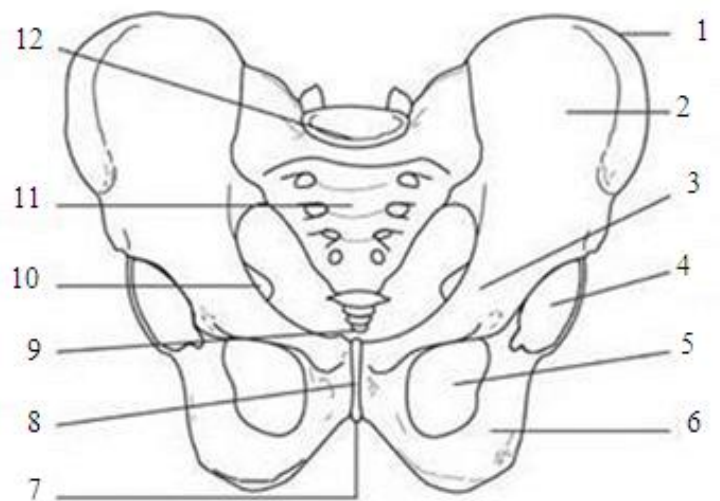
The hip bone, os coxae.

Complete the table.

Term in English	Term in Latin
The acetabulum	
Obturator foramen	
The ilium	
Ala of ilium	
Anterior superior iliac spine	
Greater trochanter	
Patellar surface	

Anatomical Terms

Anterior — the abdominal side (front) of the hip
 Posterior — the back side of the hip
 Medial — the side of the hip closest to the spine
 Lateral — the side of the hip farthest from the spine
 Abduction — move away from the body (raising the leg away from midline i.e. towards the side)
 Adduction — move toward the body (lowering the leg toward midline i.e. from the side)
 Proximal — located nearest to the point of attachment or reference, or center of the body
 example: the knee is proximal to the ankle
 Distal — located farthest from the point of attachment or reference, or center of the body
 example: the ankle is distal to the knee
 Inferior — located beneath, under or below; under surface

 <p style="text-align: center;">Anterior View</p>	<p>Write all anatomical structures.</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p> <p>10. _____</p> <p>11. _____</p> <p>12. _____</p>
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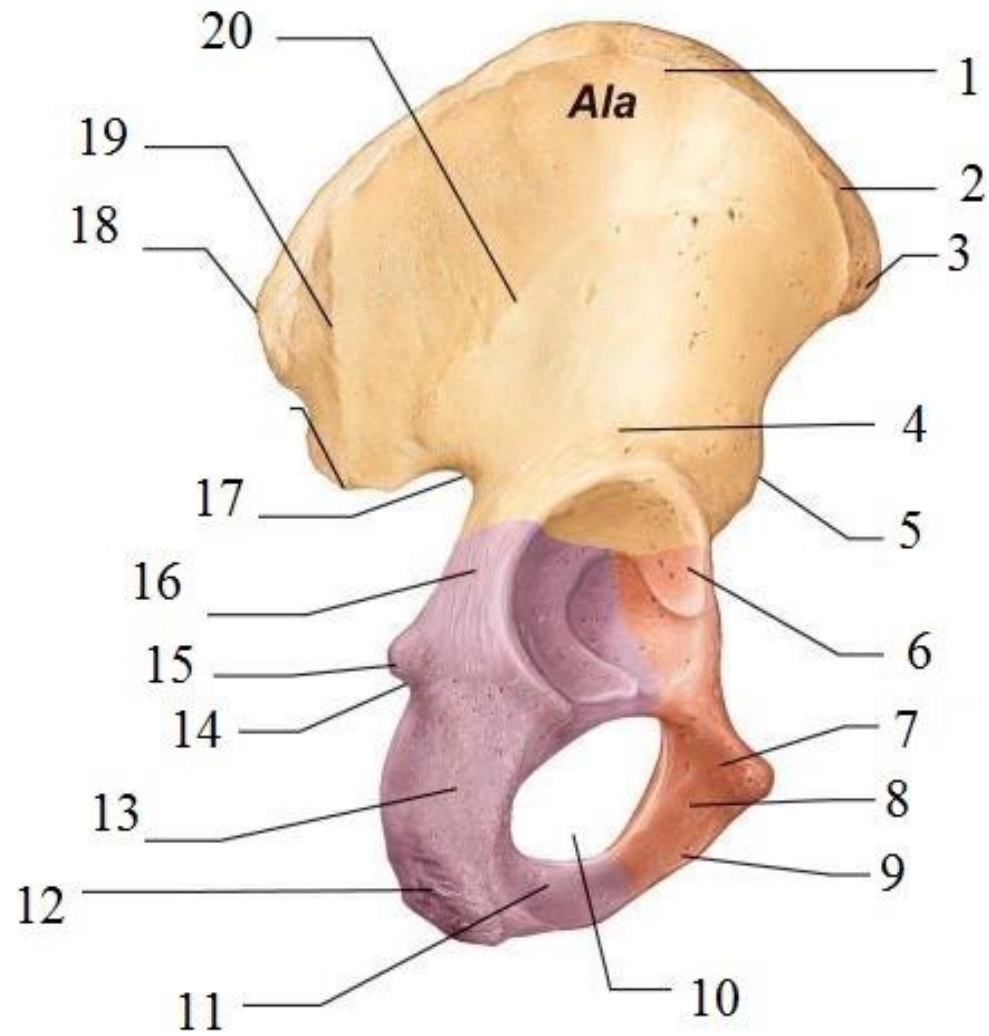
CR! Perthes disease(Legg- Calve- Perthes disease) or medically known as avascular necrosis is a disorder that is mostly found in children. The condition affects the head of the femur, when there is inadequate perfusion to the epiphysis, causing the bone to become necrotic. Eventually the blood flow returns to the area through revascularization and bone remodelling takes place. There are no somatic symptoms for this disease and the main complaint from patients with this conditions is an increased risk of hip fracture.

Questions:

1. Three separate bones are connected with cartilage in the area of pelvis cavity and are noticed on the X-ray of the pelvis. What are these bones?

2. During the football match, the player got injury of the knee joint. On the X-ray, we can see a bone fracture in the tendon of the quadriceps muscle of thigh. What of the listed groups of bones does this bone belong? _____
3. During the volleyball match, the player got injury of the knee joint. On the X-ray, we can see a bone fracture in the tendon of the quadriceps muscle of thigh. What bone must be damaged? _____
4. Where are the intertrochanteric line and the intertrochanteric crest of the femur found? _____
5. What anatomical structure is housed on the proximal epiphysis of the femur? _____

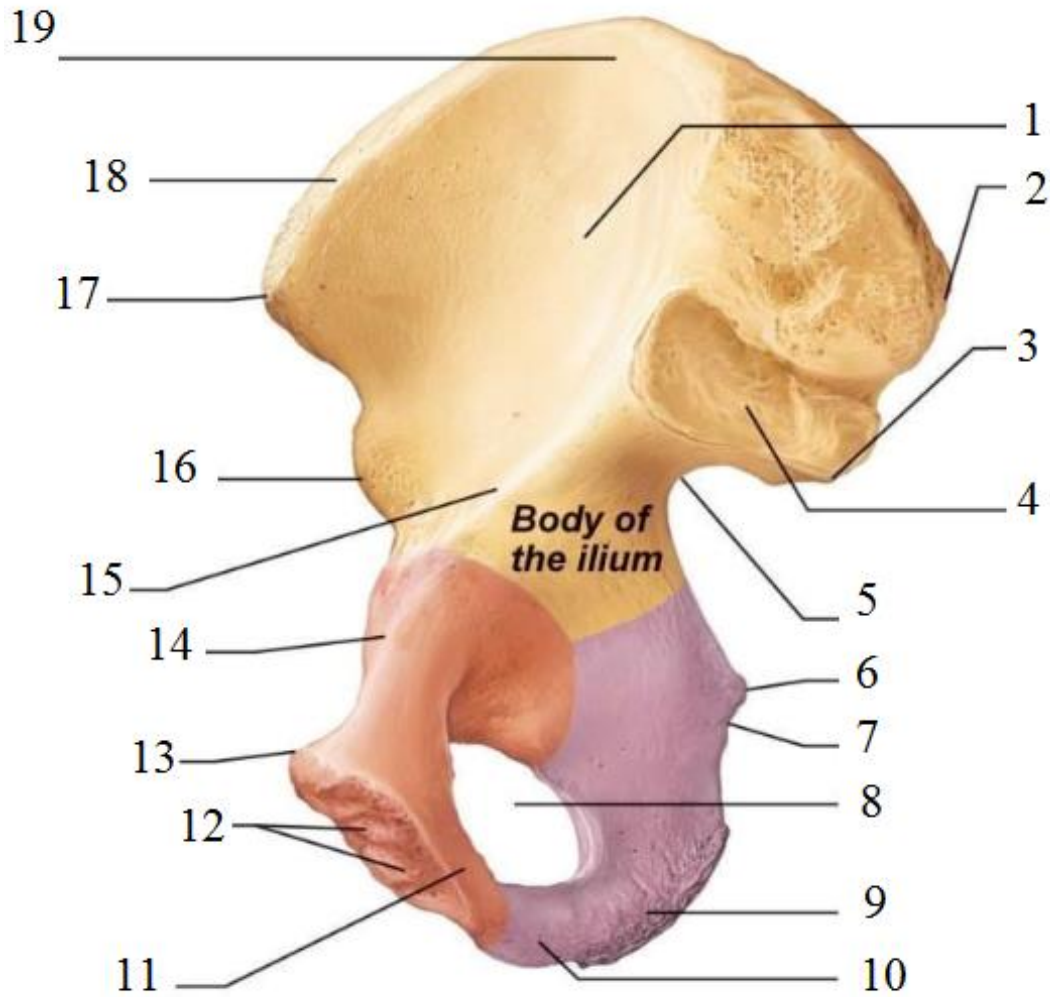
External surface of the hip bone.



Write all anatomical structures:

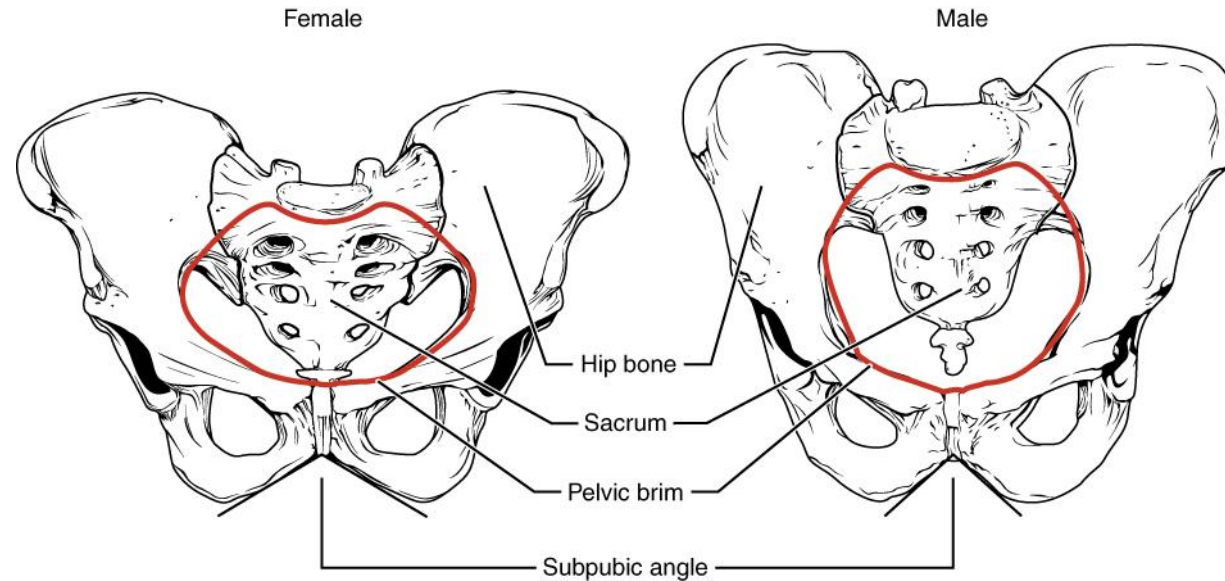
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Internal surface of the hip bone.



Write all anatomical structures:

1. _____
2. _____
3. _____
4. _____
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19. _____



Male and Female Pelvis. The female pelvis is adapted for childbirth and is broader, with a larger subpubic angle, a rounder pelvic brim, and a wider and more shallow lesser pelvic cavity than the male pelvis.

Complete the table

Term in english	Term in latin
Fovea for ligament of head	
Lateral and mideal lip	
Linea aspera	
Medial and lateral epicondyle	

CR! *Femoroacetabular impigment* is a mechanical disorder characterized by hip pain with active and passive movements (particularly flexion and rotation) as a result of contact between the femoral head and the acetabulum. Over time, the recurrent wear and tear result in damage to the cartilaginous covering, leading to osteoarthritis. This disorder can be further classified based on the morphology of the bones involved. If the problem is due to an abnormal femoral head (aspherical head of the femur) then it is called a cam deformity. On the other hand, if there is an

overgrowth of the acetabulum such that it hits the head of the femur during movement, then it is known as a pincer deformity. Of course, there are cases where both aspherical femoral heads coexist with overgrown acetabula. These situations are classified as mixed deformities.

The femur, femur

Write all anatomical structures:

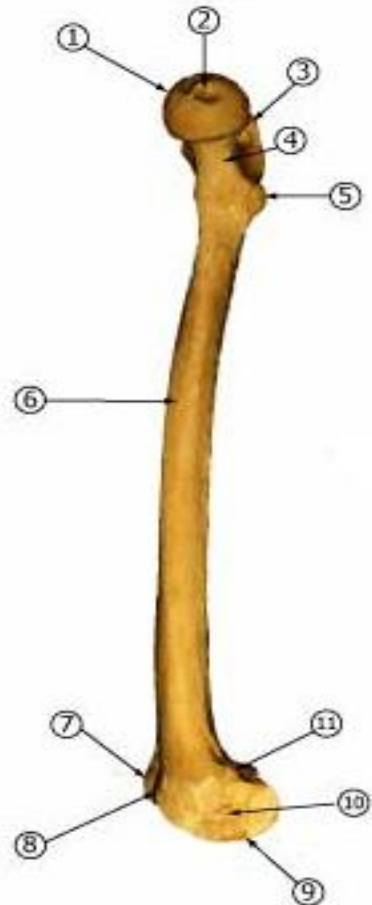
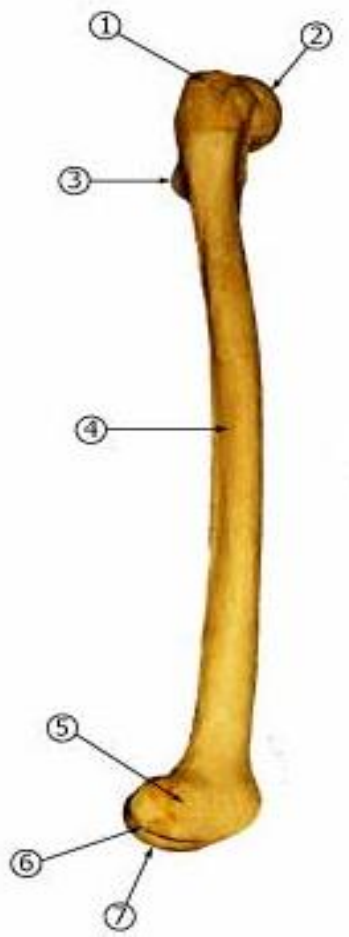
	<p>Anterior view</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p> <p>10. _____</p> <p>11. _____</p> <p>12. _____</p> <p>13. _____</p> <p>14. _____</p> <p>15. _____</p> <p>16. _____</p>	<p>Posterior view</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p> <p>10. _____</p> <p>11. _____</p> <p>12. _____</p> <p>13. _____</p> <p>14. _____</p> <p>15. _____</p> <p>16. _____</p> <p>17. _____</p> <p>18. _____</p> <p>19. _____</p> <p>20. _____</p> <p>21. _____</p>	
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CR! Two main groups of the fractures of the femur.

Intracapsular- occurs within the capsule of the hip joint. It can damage the medial femoral circumflex artery- and cause avascular necrosis of the femoral head.

Extracapsular- the blood supply to the head of femur is intact, so avascular necrosis is a rare complication.

Write all anatomical structures:

	<p>Medial view</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p> <p>10. _____</p> <p>11. _____</p>	<p>Lateral view</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p>	
--	---	--	--

Questions:

1. What bones encircle the obturator foramen? _____
2. What bones form the pelvic girdle? _____
3. Three separate bones are connected with cartilage in the area of pelvis cavity and noticed on the X-ray of the pelvis. What are these bones?

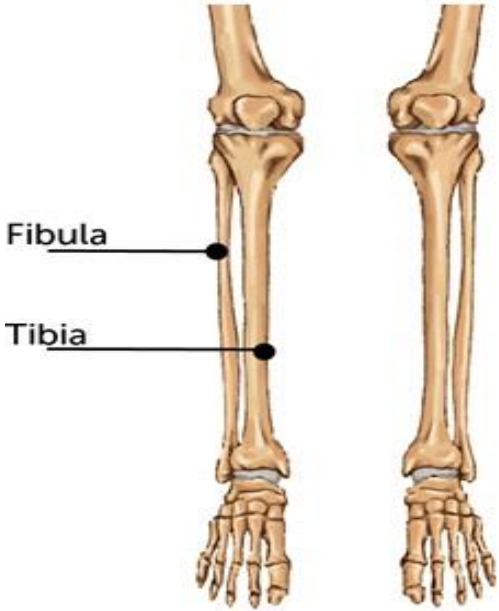


4. Because of a fall, a 70-year-old man had a femur fracture. In what part of femur do fractures happen the most often? _____
5. On which surface of the femur does the linea aspera lie? _____

Topic 8. Bones of the foreleg (shin) and foot.**Complete the table**

Term in English	Term in Latin
The kneecap	
Intercondylar eminence	
Tibial tuberosity	
Medial malleolus	
The tarsus	
The bones of the foot	
The phalanges	
Trochlea of talus	

Shin bones, patella.

CR! Patellar dislocation. These dislocations are relatively common among athletes, particularly young female athletes. The patella most often dislocates laterally, as the medial femoral condyle projects further anteriorly than the lateral femoral condyle. The apprehension test is utilized to determine if the patient has previously had a patellar dislocation. The clinical will apply pressure to the medial surface of the patella, and if the patient has previously had a dislocation they will express concern. If they have not had a dislocation previously i.e. not experienced the pain of the dislocation, they are less likely to be concerned. Patellar dislocation is also common in patients who have had prolonged bed rest. The patella is pulled medially by the vastus medialis, and laterally by the vastus lateralis and the vastus intermedius. When the patient is in the bed for a prolonged period, the vastus medialis wastes more than the lateral pulling muscles, and hence the patella can be dislocated laterally, due to the pull of two muscles (vastus lateralis and vastus intermedius) against one medially pulling muscle (vastus medialis).

	 <p>1. _____ 2. _____ 3. _____ 4. _____</p>	 <p style="text-align: center;">B</p>
<p>.The bones of the leg in the composition of the free lower limb.</p>	<p>Patella. Anterior and posterior view; Write all visible structural point.</p>	<p>In the composition of the knee joint</p>

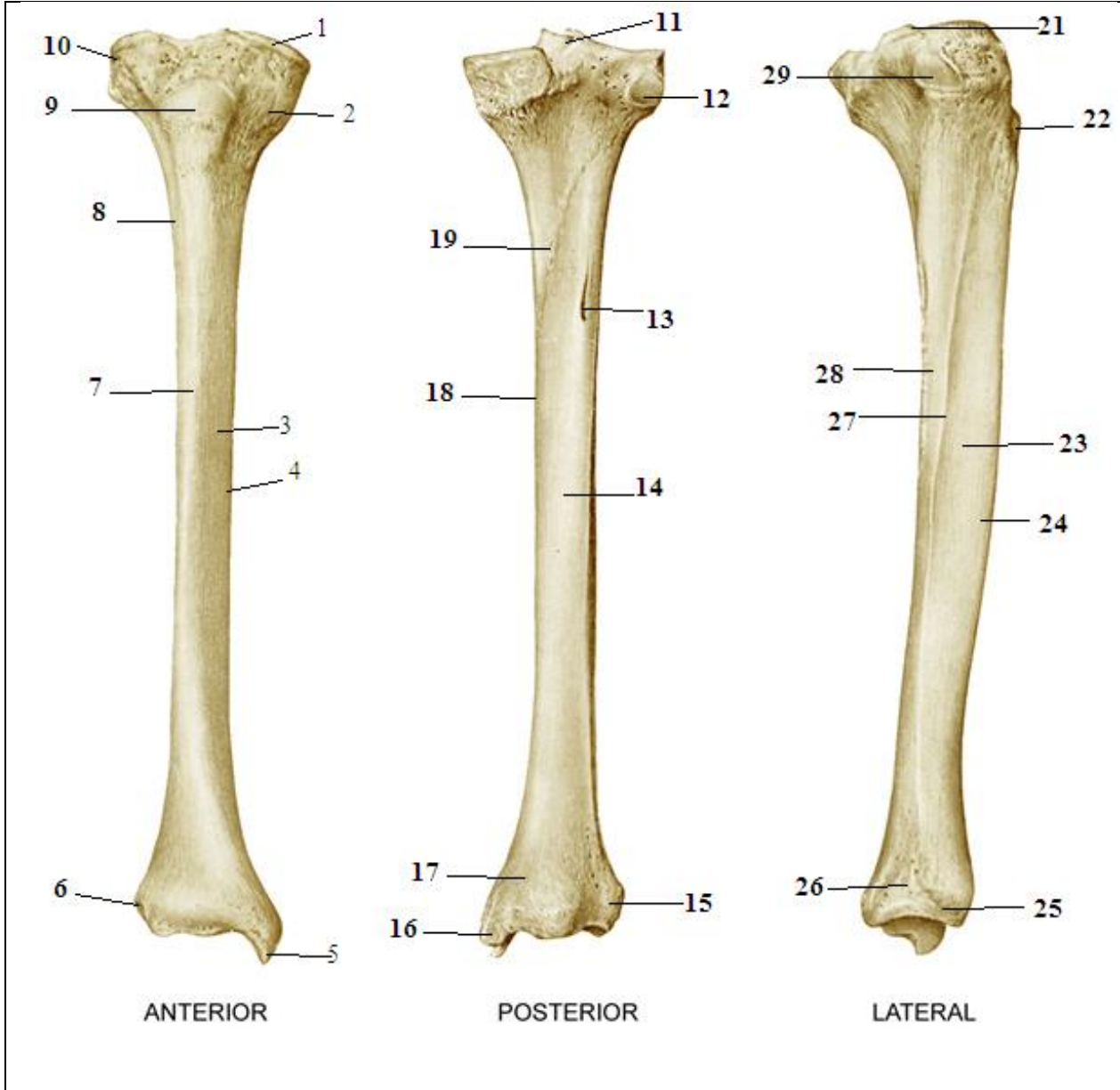
CR! The most common types of the tibias fractures:

Transverse fracture- the fracture line is horizontal through the shaft.

Oblique fracture- the fracture line is angled through the shaft.

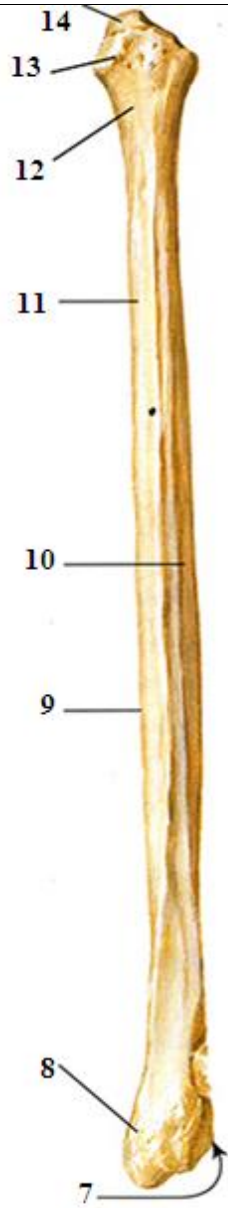
Spiral fracture-the fracture- line is spiral resulting from twisting of the bone.

Comminuted fracture- the bone is broken into free or more pieces. The symptoms that follow a tibial fracture include sharp and disabling pain when the bone is fractured followed with an inability to walk or move the limb because the tibia can no longer carry out its role of bearing body weight. Fractures are easily seen on an X-ray of the affected leg.



The Tibia, *tibia*.
 Write all anatomical structures.

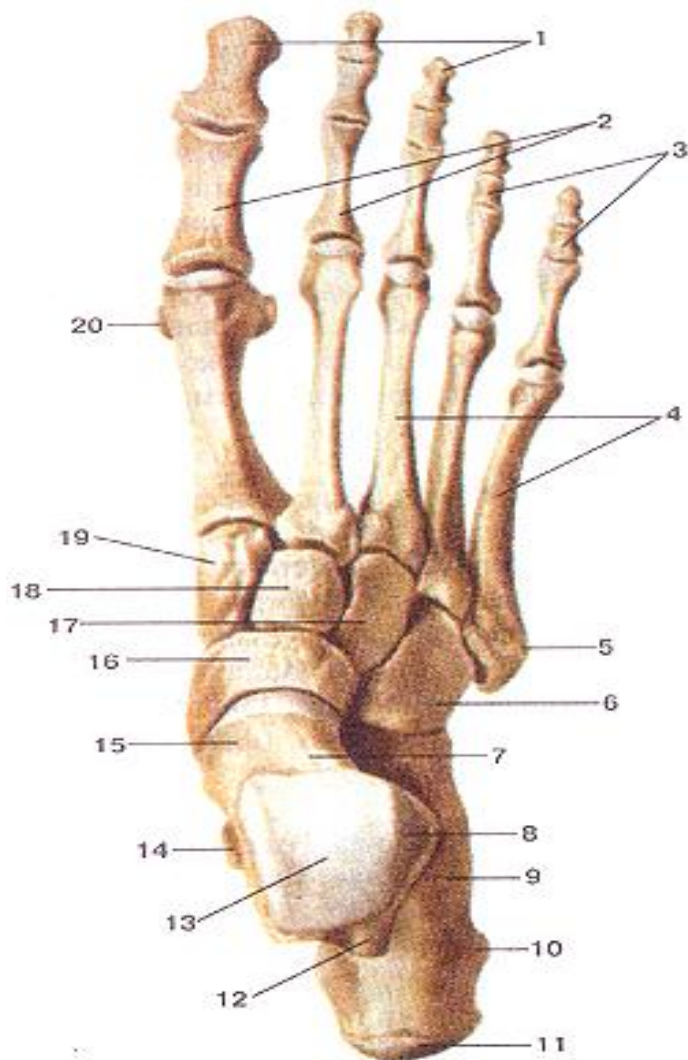
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29. _____



The Fibula (Calf Bone).

Write all anatomical structures:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
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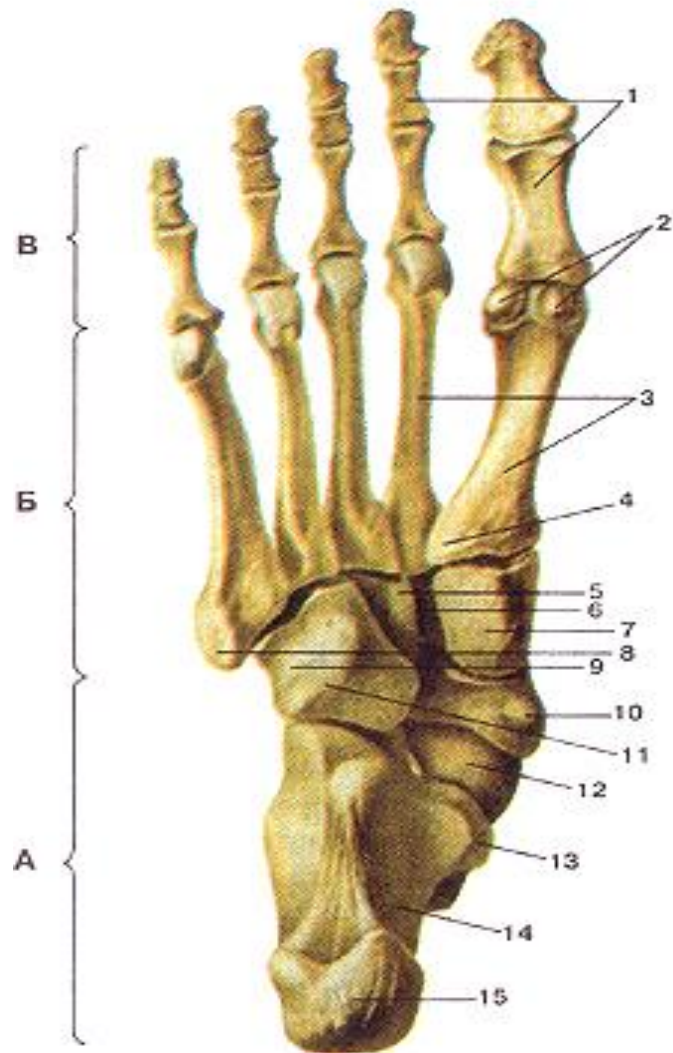


Foot bones.

Write all anatomical structures:

Dorsal surface.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
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16. _____
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18. _____
19. _____
20. _____



Write all anatomical structures:

Plantar surface.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
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13. _____
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15. _____

CR! Claw Toe-deformities of the toes can cause disabling pain and almost always occur in the lateral four toes. Claw toe is a deformity that results in dorsiflexion of the metacarpophalangeal, proximal interphalangeal and distal interphalangeal joints. This deformity is more common in women and in the elderly. Claw toe can occur in conjunction with some neuromuscular diseases such as multiple sclerosis and cerebral palsy. It can also be seen in metabolic diseases such as diabetes mellitus as well as in inflammatory diseases such as rheumatoid arthritis.

Questions:

1. What bones constitute the tarsus? _____
2. A casualty has a fracture in the region of the inner surface of the left ankle. What is the most likely site for the fracture? _____
3. What structure resides on the shaft of the tibia? _____
4. After collision of two cars, a driver got deformation of the middle third of the left crus, intensive pain, especially in attempt to move the left crus. Ends of the triangular bone come out of the wound, hemorrhage is increasing. What bone can be injured?

5. Explain the term «head»: _____
6. Explain the term «neck»: _____
7. Because of an accident, a 60-year-old man had a fibula fracture. Fibula is classified as _____

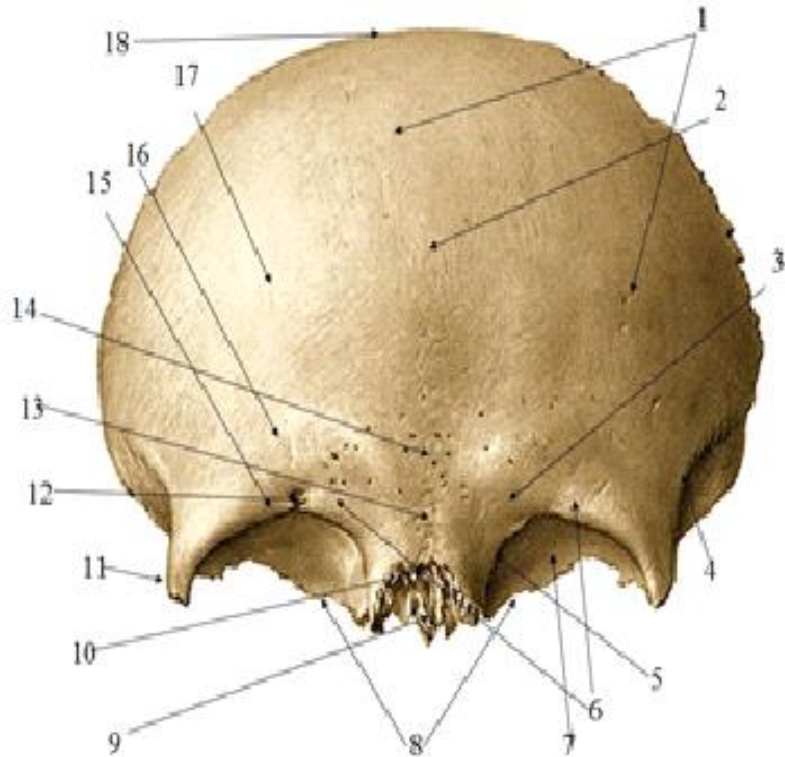
Topic 9. Bones of the skull: frontal, parietal, occipital.

Frontal bone

Complete the table

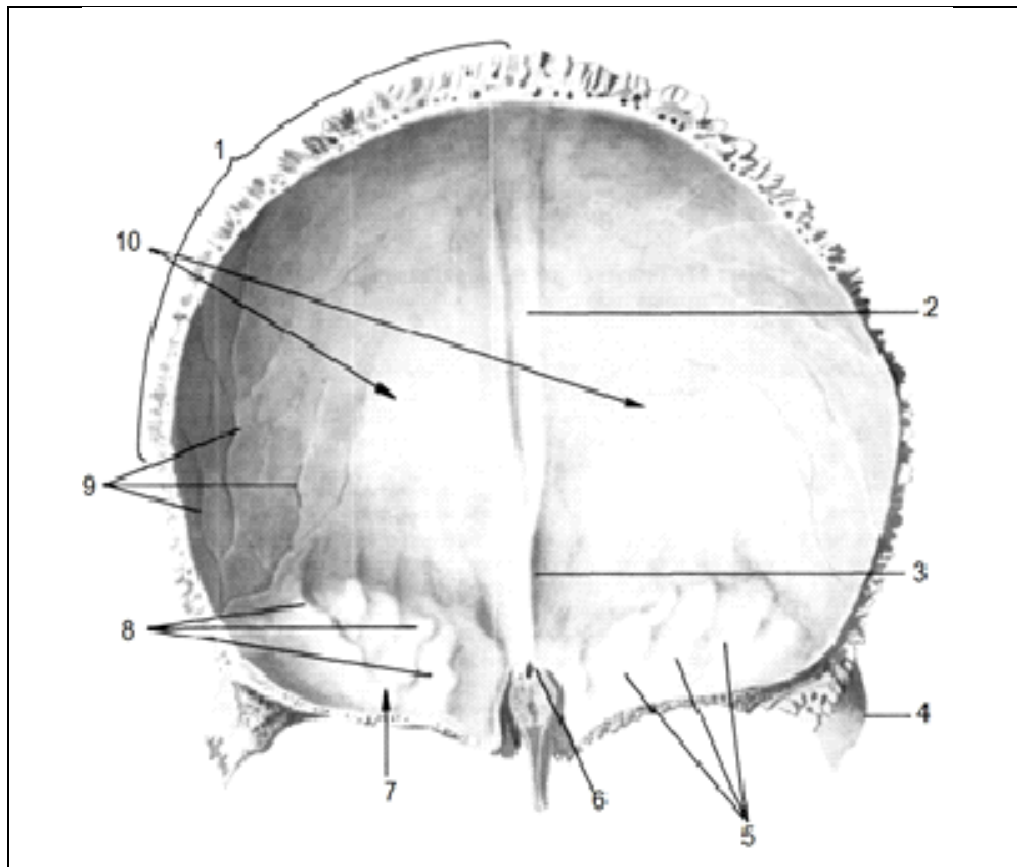
Term in English	Term in Latin
Sagittal border	
Sphenoidal angle	
Groove for superior sagittal sinus	
Granular foveolae	
Nasal part	
Superciliary arch	
Cerebral yokes	
Ethmoidal notch	

Frontal crest



Write all anatomical structures:
The frontal bone, anterior aspect.

1. _____
2. _____
3. _____
4. _____
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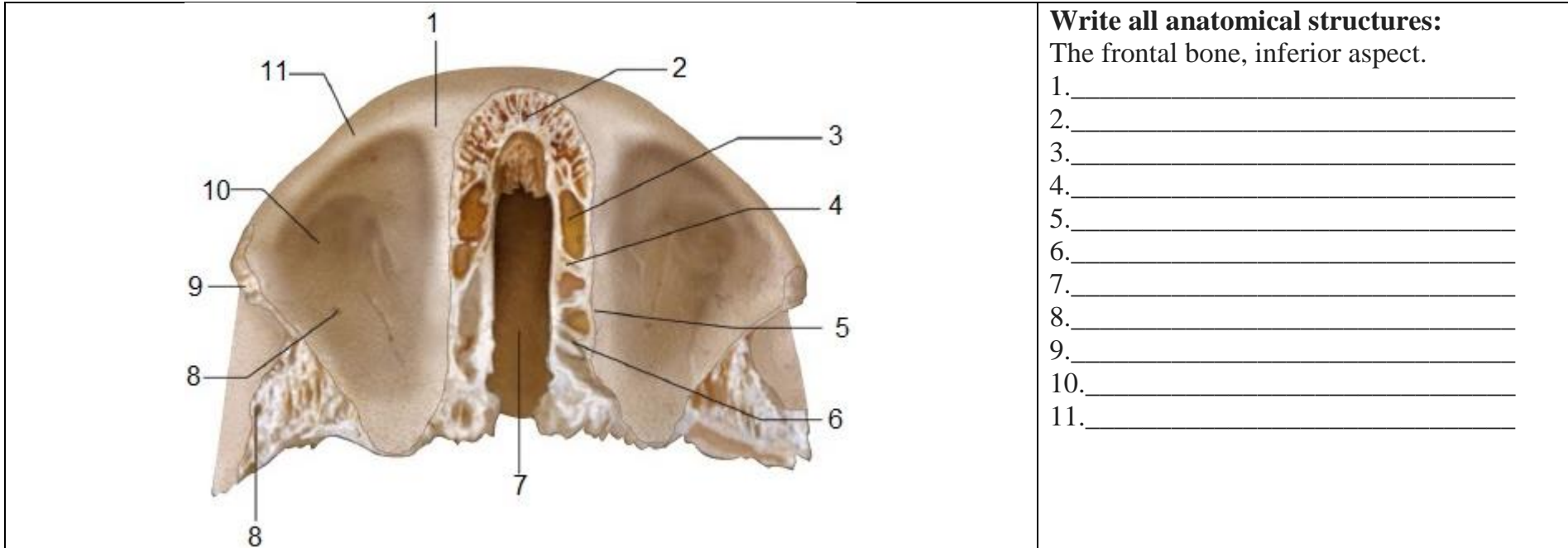


Write all anatomical structures:

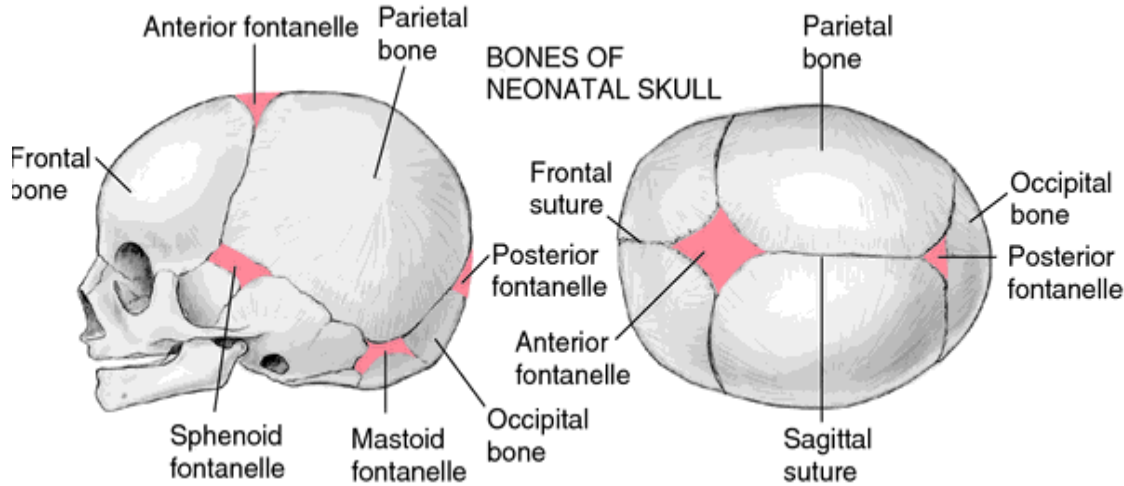
The frontal bone, posterior aspect.

1. _____
2. _____
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4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

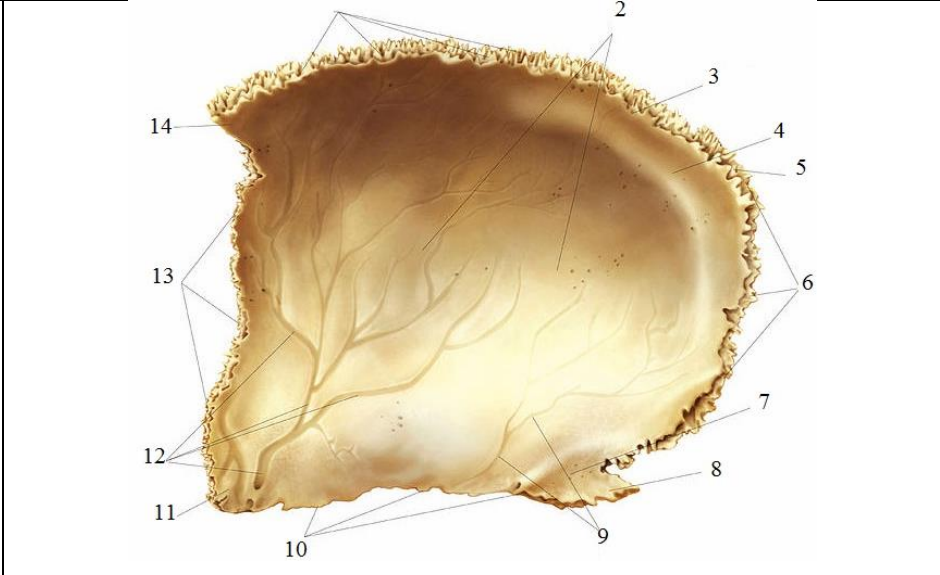
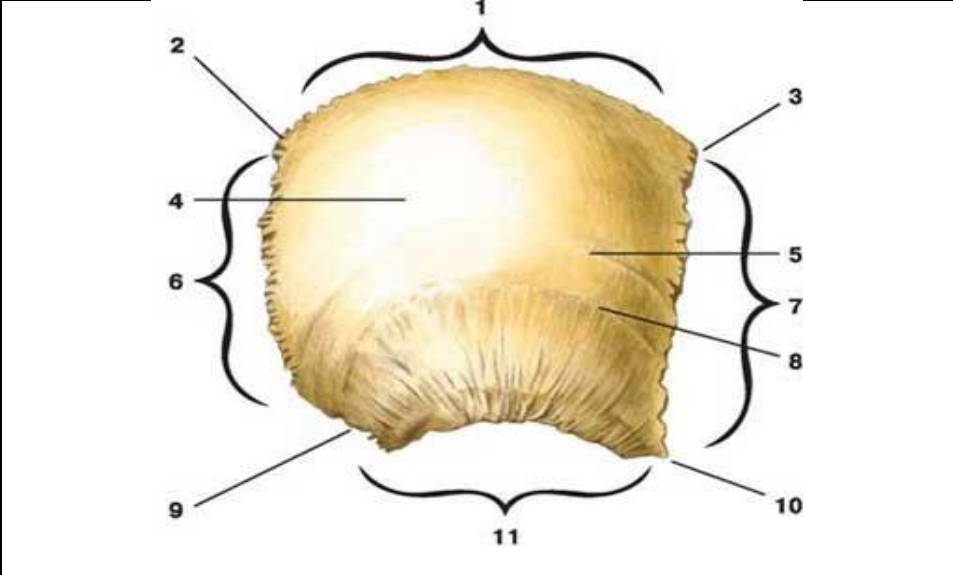
Embryology- the frontal bone derives from neural crest cells, along with anterior bones of the skull. At birth, the frontal bone is separated into two parts by the frontal suture (metopic suture), which usually lies superior to the nasoin. The bregma in the adult is the same area as the anterior fontanelle in the infant. It is the meeting of the coronal, sagittal and the frontal suture and is clinically significant when assessing the health of an infant. When these sutures close prematurely, they can lead to a developmental abnormality involving the shape of the skull termed craniosynostosis.



Parietal bone, os parietale.



Parietal bone: external and internal (brain) surface. Write all anatomical structures:



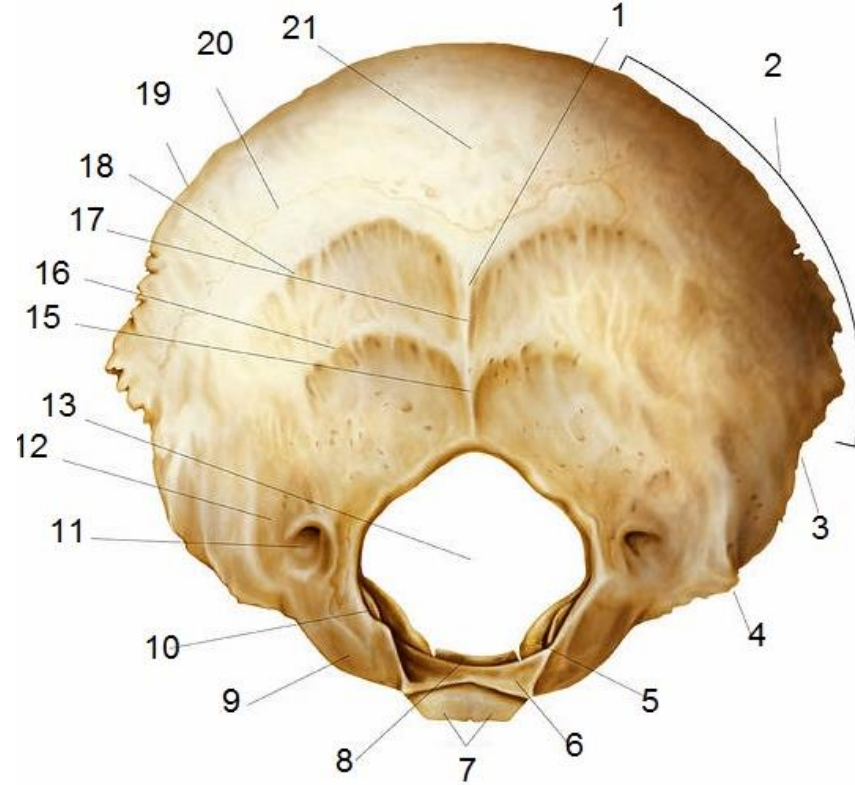
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Occipital bone

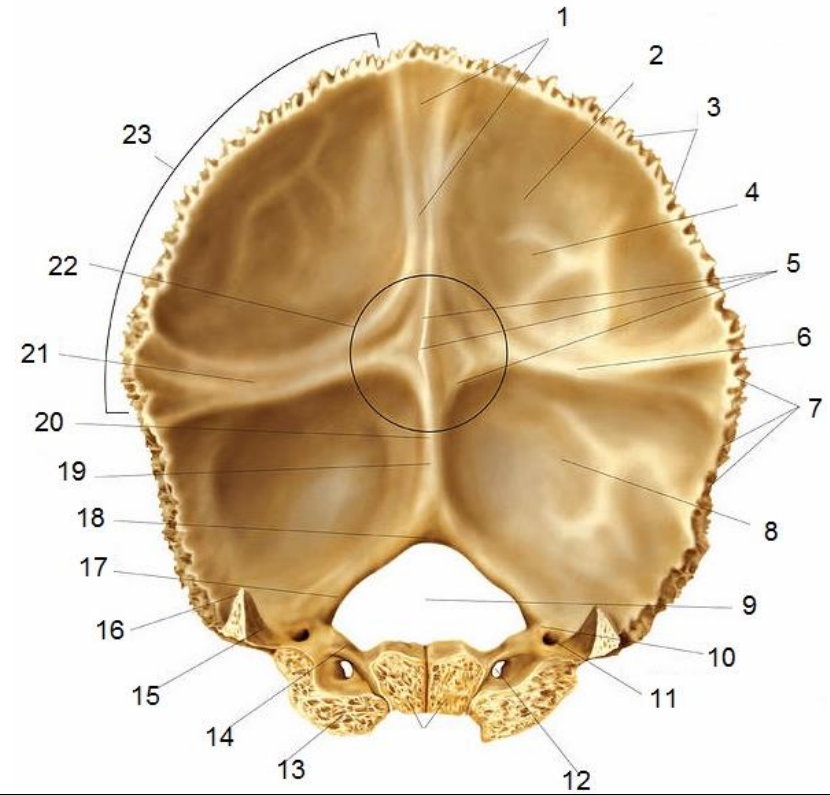
Write all anatomical structures:

The occipital bone, posterior and inferior aspects.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

The occipital bone, anterior and superior aspects.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

8. _____	8. _____
9. _____	9. _____
10. _____	10. _____
11. _____	11. _____
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17. _____	17. _____
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20. _____	20. _____
21. _____	21. _____
	22. _____
	23. _____

CR! Four major types of cranial fracture.

Depressed – fracture of the bone with depression of the bone inwards. They occur as a result of a direct blow, causing skull indentation, with possible underlying brain injury.

Linear- a simple break in the bone, traversing its full thickness. They have radiating (stellate) fracture lines away from the point of impact. The most common type of cranial fracture.

Basal skull- affects the base of the skull. They characteristically present with bruising behind the ears, known as Battle’s sign (mastoid ecchymosis) or bruising around the eyes/orbits, known as Raccoon eye’s.

Diastatic- fracture that occurs along a suture line, causing a widening of the suture (mostly seen in children).

Anomalies of foramen Magnum- the clinical effects of a small foramen magnum vary from asymptomatic individuals to those with weakness, apneic spells, hyperreflexia, hydrocephalus, and abnormal somatosensory-evoked potentials and/or polysomnograms. Achondroplasia is the most common syndrome with a small foramen magnum, but other skeletal dysplasias and disorders associated with sclerosis of the skull can also lead to a small foramen magnum. A large foramen magnum usually results from chronic increased intracranial pressure or from direct effects of an

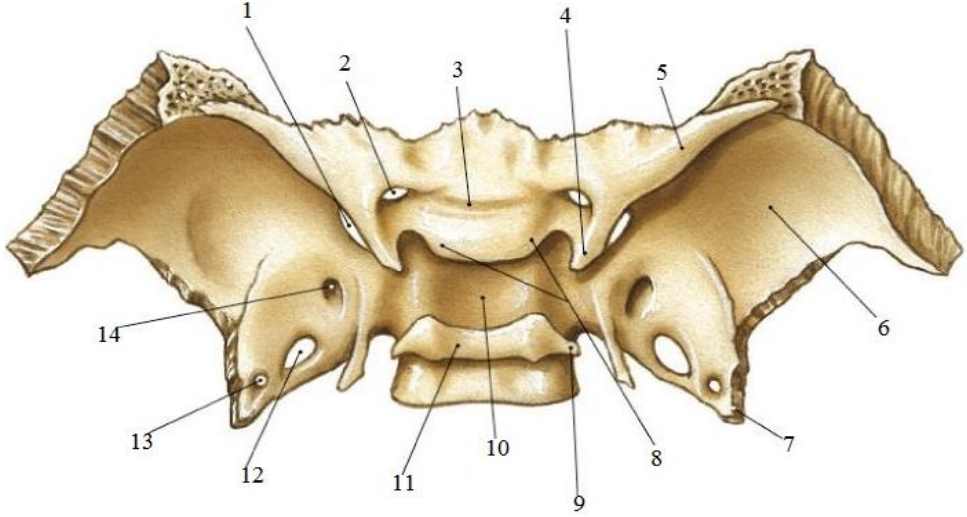
expanding process within the foramen magnum (syringomyelia, Arnold-Chiari malformation). Asymmetry of the foramen magnum occurs with craniovertebral anomalies or premature synostosis of one or more of the occipital synchondroses. Children with the latter may tend to hold their heads obliquely. A keyhole-shaped foramen magnum has been described in the hydrolethalus syndrome.

CR!In newborns, the frontal sinuses are merely small cavities without any openings. These start to develop from two years of age due to the upward migration of ethmoid air cells(secondary pneumatization) until early adolescence. The left and right frontal sinuses develop independently which is why one may have one dominant and one hypoplastic side.

Questions:

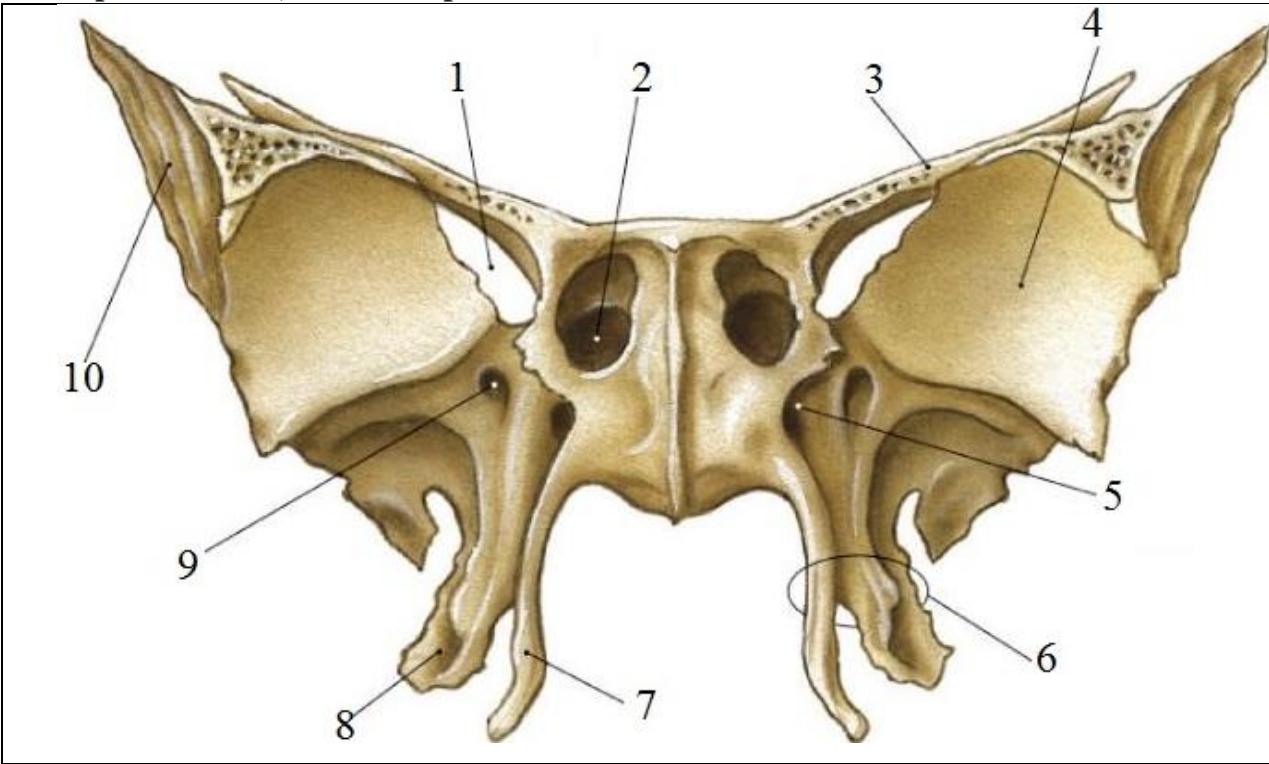
1. What is the structure of cranial flat bones? _____
2. Why is the skull divided into two regions? Name these regions _____
3. A casualty has a fracture of the base of the skull in the region of the hypoglossal canal. What bone was damaged? _____
A casualty has a fissure in the region of the groove for transverse sinus. What part of the occipital bone can be injured? _____
4. A casualty has a crack in the region of the groove for inferior petrosal sinus. What part of the occipital bone can be injured? _____
5. Purulence of occipital soft tissues took place after a trauma. Through what anatomical formations can the purulent process spread to the cranial cavity? _____

Topic 10. Sphenoid and ethmoid bones.

	<p>Sphenoid bone, Superior aspect Write by numbers all names of anatomical structures:</p>
	1. _____
	2. _____
	3. _____
	4. _____
	5. _____
	6. _____
	7. _____
	8. _____

	9.
	10.
	11.
	12.
	13.
	14.

The sphenoid bone, anterior aspect.



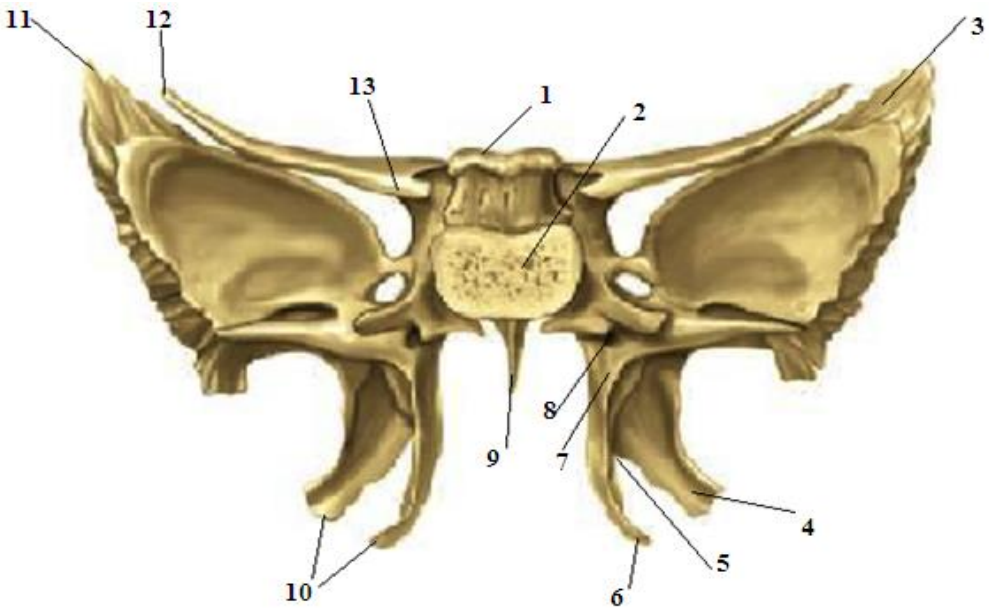
Write by numbers all names of anatomical structures:
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

--	--

Complete the table

Term in English	Term in Latin
Turkish saddle	
Dorsum sellae	
Prechiasmatic groove	
Sphenoidal crest	
Lesser wing	
Cribriform plate	

The sphenoid bone, posterior aspect.

	Write all visible structural point
	1.
	2.
	3.
	4.
	5.
	6.
	7.
	8.
	9.
	10.
	11.
	12.

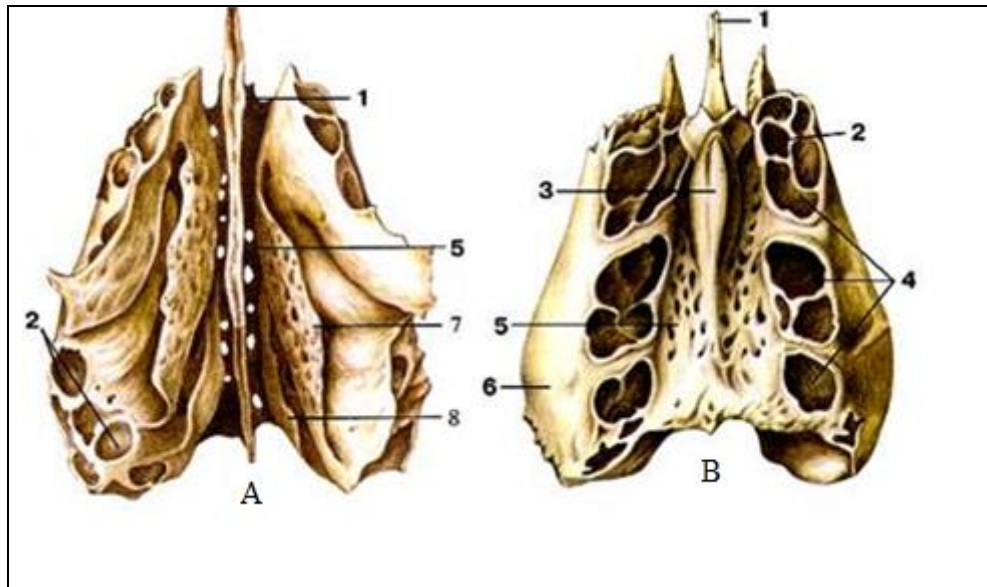
CR! This bone helps form the base of the cranium, the sides of the skull, and the floors and sides of the orbits (eye sockets). Along the middle, within the cranial cavity, a portion of the sphenoid bone rises up and forms a saddle-shaped mass called sella turcica (Turk's saddle). The depression of this saddle is occupied by the pituitary gland, which hangs from the base of the brain by a stalk. The sphenoid bone also contains two sphenoidal sinuses, which lie side by side and are separated by a bony septum that projects downward into the nasal cavity.

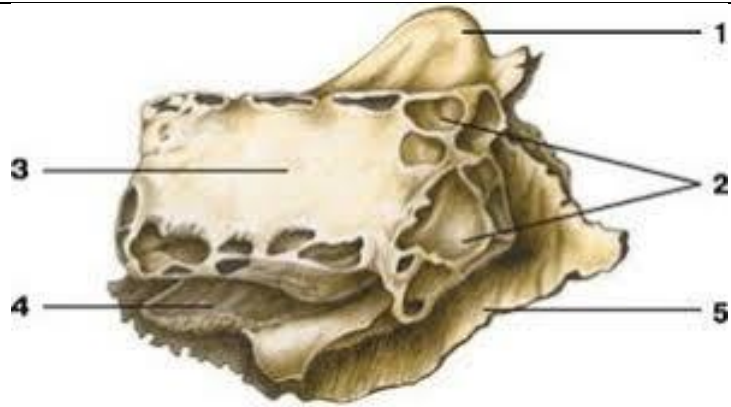
Questions:

1. What structure resides on the body of the sphenoid bone? _____
2. What opening of the sphenoid bone leads into the orbit? _____
3. What parts contain the sphenoid bone? _____

Ethmoid bone.

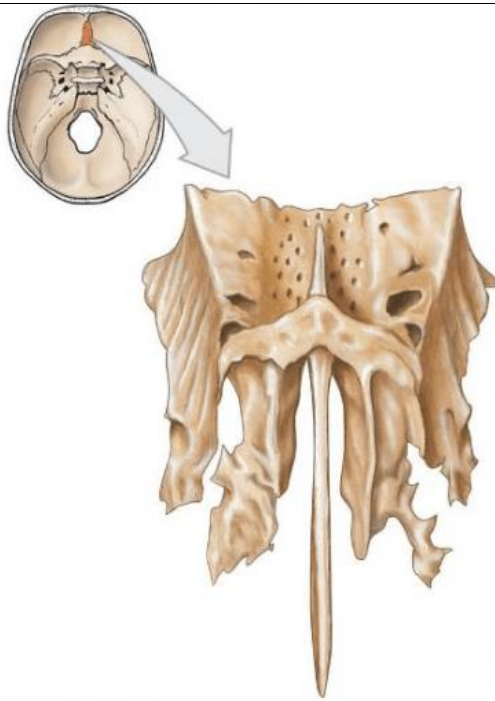
Write all anatomical structures.

	<p>A.</p> <p>1. _____</p> <p>2. _____</p> <p>5. _____</p> <p>7. _____</p> <p>8. _____</p> <p>B.</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p>
<p>. Ethmoid bone: A – anterior aspect; B. – superior aspect.</p>	



1. _____
2. _____
3. _____
4. _____
5. _____

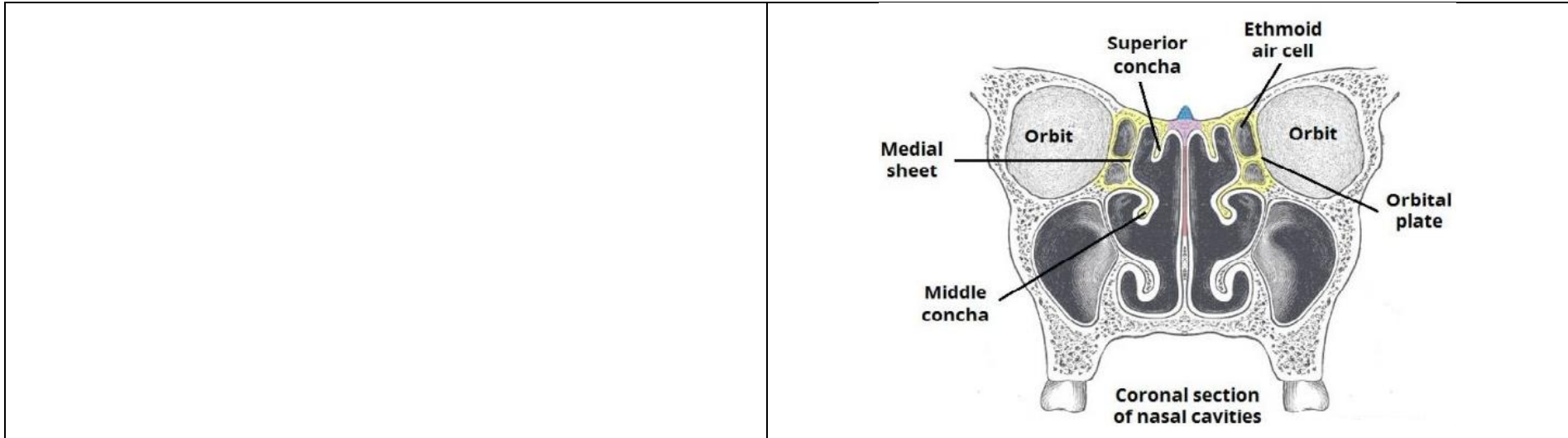
The ethmoid bone, lateral aspect.



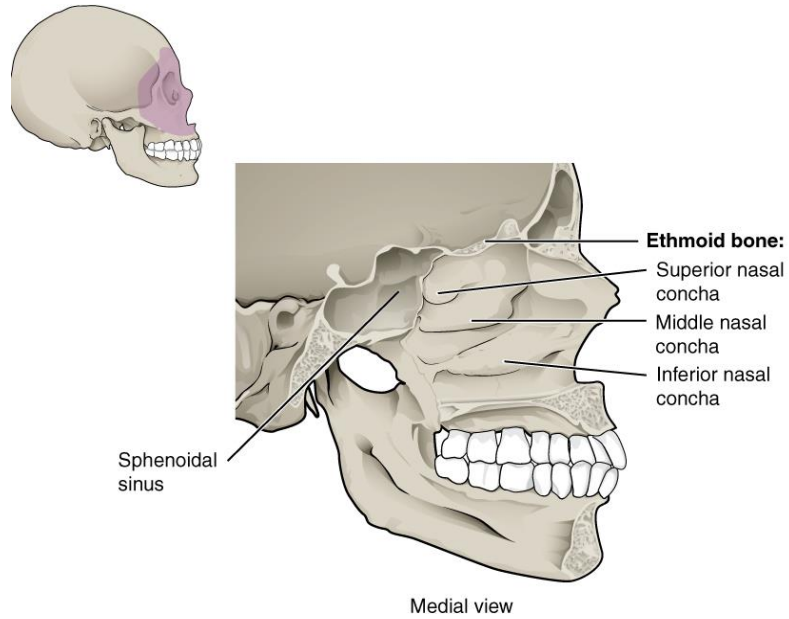
The ethmoid bone, posterior aspect.

Write all anatomical structure.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____



Lateral wall of nasal cavity.



The three nasal conchae are curved bones that project from the lateral walls of the nasal cavity. The superior nasal concha and middle nasal concha are parts of the ethmoid bone. The inferior nasal concha is an independent bone of the skull.

CR! Fracture of the ethmoid bone.

Fracture of cribriform plate- branches of the olfactory bulb may be sheared. This may cause anosmia (loss of sense of smell).

Fracture of the labyrinth- may allow communication between the nasal cavity and the orbit. It is then possible for air to enter the orbit and cause orbital emphysema.

Questions:

1. What anatomical formations are contained at the base of the greater wing of the sphenoid bone?

2. What is the structure of the brain localized in the Turkish saddle and?

3. What structures represent air-filled cavities of the ethmoid bone? _____
4. What parts contain the ethmoid bone? _____
5. After collision of two cars, a driver got destruction of the cribriform plate. What bone can be injured? _____
6. What anatomical formation runs sagittally through the base of the pterygoid process of the sphenoid bone? _____
7. After clash of two cars, a victim got destruction of the carotid sulcus. What part of the sphenoid bone can be injured? _____
8. What anatomical formation is contained at the temporal surface of the greater wing of the sphenoid bone? _____
9. After collision of two cars, a driver got destruction of the optic canal. What part of the sphenoid bone can be injured? _____

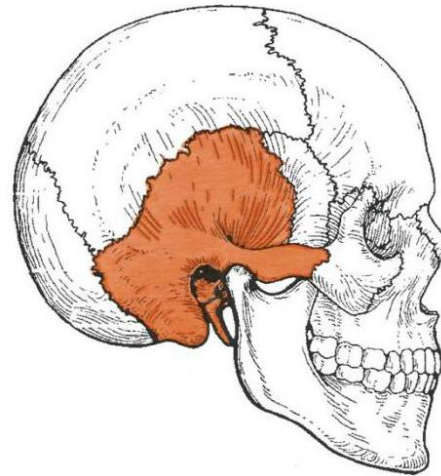
Topic 11. Temporal bone: structure, parts.

Complete the table

Term in English	Term in Latin
-----------------	---------------

Tympanic part	
External acoustic meatus	
Zygomatic process	
Carotid canal	
Temporal bone	
Musculotubal canal	

Location of the temporal bone in the skull.



CR!

There is a region on the lateral aspect of the skull where the temporal, parietal, sphenoid and frontal bones converge. This is called the pterion, it is one of the weakest areas of the skull, and is thus susceptible to fracture. Passing deep to the pterion is a large branch of the maxillary artery supplying the dura: the middle meningeal artery. Fracture at the pterion can produce a complete laceration of this artery and its accompanying vein resulting in bleeding into the epidural space between the dura mater and the skull. This results in an epidural hemorrhage.

Mastoiditis is inflammation of the air cells located in the mastoid process, and is often caused by severe middle ear infection(otitis media). Mastoiditis can spread from the temporal bone into the cranial cavity, causing meningitis, or inflammation of the meninges.

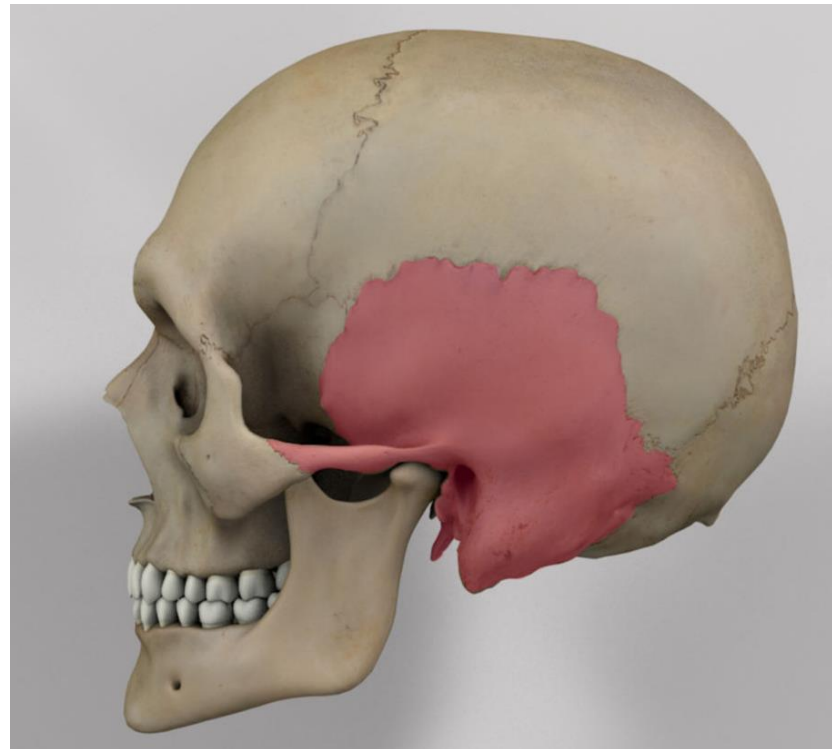
Embryology

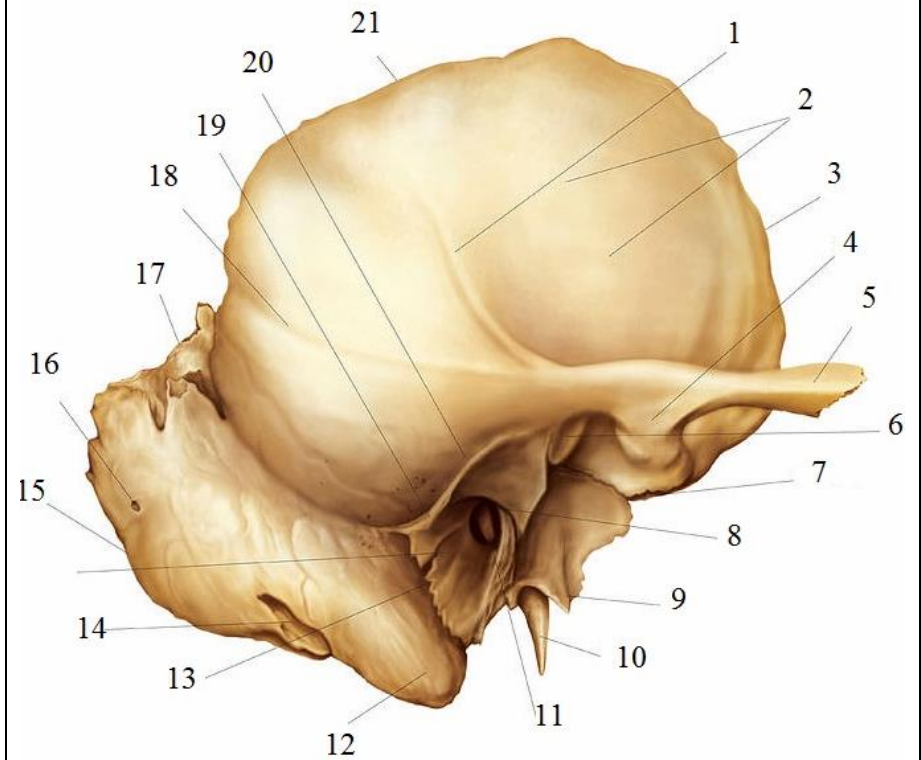
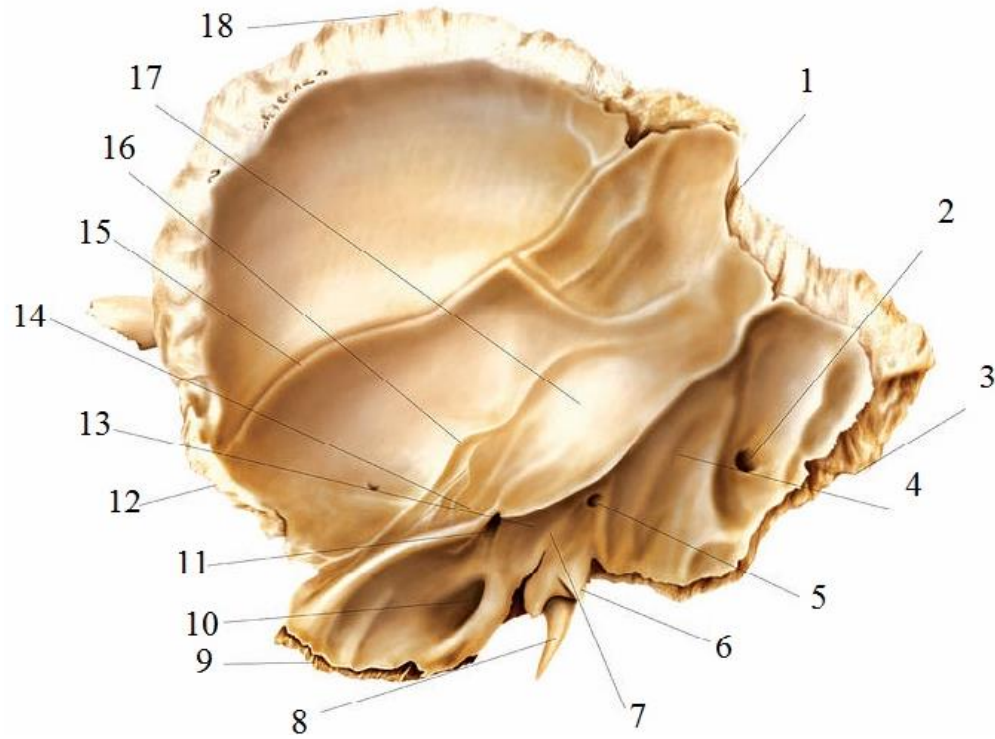
Embryologically, the temporal bone can be divided into two basic anatomic regions. The cranial nerves and the otic capsule(the cochlea and vestibular apparatus) arise from neuro-ectoderm, all another arises from ectoderm. Thus, in a case of hemifacial dysplasia(ectoderm), the cause for

hearing loss, if the external canal is still patent it is often from ossicular dysfunctions. Hearing loss on a congenital basis can also be due to neuroectoderm dysplasia, such as no otic capsule (Michele's anomaly) or otic capsule dysplasia where the cochlea and vestibular are malformed into blobs or a common cavity anomaly. The distinction is important between the 2 basic embryological types since an anomaly of the ossicles can be bypassed, usually with a BAHA device (Bone Anchored Hearing Aid) that is placed under the skin into the mastoid portion of the temporal bone.

CR!

Bening tumors of the internal auditory canal have previously been called acoustic neuromas. However, this type of tumor, which involves the acoustic division of cranial nerve VIII is rare, and the correct term is vestibular schwannoma, a benign tumor involving the sheath around the nerve, and usually involves the superior vestibular division of cranial nerve VIII. The latter can sometimes be removed from the nerve, while the former involves sacrificing the nerve.





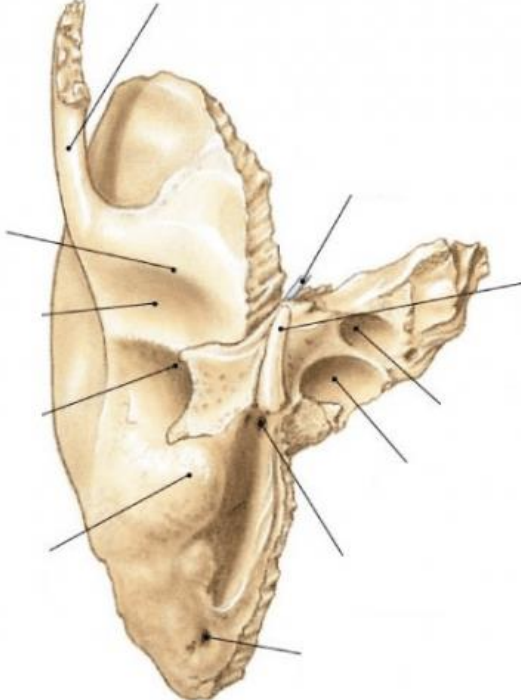
The right temporal bone, internal surface.

The right temporal bone, external aspect.

1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

7.	7.
8.	8.
9.	9.
10.	10.
11.	11.
12.	12.
13.	13.
14.	14.
15.	15.
16.	16.
17.	17.
18.	18.
	19.
	20.
	21.

Write all anatomical structures.

	The right temporal bone, inferior aspect
	1.
	2.
	3.
	4.
	5.
	6.
	7.
	8.
	9.
	10.
11.	

Questions:

1. What do the mastoid air cells of the temporal bone communicate with? What is its clinical importance? _____

2. Point out the tegmen tympani. What is its clinical importance? _____

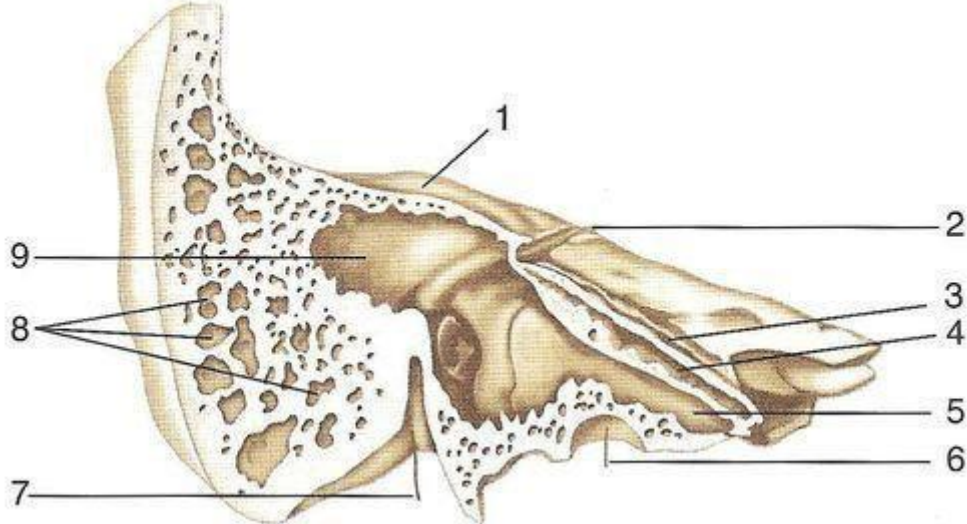
3. A 9-year-old boy with purulent otitis has the infection spread from the tympanic cavity into the inner ear. Such complication develop in case of one of the tympanic cavity walls thinning. What wall is it? _____
4. An 8-year-old boy with purulent otitis has the infection spread from the tympanic cavity into the bulb of internal jugular vein. Such complication develop in case of one of the tympanic cavity walls thinning. What wall is it? _____
5. After collision of two cars, a driver got deformation of the trigeminal impression. What part of the temporal bone can be injured? _____

6. After collision of two cars, a victim got destruction of the temporal bone in the area of the musculotubal canal. What part of the temporal bone can be injured? _____
7. After collision of two cars, a victim got destruction of the temporal bone in the area of the petrosal fossula. What part of the temporal bone can be injured? _____
8. After clash of two cars, a victim got destruction of the temporal bone in the area of the zygomatic process. What part of the temporal bone can be injured? _____
9. After clash of two cars, a victim got destruction of the temporal bone in the area of the external acoustic opening. What part of the temporal bone can be injured? _____

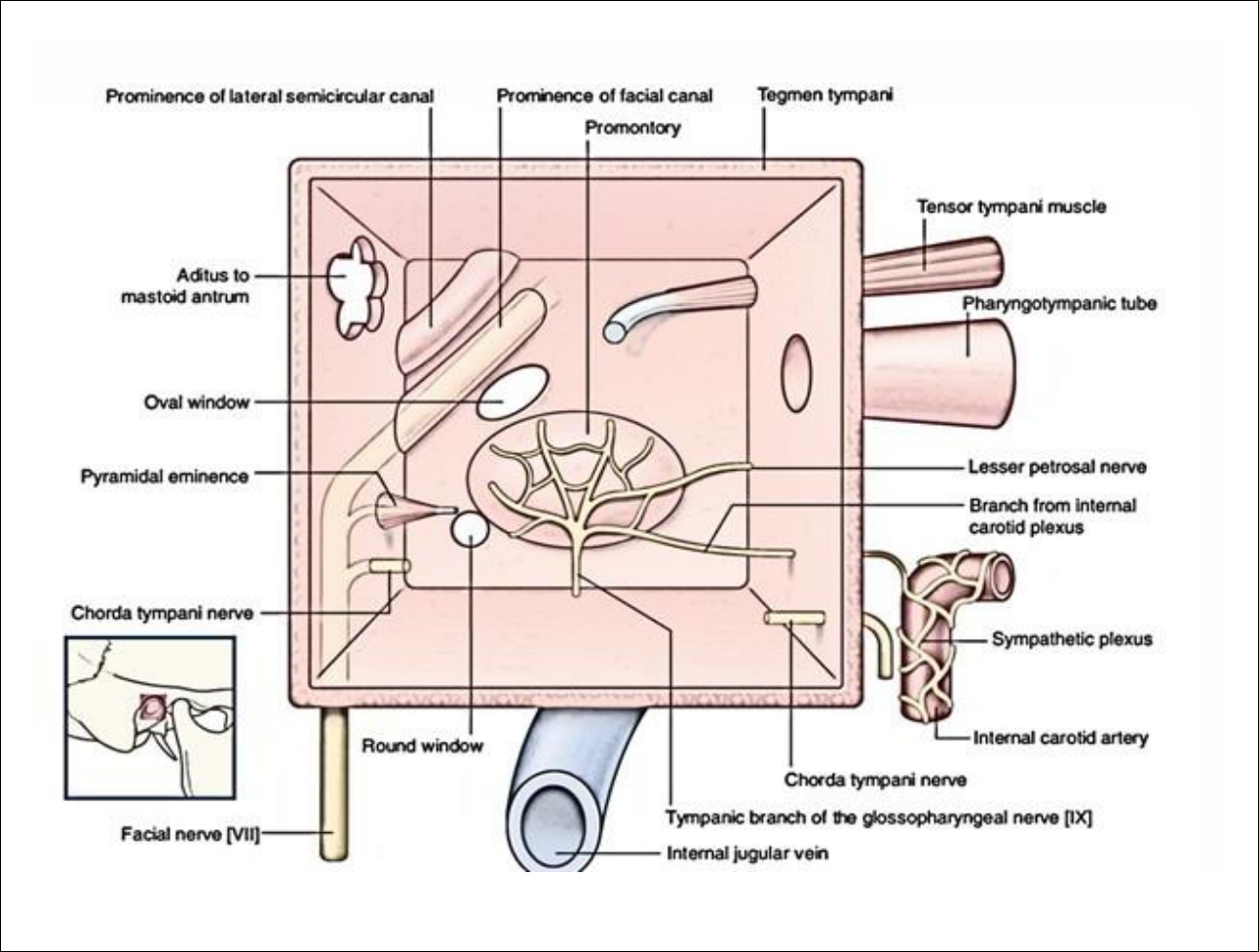
Topic 12. Temporal bone: canals, tympanic cavity.

Temporal bone: canals.

Temporal bone, vertical cut parallel to the axis of the pyramid.

	<p>Write all anatomical structure.</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____
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Temporal bone: tympanic cavity.



Canals of temporal bone and their contents			
Name	Begins	Ends	Content
Facial canal, canalis facialis	Internal acoustic	Stylomastoid foramen,	- facial nerve, <i>n. facialis</i> (VII pair)

	meatus, <i>meatus acusticus internus</i>	<i>foramen stylomastoideum</i>	- genicular ganglion, <i>ganglion geniculi</i> - stylomastoid aa. and vv., <i>aa. and vv. stylomastoideae</i>
Canal for greater petrosal nerve , <i>canalis nervi petrosi majoris</i>	Geniculum of facial canal, <i>geniculum canalis facialis</i>	Hiatus for greater personal nerve, <i>hiatus canalis nervi petrosimajoris</i>	- greater petrosal nerve, <i>n. petrosus major (branch of the facial nerve)</i>
Canaliculus for chorda tympani , <i>canaliculus chordae tympani</i>	Stylomastoid foramen, <i>foramen stylomastoideum</i>	Petrotympenic fissure, <i>fissura petrotympanica</i>	- chorda tympani, <i>chorda tympani (branch of the facial nerve)</i>
Tympanic canaliculus , <i>canaliculus tympanicus</i>	Petrous fossula, <i>fossula petrosa (apertura inferior canaliculi tympanici)</i>	Hiatus for lesser petrosal nerve, <i>hiatus canalis n. petrosi minoris</i>	- tympanic nerve, <i>n. tympanicus (branch of the glossopharyngeal nerve, IX pair)</i>
Muculotubal canal , <i>canalis musculotubarius</i> a) canal for tensor tympani, <i>semicanalis m. tensoris tympani</i> b) canal for auditory tube, <i>semicanalis tubae auditivae</i>	Tympanic cavity, <i>cavitas tympani</i>	Apex of the pyramid, <i>apex pyramis</i>	- <i>m. tensor tympani</i> - <i>pars ossea tubae auditivae</i>
Carotid canal , <i>canalis caroticus</i>	External opening of carotid canal, <i>apertura externa canalis carotici</i>	Internal opening of carotid canal, <i>apertura interna canalis carotici</i>	- internal carotid artery, <i>a. carotis interna</i> - internal carotid venous plexus, <i>plexus venosus caroticus internus</i> - internal carotid plexus, <i>plexus caroticus internus (from ganglion superius truncus sympathicus)</i>
Caroticotympanic canaliculi , <i>canaliculi caroticotympanici</i>	Carotid canal, <i>canalis caroticus</i>	Tympanic cavity, <i>cavitas tympanica</i>	- carotico-tympanic arteries, <i>aa. carotico-tympanici (from a. carotis interna)</i> - carotico-tympanic nerves, <i>nn. carotico-tympanici (from pl. caroticus internus et n. tympanicus)</i>
Mastoid canaliculus , <i>canaliculus mastoideus</i>	Jugular fossa, <i>fossa jugularis (foramen</i>	Tympano-mastoid fissure, <i>fissura</i>	- auricular branch of the vagus nerve, <i>ramus auricularis n. vagi</i>

	<i>mastoideum)</i>	tympano-mastoidea (apertura canaliculi mastoidei)	
--	--------------------	---	--

Questions:

1. A child was admitted to clinic with inflammation of the middle ear. Disease began with nasopharynx inflammation. It is detected that the infection to the tympanic cavity through the auditory tube located in _____
2. What are the main channels of the temporal bone? _____

3. Features of the passage of the facial nerve canal? _____
4. What is the practical importance of the tympanic roof? _____

5. A 9-year-old girl with purulent otitis has the infection spread from the tympanic cavity into the middle cranial fossa. Such complication develop in case of one of the tympanic cavity walls thinning. What wall is it? _____
6. A 12-years-old with purulent otitis has the infection spread from the tympanic cavity into oval window. Such complication develop in case of one of the tympanic cavity walls thinning. What wall is it? _____
7. Which canal establishes the communication between the tympanic cavity and the nasal part of the pharynx? _____
8. What opening is the beginning of the facial canal? _____
9. A child was admitted to clinic with inflammation of the middle ear. Disease began with nasopharynx inflammation. It is detected that the infection lo the tympanic cavity through the auditory tube located in: _____
10. An 8-year-old boy with purulent otitis has the infection spread from the tympanic cavity into the bulb of internal jugular vein. Such complication develop in case of one of the tympanic cavity walls thinning. What wall is it? _____

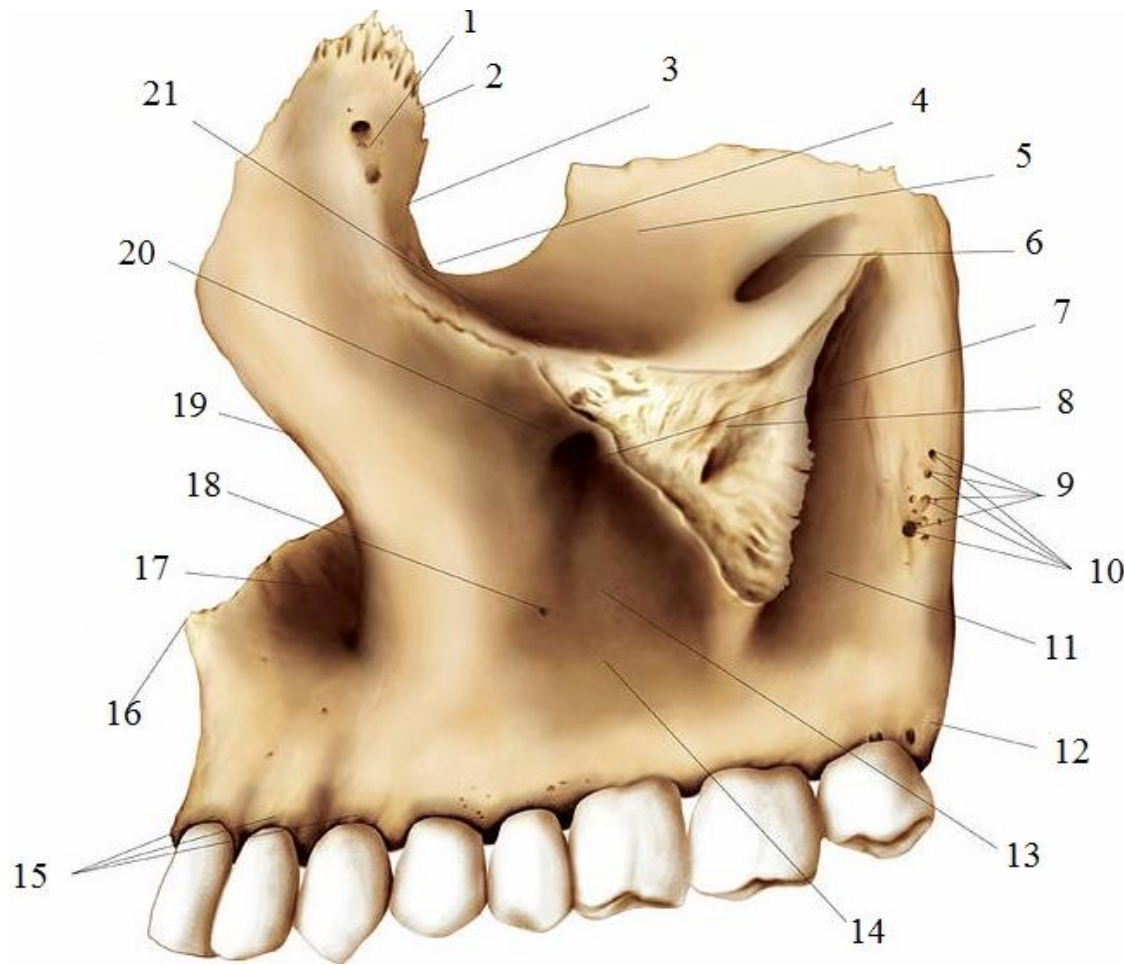
Topic 13. Bones of facial skull, hyoid bone.

Complete the table.

Term in English	Term in Latin
The body of maxilla	

Orbital surface	
Infraorbital canal	
Canine fossa	
Nasal notch	
Alveolar openings	
Lacrimal groove	
Maxillary hiatus	
Alveolar yokes	

The maxilla, lateral aspect.

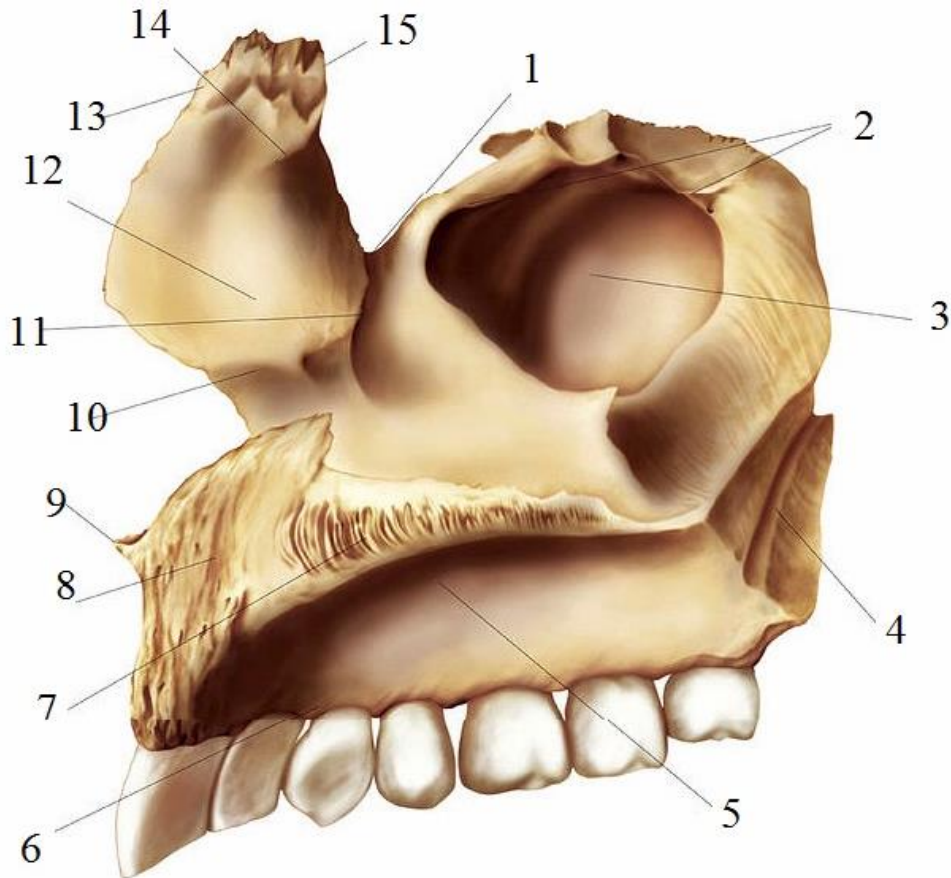


The maxilla bone..

Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____

The maxilla, medial aspect.



Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

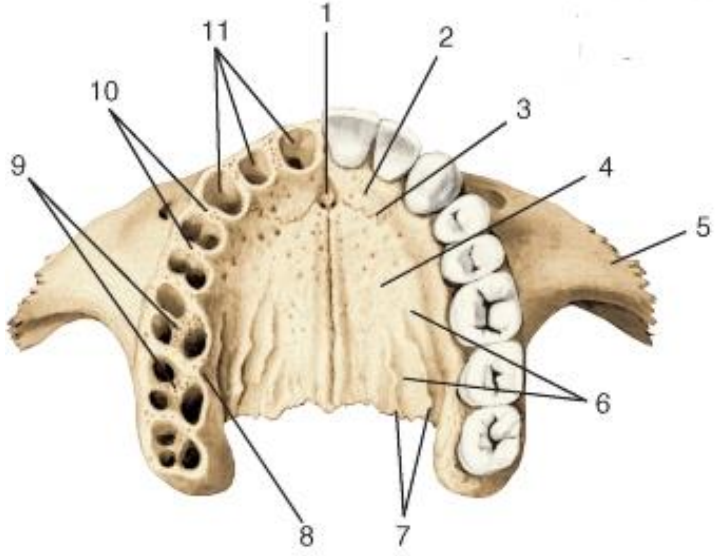
CR! As the maxilla is the central bone of the midface it can fracture through various accidents, most commonly the Le Fort fractures which are subclassified into three types:

Le Fort I fracture – detachment of the alveolar process from the maxilla in a rectangular form, with the center being at the inferior border of the bony nasal cavity. This leaves the patient with a mobile upper jaw.

Le Fort II fracture – pyramidal in shape, involving the alveolar process, midface and nasal bones. The midface is mobile.

Le Fort III fracture – separation of the viscerocranium from the neurocranium. The entire maxilla and nasal bones detach from the skull, leaving the face in its entirety to hang at the discretion of the facial tissues.

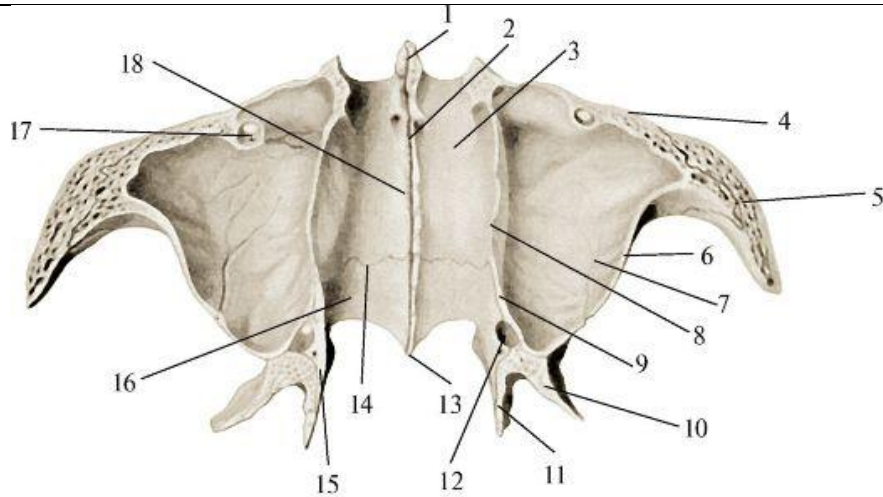
Accessory mandibular foramina. There can sometimes be additional foramina through which the branches of the inferior alveolar nerve may enter the mandible. These can be utilised for additional locoregional anaesthesia before dental surgery and assist maxillofacial surgeons in planning graft surgeries.

	<p>The bone palate, inferior aspect. Write all anatomical structures.</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____
--	---

Osseous development.

Five parts of the maxilla undergo intramembranous ossification through two ossification centers. In the 7th week of fetal life one differentiates between the maxilla and premaxilla (or incisive bone). In the third month both parts fuse around the area of the alveolar process after which the premaxilla becomes the anterior part of the maxilla. In newborns the maxilla is horizontally much longer than vertically compared to adults. Furthermore their teeth sockets extend almost far up until the orbital ridge.

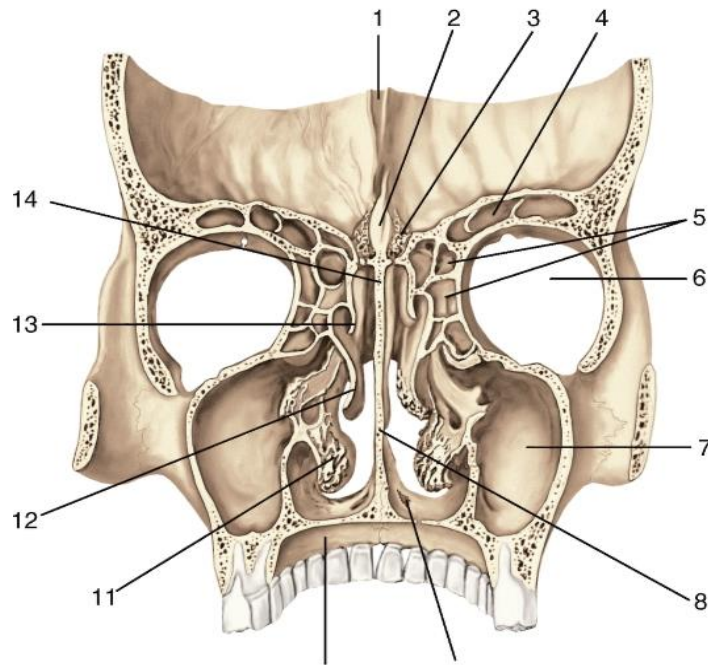
The maxillary sinuses are relatively small and become larger during the development of the maxilla and the other skull bones. In old age the alveolar process is increasingly absorbed and the teeth fall out. Since the maxilla becomes smaller it seems to come «forward»



The Palatine process of the maxillary bone and the horizontal plate of the Palatine bone. The view from the top. Horizontal section at the level of maxillary sinus

Write all anatomical structures.

- | | |
|-----------|-----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |
| 5. _____ | 6. _____ |
| 7. _____ | 8. _____ |
| 9. _____ | 10. _____ |
| 11. _____ | 12. _____ |
| 13. _____ | 14. _____ |
| 15. _____ | 16. _____ |
| 17. _____ | 18. _____ |



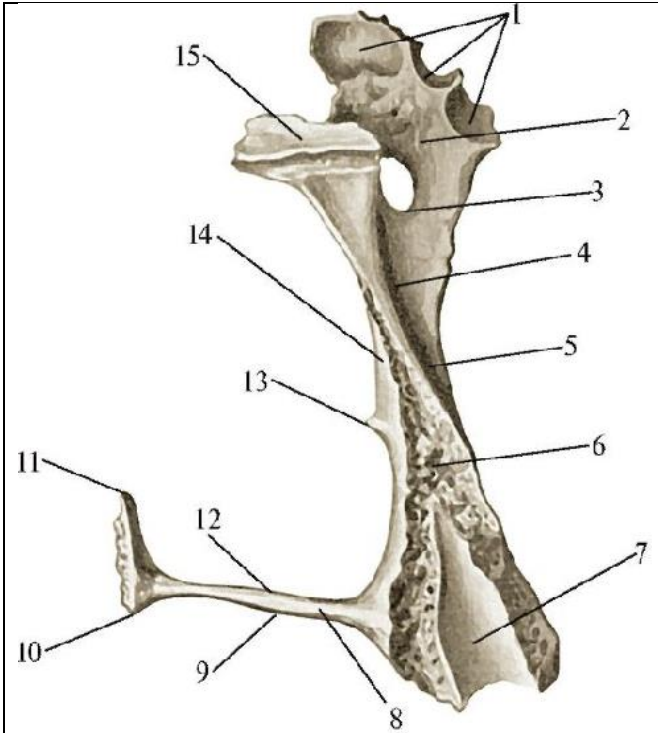
Maxillary sinus; frontal cut of the skull, posterior view.

Write all anatomical structures.

- | |
|-----------|
| 1. _____ |
| 2. _____ |
| 3. _____ |
| 4. _____ |
| 5. _____ |
| 6. _____ |
| 7. _____ |
| 8. _____ |
| 9. _____ |
| 10. _____ |
| 11. _____ |
| 12. _____ |
| 13. _____ |
| 14. _____ |

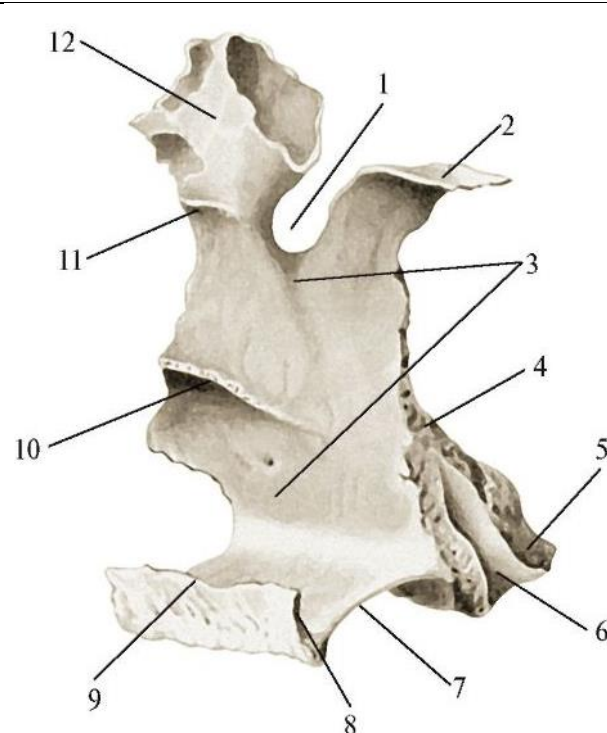
The Palatine Bone.

Write all anatomical structure.



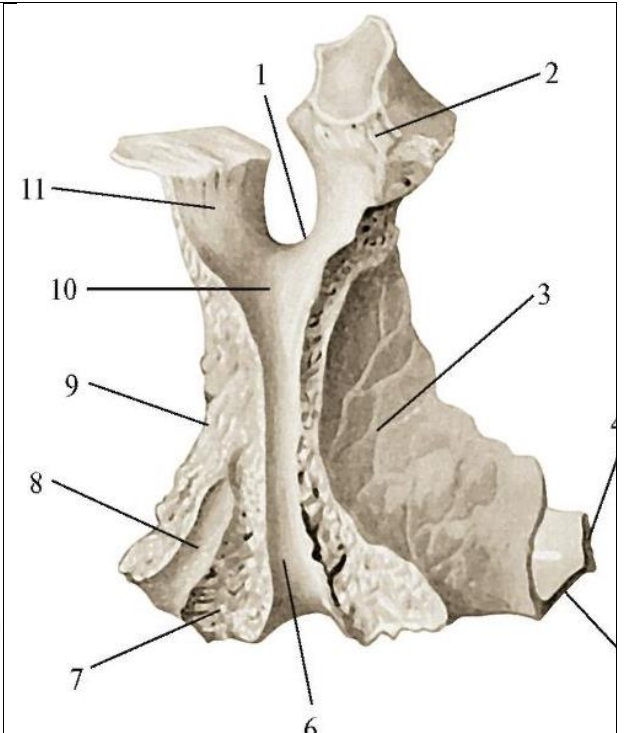
Palatine bone. posterior aspect

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____



The right palatine bone, interior aspect.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____



The right palatine bone, exterior aspect.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

10. _____	10. _____	10. _____
11. _____	11. _____	11. _____
12. _____	12. _____	
13. _____		
14. _____		
15. _____		

CR! The greater and lesser palatine nerves, found in the horizontal plate and the pyramidal process of the palatine bone respectively, are quite sensitive. This is why they need to be anesthetized before the extraction of the upper premolars and molars. For this procedure the needle is inserted on the medial side of the (adult) second molar, 1 cm from the gingival margin.

Questions:

1. At birth defect, mandibular midline slit. Which non-union processes leads to the development of anomalies? _____
2. What structure communicates the maxillary sinus with the nasal cavity? _____
3. What anatomical structure is housed on the infratemporal surface of the body of the maxilla? _____
4. What structure represents air-filled cavity of the maxilla? _____
5. What anatomical structure is placed on the nasal surface of the frontal process of the maxilla? _____
6. What anatomical structure is situated on the nasal surface of the frontal process of the maxilla? _____
7. What anatomical structure serves as an attachment for the middle nasal concha? _____

CR! A mandibular fracture rarely occurs in isolation. Much like fractures of the pelvic brim, a fracture on one side is frequently associated with a fracture on the contralateral side.

The characteristics of mandibular fractures are as followa:

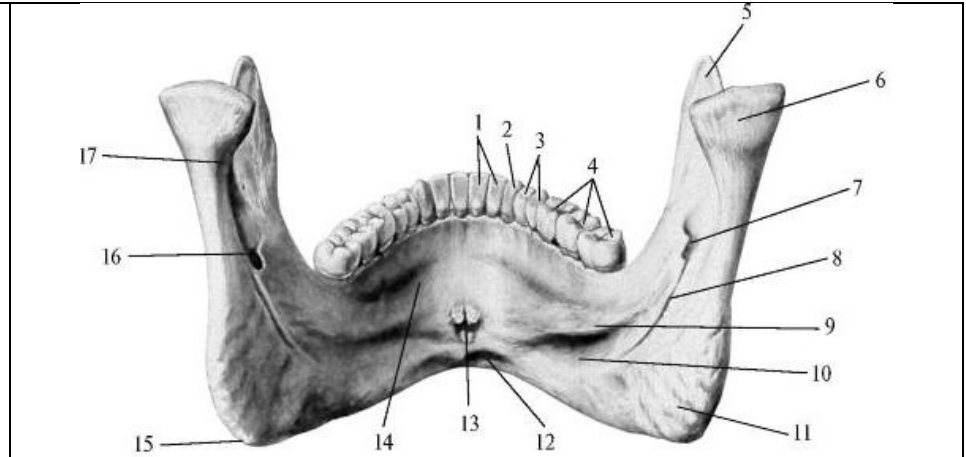
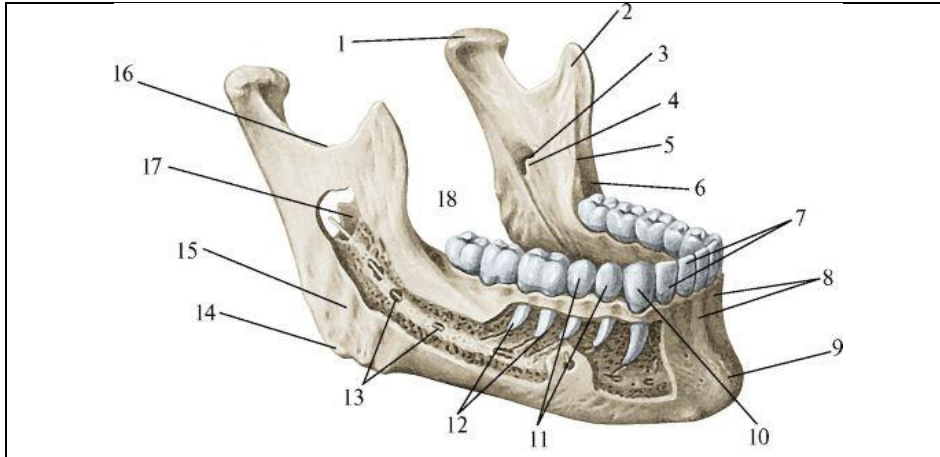
Fractures of the coronoid process are uncommon and usually singular.

Fractures of the neck of the mandible are often transverse and usually accompanied with dislocation of the temporomandibular joint.

Fractures of the angle of the mandible are usually oblique and may involve the alveolus of the 3rd molar.

Fractures of the body of the mandible frequently pass through the canine tooth. .

The mandible bone.



The mandible, exterior view.

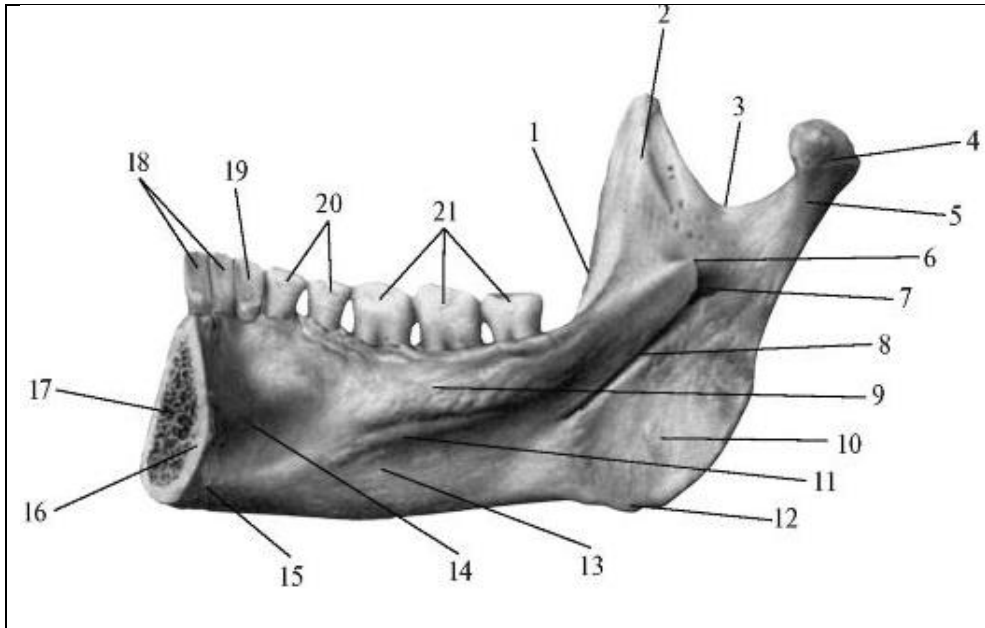
Write all anatomical structure.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____

The mandible, interior view.

Write all anatomical structure.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____



Lower jaw, right half. View from the inside.
 Write all visible structural point.

1. _____	2. _____
3. _____	4. _____
5. _____	6. _____
7. _____	8. _____
9. _____	10. _____
11. _____	12. _____
13. _____	14. _____
15. _____	16. _____
17. _____	18. _____
19. _____	20. _____
21. _____	

CR!

Le Fort fracture II.

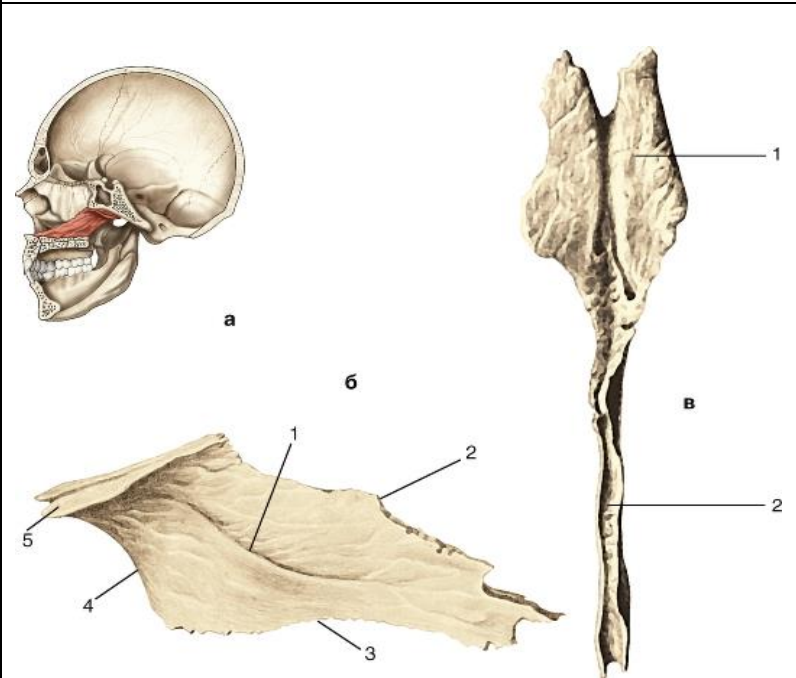
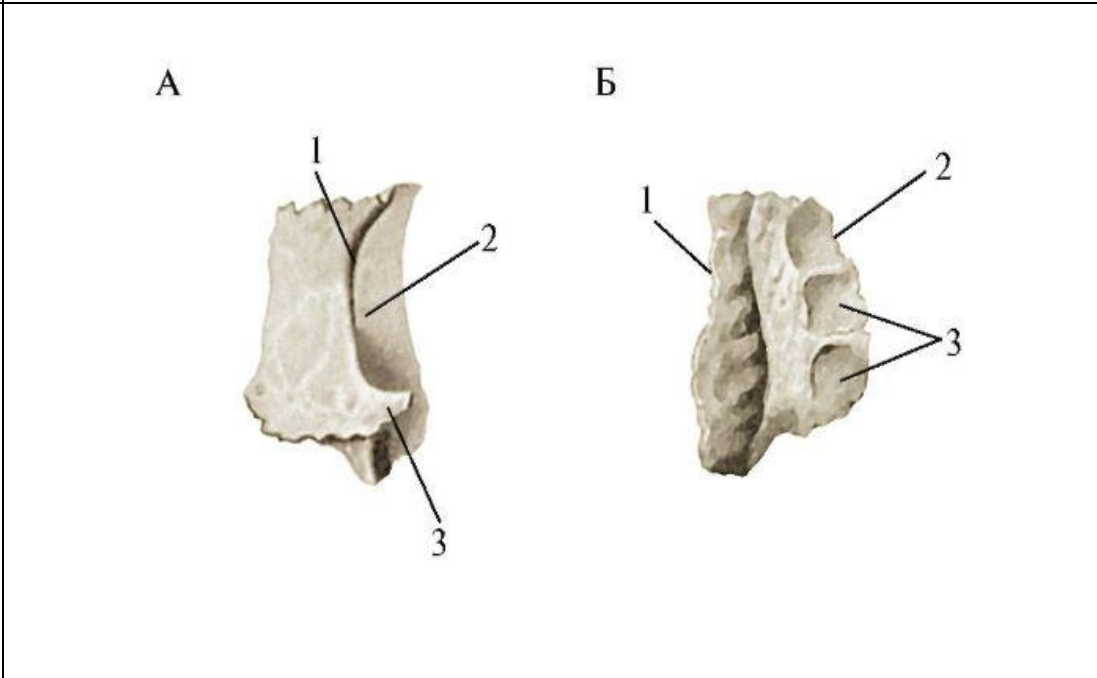
Osseous development.

The nasal bones are ossified intramembranously via the cartilaginous nasal capsule. Clinically the hypoplasia or absence of nasal bones is a common feature in Down syndrome (trisomy 21) and other chromosomal abnormalities. That is why the detection of the nasal tip during ultrasound has become part of prenatal screening tests in many countries.

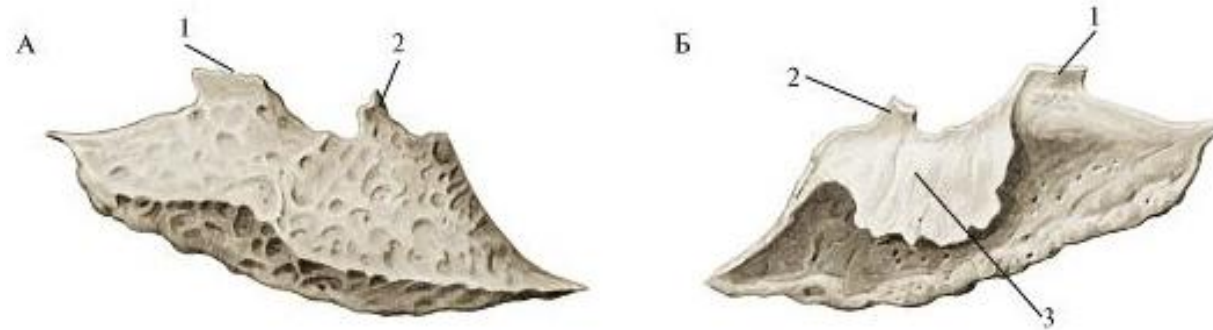
Questions:

1. What are bones of facial skull with pneumatic sinuses? _____
2. What is the unpaired bone that takes part in the formation of the nasal septum? _____
 What is fundamentally different lower nasal concha from the middle and upper? _____
3. At the victim was a fracture of the middle third of the mandible. What channel can be damaged? _____
4. At the victim was the trauma of the maxilla with a damage of the incisive canal. What process of the maxilla is damaged? _____

Write all anatomical structure.

The vomer bone	The lacrimal bone	
		
<p>A- in the skull; Б- lateral view; B- superior view.</p>	<p>Lacrimal bone: A- exterior aspect; Б- interior aspect.</p>	
<p>1. _____ 2. _____ 3. _____ 4. _____ 5. _____</p> <p>1. _____ 2. _____</p>	<p>A</p> <p>1. _____ 2. _____ 3. _____</p>	<p>Б</p> <p>1. _____ 2. _____ 3. _____</p>

The right nasal concha.



The right inferior nasal concha: A- medial aspect; B- the lateral aspect.

Write all visible structural point.

A

1. _____
2. _____

B

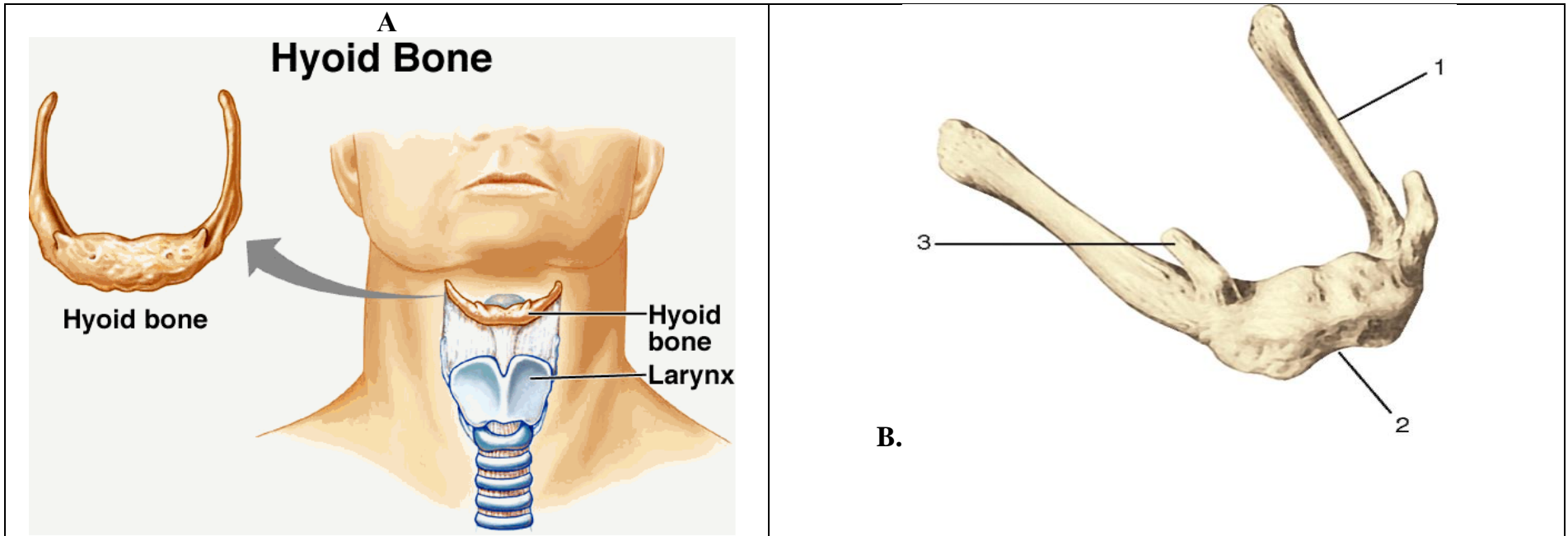
1. _____
2. _____
3. _____

Osseous development.

Laterally, the inferior nasal concha is concave and has no articulations, but it is not the same as the nasal bones or the vomer. Compared to them, the bone is rounded, with an irregular surface of small impressions and tiny holes. The inferior nasal concha forms the inferior nasal meatus. The medial surface, closest to the nasal septum, is convex and holds numerous grooves that house passing vessels.

Questions:

1. At the victim was the trauma of the maxilla with damage in the area of the interalveolar septa. What part of the maxilla is damaged? _____
2. At birth defect, mandibular midline slit. Which non-union processes leads to the development of anomalies? _____
3. After collision of two cars, a victim got destruction of the palatine bone in the area of the concha crest. What part of the palatine bone can be damaged? _____



Hyoid bone: A - in the composition of the neck; B – exterior aspect..

Write all visible structural point

1. _____
2. _____
3. _____

Questions:

4. What are the anomalies of the facial skull? _____
- _____
- _____
- _____
- _____

5. Where located the Hignore sinus and explain its clinical importance. _____
6. At the victim was the trauma of the maxilla, knocked out the first molar dens. What process of the maxilla is damaged? _____
7. What anatomical formation is situated on the alveolar part of the mandible? _____

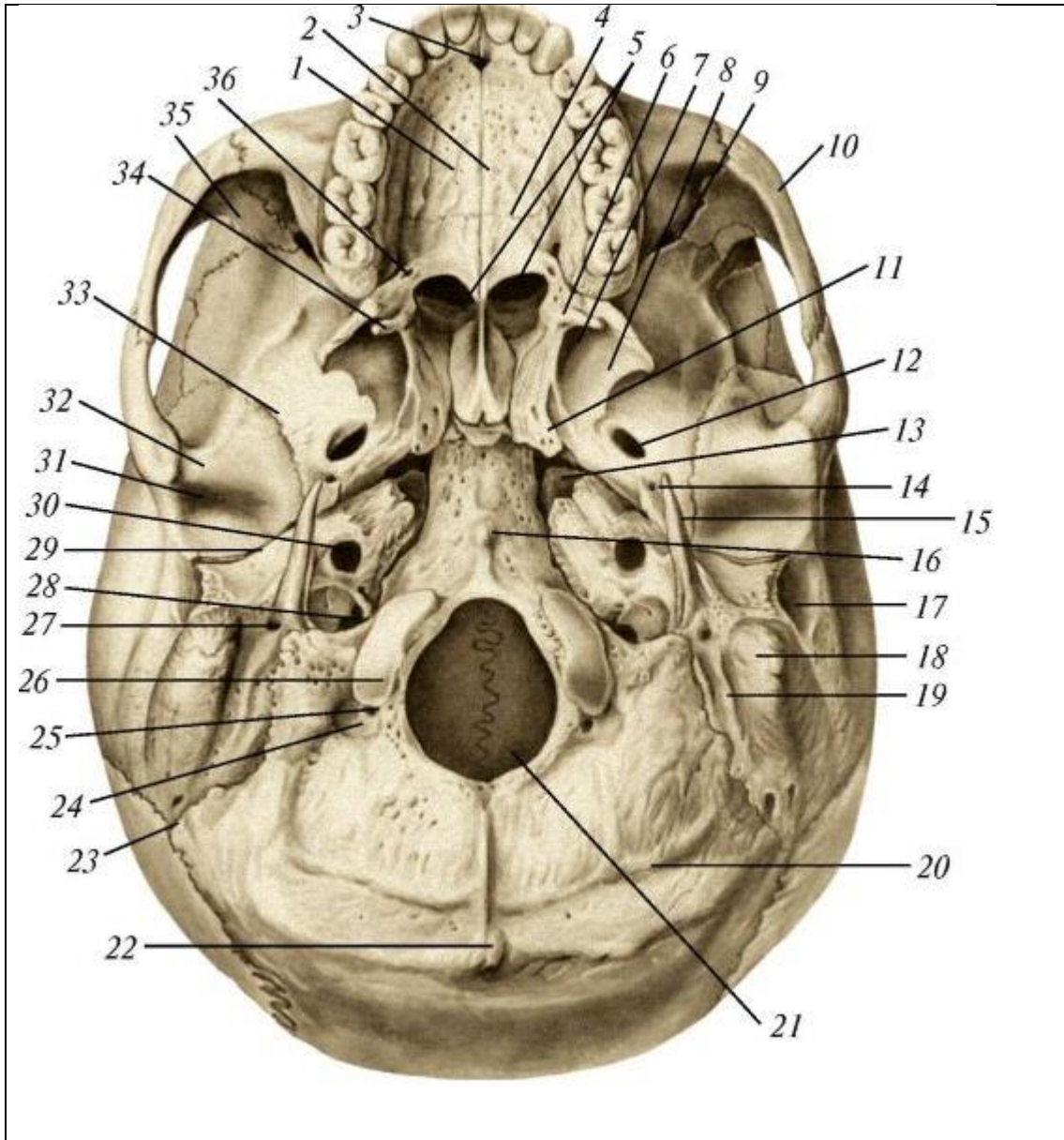
Topic 14. External, internal base of the skull. Skull as a whole.

Complete the table.

Term in English.	Term in Latin.
The anterior cranial fossa	
Cecum foramen	
Cribriform plate	
Middle cranial fossa	
Optic canal	
Superior orbital fissure	
Pituitary fossa	
Choane	
Foramen lacerum	
Foramen rotundum	

Questions:

1. What structure of the ethmoid bone communicates with the middle nasal meatus? _____
2. What opening of the sphenoid bone leads into the pterygopalatine fossa? _____
3. What opening of the sphenoid bone leads into the orbit? _____
4. What openings are located at the base of the greater wing of the sphenoid bone? _____
5. After collision of two cars, a driver got destruction of the carotid canal. What bone can be injured? _____
6. After collision of two cars, a driver got destruction of the sella turcica. What bone can be injured? _____
7. After collision of two cars, a driver got destruction of the pterygoid process. What bone can be injured? _____



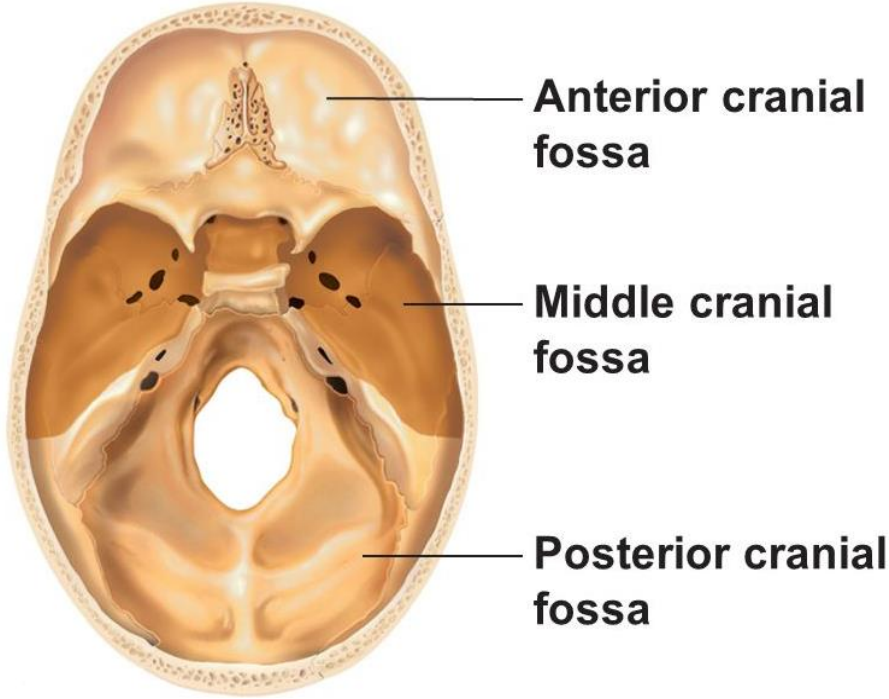
Write all anatomical structures.

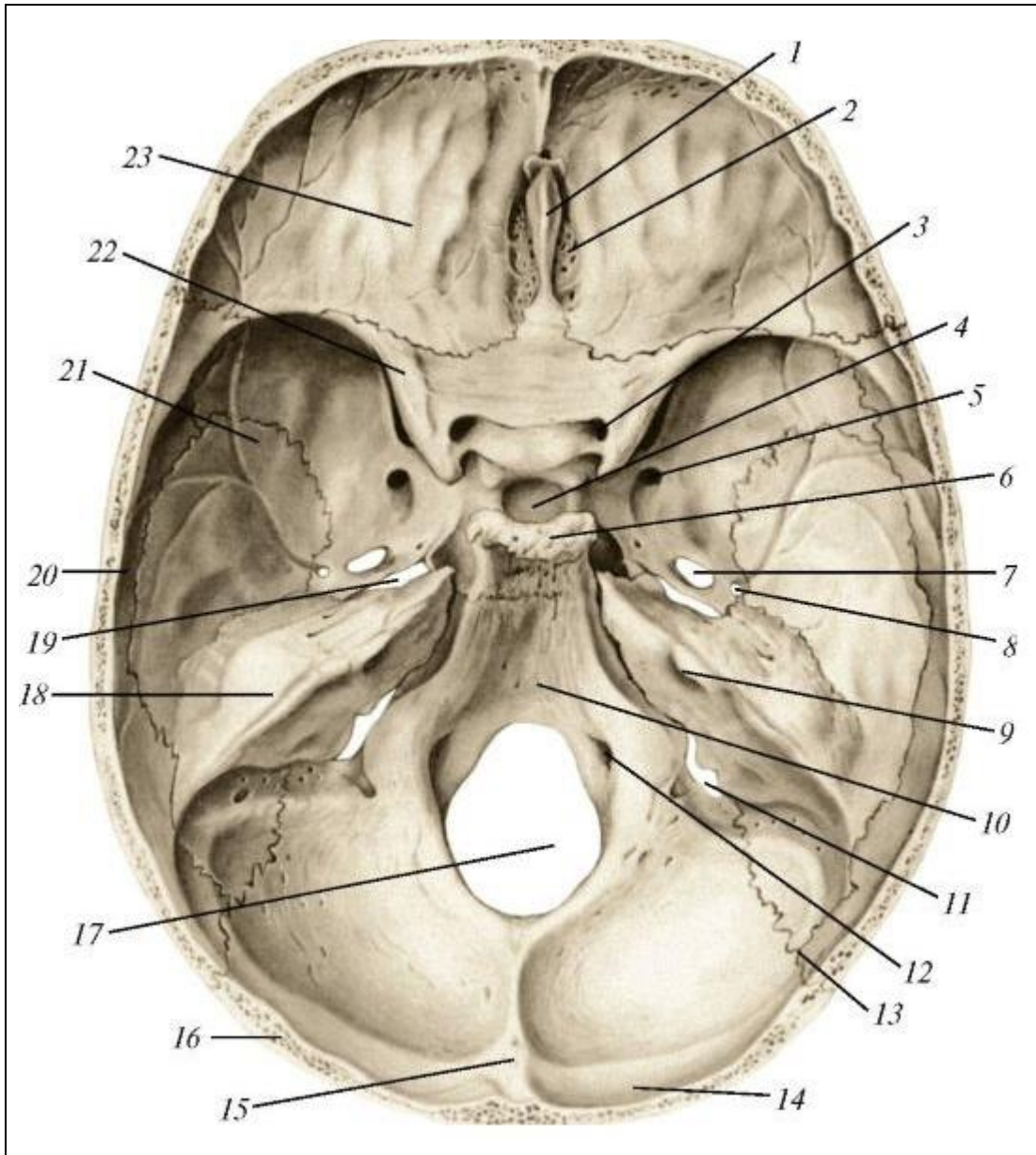
The external surface of the base of the skull.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____
26. _____
27. _____
28. _____

	29. _____
	30. _____
	31. _____
	32. _____
	33. _____
	34. _____
	35. _____
	36. _____

Internal cranial fossa.





Write all anatomical structures.
 Internal surface of the base of the skull.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____

CR!

Young children who present with cleft palate have a failure of the two maxillae to unite in the midline. This causes problems with the separation of the oropharynx and nasopharynx resulting in feeding and breathing issues.

When the internal carotid is revealed for surgery e.g. carotid endarterectomy, the styloid process and posterior belly of digastric act as landmarks which are superficial to it. Reflecting these two structures reveals the vessel in the upper cervical region.

CR!

Trauma to the frontal lobe underlying the frontal bone, especially the orbitofrontal cortex will result in personality changes, namely disinhibition.

Nasal infections may pass directly up into the brain if left untreated and give severe neurological consequences. They spread through to the cavernous sinus and may cause cavernous sinus thrombosis. The triangle of the face (which includes the nose and upper lips and philtrum) is an area which can transmit infection directly to the brain (as there are no venous valves to inhibit their flow).

Surgery to remove pituitary tumors is usually undertaken transphenoidally, where the surgeon operates through the nose, drills through the thin plate of the bone that surround the sphenoid sinus (being careful to avoid the ICA), and removes the tumor.

Questions:

1. The inner base of the skull is represented by three cranial fossas - which ones? _____

2. On the radiological investigation in a patient was diagnosed increase of the Turkish saddle's cavity, destruction of the different of the hypophyseal fossa and anterior clinoid processes. What endocrine gland is damaged? _____
3. A casualty has a fracture of the base of the skull in the region of foramen spinosum and foramen rotundum. What bone is damaged? _____

4. Name the sutures of the calvaria? _____
5. Explain sexual differences of the skull. _____

6. Patient admitted to hospital with an injury of the base of the skull. On the radiological investigation in a patient was diagnosed destruction and increase of the hypophyseal fossa. What anatomical structure will be damaged? _____
7. A casualty has a fracture of the base of the skull. Line of the injure passed through Prechiasmatic sulcus and carotid sulcus. What part of the sphenoid bone is damaged? _____
8. After collision of two cars, a victim got destruction of the temporal bone in the area of the musculotubal canal. What part of the bone can be damaged? _____
9. Which foramens are located in the bottom of middle cranial fossa? _____

10. Specify the foramen, which is located in the corner of the greater wing of the sphenoid bone: _____
11. Specify the border between middle and posterior cranial fossa: _____
12. On the radiological investigation in a patient was diagnosed fracture of the nasal septum in the superior 1/3. What bone is damaged? _____
13. After clash of two cars, a victim got destruction of the clivus. What part of the occipital bone can be injured? _____

Topic 15. Orbital fossa. Bone basis of nasal cavity. Bone palate. Malformations.

Complete the table.

Term in English	Term in Latin
	Os lacrimale
	Sutura lacrimomaxillaris
	Canalis infraorbitalis
	Lamina orbitalis ossis ethmoidalis
	Fossa sacci lacrimalis

CR!

Fractures. Any of the walls can be affected, but most commonly it's the floor, followed by the medial wall (because of the fragility of thin ethmoidal cella). When the orbital floor is affected, the inferior rectus muscles is often dragged into the fracture line which results in an inability to move the eyeball upwards in the affected eye (known as upward gaze diplopia).

Inflammatory. When it comes to the contents of the orbit, any inflammatory processes such as conjunctivitis, or even neoplastic processes, like choroidal melanoma, that affect the eye or its accessory structures show a tendency to spread into the cranium through orbital openings as they provide a direct communication between the orbit and cranial fossae. Depending on the nature or the process, it may result either with inflammation of the meninges (meningitis), or with creation of metastatic masses (cancer) within the brain tissue.

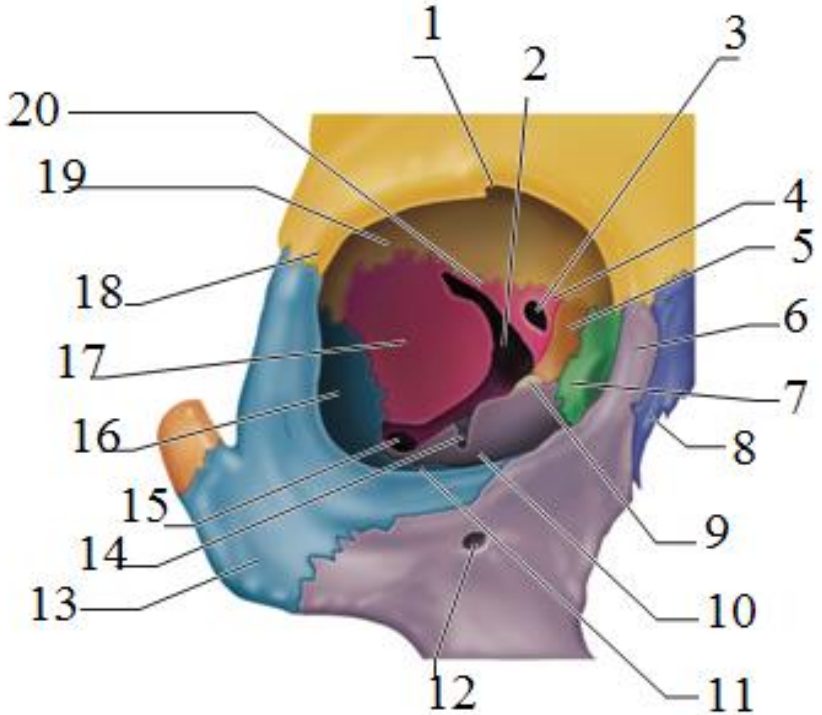
Direct trauma to eye may result in "blowout" fracture, margin remains intact, but medial and/or inferior walls of orbit have fractured.

Questions:

1. Name the opening, through which the orbit is communicated with the nasal cavity. _____
2. Name the openings, through which the orbit is communicated with the cranial cavity. _____
3. Translate from Latin the term «sinus»: _____

4. Translate from Latin the term «meatus»: _____
5. Purulence of orbit soft tissues took place after an eye's trauma. Through what anatomical formation can the purulent process spread to the canine fossa? _____

Orbital cavity, anterior view.



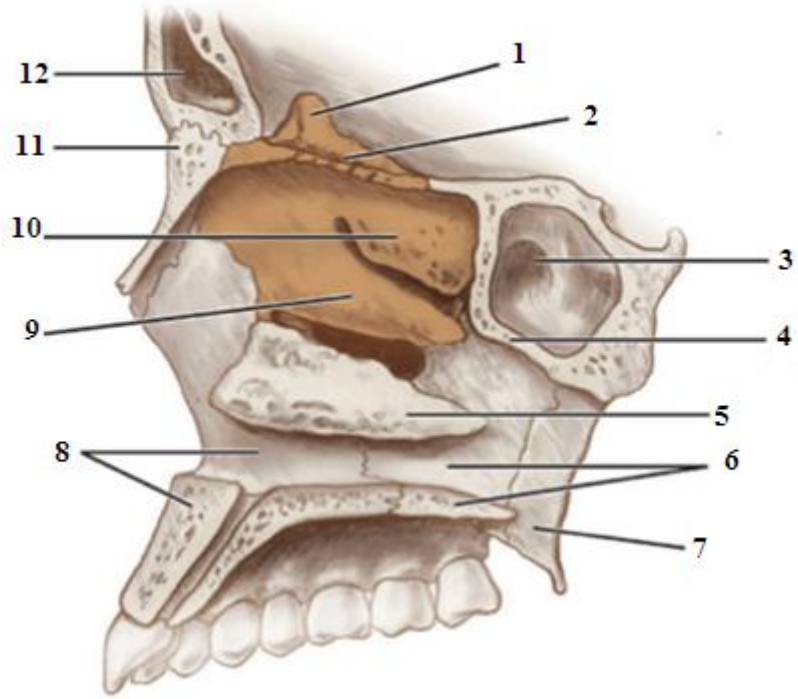
Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Walls of the orbit	
Walls of the orbit	Formed by
Superior, <i>paries superior</i>	- orbital part of frontal bone, <i>pars orbitalis ossis frontalis</i> - a lesser wing of the sphenoid bone, <i>ala minor ossis sphenoidalis</i>
Lateral, <i>paries leteral</i>	- orbital surface of the greater wing of the sphenoid bone, <i>facies orbital alae majoris ossis sphenoidalis</i> - orbital surface of zygomatic process of front bone, <i>facies orbitalis processus zygomaticus ossis frontalis</i>

	- orbital surface of zygomatic bone, <i>facies orbitalis ossis zygomatici</i>
Inferior, <i>paries inferior</i>	- orbital surface of the maxilla, <i>facies orbitalis maxillae</i> - orbital surface of zygomatic bone, <i>facies orbitalis ossis zygomatici</i> - orbital process of palatine bone, <i>processus orbitalis ossis palatini</i>
Medial, <i>paries medialis</i>	- frontal process of the maxilla, <i>processus frontalis maxillae</i> - the nasal and orbital part of frontal bone, <i>pars nasalis et pars orbitalis ossis frontalis</i> - the lacrimal bone, <i>os lacrimale</i> - orbital plate of ethmoidal labyrinth, <i>lamina orbitalis labyrinthus ethmoidalis</i> - the body of the sphenoid bone, <i>corpus ossis sphenoidalis</i>

Bone base of the nasal cavity.

	<p>Write all anatomical structures. Sagittal section of the nasal cavity.</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____
---	--

Communications of the orbit	
Opening	Communications
Optic canal, <i>canalis opticus</i>	- anterior cranial fossa, <i>fossacranii anterior</i>
Supraorbital foramen, <i>foramen supraorbitale (incisura supraorbitalis)</i>	- frontal region, <i>regio frontalis</i>
Nasolacrimal canal, <i>canalis nasolacrimalis</i>	- the nasal cavity (inferior nasal meatus), <i>cavitas nasi (meatus nasi inferior)</i>
Anterior ethmoidal foramen, <i>foramen ethmoidale anterius</i>	- anterior and medial ethmoidal air cells, <i>cellulae ethmoidales anteriores et medii</i>
Posterior ethmoidal foramen, <i>foramen ethmoidale posterius</i>	- posterior ethmoidal air cells, <i>cellulae ethmoidales posteriores</i>
Inferior orbital fissure, <i>fissura orbitalis inferior</i>	- infratemporal fossa, <i>fossa infratemporalis</i> - pterygopalatine fossa, <i>fossa pterygopalatina</i>
Superior orbital fissure, <i>fissura orbitalis superior</i>	- middle cranial fossa, <i>fossa cranii media</i>
Infraorbital canal, <i>canalis infraorbitalis</i>	- anterior surface of maxilla (canine fossa), <i>facies anterior maxillae (fossa canina)</i>
Zygomaticoorbital foramen, <i>foramen zygomaticoorbitale</i>	- zygomatic region (zygomaticofacial foramen), <i>regio zygomatica (foramen zygomaticofaciale)</i> - intratemporal fossa (zygomaticotemporal foramen), <i>fossa infratemporalis (foramen zygomaticotemporale)</i>
Communications of paranasal sinuses	
Name of sinus	Communications
Maxillary sinus, <i>sinus maxillaris</i>	- the nasal cavity (middle nasal meatus, <i>meatus nasi medius</i>)
Frontal sinus, <i>sinus frontalis</i>	- the nasal cavity (middle nasal meatus, <i>meatus nasi medius</i>)
Ethmoidal air cells, <i>cellulae ethmoidales</i> : a) anterior b) middle c) posterior	a), b) - the nasal cavity (middle nasal meatus, <i>meatus nasi medius</i>) c) - the nasal cavity (superior nasal meatus, <i>meatus nasi superior</i>)
Sphenoid sinus, <i>sinus sphenoidalis</i>	- the nasal cavity (superior nasal concha, <i>concha nasalis superior</i>)

CR!

Epistaxis. It is the clinical term for a nosebleed, is usually caused by: trauma, sinus infections, rhinitis, an arid environment, hypertension, hematologic disorders, neoplasms. The most common form is anterior epistaxis which occurs along the septum and arises from Kiesselbach's

plexus. Posterior epistaxis is usually due to the maxillary artery. Depending on the area of the bleed, various treatments are available since the blood will either run out of the nose in an anterior case or down the throat in a posterior case.

Deviated septum. A deviated septum means that the bony midline of the nasal cavity is off centre, either due to a trauma or birth defects and this results in partial or total occlusion of one side of the cavity. The treatment is surgical and a septoplasty is usually performed.

Questions:

1. Name the walls of the orbit? _____

2. Name the communications of the orbit? _____

3. What structures form the bony nasal septum? _____

4. How many nasal passages of the nasal cavity and what are their connections? _____

5. Purulence of orbit soft tissues took place after an eye's trauma. Through what anatomical formation can the purulent process spread to the middle cranial fossa? _____

6. Purulence of orbit soft tissues took place after an eye's trauma. Through what anatomical formation can the purulent process spread to the canine fossa? _____
7. Purulence of orbit soft tissues took place after an eye's trauma. Through what anatomical formation can the purulent process spread to the nasal cavity? _____
8. Purulence of orbit soft tissues took place after an eye's trauma. Through what anatomical formation can the purulent process spread to the cranial cavity? _____
9. Chronic rhinitis is complicated with the signs of maxillary sinus mucous tunic affection (maxillary sinusitis). Through what nasal formation has the infection spread? _____
10. During the first days of a newborn child, a pediatrician detected that milk gets into the child's nasal cavity. What malformation does this fact indicate? _____
11. During a meal milk gets into the nasal cavity of a newborn child. What is the probable cause of this pathology? _____

Topic 16. Temporal, infratemporal, pterygo-palatine fossae, its connections, clinical significance.

Complete the table.

Term in English	Term in Latin
Pterygopalatine fossa	
Temporal fossa	
Vault	
Infratemporal fossa	
Pterygomaxillary fissure	
	Canalis pterygoideus
	Paries lateralis
	Apertura piriformis

Questions:

- Name the opening, through which the pterygopalatine fossa is communicated with the external surface of the base of the skull. _____
- Temporal fossa – boundaries, its contact? _____

- Purulence of orbit soft tissues took place after an eye's trauma. Through what anatomical formation can the purulent process spread to the nasal cavity? _____
- Purulence of orbit soft tissues took place after an eye's trauma. Through what anatomical formation can the purulent process spread to the canine fossa? _____
- During the first days of a newborn child, a pediatrician detected that milk gets into the child's nasal cavity. What malformation does this fact indicate? _____
- Purulence of orbit soft tissues took place after an eye's trauma. Through what anatomical formation can the purulent process spread to the middle cranial fossa? _____
- Explain the term «suture»: _____
- What bones of the skull form the inferior wall of the nasal cavity? _____
- A patient has a suppurative inflammation of the posterior ethmoidal cells. What part of the nasal cavity does the pus flow out into? _____

	<p>Temporal, infratemporal and pterygopalatine fossa. Write all anatomical structures.</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 10. _____ 11. _____ 12. _____ 13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____
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CR!

Because of its location and associated connections, the pterygopalatine fossa is often involved in the spread of tumors, infections, and inflammations caused by neoplastic diseases in the head and neck (such as juvenile nasopharyngeal carcinoma, bacterial sinusitis).

For instance, in juvenile nasopharyngeal angiofibroma, the tumour extends into the pterygopalatine fossa via the sphenopalatine foramen, and spreads in a multidirectional fashion into other regions of the head, such as the sinuses, the infratemporal fossa, the orbit, and the cranial fossa.

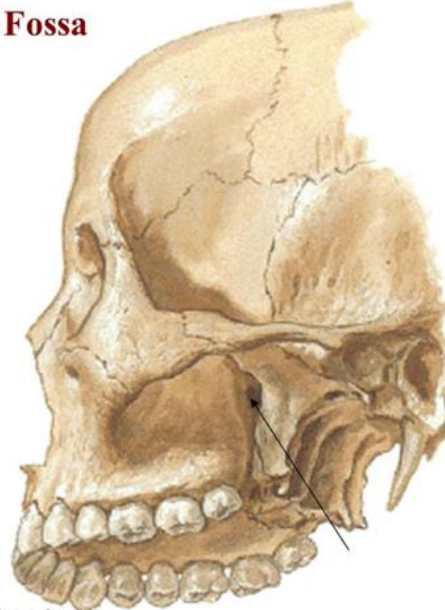
Pterygopalatine Fossa

Boundaries:

- Ant: posterior surface of maxilla
- Post: pterygoid process
- Med: perpendicular palatine plate
- Lat: pterygomaxillary fissure

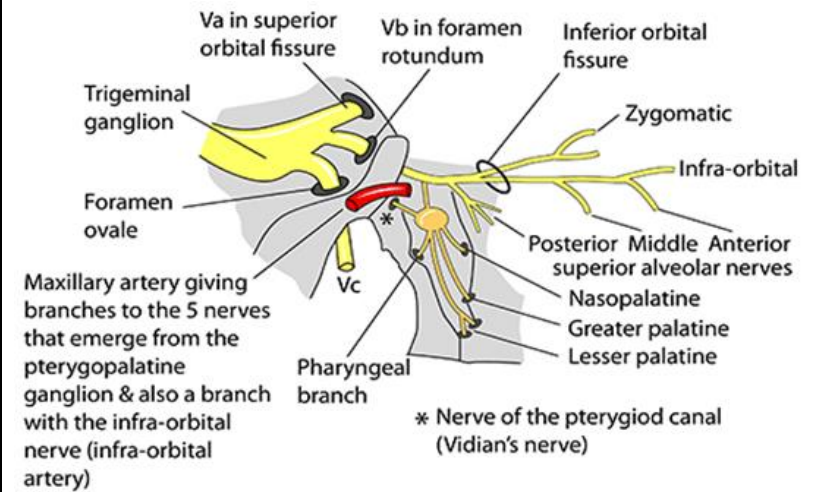
Contents:

- Maxillary nerve
- Third part of maxillary artery
- Pterygopalatine ganglion



Communications: the fossa communicates with:

- | | | |
|-----------------------|---------|--|
| •Infratemporal fossa | through | <i>pterygomaxillary fissure</i> |
| •Middle cranial fossa | through | <i>foramen rotundum</i> |
| •Nasal cavity | through | <i>sphenopalatine foramen</i> |
| •Orbital cavity: | through | <i>inferior orbital fissure</i> |
| •Palate | through | <i>greater palatine canal</i> |
| •Nasopharynx | through | <i>pharyngeal and pterygoid canals</i> |



Parasympathetic to nose, sinuses, palate, nasopharynx & lacrimal gland
Maxillary nerve (Vb) to upper teeth, floor of orbit, face/skin

Infratemporal Fossa

- The space deep to the ramus of the mandible
- Communicates with the temporal fossa deep to the zygomatic arch

Boundaries:

Ant: posterior surface of the maxilla

Lat: ramus of the mandible

Med: lateral pterygoid plate
pterygomaxillary fissure

Roof: infratemporal surface of the greater wing of sphenoid

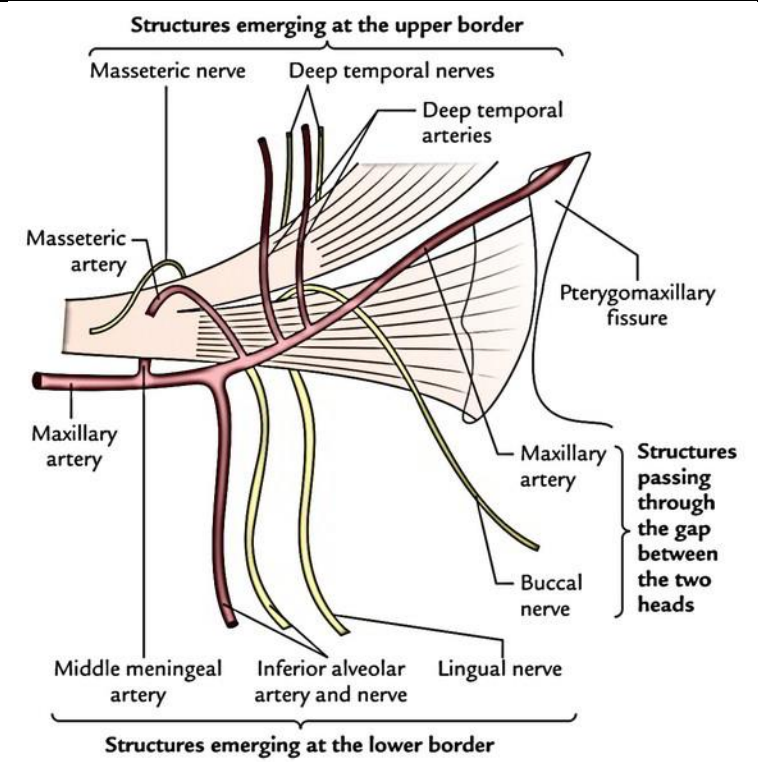
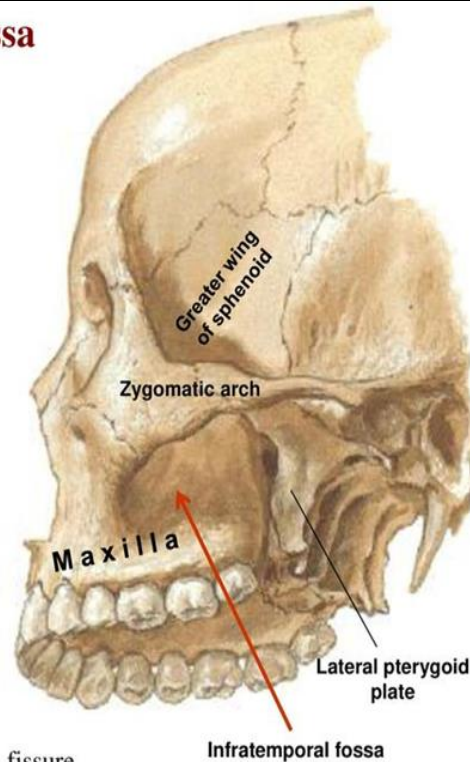
Communications of the infratemporal fossa:

With the:

a. **Temporal fossa:** deep to the zygomatic arch

b. **Pterygopalatine fossa:** through the pterygomaxillary fissure

c. **Orbital cavity:** through the inferior orbital fissure



Questions:

10. A patient has a suppurative inflammation of the frontal sinus. What part of the nasal cavity does the pus flow out into? _____
11. A patient has an inflammation of sphenoid sinus. Where does the aperture of this sinus open? _____

12. A sick has an acute inflammation of nasolacrimal duct mucous membrane. It is known that after influenza nasal discharges had been observed for a long time. From what part of the nasal cavity could the infection get to the nasolacrimal duct? _____
13. During the first days of a newborn child, a pediatrician detected that milk gets into the child's nasal cavity. What malformation does this fact indicate? _____
14. Chronic rhinitis is complicated with the signs of maxillary sinus mucous tunic affection (maxillary sinusitis). Through what nasal cavity formation has the infection spread? _____
15. A 30-year-old patient with a second upper molar pulp inflammation appealed to a doctor with complaints of headache and nose rheum. After examination, pulpitis complicated with sinusitis was diagnosed. Which sinus did the infection enter from this tooth root canal? _____

Topic № 17. General syndesmology. Types of the connections. Classification of the articulations. Connections between vertebrae. Vertebral column as a whole.

Complete the table.

Term in English	Term in Latin
Articular cavity	
Articular meniscus	
Bicondylar joint	
Anulus fibrosus	
Nucleus pulposus	

Give the definition of the term	
Synarthroses	_____ _____ _____
Ligamentum Synelastosis	_____ _____ _____

Synchondrosis	
Sutura	
Diarthroses	
Amphiarthroses	

Classification of joints.

Classification of joints on the axes of rotation, the shape of articular surfaces, the number of axes of rotation and kinds of possible movements				
<u>Axes of rotation</u>	<u>Form of articular surface</u>	<u>The number of movements</u>	<u>Axis implements</u>	<u>Ongoing movement</u>
Uniaxial	- pivot, <i>art. trochoidea</i>	1	vertical	- rotation, <i>rotatio</i>
	- hinge, <i>art. ginglymus</i>	2	frontal	- flexion, <i>flexio</i> - extension, <i>extensio</i>

	- spiral, <i>art. cochlearis</i>			
Biaxial	- ellipsoid, <i>art. ellipsoidea</i>	5	frontal	- flexio, <i>flexio</i> - extension, <i>extensio</i>
	- saddle, <i>art. sellaris</i>		sagittal	- abduction, <i>abductio</i> - adduction, <i>adductio</i>
			migration from axis to axis	- circumduction, <i>circumductio</i>
	- bicondylar, <i>art. bicondylaris</i>	3	frontal	- flexion, <i>flexio</i> - extension, <i>extensio</i>
vertical			- rotation, <i>rotatio</i>	
Multiaxial	- spheroidal, <i>art. spherioidea</i>	6	frontal	- flexion, <i>flexio</i> - extension, <i>extensio</i>
	- cup-like, <i>art. cotylica</i> or		sagittal	- abduction, <i>abductio</i> - adduction, <i>adductio</i>
	- enarthrosis, <i>art. enarthrosis</i>		migrating from axis to axis	- circumduction, <i>circumductio</i>
	- plane, <i>art. plana</i>		vertical	- glide

The axes of rotation, the number and types of possible movements		
Axes of rotation	The number of possible movements	Types of possible movements
Frontal	2	Flexion (<i>flexio</i>), extension (<i>extensio</i>)
Sagittal	2	Adduction (<i>adductio</i>), abduction (<i>abductio</i>)
Frontal and sagittal	5	Flexion (<i>flexio</i>), extension (<i>extensio</i>), adduction (<i>adductio</i>), abduction (<i>abductio</i>), circumduction (<i>circumductio</i>)

Vertical	1	Rotation (<i>rotatio</i>): inside – pronation (<i>pronatio</i>), outside – supination (<i>supinatio</i>)
----------	---	--

Functional Class	Structural class	Joint	Description Type	Example of Joint
Synarthrosis (immovable)	Fibrous	Suture	Interlocking seams	Between cranial bones
Synarthrosis (immovable)	Fibrous	Gomphosis	Peg-and-socket joint	Between teeth and socket
Synarthrosis (immovable)	Cartilaginous	Synchondrosis	Hyaline cartilage joint	Between diaphysis and epiphysis in long bones
Amphiarthrosis (slightly movable)	Fibrous	Syndesmosis	Ligament or distal interosseous membrane	Joint of tibia and fibula
Amphiarthrosis (slightly movable)	Cartilaginous	Symphysis	Fibrocartilage acts as compressible cushion	Intervertebral discs of vertebral column
Diarthrosis (freely movable)	Synovial	Gliding	Two sliding surface	Between carpals
Diarthrosis (freely movable)	Synovial	Hinge	Concave surface with convex surface	Between humerus and ulna
Diarthrosis (freely movable)	Synovial	Pivot	Rounded end fits into ring of bone and ligament	Between atlas (C1) and axis (C2) vertebrae
Diarthrosis (freely movable)	Synovial	Condylloid	Oval condyle with oval cavity	Between metacarpals and phalanges

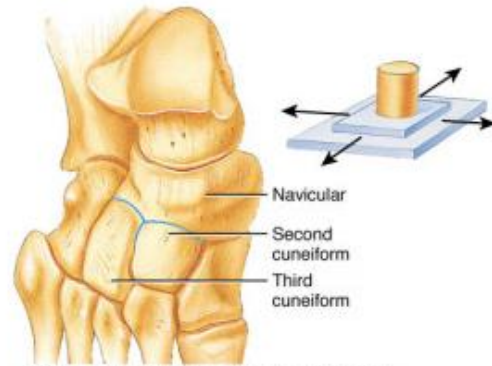
Diartrosis (freely movable)	Synovial	Saddle	Each surface is both concave and convex	Between carpus and first metacarpal
Diartrosis (freely movable)	Synovial	Ball-and-socket	Ball-shaped head with cup-shaped socket	Between femur and pelvis

Schematic description of joint:

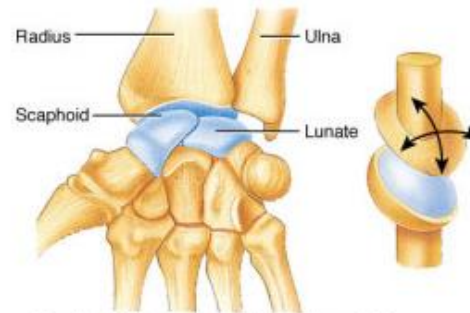
1. The name of the joint (English, Latin).
2. Joint surfaces of the bones that form the joint.
3. Features of the structure of the capsule and its attachment.
4. Type of joint (simple, complex, combined, compound).
5. Classification by form of articular surfaces.
6. Classification of joints by the number of axes of rotation.
7. Function (possible movement in the joint).
8. Fixing apparatus.
9. Extras: cartilage, menisci, glenoid lip, sesamoid bones and bursae. Morphofunctional peculiarities of joint.

Questions:

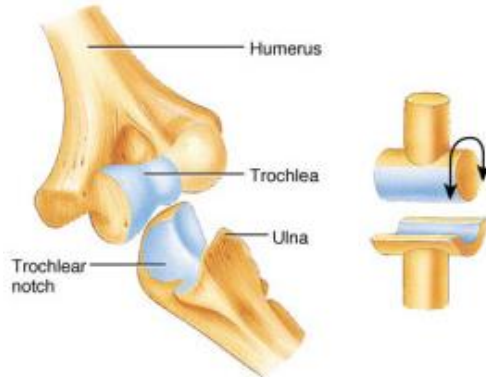
1. A patient 45 years of age with suspected inflammation of the membranes of the brain needed to obtain cerebrospinal fluid. Diagnostic puncture is made between the arches of the lumbar vertebrae (L3 - L4). Through what a bunch of needle should penetrate into the puncture? _____
2. X-ray examination of a patient has shown a thoracic spine disk herniation. What kind of vertebrae conjugation has undergone pathological changes? _____
3. Which of the following is an example of a pivot joint? _____
4. Produce the fluid that keeps most joints moist. _____
5. Which of the following type of continuous articulation is sindesmosis? _____
6. Which of the following type of continuous articulation is sinchondrosis? _____



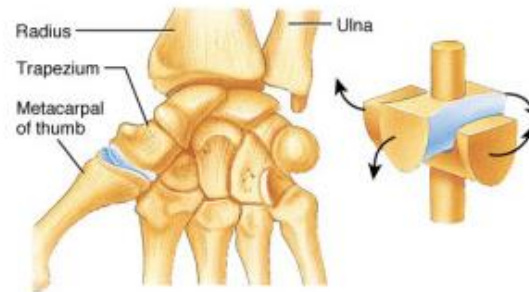
Planar joint between the navicular and second and third cuneiforms of the tarsus in the foot



Condyloid joint between radius and scaphoid and lunate bones of the carpus (wrist)



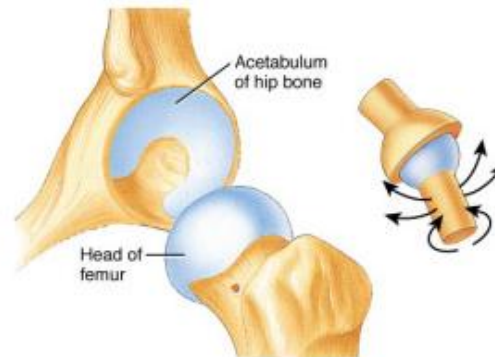
Hinge joint between trochlea of humerus and trochlear notch of ulna at the elbow



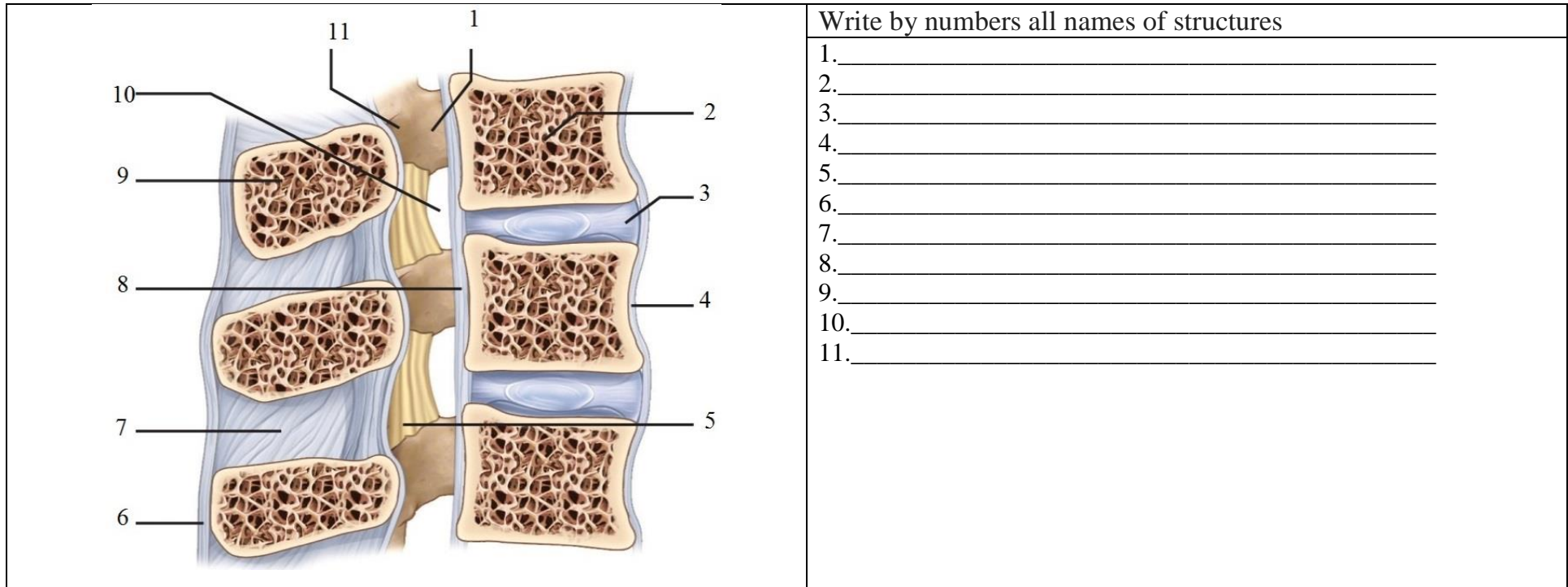
Saddle joint between trapezium of carpus (wrist) and metacarpal of thumb



Pivot joint between head of radius and radial notch of ulna



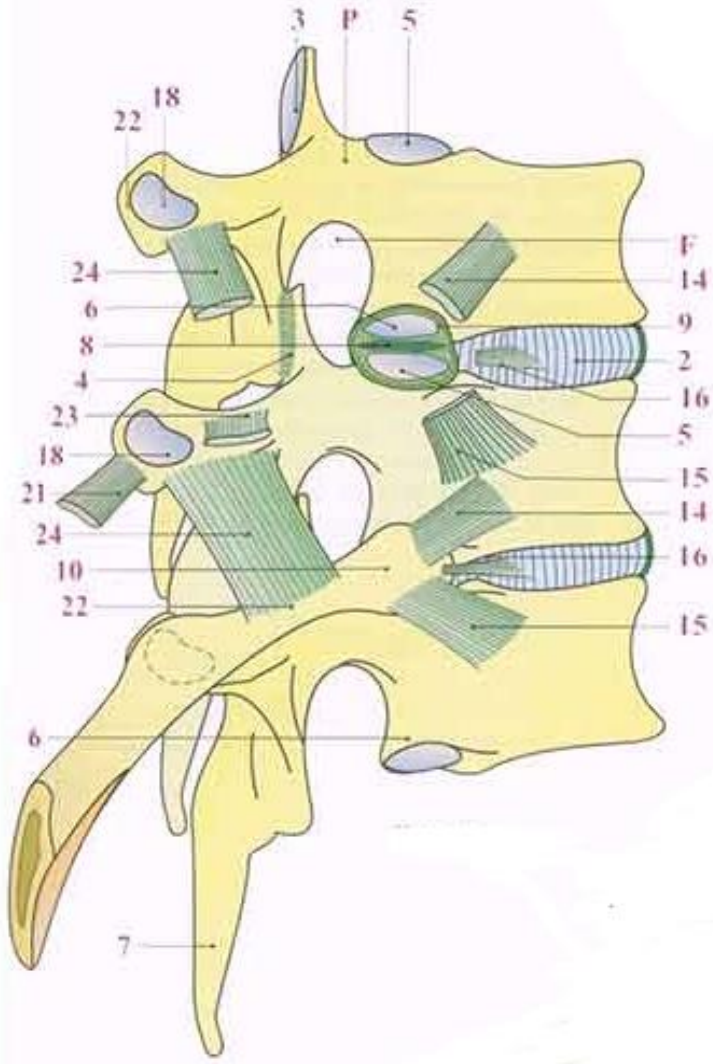
Ball-and-socket joint between head of the femur and acetabulum of the hip bone



CR!

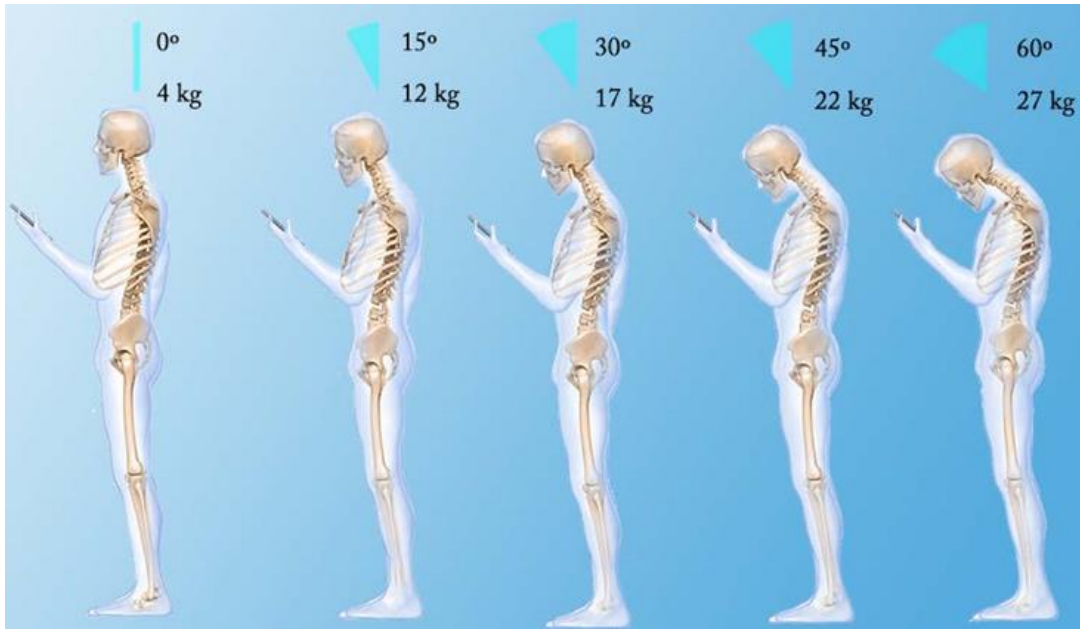
When the zygapophysial joints are injured or develop osteophytes during aging (osteoarthritis), the related spinal nerves are affected. This causes pain along the distribution pattern of the dermatomes and spasm in the muscles derived from the associated myotomes. Denervation of lumbar zygapophysial joints is a procedure that may be used for treatment of back pain caused by disease of these joints. The denervation process is directed at the articular branches of two adjacent posterior rami of the spinal nerves because each joint receives innervation from both the nerve exiting that level and the superjacent nerve.

The nucleus pulposus of the disc between L1 and L2 has herniated posteriorly through the anulus. Herniation or protrusion of the gelatinous nucleus pulposus into or through the anulus fibrosus is a well- recognized cause of low back and lower limb pain. If degeneration of the posterior longitudinal ligament and wearing of the anulus fibrosus has occurred, the nucleus pulposus may herniate into the vertebral canal and compress the spinal cord or nerve roots of spinal nerves in the cauda equina. Herniations usually occur posterolaterally, where the anulus is relatively thin and does not receive support from the ligaments.



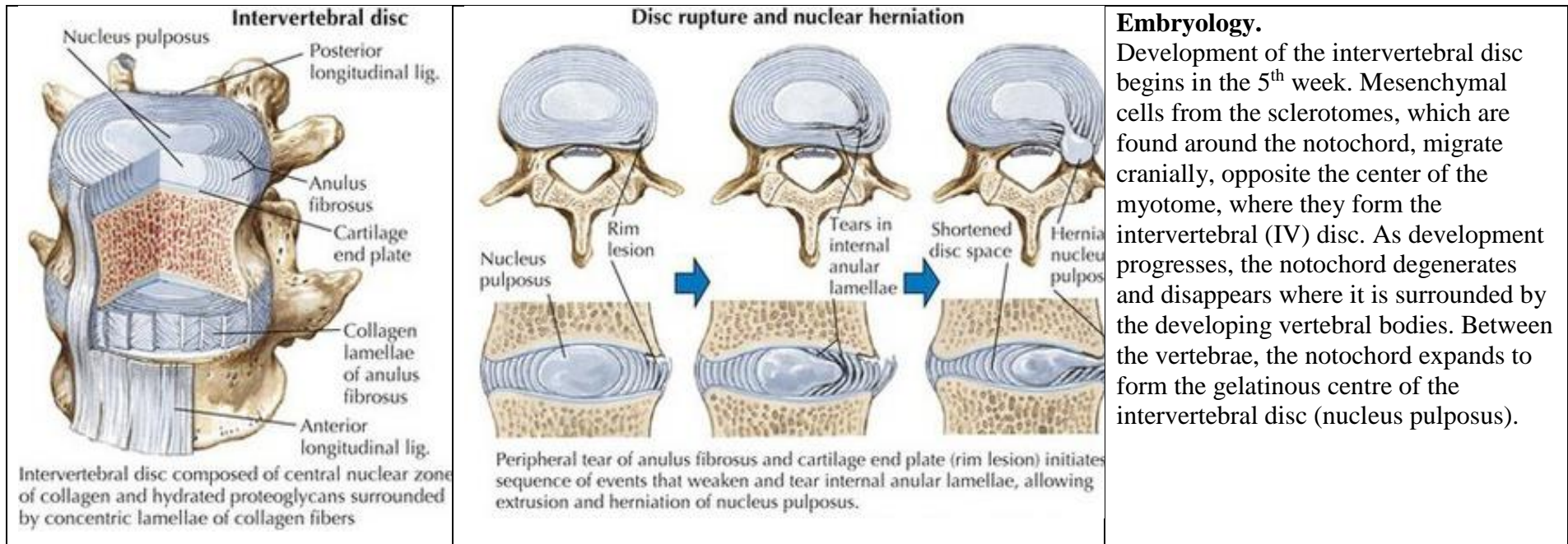
Write by numbers all names of structures.

- | | |
|-----------|-----------|
| 1. _____ | 20. _____ |
| 2. _____ | 21. _____ |
| 3. _____ | 22. _____ |
| 4. _____ | 23. _____ |
| 5. _____ | 24. _____ |
| 6. _____ | F _____ |
| 7. _____ | P _____ |
| 8. _____ | |
| 9. _____ | |
| 10. _____ | |
| 11. _____ | |
| 12. _____ | |
| 13. _____ | |
| 14. _____ | |
| 15. _____ | |
| 16. _____ | |
| 17. _____ | |
| 18. _____ | |
| 19. _____ | |



Cervical spondylosis_____

Lateral curvature_____



Questions:

1. Which of the following types of connections bones is continuous? _____
2. After a fall from a height a casualty is diagnosed a compression fracture of lumbar vertebra. The curvature of lumbar lordosis has sharply increased. Injury of what ligaments can cause such change of vertebral column curvature? _____
3. What joints are bi-axial in shape? _____
4. X-ray examination of a patient has shown a thoracic spine disk herniation. What kind of vertebrae conjugation has undergone pathological changes? _____
5. Specify the accessory elements of the joint? _____

6. The patient was observed: severe headache, stiff neck muscles, repeated vomiting, pain on percussion of the skull, increased sensitivity to light stimuli. The diagnosis – meningitis. A victim needed in lumbar puncture. Name regions are used for the punctures of the vertebral canal. _____
7. Name movements that occur around the sagittal axis. _____
8. Name movements that occur around the vertical axis. _____
9. Name movements that occur around the frontal axis. _____
10. Which of the following is an example of a pivot joint? _____
11. What joints are multi-axial in shape? _____

Topic № 18. Connections of vertebral column with the skull. Atlanto-occipital and atlanto-axial joints.

Complete the table.

Term in English	Term in Latin
Anterior atlanto-occipital membrane	
Median atlanto-axial joint	
Cruciate ligament of atlas	
Longitudinal bands	
Alar ligaments	

Questions:

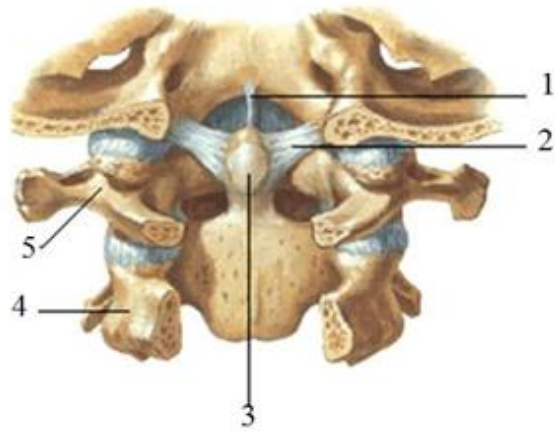
1. What movements are possible in the median atlanto-axial joint? _____
2. Specify ligament of the atlanto-axial joint. _____
3. Explain the term «sulcus»: _____
4. Explain the term «facet»: _____

	<p>Write all anatomical structures.</p> <p>Ligaments of dens of axis (anterior view).</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p>
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CR! Fractures of the cervical spine.

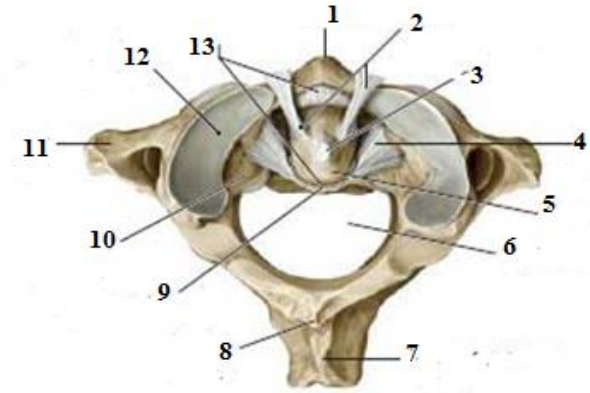
Hyperextension and hyper flexion of the head and neck. Common causes of these types of injuries are car accidents, diving in shallow waters, falls from horses, and football. If the hyperextension is severe enough, a fracture of C2 can occur. When combined with a rupture of the anterior longitudinal ligament and adjacent intervertebral disc, where the skull, C1 and C2 are separated from the rest of the spinal column, the spinal cord can be severely damaged. In these cases, the damage is usually fatal or severely catastrophic. Less severe damage can result in a range of pain and weakness symptoms that range from vague aches to loss of sensory and motor functions.

Ligaments of dens of axis (posterior view).



Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____



Ligaments of the median atlantoaxial joint, superior view. The fovea of the atlas is hidden by the joint capsule.

Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

	13. _____
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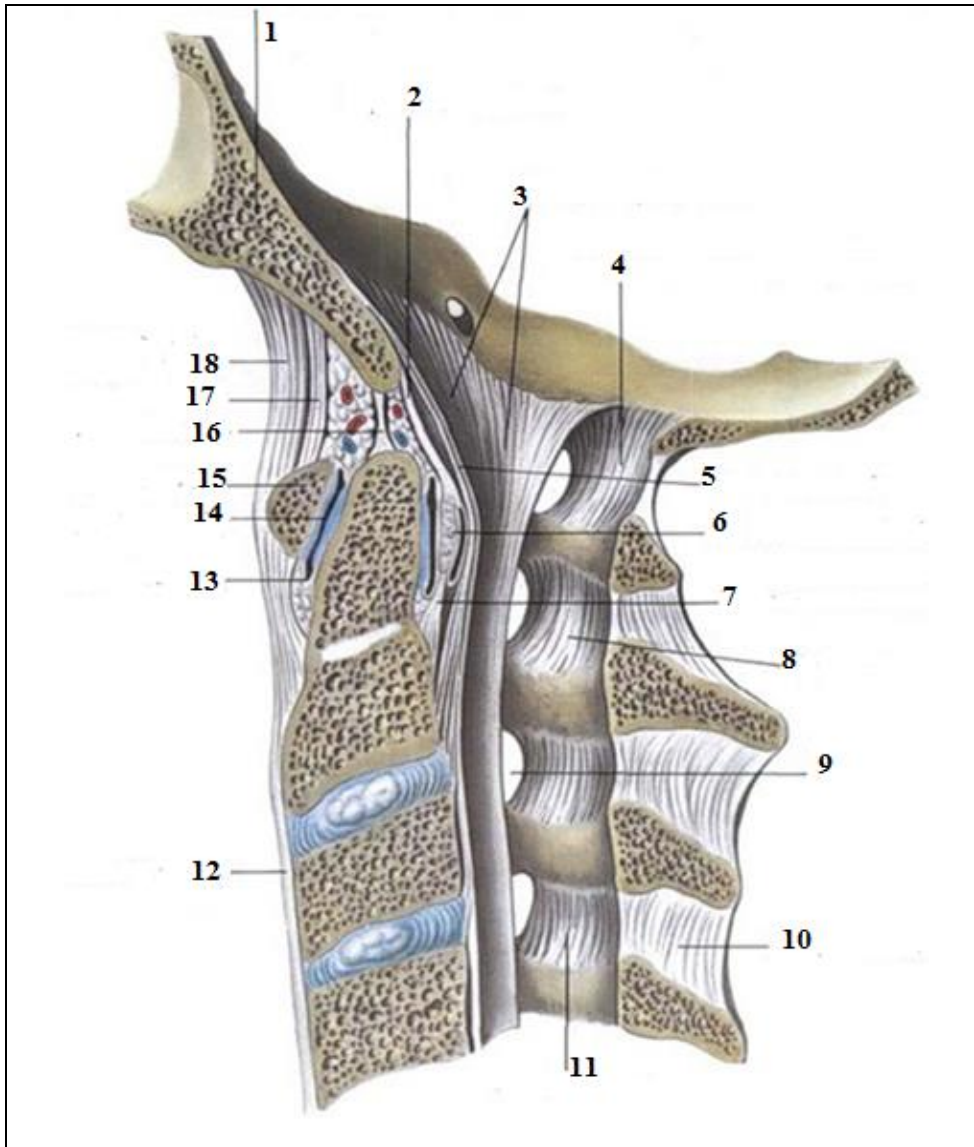
CR!

Atlantoaxial Subluxation. Change in the tautness of the transverse ligament means that the dens is not held as tightly against the anterior arch of the atlas or C1, resulting in a condition known as atlantoaxial subluxation. The transverse ligament lies between the dens and spinal cord, therefore, any increase in motion of the dens can result in compression of the spinal cord. Conditions in which there is a softening of connective tissue structures, as in 20% of people with Down syndrome, can exhibit laxity or a complete lack of the transverse ligament. This misalignment also occurs as a result of a major trauma or some types of arthritis.

Questions:

1. Because of the accident, the victim cannot nod your head (flexion and extension of the head forward and backward). What joint can be compromised? _____
 2. Write the articular surface of the atlanto-occipital joint. _____
 3. Write the articular surface of the median atlanto-axial joint. _____
 4. Because of the accident, the victim cannot nod tilt the head to the right or left. What joint can be compromised? _____
 5. Write the articular surface of the lateral atlanto-axial joint. _____
 6. How is the atlanto-occipital joint classified by shape? _____
 7. What movements are possible in the atlanto-occipital joint around the frontal axis? _____
- What type of joint is the lateral atlanto-axial joint? _____

Ligaments and joints of the cervical vertebrae and occipital bone, internal view. Sagittal-medial section through the occipital bone.



Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____

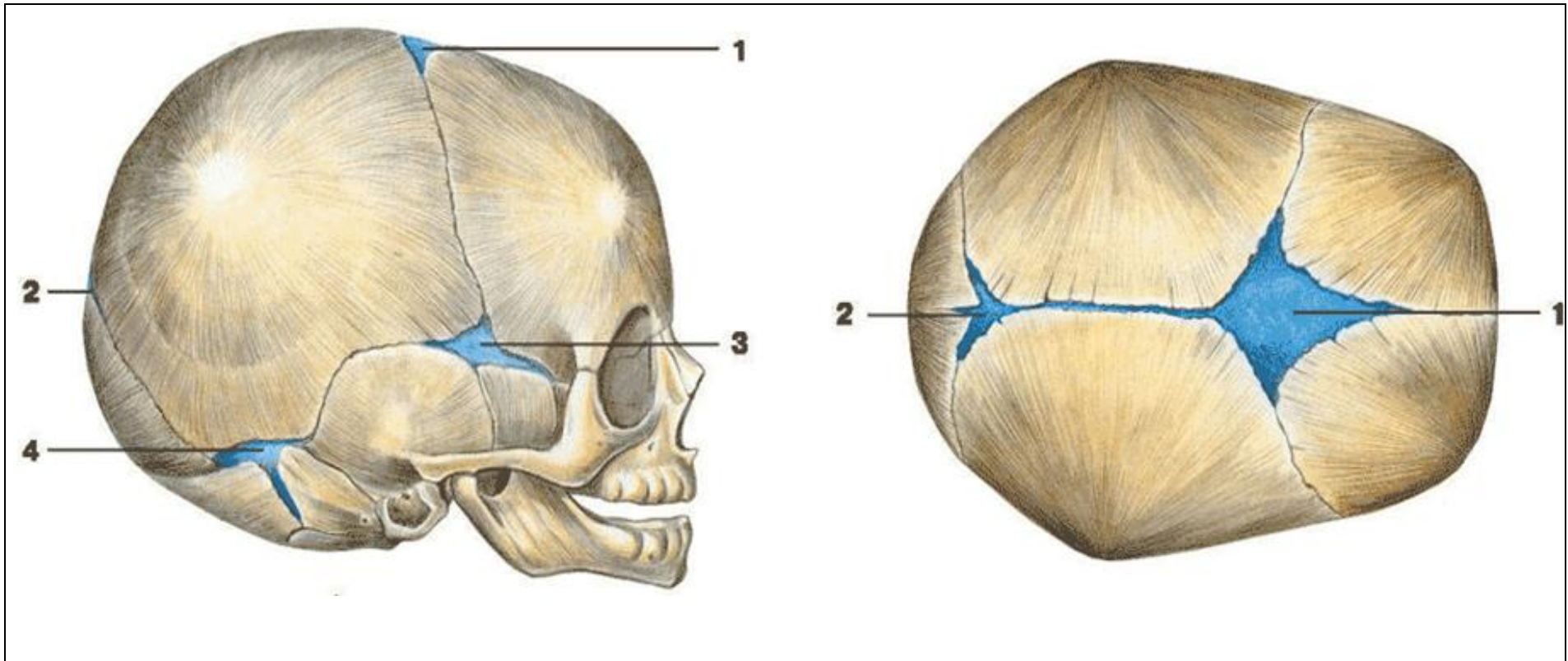
Topic 19. Connections of the bones of the skull. Temporo-mandibular joint.

Complete the table.

Term in English	Term in Latin
Plane suture	
Squamous sutura	
Temporomandibular joint	
Mandibular fossa	
Articular disc	
Styloid process	
Head of mandible	

Continuous joints of the skull	
<u>Region of the skull</u>	Type and variation of joint
<u>Roof of the skull</u>	<p>Syndesmoses.</p> <p><u>Fontanel:</u></p> <p>a) anterior</p> <p>b) posterior</p> <p>c) sphenoid</p> <p>d) mastoid</p> <p><u>Sutures:</u></p> <p>a) <u>serrate:</u></p>

	<ul style="list-style-type: none"> - <u>coronal – between parietal and frontal</u> - <u>sagittal – between parietal bones</u> - <u>lambdoid – between parietal and occipital</u> - <u>squamous – squama of the temporal bone to the parietal and sphenoid bone</u>
<u>Facial skull</u>	Syndesmoses – plane (flat, harmonious) sutures – between the facial bones
<u>Base of the skull</u>	<p>Syndesmoses:</p> <p>1. Temporary:</p> <ul style="list-style-type: none"> - sphenoccipital - anterior and posterior interoccipital <p>2. Constant:</p> <ul style="list-style-type: none"> - sphenopetrosal - petrooccipital - sphenothmoidal <p>Syndesmoses - ligaments:</p> <ul style="list-style-type: none"> - stylomandibular, lig. stilomandibularae - sphenomandibular, lig. sphenomandibulare

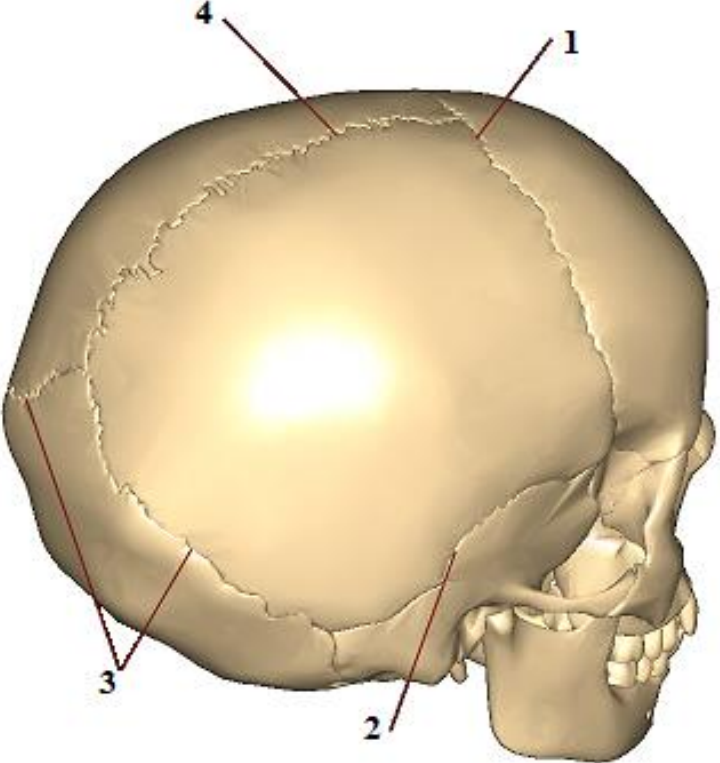


Newborn skull (fontanelles), lateral view.

- 1. _____
- 2. _____
- 3. _____
- 4. _____

Newborn skull (fontanelles), superior view.

- 1. _____
- 2. _____

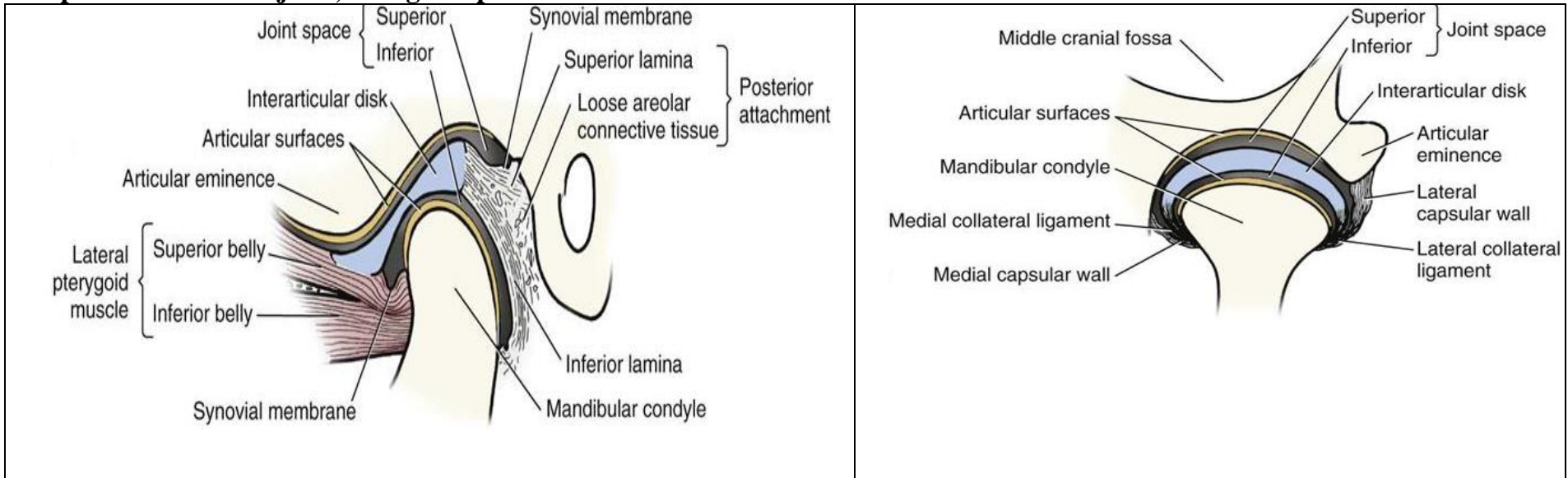
	<p>Write all anatomical structures.</p> <p>Sutures of the infant skull.</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p>
--	---

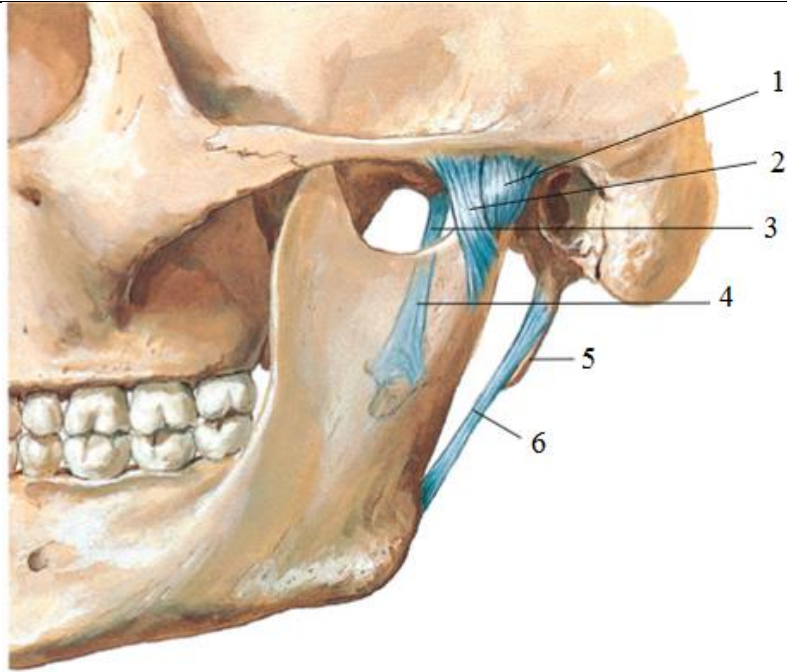
Questions:

1. The patient was admitted to the Surgery Department with a dislocation of the temporomandibular joint. The general ligament, which reinforces the temporomandibular joint, was damaged. Name this ligament. _____
2. At the victim is determined the right size separation angle of the mandible, the displacement of the fragment backward and upward. What ligament is attached to the angle of mandible? _____
3. The boxer who was hit in the area of the temporomandibular joint, diagnosed with traumatic dislocation. The displacement of which the articular surfaces will go beyond the physiological norm? _____
4. After being released from a dam in the victim marked depression of consciousness, there are many cuts on her head and neck, small wounds on his face and a fracture of the temporomandibular joint. What bones can be damaged? _____
5. Name major types of sutures. _____

6. What is located inside the temporomandibular joint? _____
7. Explain the term «neck»: _____
8. Explain the term «crest»: _____

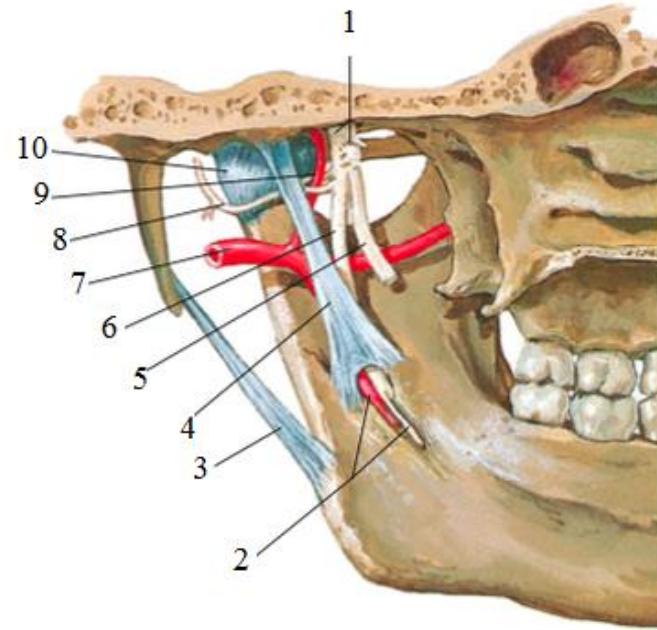
Temporo-mandibular joint, in sagittal plane.





Temporo-mandibular joint, ligaments, lateral view.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____



Temporo-mandibular joint, ligaments and vessels, medial view.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Discontinuous joints of the skull				
Joint	Articular surfaces	Type of joint	Axes of rotation	Movement on joint
Temporomandibular joint, <i>art. temporomandibularis</i>	Mandibular fossa of temporal bone and head of mandible (joint contains an articular disc)	Ellipsoidal, biaxial, combination	Frontal and vertical	Depression and elevation of mandible, its protraction and retraction

Questions:

1. The patient was admitted to the Surgery Department with a dislocation of the temporomandibular joint. The general ligament, which reinforces the temporomandibular joint, was damaged. Name this ligament. _____
2. To reposition the lower jaw dislocation to take it down. What anatomical structure determines such action? _____
3. Because of the accident, the victim cannot nod your head (flexion and extension of the head forward and backward). What joint can be compromised? _____
4. Explain why fibrous articulations are present in the region of the calvaria, where as on the base of the skull synchondroses prevail?

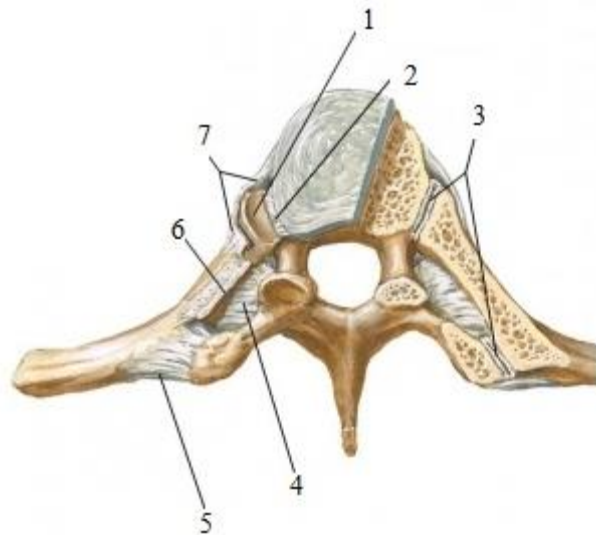
5. Because of the accident, the victim cannot nod tilt the head to the right or left. What joint can be compromised? _____
6. Name the articular surfaces of the atlanto-occipital joint. _____
7. What movements are possible in the temporomandibular joint around the frontal axis? _____
8. At the victim is determined the right size separation angle of the mandible, the displacement of the fragment backward and upward. What ligament is attached to the angle of mandible? _____
9. The boxer who was hit in the area of the temporomandibular joint, diagnosed with traumatic dislocation. The displacement of which the articular surfaces will go beyond the physiological norm? _____
10. After being released from a dam in the victim marked depression of consciousness, there are many cuts on her head and neck, small wounds on his face and a fracture of the temporomandibular joint. What bones can be damaged? _____
11. To reposition the lower jaw dislocation to take it down. What anatomical structure determines such action? _____
12. At the victim is determined the right size separation branch of the mandible, the displacement of the fragment backward and upward. What ligament is attached to the lingula of mandible? _____
13. What movements are possible in the temporomandibular joint around the frontal axis? _____

14. At the victim is determined the right size separation branch of the mandible, the displacement of the fragment backward and upward. What ligament is attached to the neck of mandible? _____

Topic: 20. Connections between ribs and vertebral column, ribs and sternum. Thorax. Connections of the bones of the girdle of upper extremity.

Complete the table.

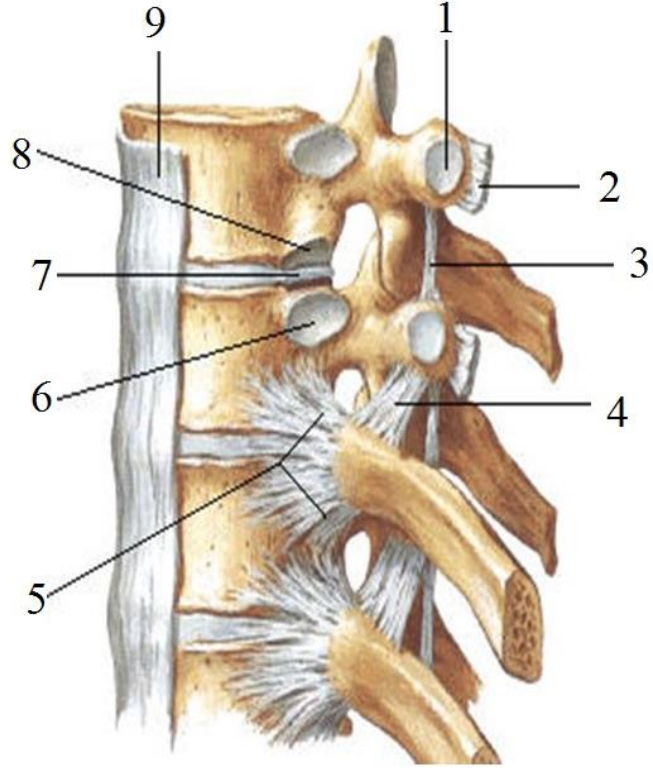
Term in English	Term in Latin
The sternoclavicular joint	
Costoclavicular ligament	
Interclavicular ligament	
Interchondral articulations	



Write all anatomical structures.

Ligaments of the vertebral column and ribs (on the right side of the transverse cut).

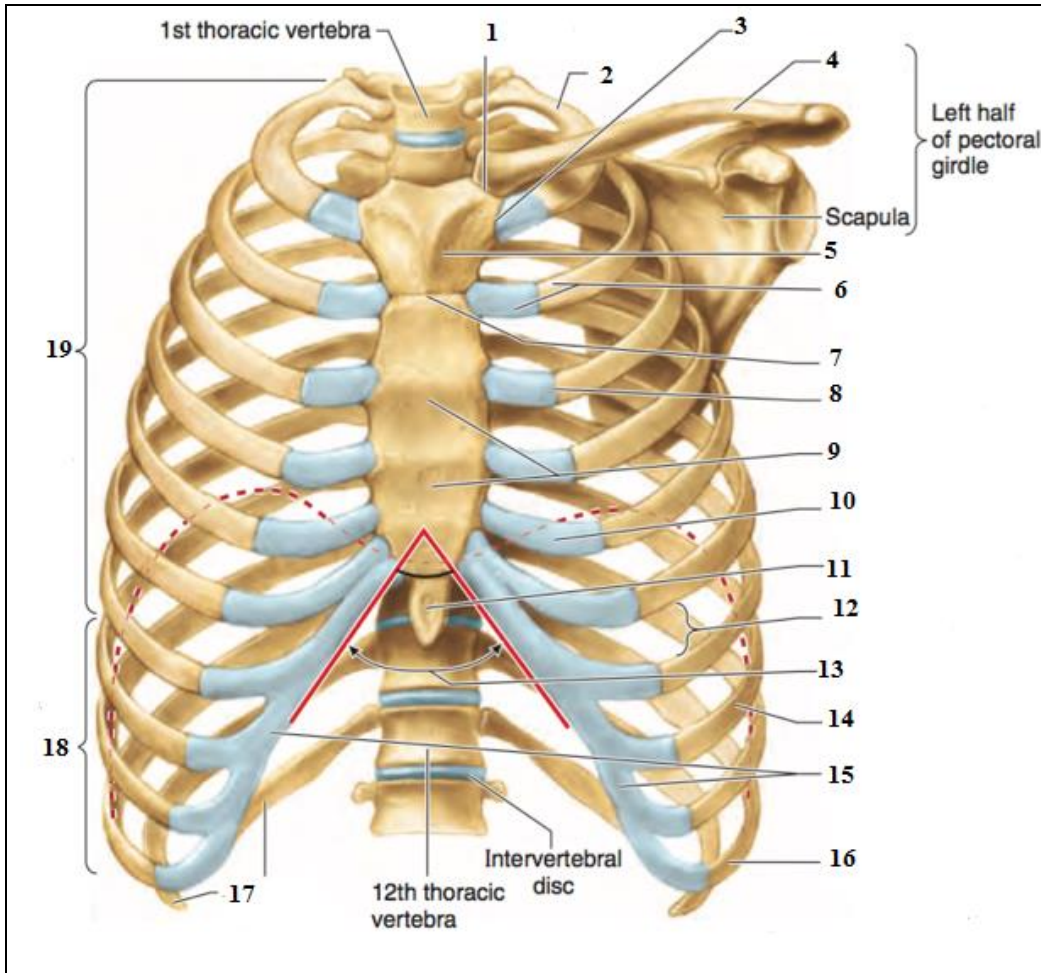
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

	<p>Write all anatomical structures. Ligaments of the vertebral column and ribs.</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p>
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CR!

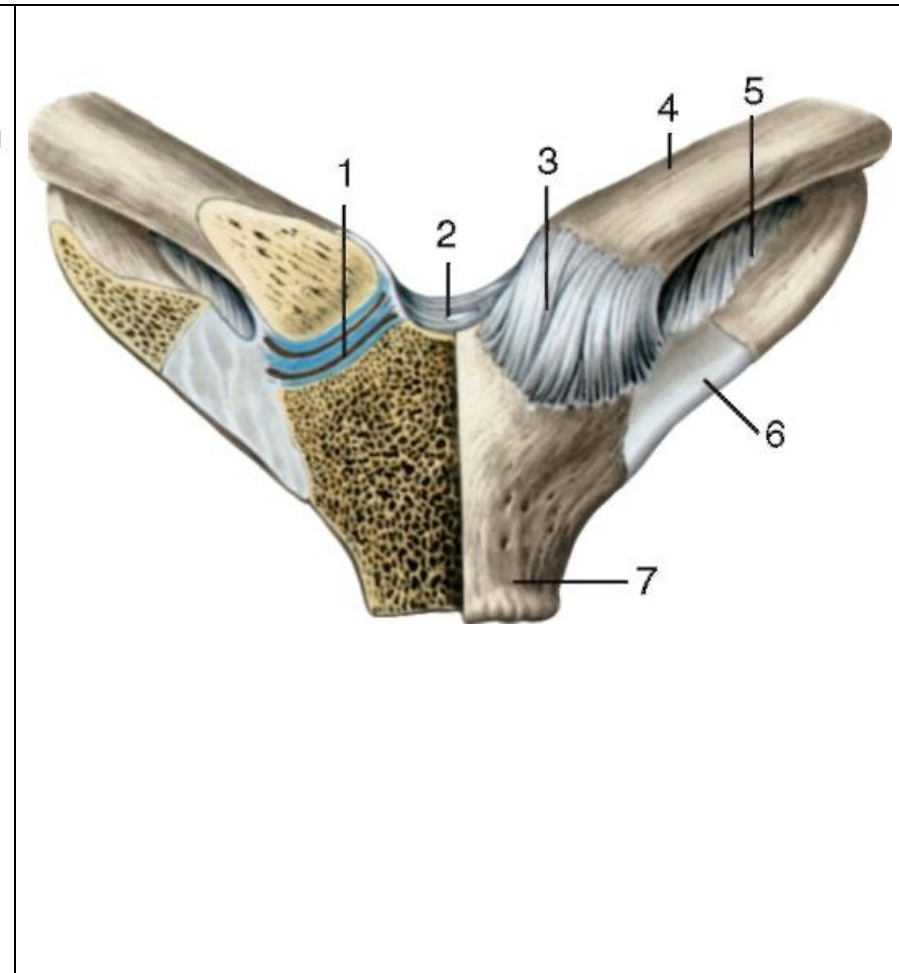
Dislocation of the sternoclavicular joint.

It is rare because the sterno-clavicular (SC) joint is highly strong. However, dislocation of this joint in people below 25 years of age may result from fractures through the epiphyseal plate because epiphysis at the sternal end of clavicle does not unite until 23-25 years. The medial end is normally dislocated anteriorly. Backward dislocation is avoided by the costoclavicular ligament.



Thoracic cage.

1. _____
2. _____
3. _____
4. _____



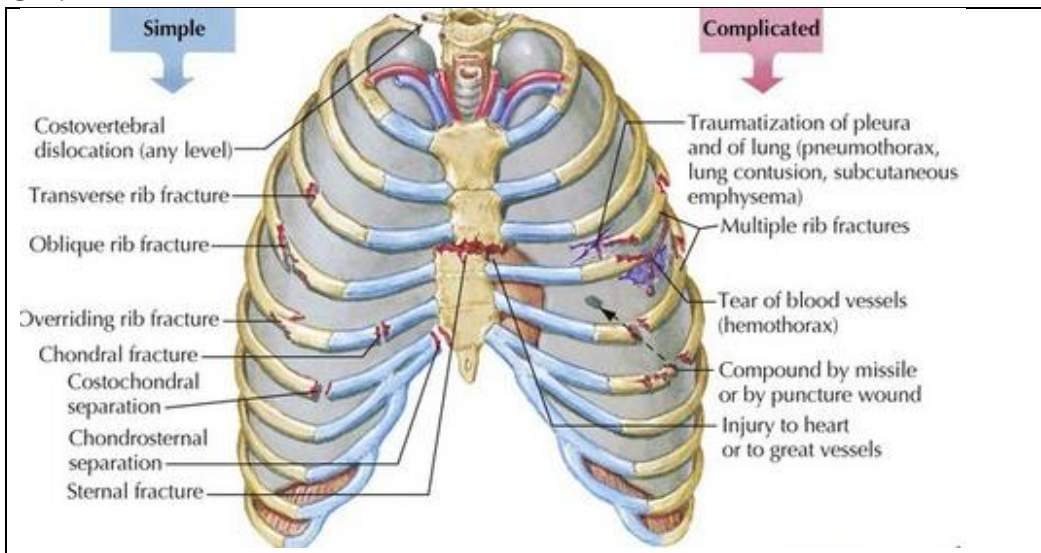
Sterno-clavicular joint, anterior view. The right joint is opened by a frontal incision.

1. _____
2. _____
3. _____
4. _____

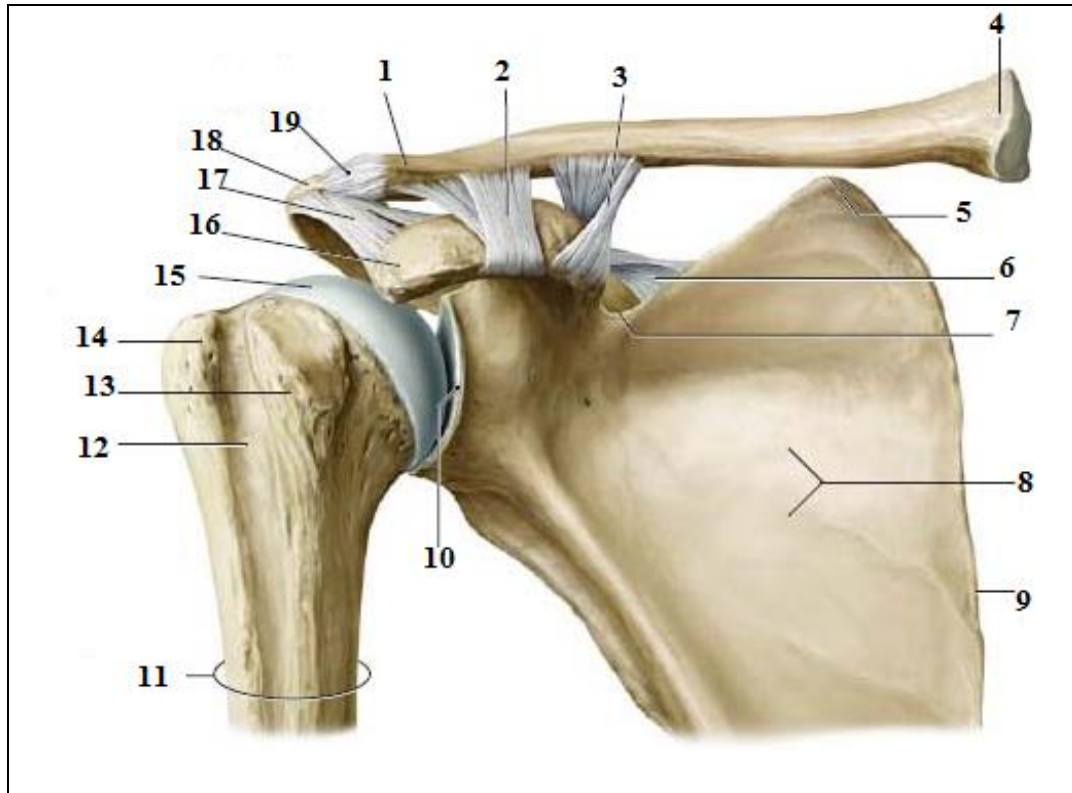
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____

5. _____
6. _____
7. _____

CR!



The thoracic cage injuries usually result from trauma and often involve rib fractures (ribs 1 and 2 and 11, 12 are more protected and often escape being fractured), crush injuries with rib fractures, and penetrating chest wounds such as gunshot and stab wounds. The pain caused by rib fractures can be intense because of the expansion and contraction of the rib cage during respiration, sometimes requiring palliation by anesthetizing the intercostal nerve (nerve block).



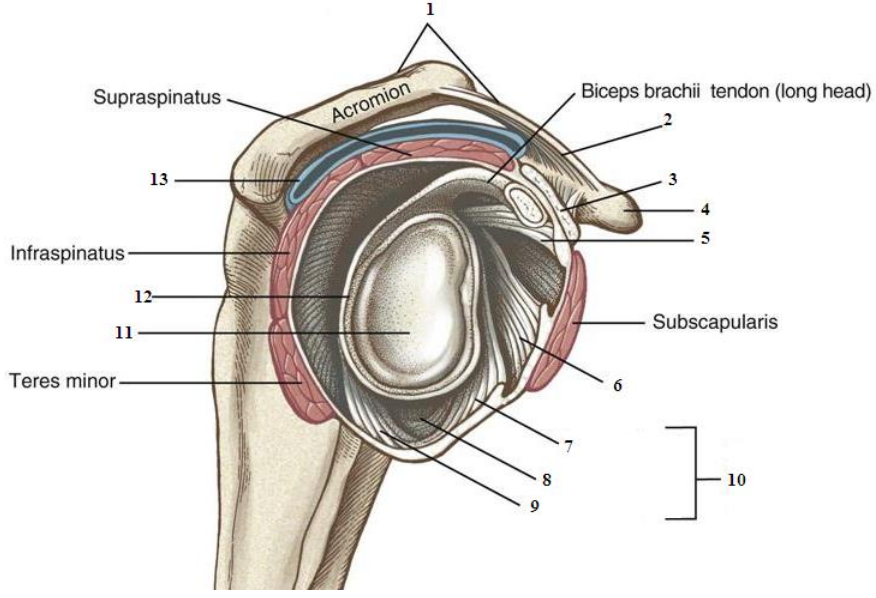
Right acromioclavicular joint.

Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____

1. Patient admitted to hospital with an injury of the vertebral column at the level vertebrae that have one full facet for connecting with the corresponding ribs. In addition, they do not have the rib facets on the transverse processes. Name level of the damage: _____
2. According Re-program the patient identified cracks of the ribs, which belong to false ribs. Determine the level of damage: _____
3. Patient admitted to hospital with an injury of the vertebral column at the level vertebrae that has a single semi-facet on the upper border of its body for connecting with the corresponding rib. Name level of the damage? _____
4. The patient went to a doctor about the blunt chest trauma. On examination, defined rib fracture, which corresponds to the lower angle of the scapula. What is this rib? _____
5. Patient admitted to hospital with an injury of the vertebral column at the level vertebrae that has one full facet for connecting with the corresponding rib on its upper border. In addition, it has a semi-facet for the articulation with the corresponding rib on its lower border. Name level of the damage. _____
6. According Re-program the patient identified cracks of the ribs, which belong to floating ribs. Determine the level of damage: _____

7. What joints form the costovertebral articulations? _____
8. What is the classification of the acromioclavicular joint according to their movements? _____
9. Patient admitted to hospital with an injury of the vertebral column at the level vertebrae that have one full facet for connecting with the corresponding ribs. In addition, they do not have the rib facets on the transverse processes. Name level of the damage. _____
10. According Re-program the patient identified cracks of the ribs, which belong to true ribs. Determine the level of damage: _____
11. What are the boundaries of thoracic inlet? _____
12. According Re-program the patient identified cracks of the ribs, which belong to floating ribs. Determine the level of damage: _____

	<p>The right shoulder and acromioclavicular joints. Write all anatomical structures.</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____ 13. _____
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Topic 21. Shoulder joint, elbow joint. Connections of the bones of forearm and hand.

Complete the table.

Term in English	Term in Latin
The shoulder joint	
Coracohumeral ligament	

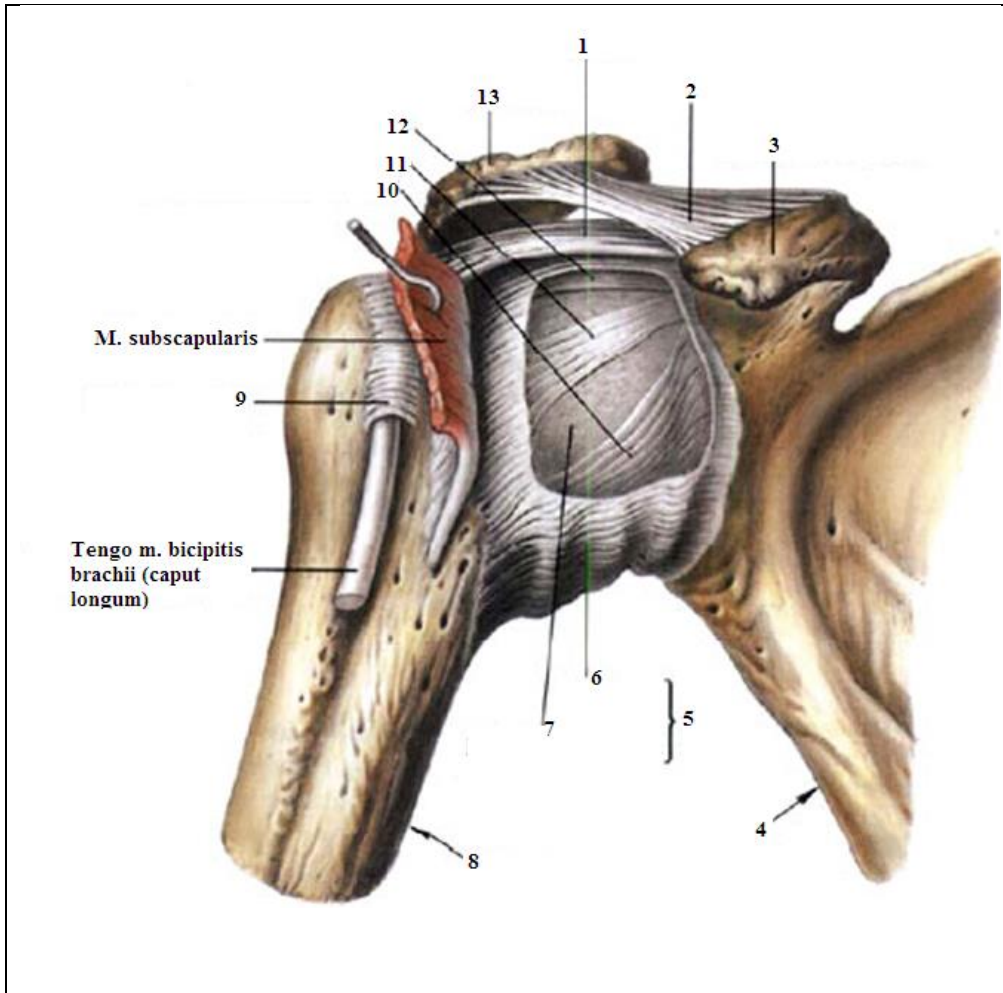
	Sulcus intertubercular
	Vagina tendinis intertubercularis
	circumductio
	Articulation cubiti
	Articulation humeroradialis
	Articulation radiocarpalis
	Articulation mediocarpalis
	Opposition
abduction	
The metacarpophalangeal joints	

CR! Most dislocations of the humeral head occur in the downward (inferior) direction but are described clinically as anterior or (more rarely) posterior dislocations, indicating whether the humeral head has descended anterior or posterior to the infraglenoid tubercle and the long head of triceps. Anterior dislocation of the glenohumeral joint occurs most often in young adults, particularly athletes. It is usually caused by excessive extension and lateral rotation of the humerus.

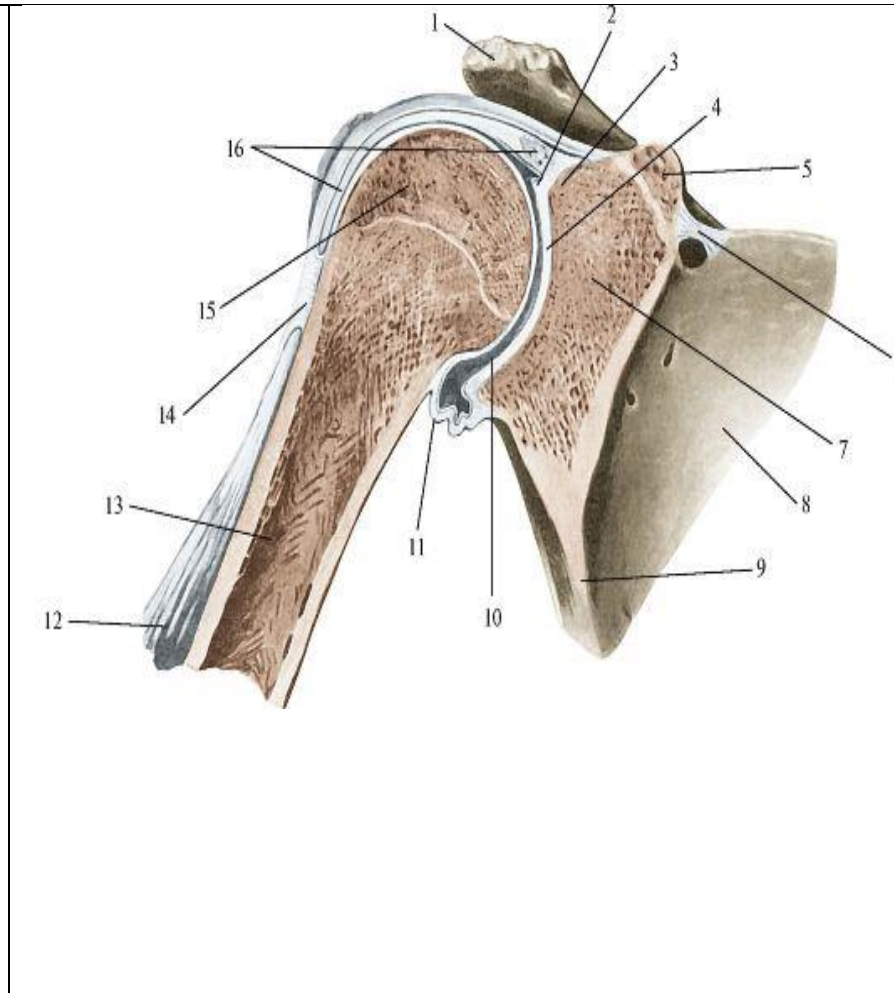
CR! Subacromial bursitis.

Inflammation and calcification of the subacromial bursa result in pain, tenderness, and limitation of movement of the glenohumeral joint. Deposition of calcium in the supraspinatus tendon may irritate the overlying subacromial bursa, producing an inflammatory reaction.

Write all anatomical structures.



The right joint, anterior view.



The right shoulder joint, coronal section.

1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____
6. _____	6. _____
7. _____	7. _____
8. _____	8. _____
9. _____	9. _____
10. _____	10. _____
11. _____	11. _____
12. _____	12. _____
13. _____	13. _____
	14. _____
	15. _____
	16. _____

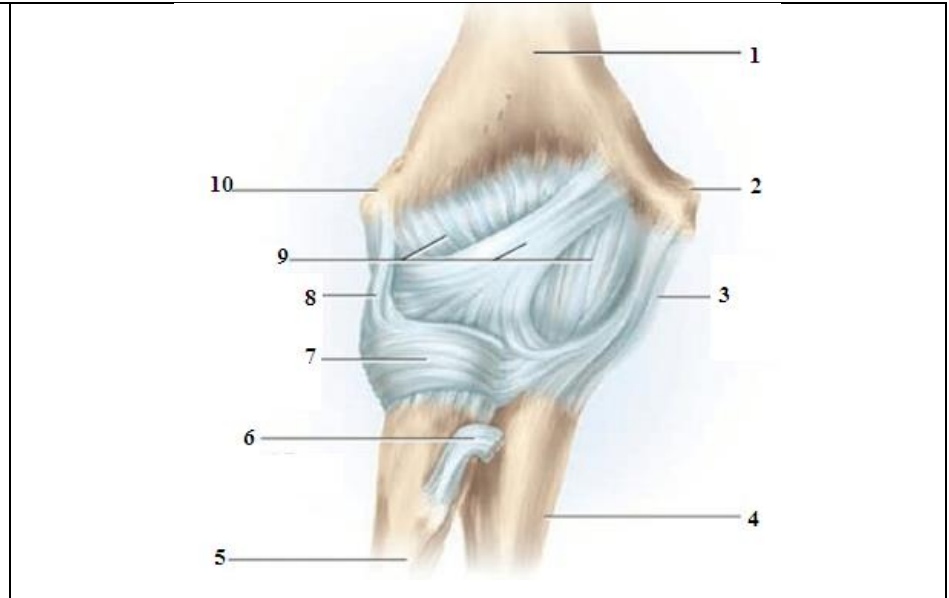
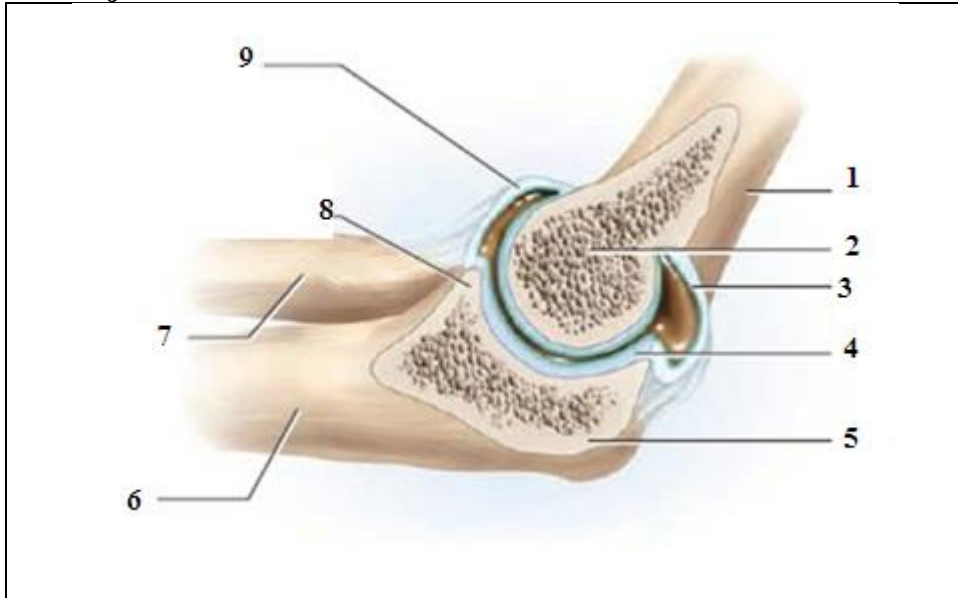
Questions:

1. Name the articular surfaces of the shoulder joint. _____
 2. Translate into Greek the term «clavicle»: _____
 3. Name the articular surfaces of the humeroradial joint. _____
 4. Translate into Greek the term «shoulder»: _____
 5. What is the shape of the carpometacarpal joint? _____
 6. Translate into Greek the term «vertebra»: _____
 7. What is the shape of the shoulder joint? _____
 8. Name the ligaments of the radiocarpal joint. _____
-
9. Name the ligaments of the elbow joint. _____
-
10. Name the articular surfaces of the proximal radio-ulnar joint. _____

11. Explain the term «line»: _____

Explain the term «fossa»: _____

Elbow joint. Write all anatomical structures.



Elbow joint, sagittal section.

Elbow joint, anterior section.

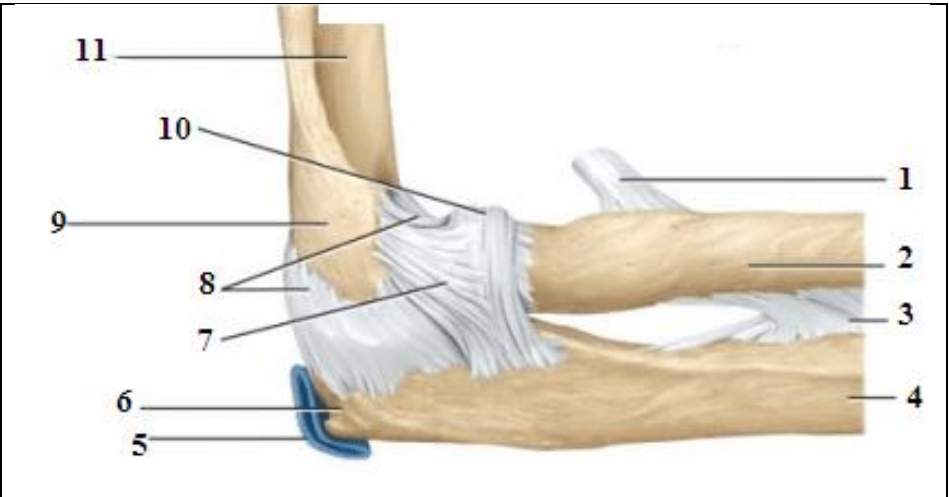
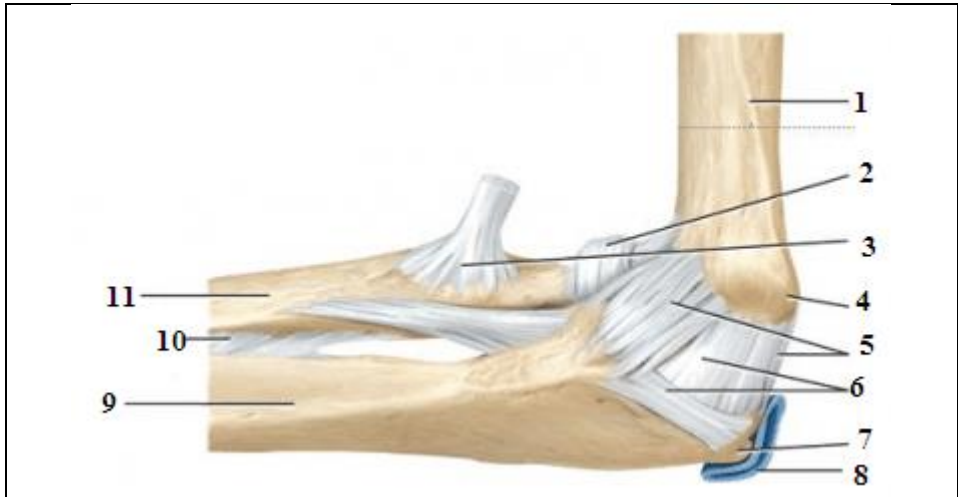
- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____
- 9. _____

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

--

6.	_____
7.	_____
8.	_____
9.	_____
10.	_____

Write all anatomical structures.



Elbow joint, medial aspect.

1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____

Elbow joint, lateral aspect.

1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____

7. _____	7. _____
8. _____	8. _____
9. _____	9. _____
10. _____	10. _____
11. _____	11. _____

CR!

Skier's thumb.

Refers to the rupture or chronic laxity of the collateral ligament of the 1st metacarpophalangeal joint. The injury results from hyperextension of the joint, which occurs when the thumb is held by the ski pole while the rest of the hand hits the ground or enters the snow.

CR! Elbow joint.

A common childhood injury is subluxation and dislocation of the head of the radius after traction on a pronated forearm (e.g., when lifting a child onto a bus). The sudden pulling of the upper limb tears or stretches the distal attachment of the less tapering anular ligament of a child. The radial head then moves distally, partially out of the anular ligament. The proximal part of the torn ligament may become trapped between the head of the radius and the capitulum of the humerus. The source of pain is the pinched anular ligament.

Questions.

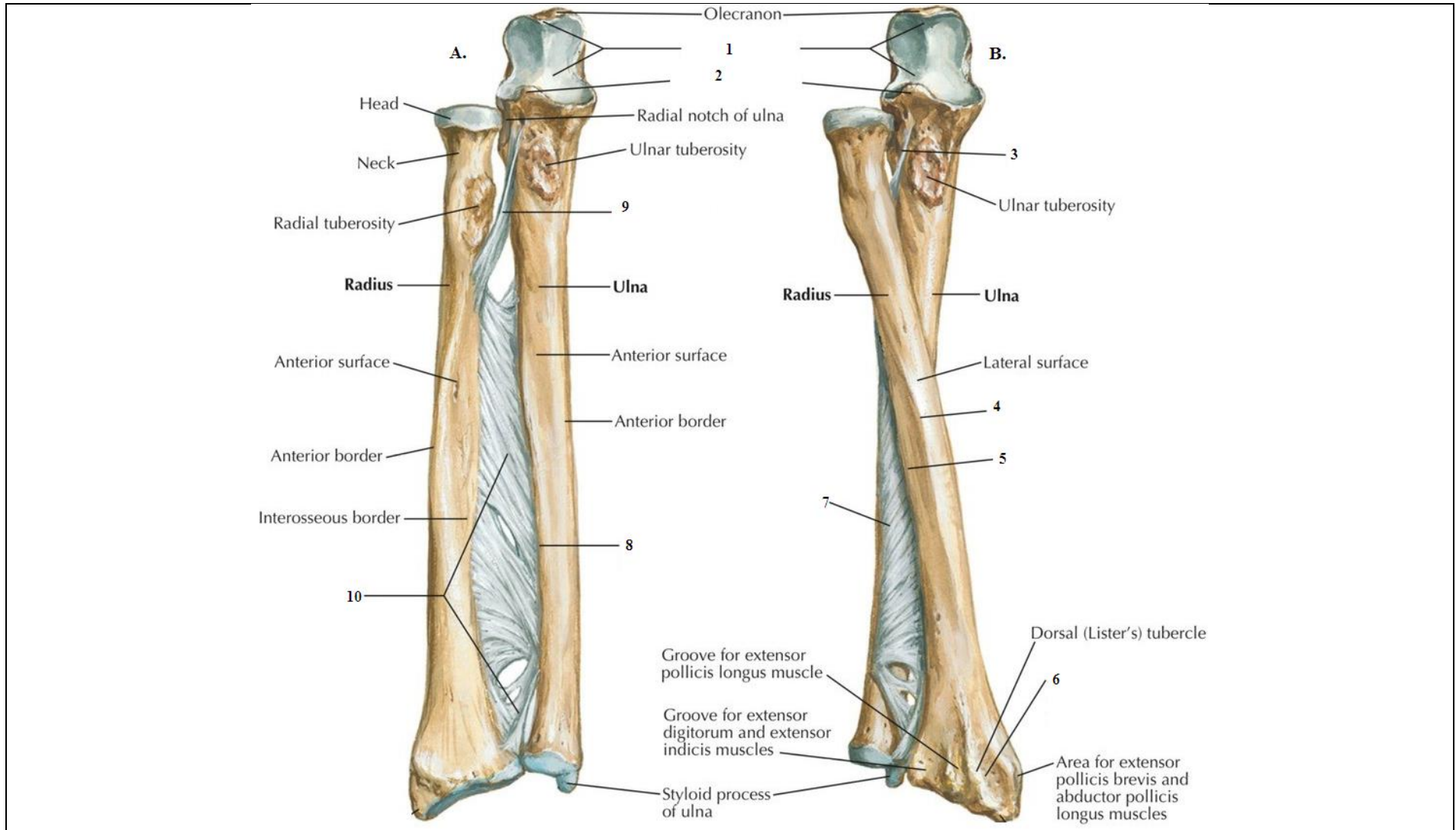
1. What extensions of the synovial membrane are formed in the shoulder joint? What is their clinical significance? _____

2. Name the articular surface of the shoulder joint.? _____

3. Name the articular surface of the humero-ulnar joint. _____

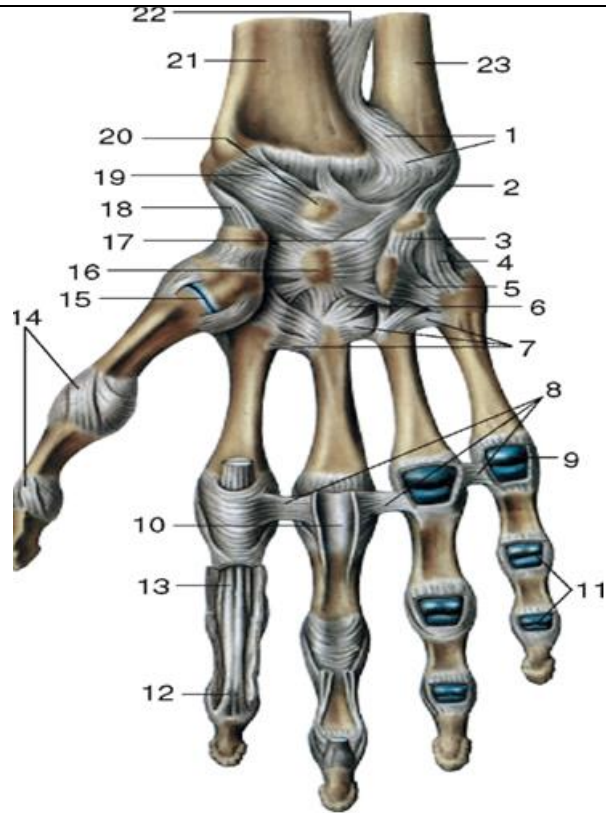
4. Name the articular surface of the distal radio-ulnar joint. _____

Write all anatomical structures.

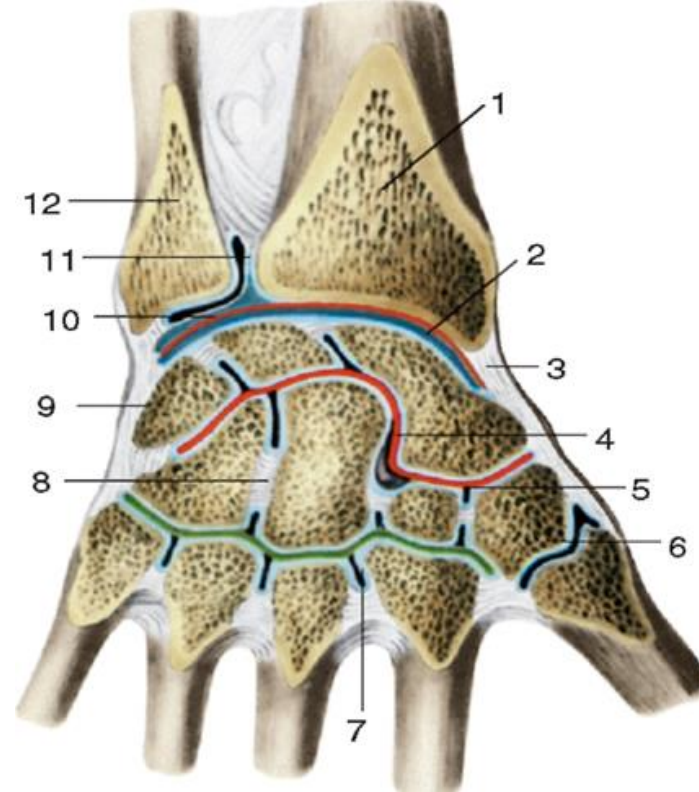


A. Right radius and ulna in supination, anterior view. B. Right radius and ulna in pronation, anterior view.

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |



The ligaments of the right wrist, dorsal surface
Write all anatomical structures.



The joints and ligaments of the right hand (section).
Write all anatomical structures.

1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____
11.	_____
12.	_____
13.	_____
14.	_____
15.	_____

1.	_____
2.	_____
3.	_____
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6.	_____
7.	_____
8.	_____
9.	_____
10.	_____
11.	_____
12.	_____

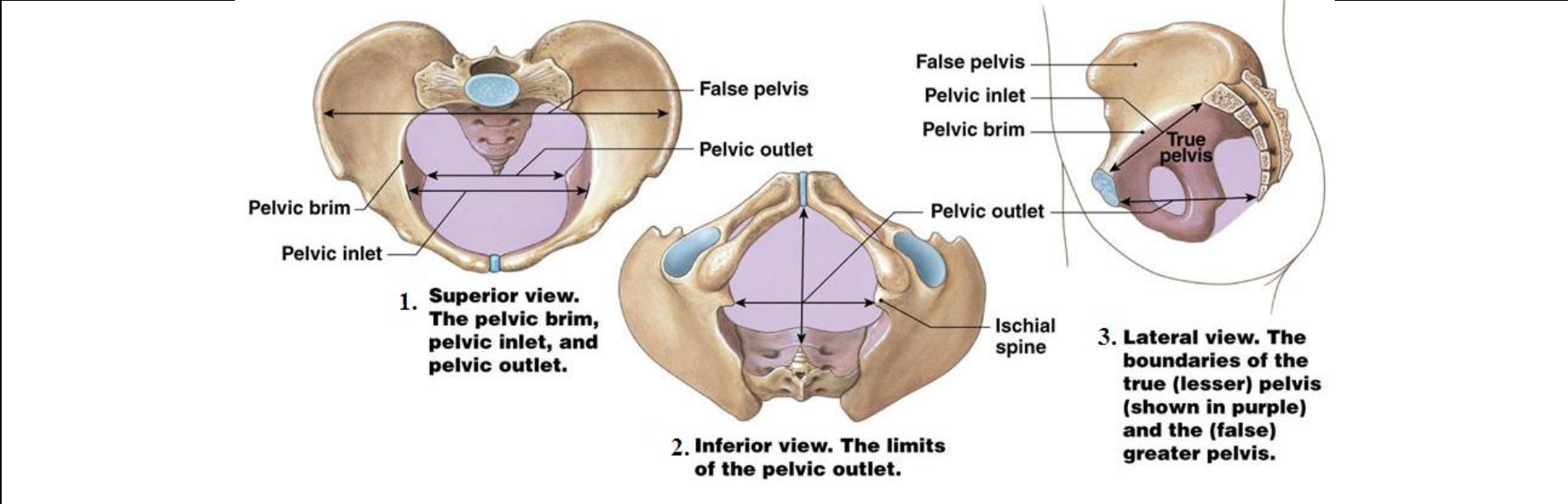
16. _____	
17. _____	
18. _____	
19. _____	
20. _____	
21. _____	
22. _____	
23. _____	

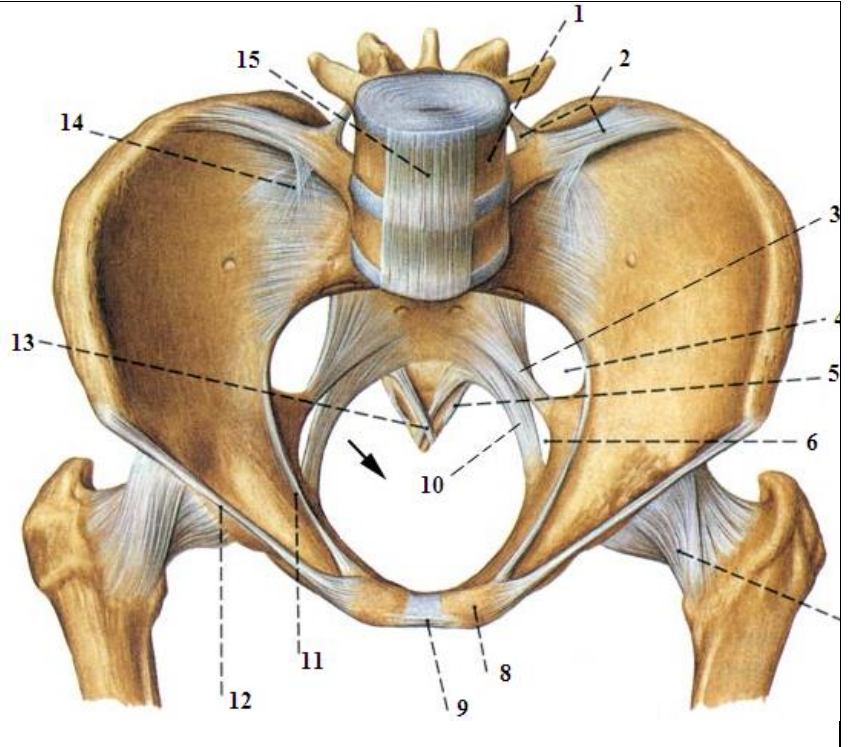
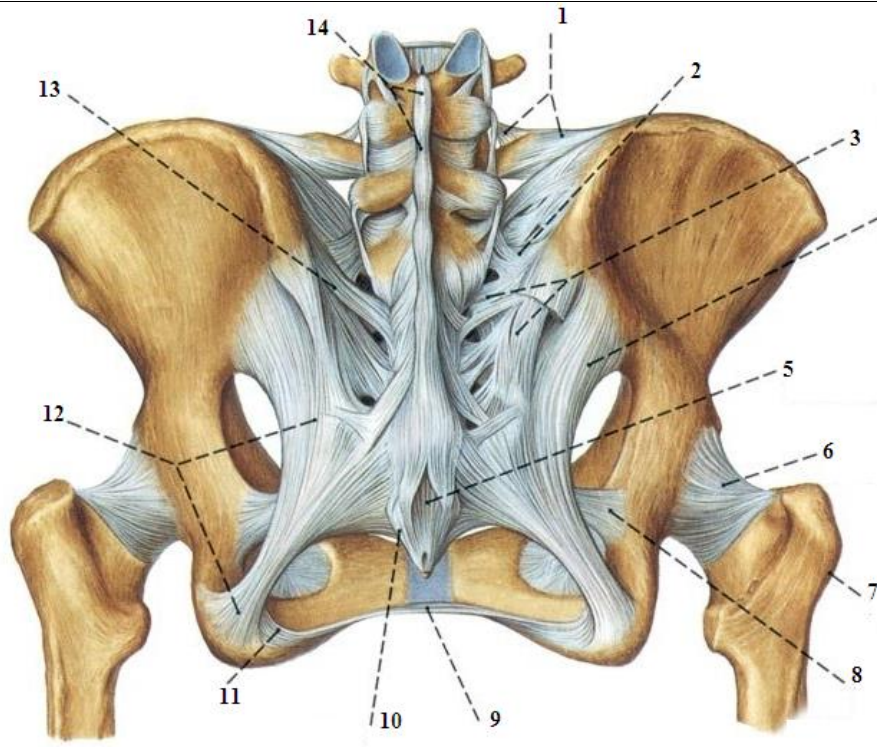
Topic 22. Connections of the bones of pelvic girdle. Pelvis as a whole. Hip joint.

Complete the table.

Term in English	Term in Latin
The sacro-iliac joint	
	Ligg. Sacroiliaca ventralia
	Lig. Arcuatum pubis
	Linea terminalis
	Linea arcuata
	Apertura pelvis superior
Acetabular labrum	
Iliofemoral ligament	

Pelvic openings.



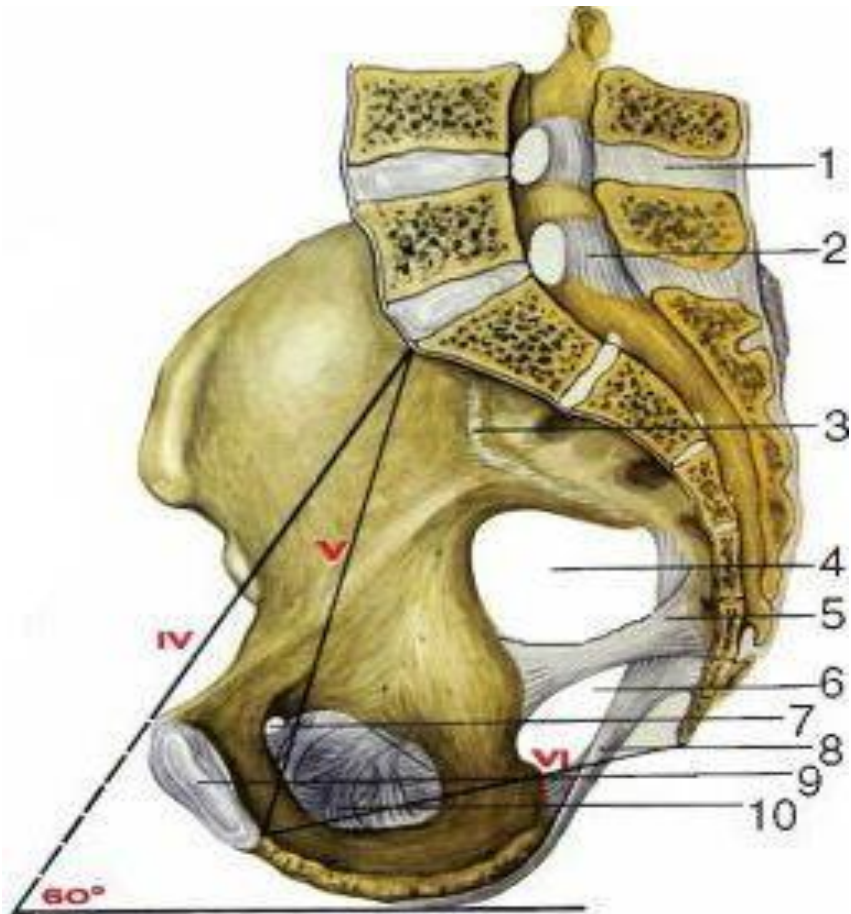


Pelvis and ligaments, rear view.
Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____

Pelvis and ligaments, front view from above.
Write all anatomical structure.

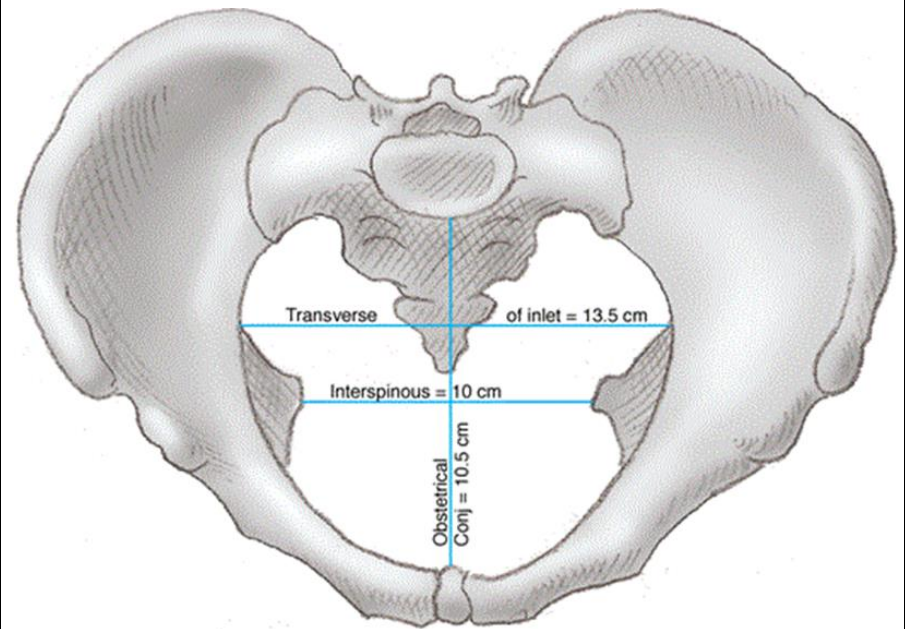
1. _____
2. _____
3. _____



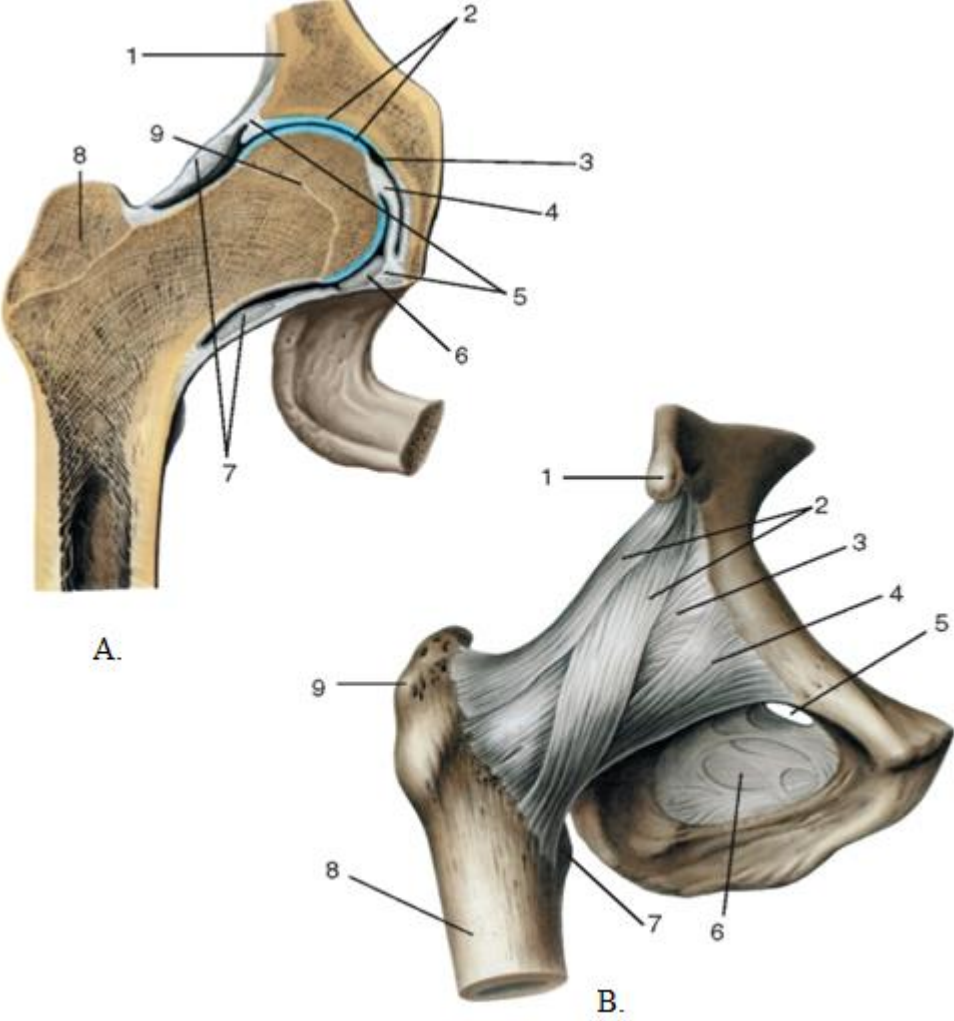
Female pelvis size lines.

Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____



Coxal Articulation (Hip joint).



- A.**
1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____

- B.**
1. _____
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____

CR!

Shenton's line. In a radiograph of the hip region, the Shenton's line is represented by a constant curved line created by the upper border of the obturator foramen and lower margin of the neck of the femur. This curve is interrupted in fractured neck of the femur or dislocation of the hip joint.

Schoemaker's line. It's a straight line that goes from the tip of the higher trochanter to the anterior superior iliac spine and proceeds upward over the anterior abdominal wall to reach the umbilicus. If greater trochanter is elevated (example, fracture of the neck of femur) this line enters below the umbilicus.

Perthes' disease (pseudocoxalgia).

It's a clinical condition characterized by destruction and flattening of the head of femur with a greater joint space in the radiograph.

Coxa vara and coxa valga.

The normal neck-shaft angle is about 120° in adults and 160° in kids. If the neck shaft angle of the femur is reduced (example, fracture neck of femur, Perthes disease), it's termed coxa vara. If the angle is raised (example, congenital dislocation of the hip joint), it's referred to as coxa valga.

This might come from Perthes disease, softening the neck because of rickets.

Dislocation of the hip joint.

The congenital dislocation of the hip joint is much more common than every other joint within the body. It happens because of two reasons: the joint capsule is loose at birth. Hypoplasia of the acetabulum and femoral head: in this state, the head of femur slips upward into the gluteal region since the upper margin of the acetabulum is developmentally deficient.

Questions:

1. A gynecologist dimensioned the pelvis of a 29-year-old pregnant woman. The distance between two anterior superior iliac spines was measured with the help of a pelvimeter. What size of the large pelvis was dimensioned? _____
2. Name the dimensions of the lesser pelvis (in women). _____
3. A doctor defined sizes of the pelvis of the pregnant woman. He measured the distance between two superior anterior iliac spines. What size of the pelvis was defined? _____
4. Name the intraarticular ligaments of the hip joint. _____
5. A doctor defined sizes of the pelvis of the pregnant woman. He measured the distance between two iliac crests. What size of the pelvis was defined? _____
6. A gynecologist dimensioned the pelvis of a 18-year-old pregnant woman. The distance from the promontory to the upper point of the pubic symphysis was measured. What size of the lesser pelvis was dimensioned? _____
7. Attachment of the pubofemoral ligament. _____
8. A gynecologist dimensioned the pelvis of a 25-year-old pregnant woman. The distance between the iliac crests was measured with the help of a pelvimeter. What size of the large pelvis was dimensioned? _____
9. Attachment of the iliofemoral ligament. _____

10. Name the articular surfaces of the sacro-iliac joint. _____
11. A gynecologist dimensioned the pelvis of a 20-year-old pregnant woman. The distance between the greater trochanters of the femurs was measured with the help of a pelvimeter. What size of the large pelvis was dimensioned? _____
12. Name the ligaments, which reinforce the sacro-iliac joint. _____
13. A gynecologist dimensioned the pelvis of a 19-year-old pregnant woman. The distance from the promontory to the most protruding point on the posterior surface of the pubis symphysis was measured. What size of the lesser pelvis was dimensioned? _____
14. Origin of the iliofemoral ligament _____
15. Attachment of the pubofemoral ligament. _____

Topic 23. Knee-joint. Connections of the bones of foreleg (shin) and foot.

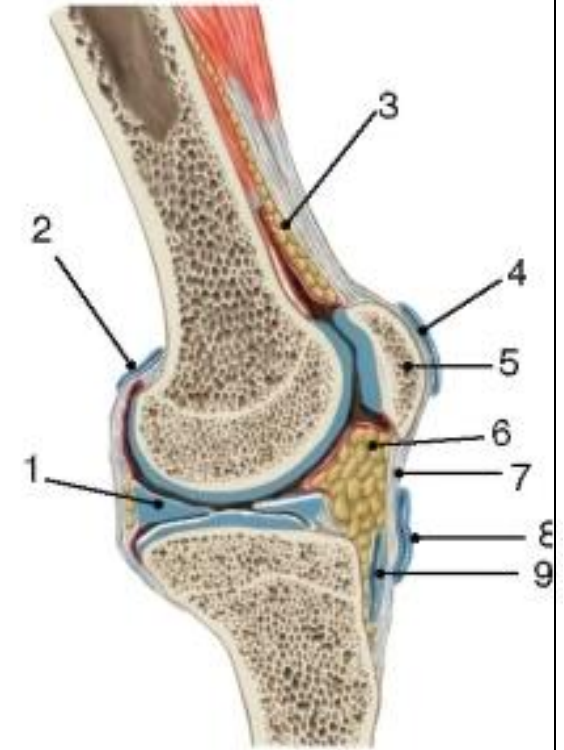
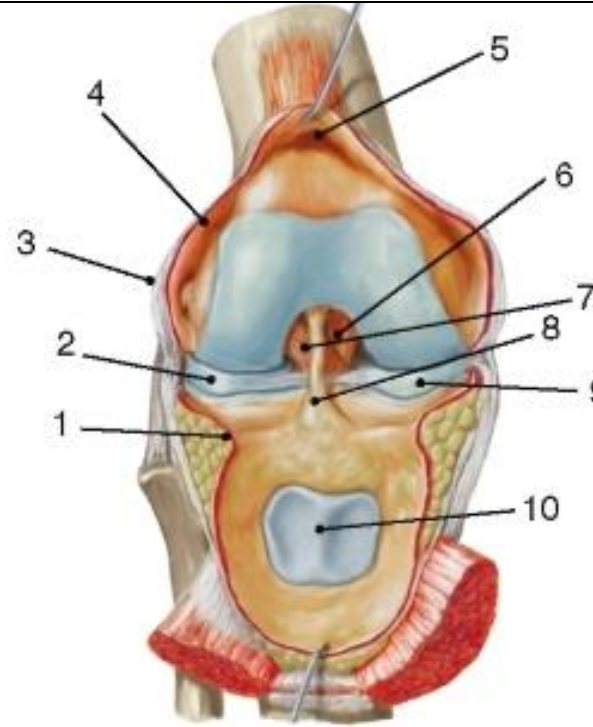
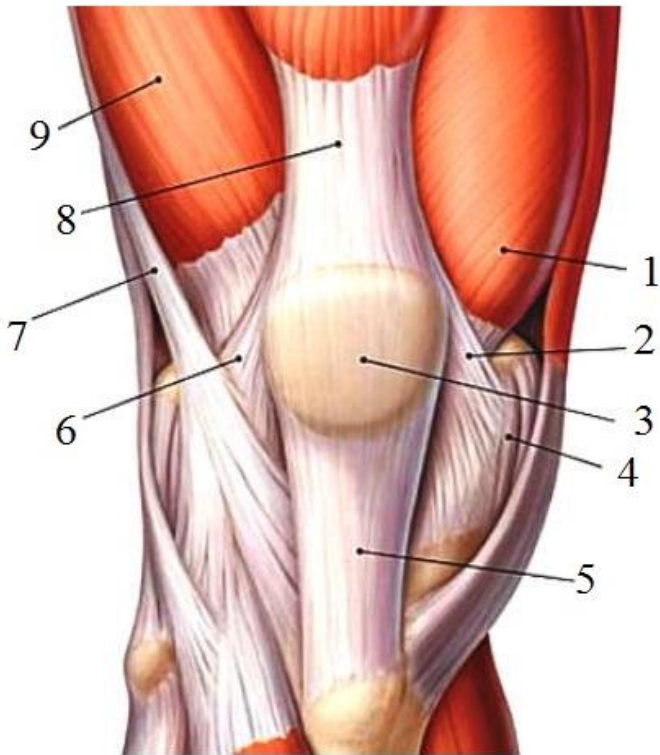
Complete the table.

Term in English	Term in Latin
	Articulatio genus
	Ligamentum collaterale tibiale
	Crucial ligaments
	Semilunar fibrocartilages
	Articulation talocruralis
	Articulations metatarsophalangeae

Questions:

1. Name the extraarticular ligament of the knee joint. _____
2. Name the ligament of the tarsus. _____
3. Name the extraarticular ligament of the knee joint. _____
4. Name movements that occur around the sagittal axis. _____
5. Name movements that occur around the frontal axis. _____
6. What joints are uni-axial in shape? _____
7. What joints are bi-axial in shape? _____

The Knee-joint.
Write all anatomical structures.



Right knee- joint.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Opened knee-joint.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Knee-joint in sagittal section.

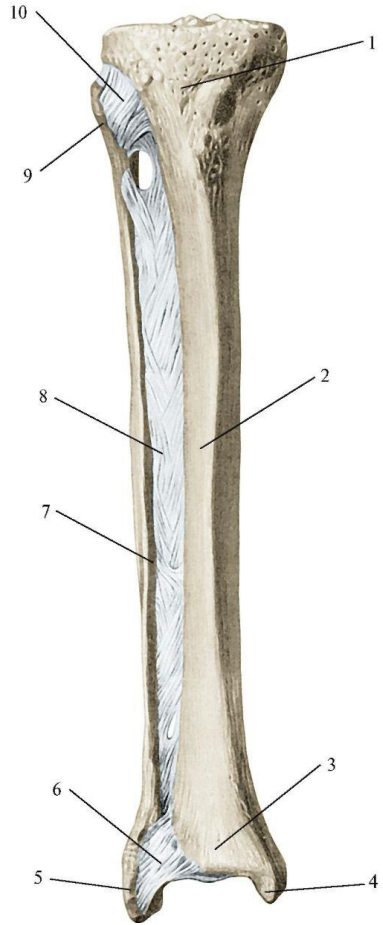
1. _____
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8. _____	8. _____	8. _____
9. _____	9. _____	9. _____
	10. _____	

CR! Patellar dislocation mostly dislocates laterally. The tendency toward lateral dislocation is normally counterbalanced by the medial, more horizontal pull of the powerful vastus medialis. In addition, the more anterior projection of the lateral femoral condyle and deeper slope for the large lateral patellar facet provides a mechanical deterrent to lateral dislocation. An imbalance of the lateral pull and the mechanisms resisting it result in abnormal tracking of the patella within the patellar groove and chronic patellar pain, even if actual dislocation does not occur.

Fractures of the distal end of the femur, or lacerations of the anterior thigh, may involve the suprapatellar bursa and result in infection of the knee joint. When the knee joint is infected and inflamed, the amount of synovial fluid may increase. Joint effusions, the escape of fluid from blood or lymphatic vessels, result in increased amounts of fluid in the joint cavity. Because the suprapatellar bursa is a superior continuation of the synovial cavity of the knee joint, fullness of the thigh in the region of the bursa may indicate increased synovial fluid. This bursa can be aspirated to remove the fluid for examination. Direct aspiration of the knee joint is usually performed with the patient sitting on a table with the knee flexed. The joint is approached laterally, using three bony points as landmarks for needle insertion: the anterolateral tibial (Gerdy) tubercle, the lateral epicondyle of the femur, and the apex of the patella. In addition, this triangular area also is used for drug injection for treating pathology of the knee joint.

Write all anatomical structures.

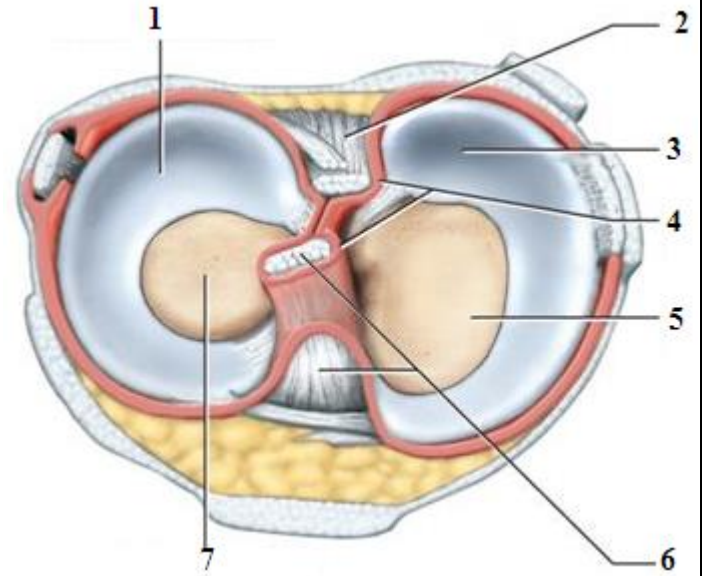


Tibiofibular articulation, anterior view.

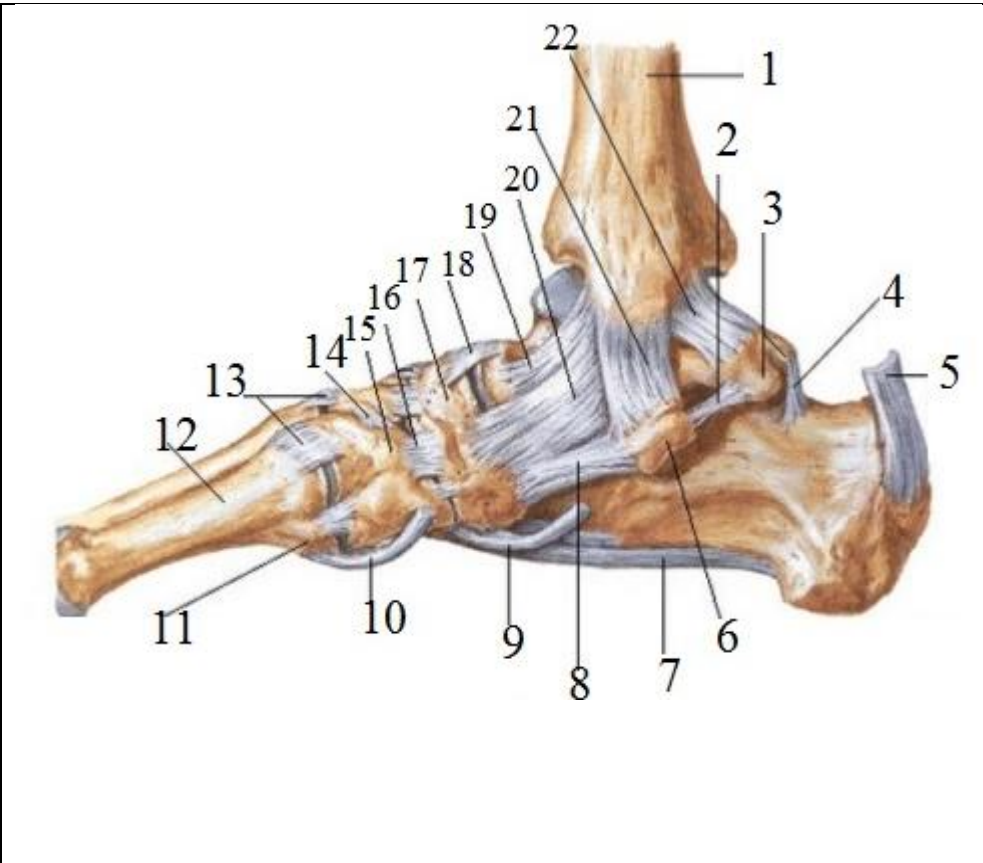
- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____

Superior view of tibia and menisci.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____

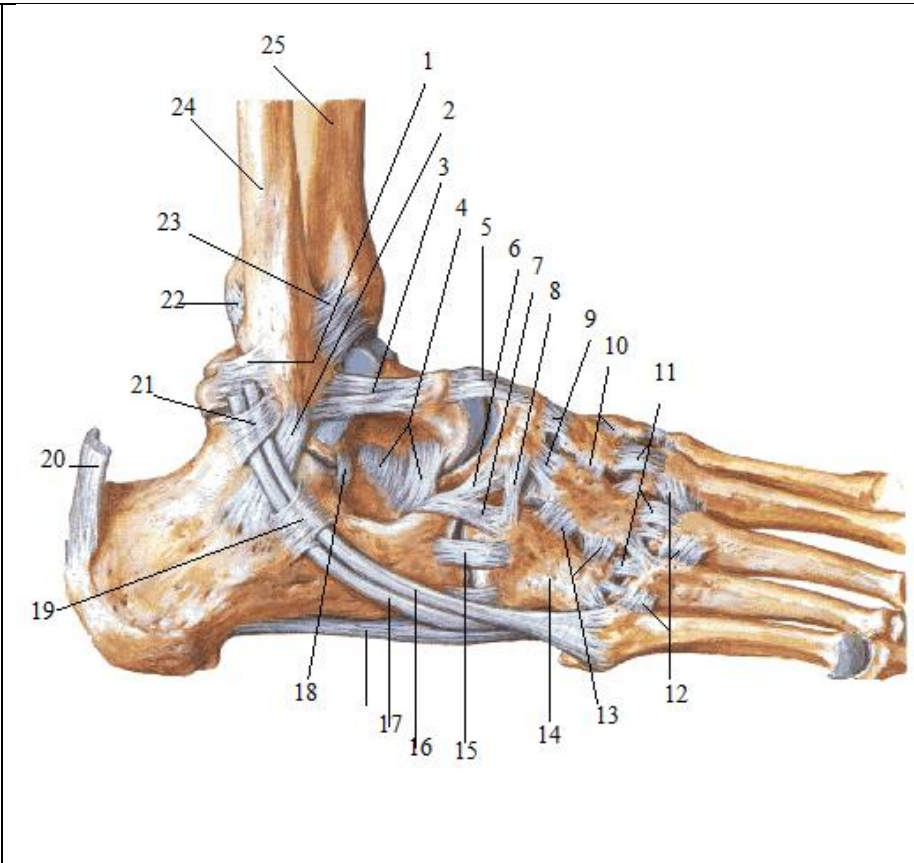


Write all anatomical structures.



Ligaments of ankle joint , foot (medial view).

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

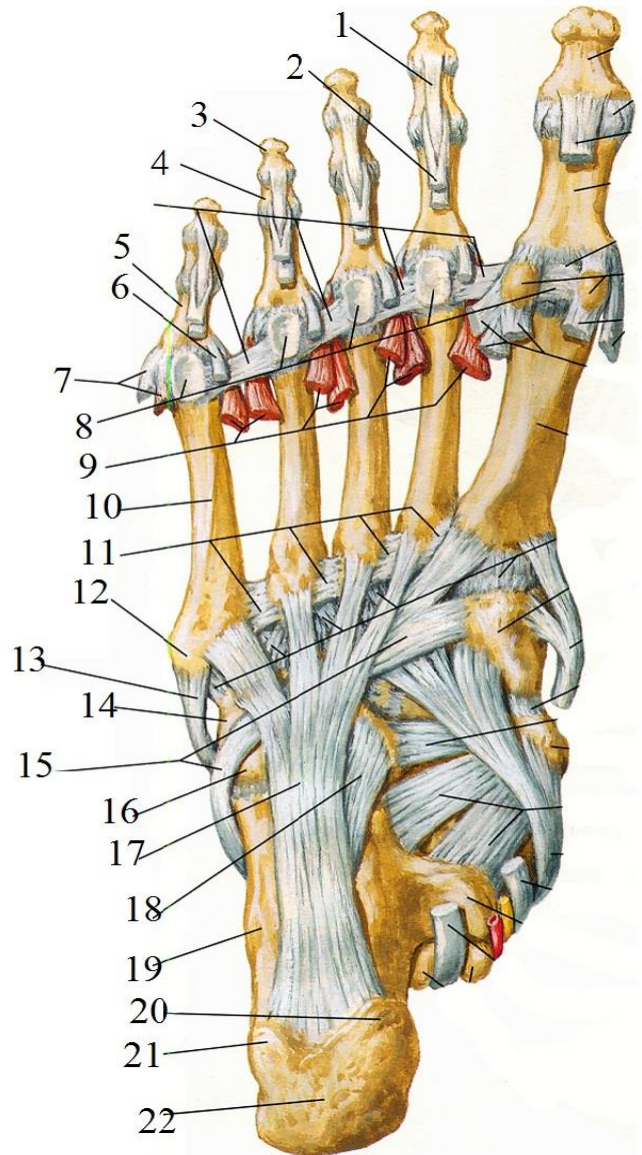


Ligaments of ankle joint (lateral view).

1. _____
2. _____
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- 23. _____
- 24. _____
- 25. _____



**The joints and ligaments of the right foot, plantar surface.
Write all anatomical structures.**

1. _____
2. _____
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11. _____
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16. _____

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	20. _____
	21. _____
	22. _____

CR!

Ankle sprains (partial or fully torn ligaments) are common injuries. Ankle sprains nearly always result from forceful inversion of the weight-bearing plantar flexed foot. The anterior talofibular ligament is most commonly injured, resulting in instability of the ankle. The calcaneofibular is also often torn.

Calcaneal fractures. A hard fall onto the heel may fracture the calcaneus into several pieces, resulting in a comminuted fracture. A calcaneal fracture is usually disabling because it disrupts the subtalar (talocalcaneal) joint.

Hallux valgus is a foot deformity caused by pressure from footwear and degenerative joint disease. It is characterized by lateral deviation of the base of the 1st metatarsal and base of the proximal phalanx of the great toe. In some people, the deviation is so great that the 1st toe overlaps the 2nd toe. These individuals are unable to move their 1st digit away from their 2nd digit because the sesamoid bones under the head of the 1st metatarsal are displaced and lie in the space between the heads of the 1st and 2nd metatarsals. In addition, a subcutaneous bursa may form owing to pressure and friction against the shoe. When tender and inflamed, the bursa is called a bunion.

Topic 24. General myology. Muscles and fascias of the back. Topography.

Complete the table.

Term in English	Term in Latin
belly	
tail	
Unipennate muscle	
The synovial bursae	

General myology.

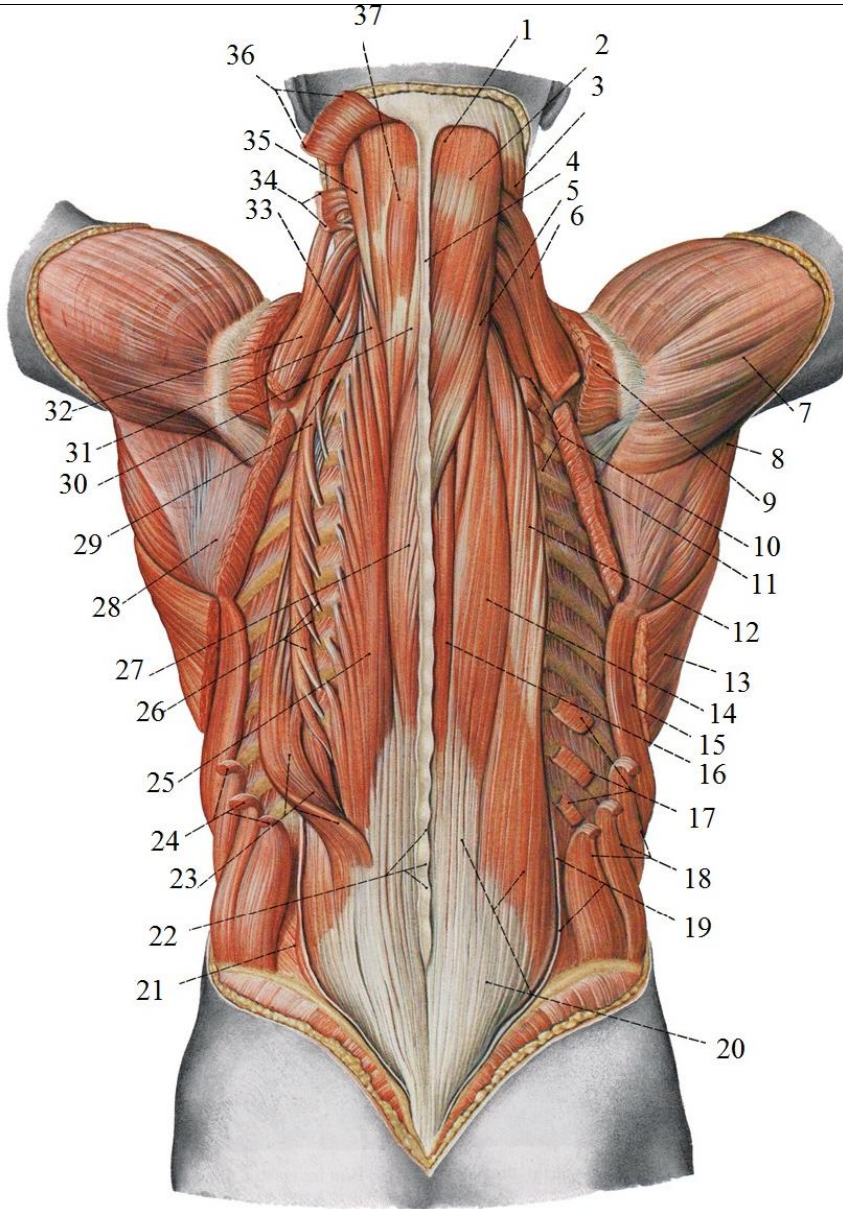
Define the term	
Frosted (striated muscle tissue)	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Non-striated muscle fibers.	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Non-striated (smooth).	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Cardiac muscles.	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Red and white muscles fibers.	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Tendons	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Complete the table.

Define the term	
Myofibrils.	<hr/> <hr/> <hr/> <hr/>
Aponeuroses.	<hr/> <hr/> <hr/> <hr/>
Endomysium.	<hr/> <hr/> <hr/> <hr/>
Perimysium	<hr/> <hr/> <hr/> <hr/>
Epimysium	<hr/> <hr/> <hr/> <hr/>
Myone.	<hr/> <hr/> <hr/> <hr/>

Muscles and fascias of the back.

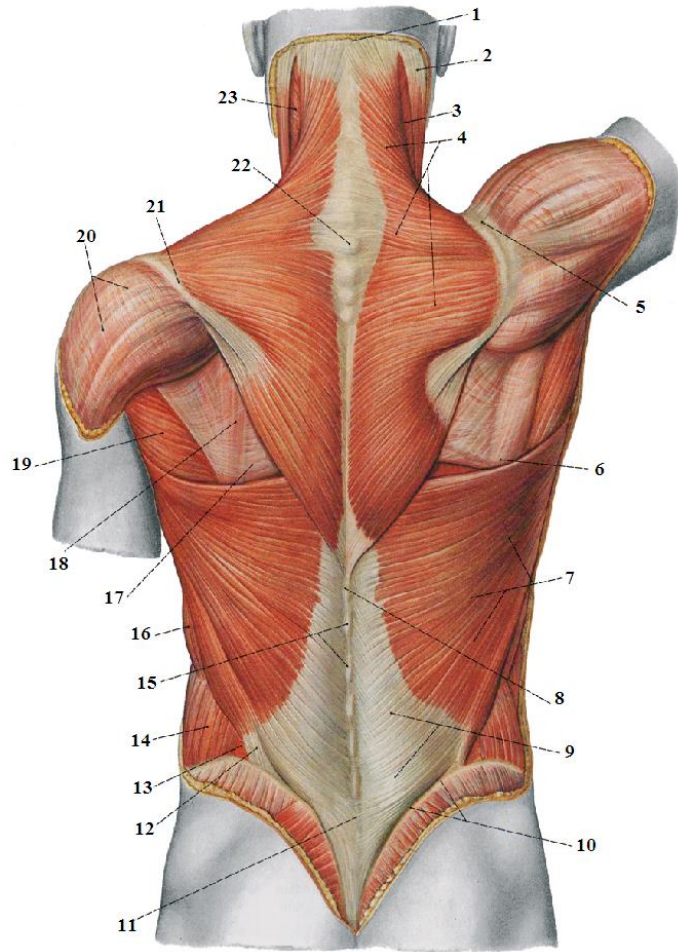
Write all anatomical structures.



The muscles of the back and posterior cervical region.

1. _____
2. _____
3. _____
4. _____
5. _____
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14. _____
15. _____
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32. _____

- 33. _____
- 34. _____
- 35. _____
- 36. _____
- 37. _____



The superficial back muscles.

Write all anatomical structures.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____
- 11. _____
- 12. _____
- 13. _____
- 14. _____
- 15. _____
- 16. _____
- 17. _____
- 18. _____
- 19. _____
- 20. _____
- 21. _____
- 22. _____
- 23. _____

Questions:

1. The orchestra conductor cannot get out of his back pocket-handkerchief .What muscle does not perform its function? _____
2. A man cannot tilt your head backward. What muscle is injured? _____
3. A man cannot maintain the body in the vertical position. What muscle is injured? _____
4. Specify the function of musculus serratus posterior. _____
5. After a brain hemorrhage at the victim developed phenomenon of paralysis of some muscles back. After this, disruption the function of extension of the lumbar part of the column vertebrae was observed. What muscles are injured after a cerebral hemorrhage? _____
6. The patient who needed surgery on account of lumbar hernia (exit of abdominal contents in the "weak spot" - lumbar triangle) was admitted into the surgical unit. What forms its median boundary? _____
7. A coach noticed that the gymnast has weak back muscles involved in scapula lowering, and adduct it to the spine. The athlete was prescribed with exercises that strengthen these muscles. Weakness of which muscles is observed in the athlete? _____
8. The injured has deep cut wound in the area of the posterior surface of the neck with muscle damage. What muscle is damaged? _____
9. As a consequence of back injury the patient experienced the dysfunction of torso and neck bending to their side. Function of which muscles was impaired? _____
10. As a consequence of back injury the patient experienced the dysfunction of shoulder adduction to the torso and its pronation. Function of which muscles was impaired? _____
11. As a consequence of back injury the patient experienced the dysfunction of respiration, namely, shortage of inhaling the air, and elevation of the upper ribs. Function of which muscles was impaired? _____
12. The patient who needed surgery on account of fracture of spinous processes of the 5, 6, 7 cervical vertebrae and the 1, 2, 3 thoracic vertebrae was admitted into the surgical unit. What muscles start from these processes? _____
13. The patient who needed surgery in the area of the mastoid process of the temporal bone was admitted into the surgical unit. What muscles of the back are attached to this process? _____
14. The man injured the left scapular region. The x-ray examination shows that the upper angle of the left scapula was broken off. The function which muscles of the back will be impaired? _____

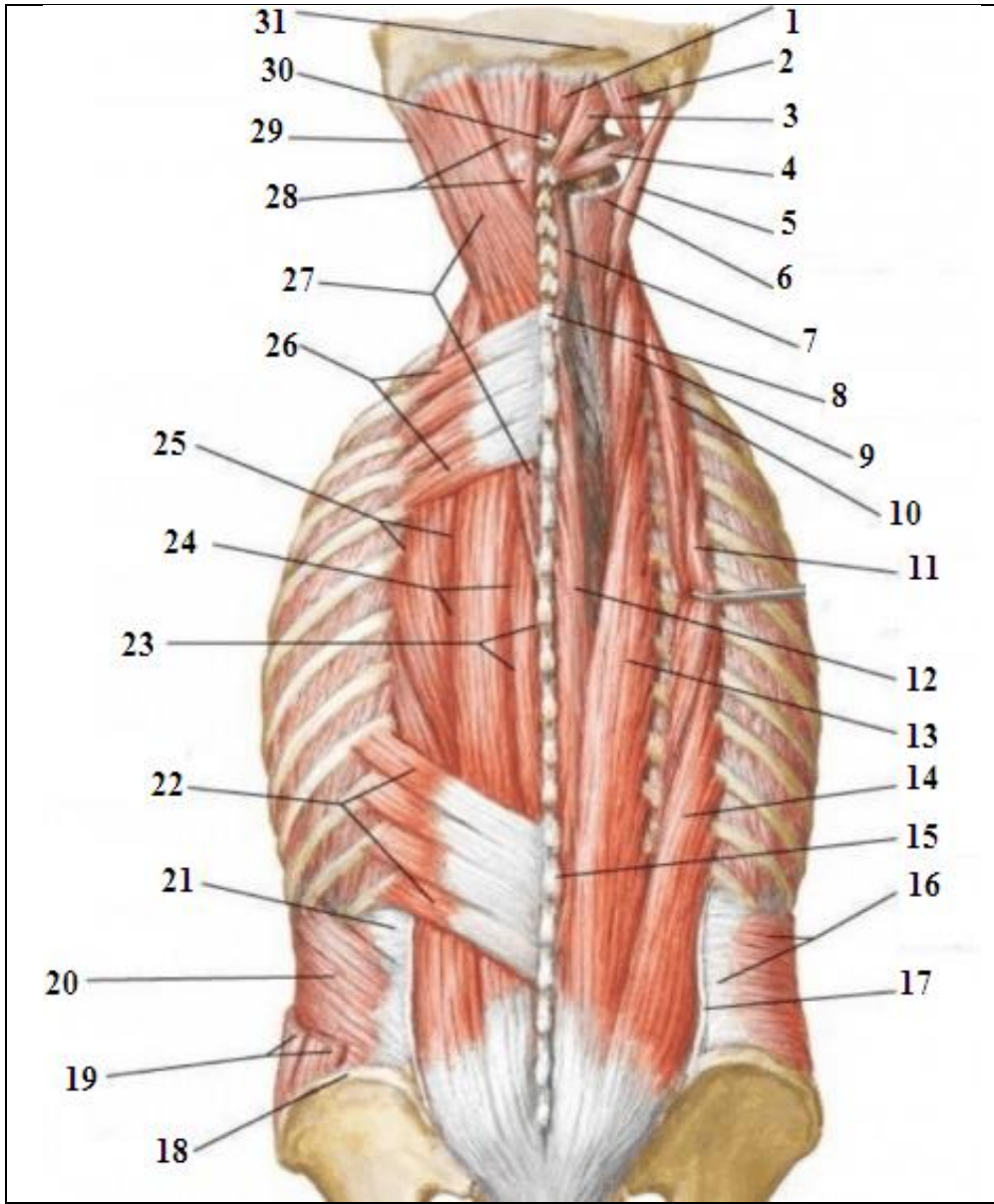
CR!

Lumbar triangle of Petit it is a small apace bounded by iliac crest, latissimus dorsi and external oblique muscles. The floor is occupied by internal oblique, this space is sometimes the site of lumbar hernia.

CR! *Trapezius muscle*- responsible for holding scapula against thoracic wall against gravity. Drooping of shoulder indicates weakness of or injury to accessory nerve.

Intrinsic back muscles- microscopic stretching or tearing of muscle fibers produces back strain, a common cause of low back pain.

Lumbago. Non-specific musculoskeletal pain symptoms are common in patients with Lumbago, a general term referring to low back pain or 'aches'. Paraspinal muscle wasting and increased fatigability are seen in patients with chronic low back pain. Several studies have shown that the lumbar multifidus muscles, important stabilizers of the neutral spine, in particular, play an important role in lumbar stability and are persistently involved in lower back pain.



The deep muscles of the back and neck.

Write all anatomical structures.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
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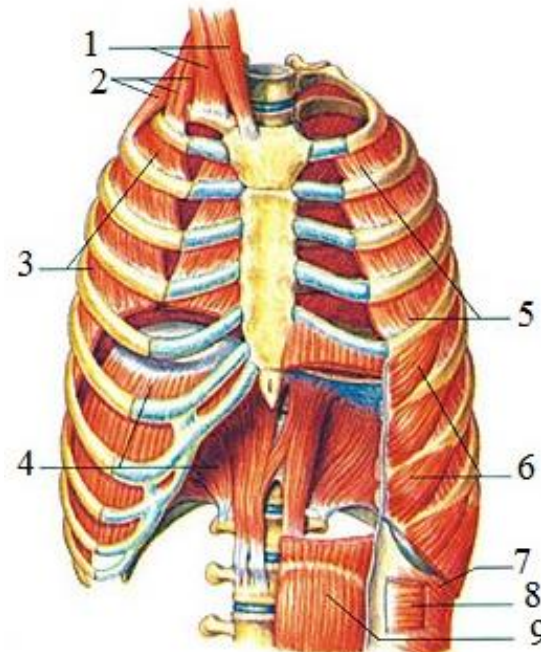
	29. _____
	30. _____
	31. _____

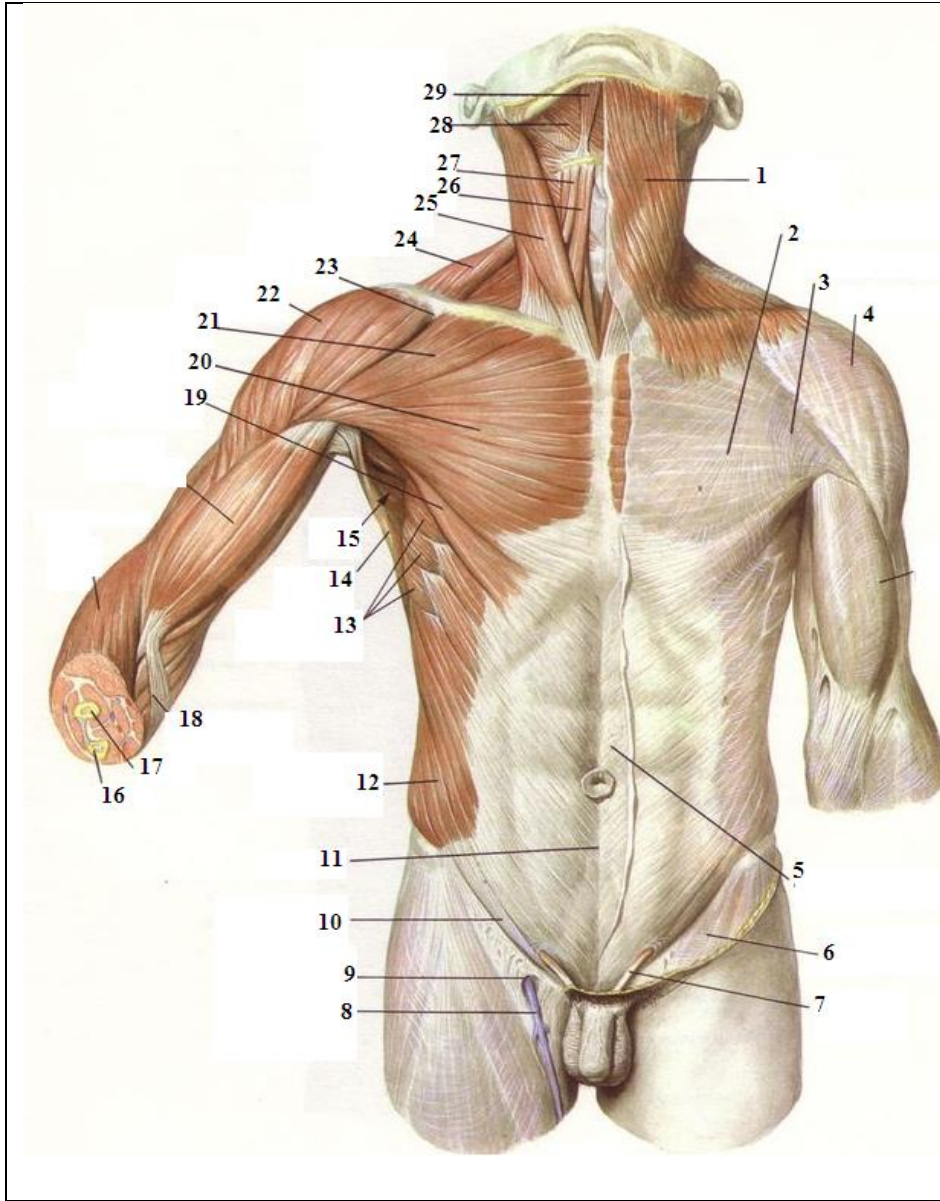
Muscles of the back				
Muscles	Origin	Insertion	Innervation	Functions
Trapezius	Spinous prominences of CVII to TXII, Superior nuchal line, external occipital protuberance, ligamentum nuchae.	Lateral one third of clavicle, acromion, and spine of scapula.	Motor stimulation is due to accessory nerve [XI], and sensory stimulation is due to sensory nerve endings C3 and C4.	During abduction of humerus above horizontal it assists in rotating the scapula; upper fibers help in elevation, middle fibers help in adduction, and lower fibers help in depression scapula.
Latissimus dorsi	Spinous processes of TVII to LV and sacrum, iliac crest, ribs X to XII.	Floor of intertubercular sulcus of humerus.	Thoracodorsal nerve (C6 to C8).	Extends, adducts, and medially rotates humerus.
Levator scapulae	Transverse processes of CI to CIV.	Upper portion medial border of scapula.	C3 to C4 and dorsal scapular nerve (C4, C5).	Elevates scapula.

Rhombdoid major	Spinous processes of TII to TV.	Medial border of scapula between spine and inferior angle.	Dorsal scapular nerve (C4, C5).	Retracts (adducts) and elevates scapula.
Rhombdoid minor	Lower portion of ligamentum nuchae, spinous processes of CVII and TI.	Medial border of scapula at spine of scapula.	Dorsal scapular nerve (C4, C5).	Retracts (adducts) and elevates scapula.
Serratus posterior superior	Lower portion of ligamentum nuchae, spinous processes of CVII to TIII, and supraspinous ligaments.	Upper border of ribs II to V just lateral to their angles.	Anterior rami of upper thoracic nerves (T2 to T5).	Elevates ribs II to V.
Serratus posterior inferior	Spinous processes of TXI to LIII and supraspinous ligaments.	Lower border of ribs IX to XII just lateral to their angles.	Anterior rami of lower thoracic nerves (T9 to T12).	Depresses ribs IX to XII and may prevent lower ribs from being elevated when the diaphragm contracts.
Splenius capitis	Lower half of ligamentum nuchae, spinous processes of CVII to TIV.	Mastoid process, skull below lateral one third of superior nuchal	Posterior rami of middle cervical nerves.	Together, they draw head backward, extending the neck and individually, each one draws and rotates head to one side i.e. turns face to same side.

		line.		
Splenius cervicis	Spinous processes of TIII to TVI.	Transverse processes of CI to CIII.	Posterior rami of lower cervical nerves.	Together they extend neck, and individually they draw and rotate head to one side i.e. same side.

Topic 25. Muscles and fascias of the chest. Diaphragm.

	<p>Deep muscles of the chest. Write all anatomical structures.</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p>
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Muscles and fascias of the trunk

Write all anatomical structural point.

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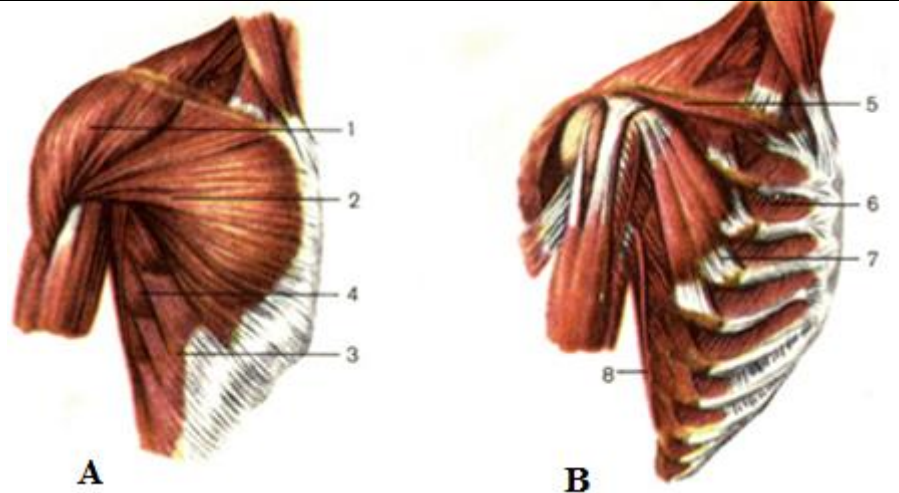
CR! Intercostal spaces-important relationship of intercostal neurovascular bundle to ribs when placing chest drainage tube to relieve pneumothorax.

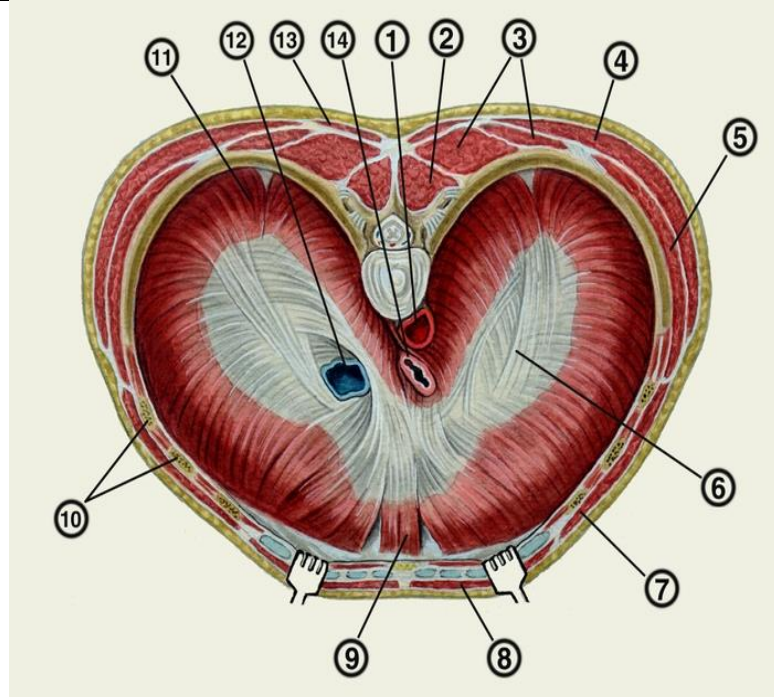
Respiratory diaphragm- widening of esophageal hiatus or congenital defect allows for protrusion of stomach into thorax (hiatal hernia).

Polymyositis. It is disease of muscle characterized by inflammation of muscle fibers. It starts as white blood cell invade muscle. Muscle close to trunk are mostly affected that results in severe weakness. Polymyositis associated with skin rash is called dermatomyositis.

Fibrillation. It is abnormal contraction of cardiac muscle. The cardiac chambers do not contract as a whole resulting in disruption of pumping action. In atrial fibrillation there is rapid and incoordinated contraction of atria resulting in ineffective pumping and abnormal contraction of av node.

Ventricular fibrillation is characterized by very rapid and disorganized contraction of ventricles.

	<p>The muscles of the chest and shoulder. Write all anatomical structures.</p> <p>A</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>B</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p>
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The diaphragm, superior aspect.

Write all anatomical structures.

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3. _____
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11. _____
12. _____
13. _____
14. _____

Define the term

Autochthonous m.

Heterochthonous m.

Muscle table

Muscle	Muscle group	Proximal attachment (origin)	Distal attachment (insertion)	Innervation	Blood supply	Main actions
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Respiratory diaphragm	Posterior abdominal wall	Xiphoid process, lower six costal cartilages, L-1 - L-3 vertebrae	Converge into central tendon	Phrenic nerve	Pericardiophrenic, musculophrenic, superior and inferior phrenic arteries.	Draws central tendon down and forward during inspiration.
External intercostal	Thoracic wall	Lower border of ribs	Upper border of rib below rib of origin	Intercostal nerves	Posterior intercostal arteries, collateral branches of posterior intercostal arteries, costocervical trunk, anterior intercostal branches of internal thoracic artery, musculophrenic artery.	Supports intercostal spaces in inspiration and expiration, elevates ribs in inspiration.
Innermost intercostal	Thoracic wall	Lower border of ribs	Upper border of rib below of origin	Intercostal nerves	Muscular branches of anterior intercostal arteries, muscular branches of posterior intercostal arteries, intercostal branches of internal thoracic and musculophrenic arteries, costocervical trunk branches	Elevates ribs
Internal intercostal	Thoracic wall	Lower border of ribs	Costal cartilage and edge of costal groove of rib above rib of origin	Intercostal nerves	Muscular branches of anterior intercostal arteries, muscular branches of posterior intercostal arteries,	Prevents pushing out or drawing in of intercostal spaces in inspiration and expiration, lowers ribs in forced expiration.

					intercostal branches of internal thoracic and musculophrenic arteries, costocervical trunk branches	
Levator costarum	Thoracic wall	Transverse processes of C7 and T1-T11	Subjacent ribs between tubercle and angle	Posterior ramus of lower thoracic nerves	Posterior intercostal arteries	Elevates ribs
Pectoralis major	Pectoral/axillary regions	Sternal half clavicle, sternum to 7 th rib, cartilages of true ribs, aponeurosis of external abdominal oblique muscle	Lateral lip of intertubercular sulcus of humerus	Medial and lateral pectoral nerves	Pectoral branch of thoracoacromial artery, perforating branches of internal thoracic artery	Flexes, adducts, and medially rotates arm
Pectoralis minor	Pectoral/ axillary regions	Outer surface of upper margin of ribs 3-5	Coracoid process of scapula	Medial pectoral nerve	Pectoral branch of thoracoacromial artery, and superior and lateral thoracic arteries	Lowers lateral angle of scapula and protracts scapula
Serratus anterior	Shoulder	Lateral surfaces of upper 8-9 ribs	Costal surface of medial border of scapula	Long thoracic nerve	Lateral thoracic artery	Protracts and rotates scapula and holds it against thoracic wall
Serratus posterior inferior	Intermediate back	Spinous processes of T11-L2	Inferior aspect of ribs 9-12	Anterior rami of lower thoracic nerves	Posterior intercostal arteries	Depresses ribs
Serratus posterior superior	Intermediate back	Nuchal ligament, spinous processes of C7- T3	Superior aspect of ribs 2-5	Anterior rami of upper thoracic nerves	Posterior intercostal arteries	Elevates ribs

Subcostal	Thoracic wall	Internal surface of lower ribs near their angles	Superior borders of 2 nd or 3 rd rib below	Intercostal nerves 2 nd -5 th	Posterior intercostal artery, musculophrenic artery	Depresses ribs
Transversus thoracic	Thoracic wall	Internal surface of costal cartilages 2-6	Posterior surface of lower sternum	Intercostal nerves	Anterior intercostal arteries, internal thoracic artery	Depresses ribs and costal cartilages

Questions:

1. What part of the diaphragm protects the aorta from the pressure? _____
 2. Which of the following muscles are autochthonous chest muscles? _____
 3. Which of the following muscles are not related to the act of breathing? _____
 4. A victim asked the physician with complaints of pain in the chest when he is breathing, shortness of breath, difficulty coughing movements, and hiccups. What are the respiratory muscles affected? _____
 5. In women developed phenomena characteristic of diaphragmatic hernia. Specify the weakest spots diaphragm, where diaphragmatic hernia may occur because of increased intraabdominal pressure? _____
 6. The patient has trauma of upper extremity. During the examination, the physician has determined that the shoulder bone was damaged. The x-ray shows that greater tubercle of the humerus broke off. The function of which muscles will be impaired? _____
 7. The patient has inflammation of the muscles of the thorax. During the examination, the physician suggested a patient to adduct and turn the shoulder into the middle, but the patient was not able to perform this movement. Which muscle does not perform its functions? _____
-
8. A patient has the back injury. The patient feels severe pain in palpation of back scapular. During x-ray examination a physician discovered that coracoid process of the scapula was broken. What muscle of the chest is fastened to this process? _____
 9. A patient experiences inflammation of small pectoral muscle. What activity will the patient not be able to perform? _____
 10. In contraction of which muscle does the first rib elevate? _____

Topic 26. Muscles and fascias of the abdomen. Vagina of rectus abdominis. Inguinal canal. White line of abdomen. Topography of the anterior wall of the abdominal cavity.

Muscle Table

Muscle	Muscle group	Proximal attachment (origin)	Distal attachment (insertion)	Innervation	Blood supply	Main actions
Respiratory diaphragm	Posterior abdominal wall	Xiphoid process, lower six costal cartilages, L1-L3 vertebrae	Converges into central tendon	Phrenic nerve	Pericardiophrenic, musculophrenic, superior and inferior phrenic arteries	Draws central tendon down and forward during inspiration
External abdominal oblique	Anterior abdominal wall	External surface of ribs 5-12	Linea alba, pubic tubercle, anterior half of iliac crest	Anterior rami of six inferior thoracic nerves	Superior and inferior epigastric arteries	Compresses and supports abdominal viscera, flexes and rotates trunk
Internal abdominal oblique	Anterior abdominal wall	Thoracolumbar fascia, anterior 2/3 of iliac crest, lateral half of inguinal ligament	Inferior borders of ribs 10-12, linea alba, pubis via conjoint tendon	Anterior rami of six inferior thoracic and first lumbar nerves	Superior and inferior epigastric and deep circumflex iliac arteries	Compress and supports abdominal viscera, flexes and rotates trunk
Psoas major	Posterior abdominal wall	Transverse processes of lumbar vertebrae, sides of bodies of T12-L5 vertebrae, intervening intervertebral discs	Lesser trochanter of femur	Anterior rami of first three lumbar nerves	Lumbar branches of iliolumbar artery	Acting superiorly with iliacus, flexes hip, acting inferiorly, flexes vertebral column

						laterally, used to balance trunk in sitting position, acting inferiorly with iliacus, flexes trunk.
Psoas minor	Posterior abdominal wall	Vertebral margins of T12-L1 vertebrae, corresponding intervertebral disc	Pectineal line, iliopectineal eminence	Anterior rami of first lumbar nerve	Lumbar branch of iliolumbar artery	Flexes pelvis on vertebral column
Pyramidalis	Anterior abdominal wall	Body of pubis, anterior to rectus abdominis	Linea alba	Iliohypogastric nerve	Inferior epigastric artery	Tenses linea alba
Quadratus lumborum	Posterior abdominal wall	Medial half of inferior border of 12 th rib, tips of lumbar transverse processes	Iliolumbar ligament, internal lip of iliac crest	Anterior rami of T12 and first four lumbar nerves	Iliolumbar artery	Extends and lateral flexes vertebral column, fixes 12 th rib during inspiration
Rectus abdominis	Anterior abdominal wall	Pubic symphysis, pubic crest	Xiphoid process, costal cartilages 5-7	Anterior rami of six inferior thoracic nerves	Superior and inferior epigastric arteries	Flexes trunk, compresses abdominal viscera

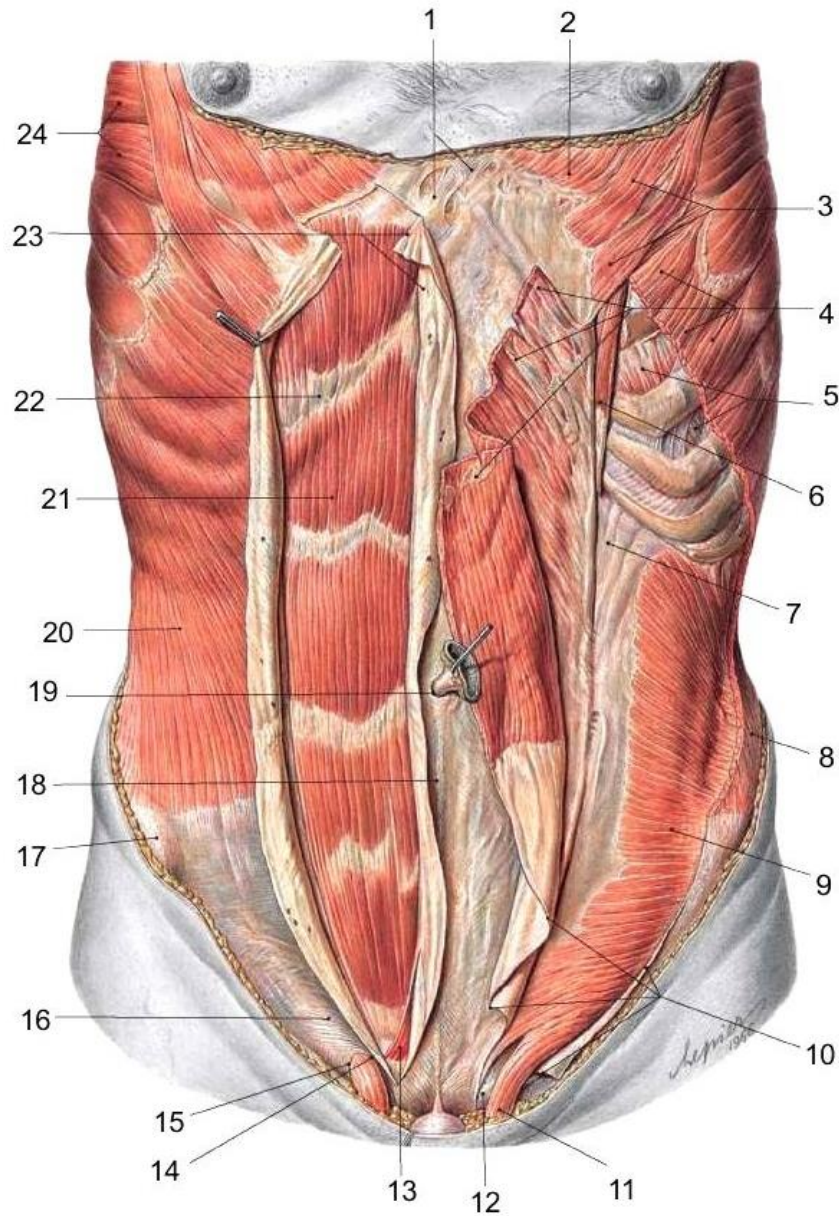
Questions:

1. The patient has oblique inguinal hernia. What anatomical structure was the weak spot of the anterior abdominal wall? _____
2. A man 52 years old when picked up much weight hernias protrusion was formed in the right suprapubic region. Where the hernias protrusion could develop? _____
3. The surgeon should conduct an inspection of the abdomen, which is necessary to open the abdominal wall. In what part of the abdominal wall can spend the most bloodless incision? _____

4. To the doctor asked mother of a newborn who had picked congenital inguinal hernia. The inguinal canal is very wide; part of the intestine was in the scrotum. Plastic surgery is needed inguinal canal. What is the structure formed the anterior wall of the inguinal canal? _____

5. To the doctor the mother brought a child 3 months, because swelling appeared in the region of the navel. When viewed in the umbilicus revealed bulging of the size of 2,0 x 2,0 cm, soft-elastic consistency, increasing when crying. When the child is resting, lying the protrusion disappears and it is palpated around navel ring with a diameter of 1 cm. The presence of what disease can be assumed in this age? _____

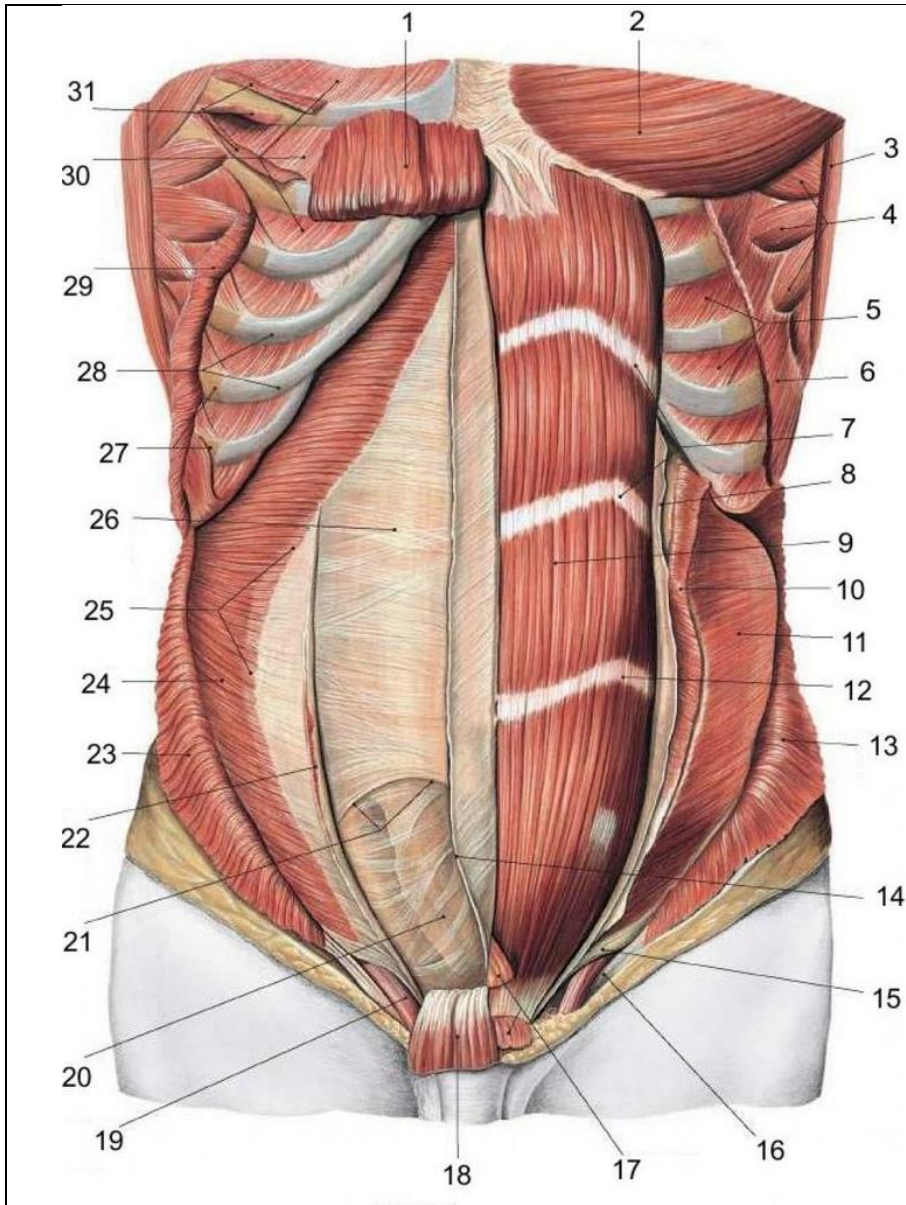
	<p>Inguinal canal. Write all anatomical structures.</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____ 13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____ 19. _____
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Muscles of the abdomen.

Write all anatomical structures.

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The muscles of the abdomen. On the right, the oblique abdominal muscles are removed and the rectus abdominis is sectioned. On the left, the external oblique is removed and the rectus sheath is sectioned.

Write all anatomical structures.

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CR! Linea alba- site used for abdominal wall incisions because there is lack of significant neurovascular branches in this region.

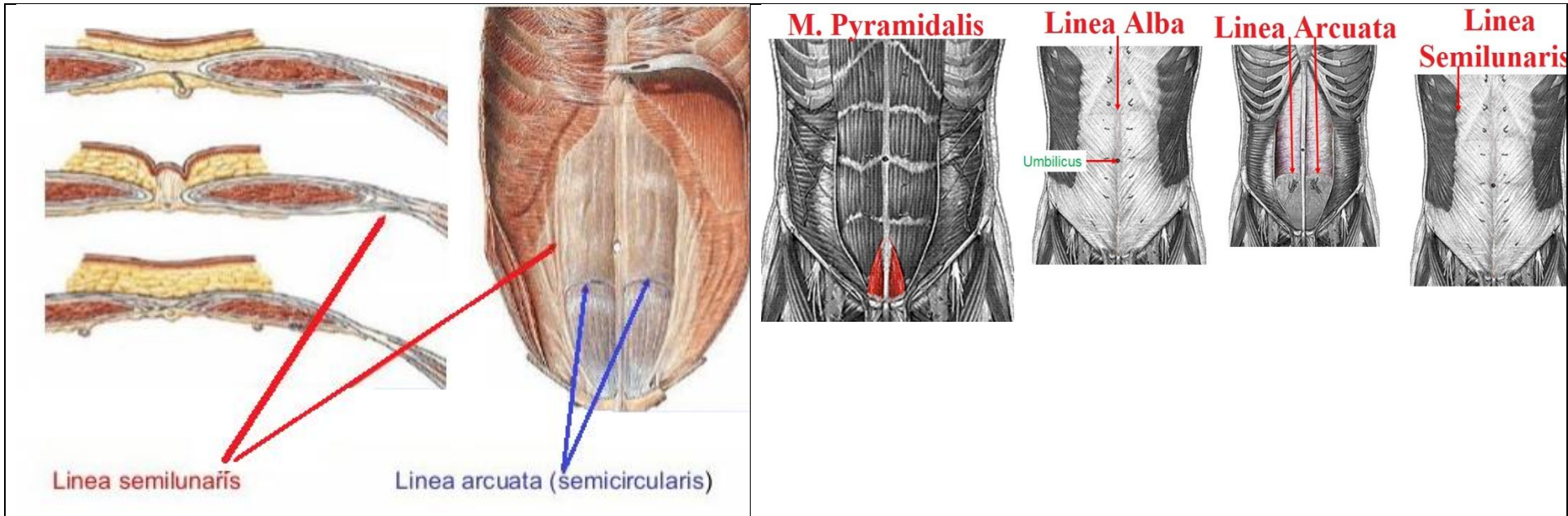
Inguinal ligament- surface landmark that marks division between abdominal wall and thigh.

Inguinal (Hesselbach's) triangle- weak area on anterior abdominal wall where abdominal contents may herniate, producing direct inguinal hernia.

Deep (internal) inguinal ring- opening on anterior abdominal wall where abdominal contents may herniate, producing indirect inguinal hernia.

Femoral ring- opening medial to external iliac vessels where abdominal contents may herniate, producing femoral hernia.

Esophageal hiatus of diaphragm- widening of this opening allows stomach to protrude into mediastinum, causing gastroesophageal reflux.



Questions:

1. A 50 year old man was asked for medical assistance complaining of the impossibility of the torso band forward after surgery on organs of the abdominal cavity. What muscle was damaged? _____
2. The patient who needs surgery on account of lumbar hernia (exit of abdominal contents in the weak spot - the lumbar triangle) was admitted to the surgical unit. What forms its lateral boundary? _____
3. The man has a blunt trauma to the right side of the abdomen. During the examination, the physician suggested the patient to turn the torso to the right, but he was unable to perform this movement. Which of the abdominal muscles is damaged? _____
4. The patient who needs surgery on account of lumbar hernia (exit of abdominal contents in the weak spot - the lumbar triangle) was admitted to the surgical unit. What limits the bottom of this triangle? _____
5. Abdominal trauma led to damage of the muscle that is involved in the formation of the upper wall of the inguinal canal. What muscle is damaged? _____

Topic 27. Muscles and fascias of the neck. Topography of the neck: triangles of the neck.

Cervical muscles		
Muscles	Function	Nerve
Sternocleidomastoid	Extends & rotates head, flexes vertebral column	C2, C3
Scalenus	Flexes & rotates neck	Lower cervical
Spinalis Cervicis	Extends & rotates head	Middle/lower cervical
Spinalis Capitus	Extends & rotates head	Middle/lower cervical
Semispinalis Cervicis	Extends & rotates vertebral column	Middle/lower cervical
Semispinalis Capitus	Rotates head & pulls backward	C1 – C5
Splenius Cervicis	Extends vertebral column	Middle/lower cervical
Longus Colli Cervicis	Flexes cervical vertebrae	C2 – C7
Longus Capitus	Flexes head	C1 – C3
Rectus Capitus Anterior	Flexes head	C2, C3
Rectus Capitus Lateralis	Bends head laterally	C2, C3
Iliocostalis Cervicis	Extends cervical vertebrae	Middle/lower cervical

Longissimus Cervicis	Extends cervical vertebrae	Middle/lower cervical
Longissimus Capitis	Rotates head & pulls backward	Middle/lower cervical
Rectus Capitus Posterior Major	Extends & rotates head	Suboccipital
Rectus Capitus Posterior Minor	Extends head	Suboccipital
Obliquus Capitus Inferior	Rotates atlas	Suboccipital
Obliquus Capitus Superior	Extends & bends head laterally	Suboccipital

CR!

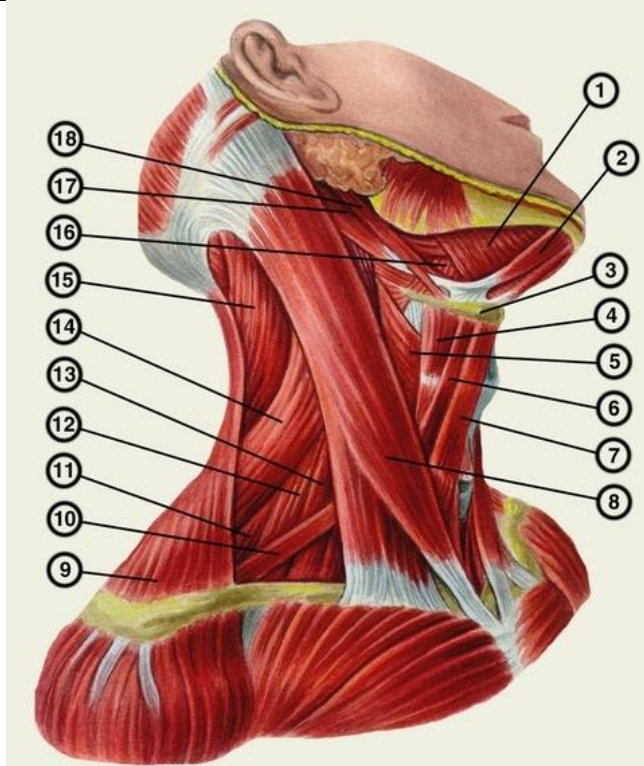
Torticollis- is a condition resulting in asymmetrical positioning of the neck. The name is derived from the Latin words tortus, meaning ‘twisted’ and collis, which means ‘neck’. It is caused by damage to and effectively, shortening of the sternocleidomastoid muscle in the lateral neck. In relation to the affected sternocleidomastoid muscle, torticollis presents as an ipsilateral (same side) head tilt, and contralateral (opposite side) rotation of the face and chin. Presenting at childbirth, congenital muscular torticollis (CMT) is the most common presentation of torticollis. Contracture of the sternocleidomastoid muscle as a result of a traumatic childbirth is regarded as one of the most frequent causes of CMT.

Questions:

1. A mother appealed to a pediatrician complaining of her 1-year -old child’s head always turned to the left. What neck muscle is underdeveloped?

2. A patient complains of pain in the left part of the neck while moving. The best painless position is bending the neck to the left with simultaneous raising of the chin and rotation of the face to the opposite side. What muscle is injured? _____
3. A 37-year-old patient had a cough, then asphyxia because a foreign body got into the respiratory tracts. Tracheotomy was made in the neck region limited by the superior belly of omohyoid muscle, sternocleidomastoid muscle and the median neckline. In what triangle of neck was the operation performed? _____
4. What is the action of splenius capitis and cervicis muscles in bilateral contraction? _____
5. What are the boundaries of the submandibular triangle? _____

6. Between what plates of neck fascia is the suprasternal space situated? _____
7. The patient complains about the difficulty in opening the mouth, pain when lowering the mandible. The physician diagnosed the inflammation of the mylohyoid muscles. Name the place where these muscles are attached on the lower jaw. _____
8. The patient should be undergone the surgery on cervical part of trachea. The surgeon will find access to: _____

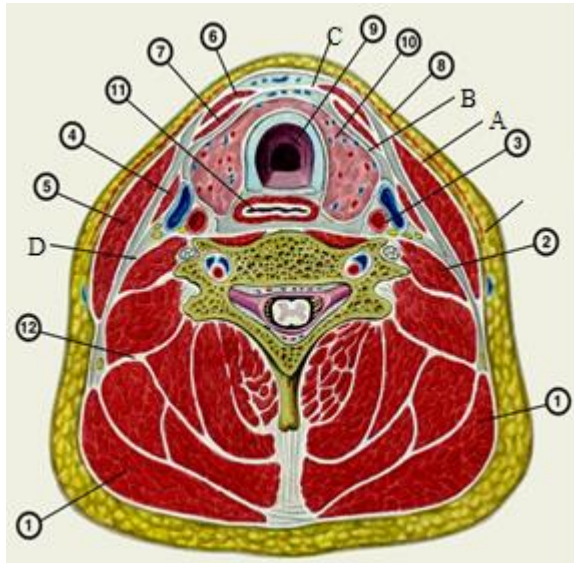
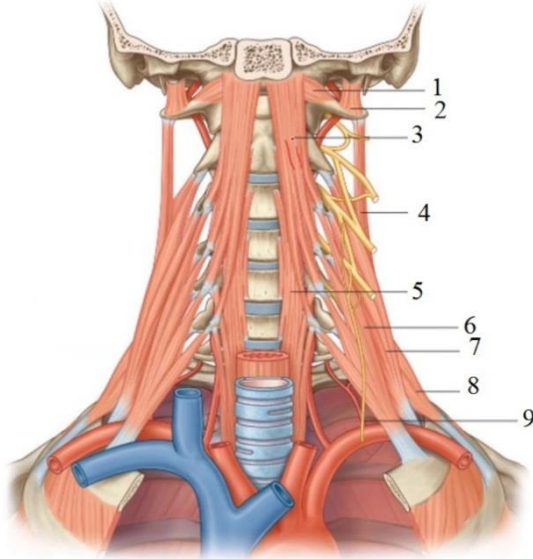


Muscles of the neck. Write all anatomical structures.

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18. _____

CR!

Accessory nerve test- the integrity of the accessory nerve can be examined by testing the function of the sternocleidomastoid muscle. This is done by rotating the head against resistance. The clinician will place their hand on the side of the head and ask the patient to turn the head towards the side where the hand is placed. The ability to produce this movement indicates that the accessory nerve is intact and functional as far as the level at which the motor supply to sternocleidomastoid branches.



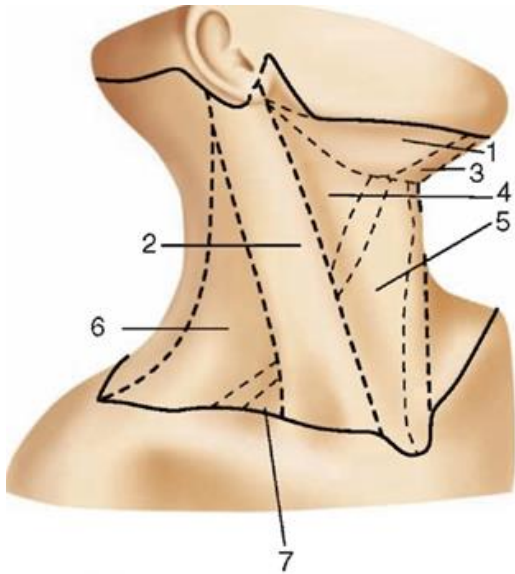
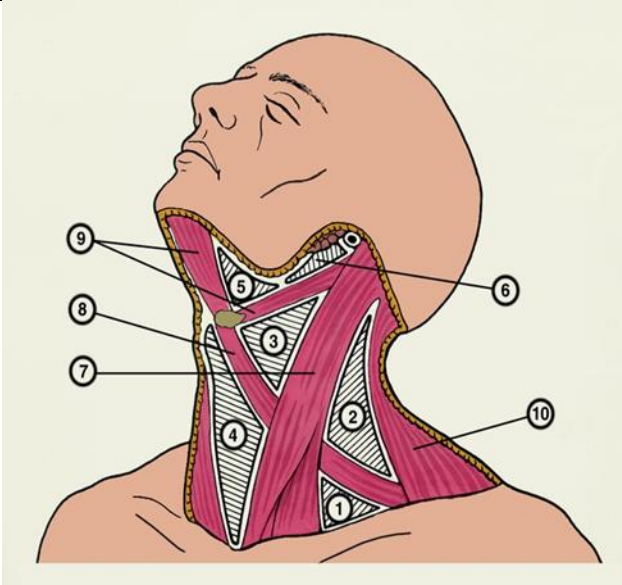
Muscles of the neck.

Write all anatomical structures.

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2. _____
3. _____
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9. _____

Fasciae of the neck.

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- A. _____ B. _____
- C. _____ D. _____



Triangles of the neck.

Write all anatomical structures.

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10. _____

1. _____
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Topic 28. Muscles and fascias of the head. Muscles of mastication, mimic muscles.

Muscles Table.

Muscles of the head					
Movement	Target	Target motion direction	Prime mover	Origin	Insertion
Brow					
Furrowing brow	Skin of scalp	Anterior	Occipito-frontalis, frontal belly	Epicranial aponeurosis	Underneath skin of forehead
Unfurrowing brow	Skin of scalp	Posterior	Occipito-frontalis, occipital belly	Occipital bone; mastoid process (temporal bone)	Epicranial aponeurosis
Lowering eyebrows (e.g., scowling, frowning)	Skin underneath eyebrows	Inferior	Compressor supercilli	Frontal bone	Skin underneath eyebrow
Nose					
Flaring nostrils	Nasal cartilage (pushes nostrils open when cartilage is compressed)	Inferior compression; posterior compression	Nasal	Maxilla	Nasal bone
Mouth					
Raising upper lip	Upper lip	Elevation	Elevator labii superioris	Maxilla	Underneath skin at corners of the mouth; orbicularis oris

Lowering lower lip	Lower lip	Depression	Depressor Labii inferioris	Mandible	Underneath skin of lower lip
Opening mouth and sliding lower jaw left and right	Lower jaw	Depression, lateral	Depressor angulus oris	Mandible	Underneath skin at corners of mouth
Smiling	Corners of mouth	Lateral elevation	Zygomaticus major	Zygomatic bone	Underneath skin at corners of mouth (diple area); orbicularis oris
Shaping of lips (as during speech)	Lips	Multiple	Orbicularis oris	Tissue surrounding lips	Underneath skin at corners of the mouth
Lateral movement of cheeks (e.g., sucking on a straw; also used to compress air in mouth while blowing)	Cheeks	lateral	Buccinator	Maxilla, mandible; sphenoid bone (via pterygomandibular raphae)	Orbicularis oris
Pussing of lips by straightening them laterally	Corners of mouth	Lateral	Risorius	Fascia of paritid salivary gland	Underneath skin at corners of the mouth
Protrusion of lower lip (e.g.,	Lower lip and skin of chin	Protraction	Mentalis	Mandible	Underneath skin of chin

pouting expression)					
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Muscles of the eyes					
Movement	Target	Target motion direction	Prime mover	Origin	Intertion
Moves eyes up and toward nose; rotates eyes from 1 o'clock to 3 o'clock	Eyeballs	Superior (elevates); medial (adducts)	Superior rectus	Common tendinius ring (ring attaches to optic foramen)	Superior surface of eyebal
Moves eyes down and toward nose; rotates eyes from 6 o'clock to 3 o'clock	Eyeballs	Inferior (depresses); Medial (adducts)	Inferior rectus	Common tendinous ring (ring attaches to optic fjramen)	Inferior surface of eyebal
Moves eyes away from nose	Eyeballs	Lateral (abducts)	Lateral rectus	Common tendinous ring (ring attaches to optic foramen)	Lateral surface of eyeball
Moves eyes toward nose	Eyeballs	Medial (adducts)	Medial rectus	Common tendinous ring (ring attaches to optic foramen)	Medial surface of eyeball
Moves eyes up and away from nose; rotates	Eyeballs	Superior (elevates); lateral	Inferior oblique	Floor of orbit (maxilla)	Surface of eyeball between inferior rectus and lateral rectus

eyeball from 12 o'clock to 9 o'clock		(abducts)			
Moves eyes down and away from nose; rotates eyeball from 6 o'clock to 9 o'clock	Eyeballs	Superior (elevates); lateral (abducts)	Superior oblique	Sphenoid bone	Surface of eyeball between superior rectus and lateral rectus
Opens eyes	Upper eyelid	Superior (elevates)	Levator palabrae superioris	Roof of orbit (sphenoid bone)	Skin of upper eyelids
Closes eyelids	Eyelid skin	Compression along superior-inferior axis	Orbicularis oculi	Medial bones composing the orbit	Circumference of orbit

Muscles of the lower jaw					
Movement	Target	Target motion direction	Prime mover	Origin	Insertion
Closes mouth; aids chewing	Mandible	Superior (elevates)	Masseter	Maxilla arch; zygomatic arch (for masseter)	Mandible
Closes mouth; pulls lower jaw in under upper jaw	Mandible	Superior (elevates); posterior (retracts)	Temporalis	Temporal bone	Mandible
Opens mouth; pushes lower jaw out under upper jaw; moves lower jaw side-to-side	Mandible	Inferior (depresses); posterior (protracts); lateral (abducts); medial (adducts)	Lateral pterygoid	Pterygoid process of sphenoid bone	Mandible

Closes mouth; pushes lower jaw out under upper jaw; moves lower jaw side-to-side	Mandible	Superior (elevates); posterior (protracts); lateral (abducts); medial (adducts)	Medial pterygoid	Sphenoid bone; maxilla	Mandible; temporo-mandibular joint
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Questions:

1. A man, 30 years old, appealed to a dentist complaining of mastication disorder: painful backward movement of the mandible. The doctor detected the inflammation of a masticatory muscle. Which muscle exactly is it? _____
2. A boy, 8 years old, cannot put lips round, the angles of the mouth are pulled out and up, and oral fissure is stretched aside. What muscle is injured? _____
3. Examination of a patient's expression has shown that he cannot put his lips round, whistle, the oral fissure is stretched to sides. What muscle's atrophy do these indicate? _____
4. During a traffic accident a got multiple injures of the later, area including jugal bridge fracture. Which muscle function is affected? _____
5. Right palpebral fissure of a patient is noticeably bigger than thr left one. Which facial muscle function is damaged? _____
6. The patient's eye slit on the right is noticeably bigger than the left one. The function of which mimic muscles is impaired? _____

CR!

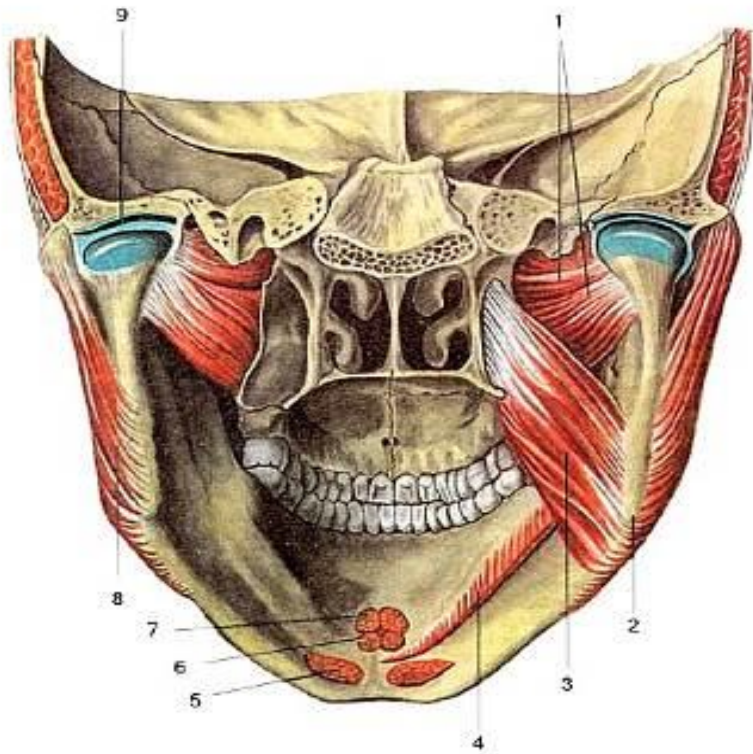
Muscles of facial expression- used to assess function of CN VII during cranial nerve examination, may become weak or paralyzed with CN VII dysfunction (Bell's palsy).

Sternocleidomastoid muscle- palpated to identify "nerve point of neck" for administration of anesthesia to cervical plexus.

Genioglossus muscle- used to assess CN XII function during cranial nerve examination, deviates to side of lesion when protruded following CN XII injury.

Eye muscles- used to assess function of CN III, CN VI and CN VI during cranial nerve examination.

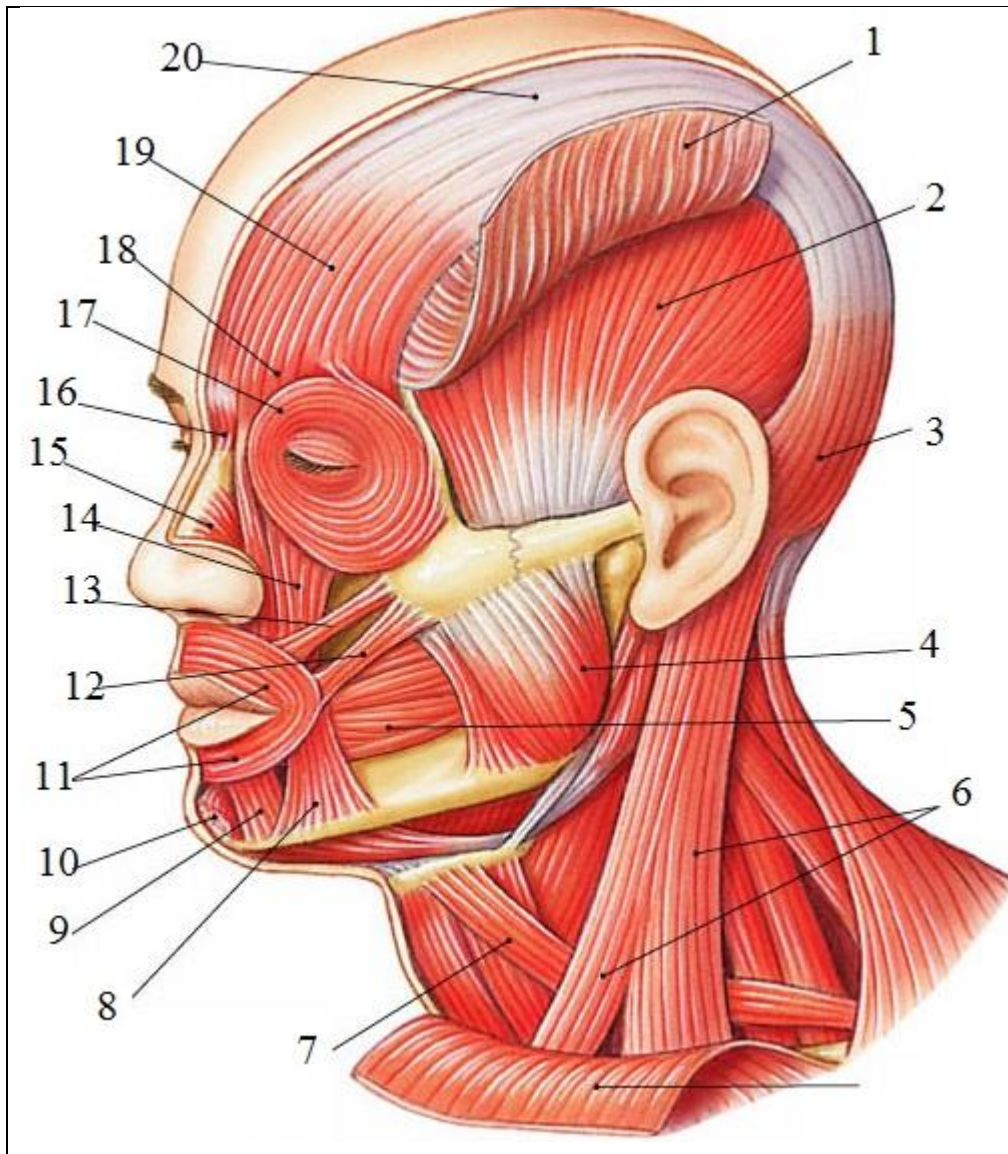
Dilator pupillae muscle- Important in assessment of sympathetic function in head, lack of dilation indicates interruption in sympathetic outflow (Horner's syndrome).



Chewing muscles, anterior aspect.

Write all anatomical structures.

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Muscles of the head.

Write all anatomical structures.

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2. During the examination the physician diagnosed that the patient could not raise eyebrows, whistle, fully close the eyes, and grin. The function of which muscles is impaired? _____
3. The patient complains of the sagging lower jaw, which complicates the act of chewing. Dysfunction of which muscles occurs? _____

Topic 29. Muscles and fasciae of the shoulder girdle. Axillar cavity. Muscles and fascias of the shoulder. Topography of the shoulder.

Muscles Table.

Muscles of the upper extremity				
Muscles	Function	Origin	Insertion	Innervation
Pectoralis major	flexion, adduction, medial rotation of the humerus	clavicular head: medial clavicle anteriorly, sternocostal head: anterior sternum and costal cartilages of ribs 1 to 6 as well as external oblique aponeurosis	lateral edge of intertubercular groove of humerus	medial pectoral nerve (C8, T1) lateral pectoral nerve (C5, C6, C7) of brachial plexus
Pectoralis minor	Depression of shoulder, protraction of scapula	Third, fourth, fifth ribs close to their respective costal cartilages	Coracoid process	Medial pectoral nerve (C8, T1)
Subclavius	Depression and stabilization of clavicle	First rib medially	Middle of clavicle, inferiorly	Nerve to subclavius (C5, C6)
Serratus anterior	Protraction of scapula, rotation of scapula	Lateral first to the eighth rib	anterior scapula, medially	long thoracic nerve (C5, C6, C7)
Latissimus dorsi	Adduction, medial rotation, extension of humerus	Spinous processes of seventh to 12th thoracic vertebrae, iliac crest, thoracolumbar fascia, and inferior third and fourth rib	Intertubercular groove of humerus	Thoracodorsal nerve (C5,C6,C7)

Trapezius	Elevation, depression, and retraction of the scapula, rotation of glenoid cavity	Superior nuchal line, nuchal ligament, occipital protuberance, spinous processes of C7- T12	Spine of scapula, acromion, and lateral clavicle	CN XI
Levator scapulae	Adduction, medial rotation, extension of humerus	Transverse processes of C1 through C4 vertebrae	Scapula at its medial border	Thoracodorsal nerve (C5, C6, C7)
Rhomboid major	Retraction of scapula and depression of glenoid cavity	Spinous processes of T2 through T5 vertebrae	Inferior aspect of medial scapula	Dorsal scapular nerve (C4, C5)
Rhomboid minor	Retraction of scapula and depression of glenoid cavity	Nuchal ligament as well as spines of C7 and T1 vertebrae	Superior aspect of medial scapula	Dorsal scapular nerve (C4, C5)
Deltoid	Anterior part: flexion and medial rotation of arm, middle part: abduction of arm, posterior part: extension and lateral rotation of arm	Lateral clavicle, acromion and scapular spine	Deltoid tuberosity	Axillary nerve (C5, C6)
Teres major	Adduction and medial rotation of arm	Posterior surface of scapula at its inferior angle	Intertubercular groove on its medial aspect	Lower scapular nerve (C5, C6)
Supraspinatus	Initiation of arm abduction	Posterior scapula, superior to the scapular spine	Superior aspect of the greater tubercle	Suprascapular nerve (C5, C6)
Infraspinatus	Lateral rotation of arm	Posterior scapula, inferior to the scapular spine	Greater tubercle of humerus, between supraspinatus and teres minor insertion	Suprascapular nerve (C5, C6)
Teres minor	Lateral rotation of arm	Posterior surface of scapula at its inferior angle	Inferior aspect of the greater tubercle	Axillary nerve (C5, C6)
Subscapularis	Adduction and medial rotation of the arm	Anterior aspect of scapula	Lesser tubercle of humerus	Subscapular nerves (C5, C6, C7)
Biceps brachii	Major flexion of forearm, supination of forearm, resists	Short head originates from the coracoid process. The	Radial tuberosity and forearm fascia (as	Musculocutaneous nerve (C5, C6)

	dislocation of shoulder	long head is from the supraglenoid tubercle of scapula	bicipital aponeurosis)	
Brachialis	Flexion of forearm	Distal anterior humerus	Coronoid process and ulnar tuberosity	musculocutaneous nerve (C5, C6, C7 small contribution)
Coracobrachialis	Flexion and adduction of arm	Coracoid process	Middle of the humerus, on its medial aspect	Musculocutaneous nerve (C5, C6, C7)
Triceps brachii	Major extensor of forearm, resists dislocation of shoulder	Lateral head: above the radial groove, medial head: below the radial groove, long head: infraglenoid tubercle of scapula	Olecranon process of ulna and forearm fascia	Radial nerve (C6,C7,C8)
Anconeus	Extension of forearm, stabilization of elbow joint	Lateral epicondyle of humerus	Olecranon process and posterior ulna	Radial nerve (C7, C8, T1)
Pronator teres	Pronation of radio-ulnar joint	Coronoid process and medial epicondyle of humerus	Lateral surface of the radius	Median nerve (C6, C7)
Flexor carpi radialis	Flexion and adduction at the wrist	Medial epicondyle of humerus	Base of second metacarpal	Median nerve (C6, C7)
Palmaris longus	Flexion at the wrist, tensing of the palmaris aponeurosis	Medial epicondyle of humerus	Flexor retinaculum	Median nerve (C7, C8)
Flexor carpi ulnaris	Flexion and adduction at the wrist	Medial epicondyle of humerus and olecranon	Pisiform, hook of hamate and fifth metacarpal	Median nerve (C7, C8)
Flexor digitorum superficialis	Flexion of the proximal interphalangeal joint of the second, third, fourth, and fifth finger. Also has a weaker flexion action on the metacarpophalangeal joints of the same fingers	Medial epicondyle, coronoid process, and anterior radius	Second, third, fourth, and fifth middle phalanges	Median nerve (C7, C8, T1)

Flexor digitorum profundus	Flexion of the distal interphalangeal joint of the second, third, fourth, and fifth finger	Medial and anterior surface of proximal ulna and interosseous membrane	Second, third, fourth, and fifth distal phalanges	Ulnar nerve (C8, T1) for the medial part, anterior interosseous nerve (C8,T1) for the lateral
Flexor pollicis longus	Flexion of the interphalangeal joint of the thumb	Anterior aspect of radius as well as interosseous membrane	Base of distal phalanx of thumb	Anterior interosseous nerve (C7, C8)
Pronator quadratus	Pronator of forearm	Anterior aspect of distal ulna	Anterior aspect of distal radius	Anterior interosseous nerve (C7, C8)
Brachioradialis	Weak flexor of the forearm	Proximal supracondylar ridge on humerus	Lateral surface of distal end of radius	Radial nerve (C5, C6, C7)
Extensor carpi radialis longus	Extension and abduction of the wrist	Proximal supracondylar ridge on humerus	Dorsal base of second metacarpal	Radial nerve (C6, C7)
Extensor carpi radialis brevis	Extension and abduction of the wrist	Lateral epicondyle of humerus	Dorsal base of third metacarpal	Deep branch of the radial nerve (C7, C8)
Extensor digitorum	Extension of the proximal interphalangeal joint of the second, third, fourth, and fifth finger. Also has a weaker extension action on the metacarpophalangeal joints of the same fingers	Lateral epicondyle of humerus	Extensor expansions on dorsal aspect of second, third, fourth, and fifth middle and distal phalanges	Posterior interosseous nerve (C7, C8)
Extensor digiti minimi	Extension of the little finger at metacarpophalangeal joint and interphalangeal joint	Lateral epicondyle of humerus	Extensor expansion on dorsal aspect of fifth phalanx	Posterior interosseous nerve (C7, C8)
Extensor carpi ulnaris	Extension and adduction of the wrist	Lateral epicondyle of humerus and posterior ulna	Fifth metacarpal base	Posterior interosseous nerve (C7, C8)
Extensor indicis	Extension of the index finger	Dorsal surface of distal ulna and interosseous membrane	Extensor expansion of second finger	Posterior interosseous nerve (C7, C8)
Supinator	Supination of the forearm	Lateral epicondyle and	Lateral surface of radius	Deep branch of radial nerve

		supinator crest of ulna		(C7, C8)
Abductor pollicis longus	Abduction of the thumb by acting on the carpometacarpal joint and the metacarpophalangeal joint	Dorsal aspects of proximal radius, ulna, and interosseous membrane	Base of first metacarpal	Posterior interosseous nerve (C7, C8)
Extensor pollicis longus	Extension of the thumb by acting on the carpometacarpal joint, the metacarpophalangeal joint, and the interphalangeal joint.	Dorsal aspects of middle ulna and interosseous membrane	Distal phalanx of 1st finger	Posterior interosseous nerve (C7, C8)
Extensor pollicis brevis	Extension of the thumb by acting on the carpometacarpal joint and the metacarpophalangeal joint	Dorsal aspects of middle radius and interosseous membrane	Distal phalanx of 1st finger	Posterior interosseous nerve (C7, C8)
Opponens pollicis	Opposition of the thumb	Flexor retinaculum and tubercle of trapezium	Lateral aspect of first metacarpal	Recurrent branch of median nerve (C8, T1)
Abductor pollicis brevis	Abduction of the thumb at the metacarpophalangeal joint	Flexor retinaculum and tubercle of scaphoid	Lateral aspect of proximal phalanx of first finger	Recurrent branch of median nerve (C8, T1)
Flexor pollicis brevis	Flexion of the thumb at the metacarpophalangeal joint	Flexor retinaculum and tubercle of trapezium	Lateral aspect of proximal phalanx of first finger	Recurrent branch of median nerve (C8, T1)
Adductor pollicis	Adduction of the thumb	Second, third metacarpal, and capitate	Proximal phalanx and extensor expansion of 1st finger	Deep branch of ulnar nerve (C8, T1)
Abductor digiti minimi	Abduction of the little finger at the metacarpophalangeal joint	Pisiform	Medial aspect of proximal phalanx of fifth finger	Deep branch of ulnar nerve (C8, T1)
Flexor digiti minimi brevis	Flexion of the little finger at the metacarpophalangeal joint	Flexor retinaculum and hook of hamate	Medial aspect of proximal phalanx of fifth finger	Deep branch of ulnar nerve (C8, T1)
Opponens digiti	Opposition of the little finger	Flexor retinaculum and	Medial aspect of fifth	Deep branch of ulnar nerve

minimi		hook of hamate	metacarpal	(C8, T1)
Lumbricals	Flexion of the metacarpophalangeal joints with extension of the interphalangeal joints	Arise from tendons of flexor digitorum profundus. First 2 are unipennate, and the third and fourth are bipennate	Extensor expansions of second, third, fourth, and fifth finger	Median nerve (C8, T1) for the lateral 2 lumbricals, deep branch of ulnar nerve (C8, T1) for the medial 2 lumbricals
Dorsal interossei	Abduction of the second, third, and fourth finger away from the axial line	Adjacent metacarpals	Extensor expansions and proximal phalanges of the second, third, and fourth fingers	Deep branch of ulnar nerve (C8, T1)
Palmar interossei	Adduction of the second, third, and fourth finger towards the axial line	Palmar surfaces of second, fourth, and fifth metacarpals	Extensor expansions and proximal phalanges of the second, fourth, and fifth fingers	Deep branch of ulnar nerve (C8, T1)

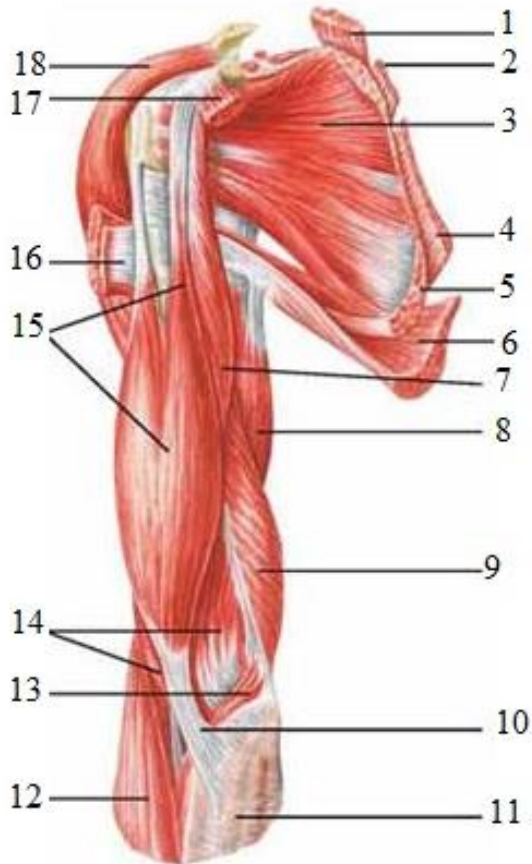
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Shoulder bursitis.

Infection of any of the bursa (usually the subacromial bursa) surrounding the shoulder joint will lead to pain known as bursitis. Pain mainly occurs upon movement especially abduction when the bursa becomes compressed between the tendons of the rotator cuff muscles and the acromion process. Treatment includes anti-inflammatory medication, drainage, steroid injection (if non infectious) and more aggressive treatment e.g. intravenous antibiotic therapy or even arthroscopic joint wash out.

Rotator cuff tear

The rotator cuff is formed by four muscles, supraspinatus, infraspinatus, teres minor, and subscapularis. Tearing most commonly occurs in the tendon of supraspinatus. As the supraspinatus passes under the subacromial arch it is vulnerable to rupture from a bony spur. Supraspinatus tears result in inability to initiate shoulder abduction. A rotator cuff tear presents with general pain with overhead activities and may present with night pain.



A.

Write all anatomical structures.

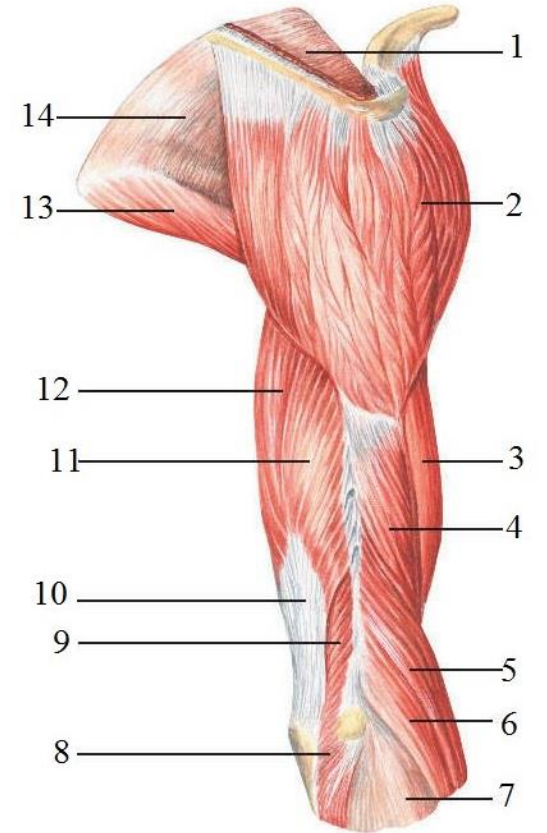
Muscles of the shoulder and arm.

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B.

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Questions:

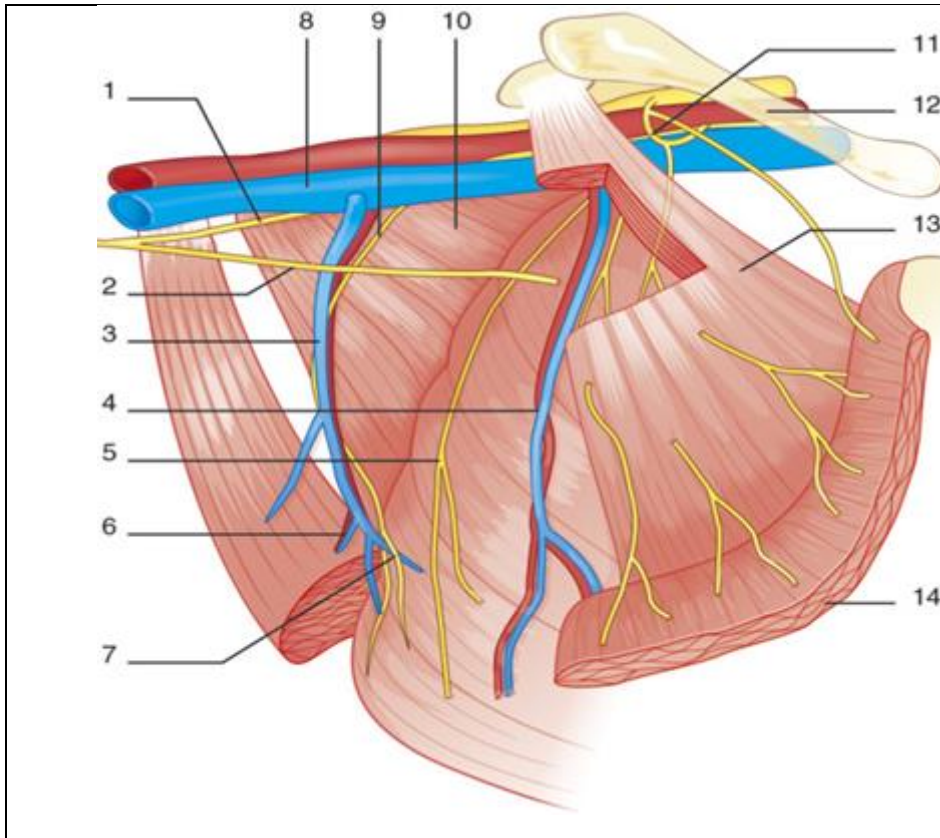
1. A 45-year-old man was admitted to a traumatology center after a shoulder home accident. Examination has shown the absence of extension, adduction and pronation functions of the shoulder. What muscle has been injured? _____
2. An X-ray examination has a comminuted fracture of the infraglenoid tubercle of a patient in the shoulder joint area. Tendon of what muscle head beginning in this place has been damaged? _____
3. A patient complains of impossible external rotation caused by a shoulder trauma in the great tubercle of humeri area. What muscles are injured? _____
4. A man cannot bend his arm in the elbow joint because of a wound of interior shoulder surface. Which muscle is injured? _____

4. A patient has a fissure of the shaft of humerus posterior surface diagnosed. Symptoms of the radial nerve injury in the region of canalis humeromuscularis are observed. What is this canal limited by? _____
5. Due to injured areas of the anterior shoulder the man cannot bend the arm in the elbow joint. Which of the muscles was likely damaged? _____

6. After falling from a tree, the boy experienced the difficulty to abduct the arm up to the horizontal position. Which of these muscles was likely damaged? _____
7. The 42 year old man was asked for medical assistance as for the incised wound of the lower part of the anterior surface of the shoulder. On examination: shortness of flexion of the forearm. Which of these muscles is likely damaged? _____

8. After trauma the patient can't straighten the arm in the elbow joint. Impairment of which of the major muscles can cause it? _____

9. What limits the posterior wall of the axillary cavity: _____



Anatomical structure of the axillary cavity.
 Write all anatomical structures.

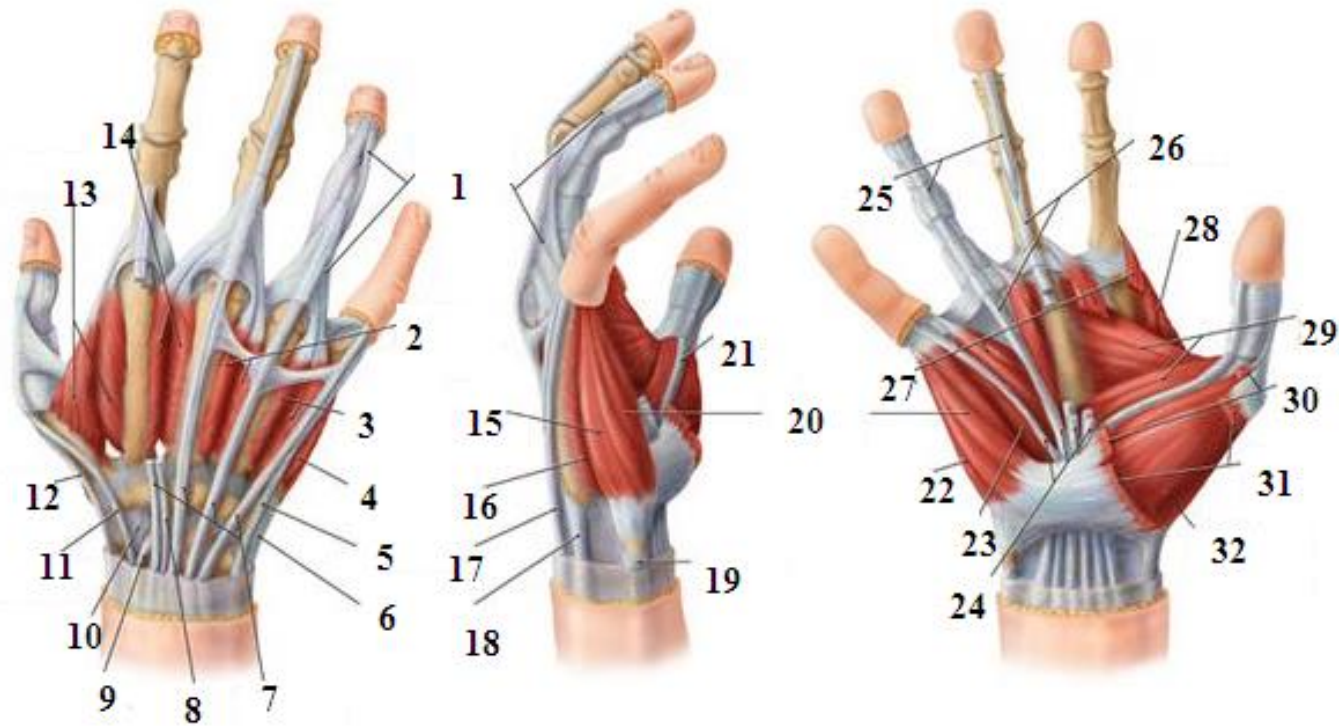
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CR!

Spread of infections.

The local arrangement of the shoulder fascia determines the precise course of the pus or infectious material spreads within the axillary region. The infectious spread (suppuration) may be superficial or deep to the clavipectoral fascia, and may be between the pectoral muscles or sometimes posterior to the pectoralis minor.

If it occurs between the pectoral muscles, an abscess would appear at the edge of the anterior axillary fold or the groove between deltoid and pectoralis major. If it occurs posterior to pectoralis minor, pus usually travels to surround vessels and nerves and ascend into the neck which is the direction of least resistance. The infectious material may also track along the vessels into the arm. When an axillary abscess is incised, the scalpel



Muscles and tendons of the hand.

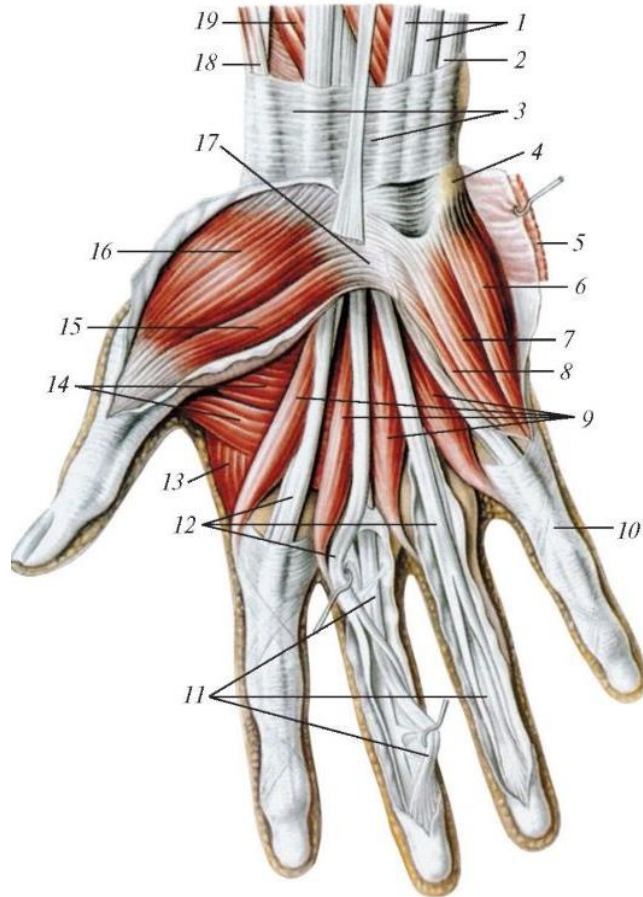
Write all anatomical structures.

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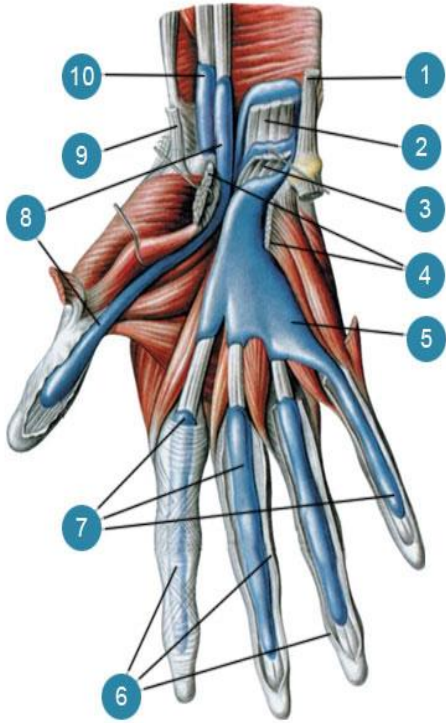
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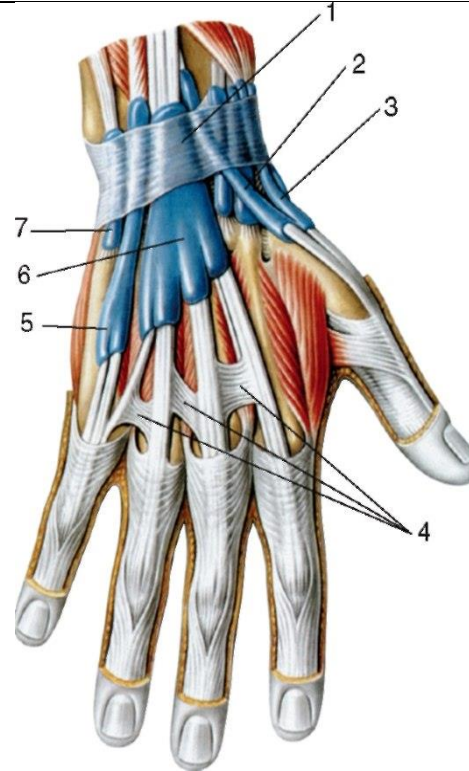
Write all anatomical structures.

Muscles of the hand.

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A



B

Write all anatomical structures.

The synovial vagina of the right hand: a- palmar surface; b- external surface.

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CR!

Forearm.

A chronic false strain of the superficial flexors often leads to inflammation and increased connective tissue in the common flexor tendon at the medial epicondyle of the humerus (medial epicondylitis). Particularly golfers are affected by this condition as they permanently have to flex their hand wrist for the swing. For that reason, this condition is also referred to as the golfer's elbow.

Classic symptoms are pain which increases during hand movements and trouble performing day-to-day tasks (e.g. pressing the door handle, hand shaking). Noticeably, adolescent baseball players often suffer from the medial epicondylitis as well ("little league elbow"). The reason is that children's bones have ossification centers as they are still growing. When these experience massive false strain, the pressure is carried forward to the apophysis causing inflammation (apophysitis) or even deformation.

Boutonniere's deformity

This is a bony deformity of the finger or toes associated with rheumatoid arthritis and trauma to the end of the extended finger. It is caused by proximal interphalangeal joint flexion, and distal interphalangeal joint extension. Resulting in the inability to straighten the digit.

Questions:

1. Little finger felon was complicated by the phlegmon of hand and forearm. Purulent process has spread over _____

2. A 38-year-old man with a right hand trauma has been taken to a traumatology center. Examination has shown an incised wound in the region of the right hand thumb eminence, the distal phalanx of the first finger does not bend. What muscle has been damaged? _____

3. A 39-year-old man has been taken to a traumatology center with a left hand trauma. Examination has shown an incised wound in the region of the left hand thumb eminence, the proximal phalanx of the first finger does not bend. What muscle has been damaged? _____

4. Due to injured areas of the anterior shoulder the man cannot bend the arm in the elbow joint. Which of the muscles was likely damaged? _____

5. After falling from a tree, the boy experienced the difficulty to abduct the arm up to the horizontal position. Which of these muscles was likely damaged? _____

6. The 42 year old man was asked for medical assistance as for the incised wound of the lower part of the anterior surface of the shoulder. On examination: shortness of flexion of the forearm. Which of these muscles is likely damaged? _____

7. After trauma the patient can't straighten the arm in the elbow joint. Impairment of which of the major muscles can cause it? _____

8. When performing gymnastic exercises a gymnast bruised the torso area, which corresponds to the medial wall of the axillary fossa. Which muscle forms this wall? _____
9. Due to injured area of the anterior shoulder the man can not bend his arm in the elbow joint. Which of these muscles is likely damaged? _____
10. After trauma the patient cannot abduct the shoulder from the torso. Dysfunction of which muscles was caused this? _____

Topic 31. Muscles and fascias of the pelvic girdle. Muscles and fascias of the thigh. Femoral canal. Muscular and vascular lacunas.

Muscle Table.

Muscles of the lower limb				
Muscle	Origin	Insertion	Nerve	Action
Muscles of gluteal region				
gluteus maximus	outer surface of ilium, sacrum, coccyx, sacrotuberous ligament	iliotibial tract and gluteal tuberosity of femur	inferior gluteal nerve	extends & laterally rotates thigh; through iliotibial tract, it extends knee joint
gluteus medius	outer surface of ilium	greater trochanter of femur	superior gluteal nerve	abducts thigh. Tilts pelvis when walking
gluteus minimus	outer surface of ilium	greater trochanter of femur	superior gluteal nerve	abduct thigh; anterior fibers medially rotate thigh
tensor fasciae latae	iliac crest	iliotibial tract	superior gluteal nerve	assists gluteus major in locking the knee into full extension
piriformis	anterior surface of sacrum	greater trochanteric fossa	1st & 2nd sacral nerves	lateral rotator of thigh
superior gemellus	spine of ischium	greater trochanteric fossa	sacral plexus	lateral rotator of thigh

obturator internus	inner surface of obturator membrane	greater trochanteric fossa	sacral plexus	lateral rotator of thigh
inferior gemellus	ischial tuberosity	greater trochanteric fossa	sacral plexus	lateral rotator of thigh
obturator externus	outer surface of obturator membrane	greater trochanteric fossa of femur	obturator nerve	lateral rotator of thigh
Anterior compartment of thigh				
sartorius	anterior superior iliac spine	upper medial surface of tibia	femoral nerve	flexes, abducts, laterally rotates thigh; flexes & medially rotates leg
iliacus	iliac fossa	with psoas into the lesser trochanter of femur	femoral nerve	flexes thigh on trunk; if thigh is fixed, it flexes the trunk onto the thigh as in sitting up
psoas	12th thoracic body; transverse process, bodies & intervertebral discs of the 5 lumbar vertebrae	lesser trochanter of femur along with iliacus	lumbar plexus	flexes thigh on trunk; if thigh fixed, it flexes trunk onto thigh as in sitting up
pectineus	superior ramus of pubis	upper end shaft of femur	femoral nerve	flexes and adducts thigh
quadriceps femoris, rectus femoris	straight head from anterior inferior iliac spine; reflected head from ilium above acetabulum	quadriceps tendon into patella; into tibial tuberosity by patellar tendon	femoral nerve	extension of leg

quadriceps femoris, vastus lateralis	upper end and shaft of femur	quadriceps tendon into patella; into tibial tuberosity by patellar tendon	femoral nerve	extension of leg
quadriceps femoris, vastus medialis	upper end and shaft of femur	quadriceps tendon into patella; into tibial tuberosity by patellar tendon	femoral nerve	extension of leg
quadriceps femoris, vastus intermedius	shaft of femur	quadriceps tendon into patella; into tibial tuberosity by patellar tendon	femoral nerve	extension of leg
Muscles of medial compartment of thigh				
gracilis	inferior ramus of pubis; ramus of ischium	upper part of shaft of tibia on medial surface	obturator nerve	adducts thigh and flexes leg
adductor longus	body of pubis	posterior surface of shaft of femur	obturator nerve	adducts thigh; assists in lateral rotation
adductor brevis	inferior ramus of pubis	posterior surface of shaft of femur	obturator nerve	adducts thigh; assists in lateral rotation
adductor magnus	inferior ramus of pubis; ramus of ischium, ischial tuberosity	posterior surface of shaft of femur near linea aspera; adductor tubercle of femur	obturator nerve; tibial nerve to hamstring part	adducts thigh and assists in lateral rotation; hamstring part extends thigh
Muscles of posterior compartment of thigh				
biceps femoris	long head from ischial tuberosity; short head from shaft of femur	head of fibula	long head:tibial; short head:common peroneal	flexes and laterally rotates leg; long head extends thigh

semitendinosus	ischial tuberosity	upper part medial surface of shaft of tibia	tibial nerve	flexes and medially rotates leg; extends thigh
semimembranosus	ischial tuberosity	medial condyle of tibia; forms oblique popliteal ligament	tibial nerve	flexes and medially rotates leg; extends thigh
adductor magnus (hamstring part)	ischial tuberosity	adductor tubercle of femur	tibial nerve	extends thigh

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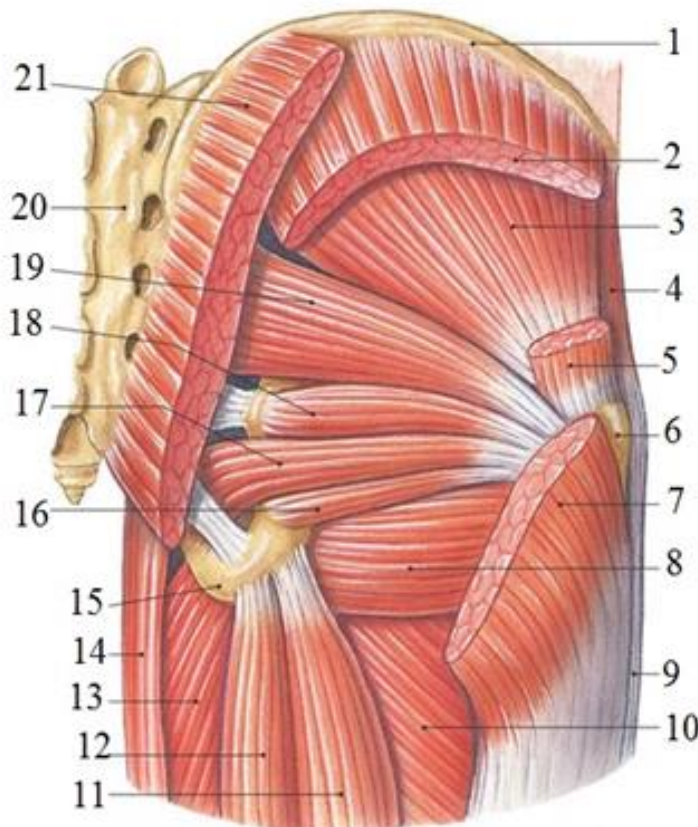
Landmark of the Gluteal Region

The piriformis is an important anatomical landmark in the gluteal region. As the muscle travels through the greater sciatic foramen, it effectively divides the gluteal region into an inferior and superior part. This division determines the name of the vessels and nerves that supply the area. The superior gluteal nerve and vessels emerge into the gluteal region superiorly to the piriformis (and vice versa for the inferior gluteal nerve). In addition, the piriformis can be used to locate the sciatic nerve (a major peripheral nerve of the lower limb). The sciatic nerve enters the gluteal region directly inferior to the piriformis, and is visible as a flat band, approximately 2cm wide.

Questions:

1. During physical training, a 17-year-old pupil felt pain in the hip joint after the lower extremity internal rotation. Traumatologist detected an injury of a muscle tendon. What muscle is it? _____
2. During the game, a basketball-player injured his right leg in consequence of which he couldn't bend the right foot. A doctor detected that tendons were injured. The tendon of what muscle was injured? _____
3. A 55-year-old patient was hospitalized in result of the trauma of the medial group of femoral muscles. What kind of movements is the patient unable to do? _____
4. What muscles goes through lacuna musculorum? _____
5. What muscles goes through foramen ischiadicum major? _____
6. The patient was admitted to the hospital with inflammation of the adipose body of the gluteal anal area. During the operation a surgeon must know which muscle limits its lateral wall: _____
7. The surgeon carries out operation in the area of the femoral triangle. What muscle is it bounded by laterally? _____

8. The patient was admitted to hospital with the injury of the medial group of muscles of the thigh. What movements can the patient not do? ____

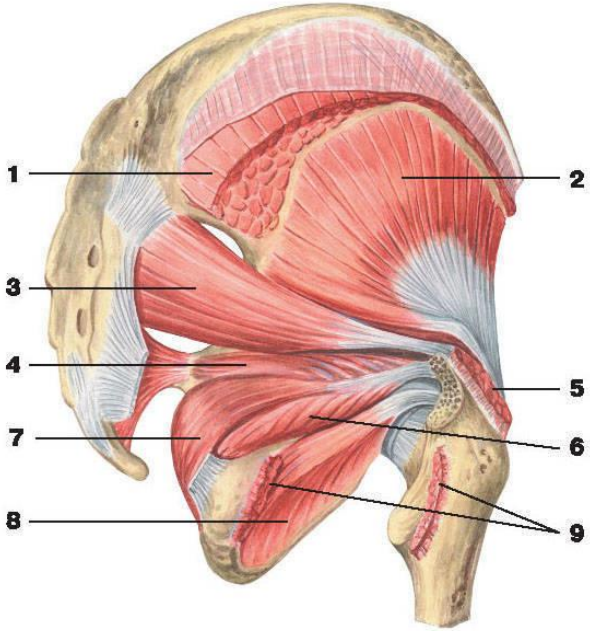
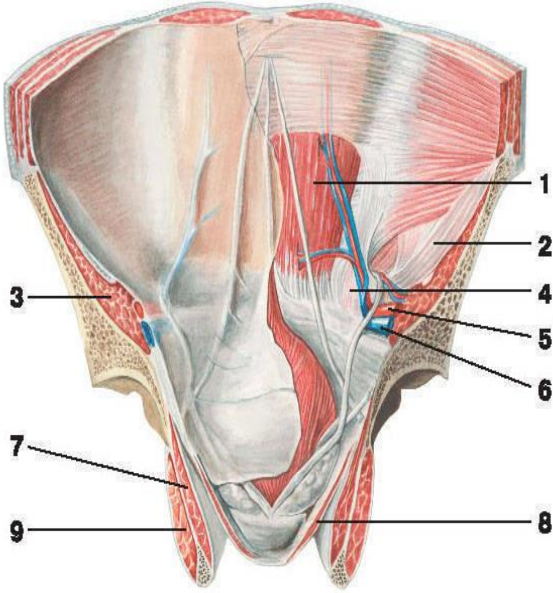
	<p>Write all anatomical structures. Muscles of the pelvic girdle.</p> <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____ 13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____ 19. _____ 20. _____ 21. _____
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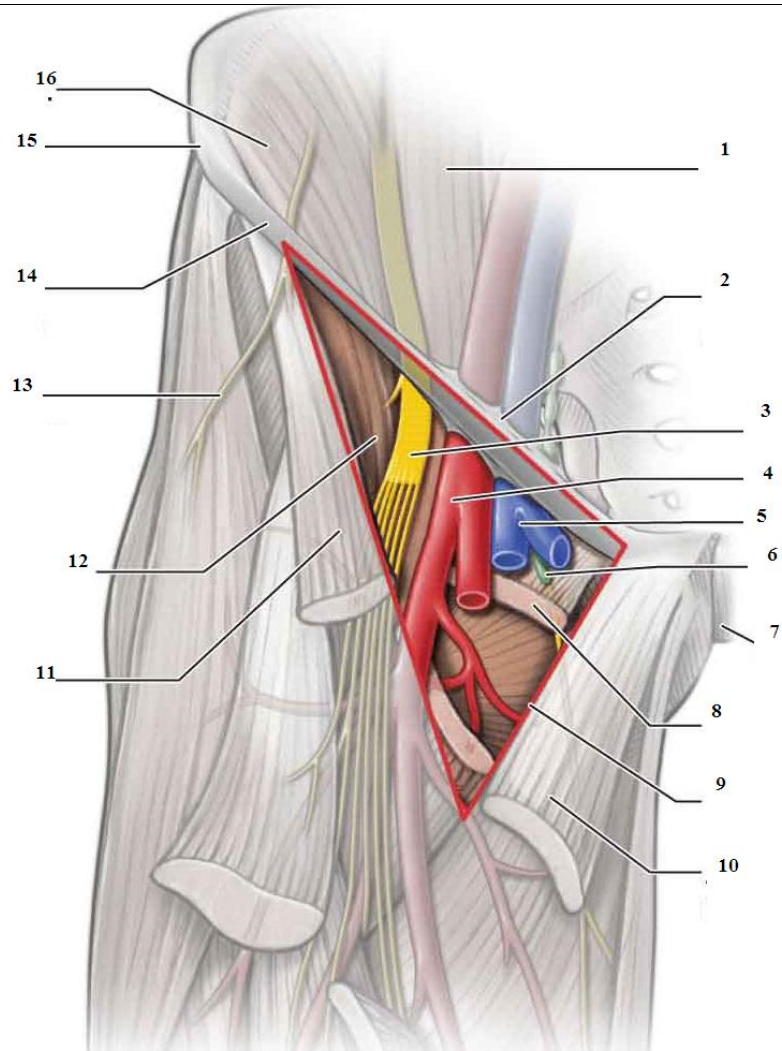
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Injury to the Adductor Muscles

Strain of the adductor muscles is the underlying cause of what is colloquially known as a 'groin strain'. The proximal part of the muscle is most commonly affected, tearing near their bony attachments in the pelvis.

Groin injuries usually occur in sports that require explosive movements or extreme stretching. Treatment of any muscle strain should utilise the RICE protocol – rest, ice, compression and elevation.

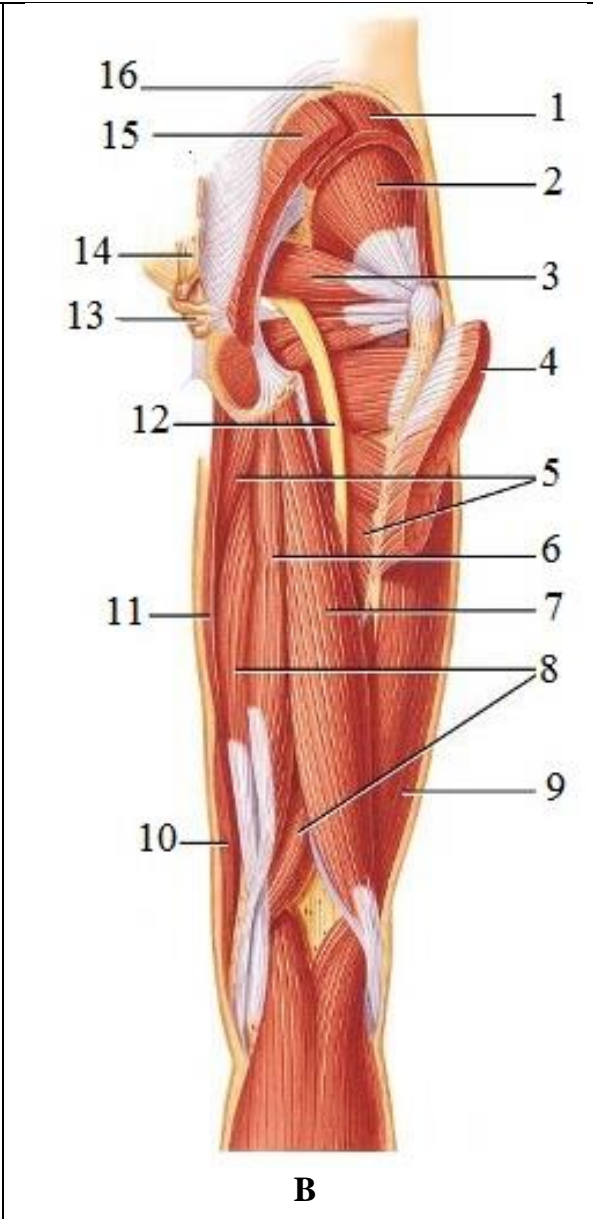
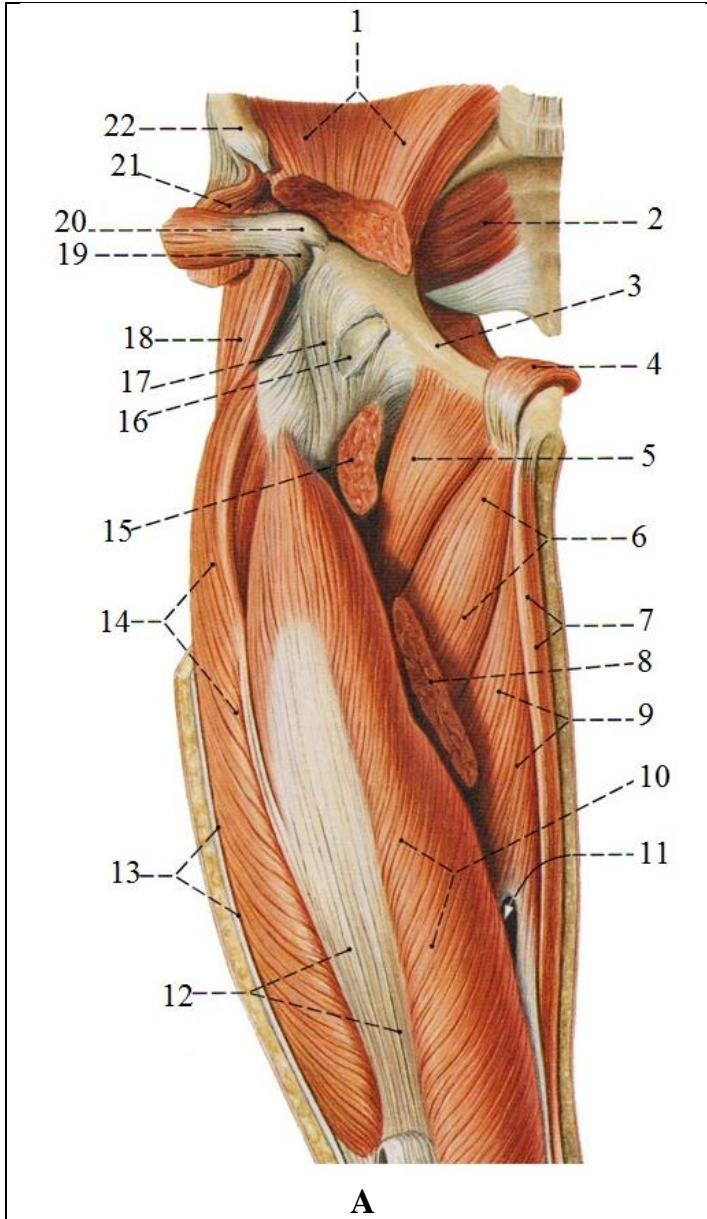
 <p style="text-align: center;">A.</p>	 <p style="text-align: center;">B.</p>	<p>Write all anatomical structures.</p> <p>A</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p> <p>B</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p> <p>9. _____</p> <p>—</p>
<p>Muscles: A - pelvis, posterior aspect; B - the muscles of the anterior abdominal wall and pelvis.</p>		



Write all anatomical structures.

Femoral triangle.

1. _____
2. _____
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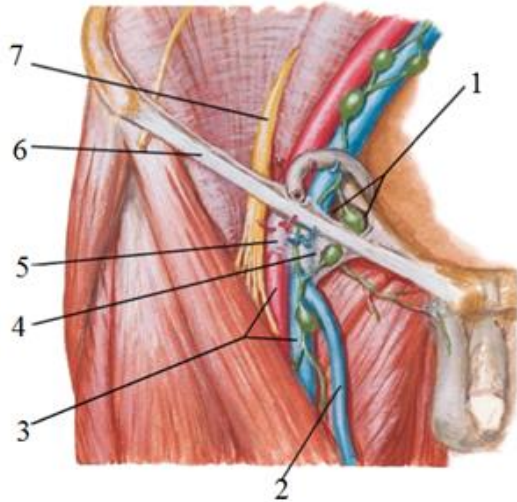


Write all anatomical structures.

- A**
1. _____
 2. _____
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 21. _____
 22. _____
- B**
1. _____
 2. _____
 3. _____
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 7. _____

The muscles of the pelvis and thighs: a – anterior aspect, B –posterior aspect.

- 8. _____
- 9. _____
- 10. _____
- 11. _____
- 12. _____
- 13. _____
- 14. _____
- 15. _____
- 16. _____



Femoral canal.

Write all anatomical structures.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____

Questions:

1. A patient with a hip injury experiences the difficulty in shin extension. What muscle was affected? _____
2. A 60 year old female patient complains about the inability to adduct the thigh to the stomach. History: injury of soft tissues and muscles of the medial femoral area group. What muscles lost its function? _____
3. The patient experiences inflammation of the ischial bursa of gluteus maximus muscle. The doctor diagnosed an inflammation and recorded in the medical history that the patient had: _____

4. During examination an orbicular induration in the popliteal fossa has been found in the female patient. The doctor explained the patient that there is an urgent need to remove it and send to the analysis. What limits the popliteal fossa laterally and superficially? _____
-

Topic 32. Muscles of the leg (shin) and foot.

Muscle Table.

Muscles of the lower limb				
Muscle	Origin	Insertion	Nerve	Action
Muscles of anterior compartment of the leg				
tibialis anterior	shaft of tibia and interosseous membrane	medial cuneiform & base of first metatarsal	deep peroneal nerve	extends the foot; inverts foot at subtalar and transverse tarsal joints; supports medial longitudinal arch
extensor digitorum	shaft of fibula and interosseous membrane	extensor expansion of lateral four toes	deep peroneal nerve	extends toes; dorsiflexes (extends) foot
peroneus tertius	shaft of fibula & interosseous membrane	base of 5th metatarsal bone	deep peroneal nerve	dorsiflexes (extends) foot; everts foot at subtalar and transverse tarsal joints
extensor hallucis longus	shaft of fibula & interosseous membrane	base of distal phalanx of big toe	deep peroneal nerve	extends big toe; dorsiflexes (extends) foot; inverts foot at subtalar and transverse tarsal joints
Muscles of lateral compartment of leg				
peroneus longus	shaft of fibula	base of 1st metatarsal & medial cuneiform	superficial peroneal nerve	plantar flexes foot; everts foot at subtalar & transverse tarsal joints; supports lateral longitudinal and transverse arches of foot
peroneus brevis	shaft of fibula	base of 5th metatarsal bone	superficial peroneal nerve	plantar flexes foot; everts foot at subtalar & transverse tarsal joints;

				supports lateral longitudinal arch
Muscles of posterior compartment of the leg				
gastrocnemius	medial and lateral condyles of femur	by way of Achilles tendon to calcaneum	tibial nerve	plantar flexes foot; flexes leg
plantaris	lateral supracondylar ridge of femur	calcaneum	tibial nerve	plantar flexes foot; flexes leg
soleus	shafts of tibia and fibula	by way of achilles tendon into calcaneum	tibial nerve	with gastrocnemius & plantaris is powerful plantar flexor of foot; provides main propulsive force in walking & running
popliteus	lateral condyle of femur	shaft of tibia	tibial nerve	flexes leg; unlocks full extension of knee by laterally rotating femur on tibia
flexor digitorum longus	shaft of tibia	distal phalanges of lateral four toes	tibial nerve	flexes distal phalanges of lateral four toes; plantar flexes foot; supports medial and lateral longitudinal arches of foot
flexor hallucis longus	shaft of fibula	base of distal phalanx of big toe	tibial nerve	flexes distal phalanx of big toe; plantar flexes foot; supports medial longitudinal arch
tibialis posterior	shafts of tibia and fibula & interosseous membrane	tuberosity of navicular bone	tibial nerve	plantar flexes foot; inverts foot at subtalar and transverse tarsal joints; supports medial longitudinal arch of foot
Muscles on the dorsum of foot				
extensor digitorum brevis	calcaneum	by four tendons into the proximal phalanx of big toe and long extensor tendons to 2nd, 3rd and 4th toes	deep peroneal nerve	extends toes
Muscles of the sole of the foot (first layer)				
abductor hallucis	medial tubercle of calcaneum; flexor retinaculum	medial side, base of proximal phalanx of big toe	medial plantar nerve	flexes, abducts big toe; supports medial arch
flexor digitorum	medial tubercle of	middle phalanx of four lateral toes	medial plantar	flexes lateral four toes; supports medial

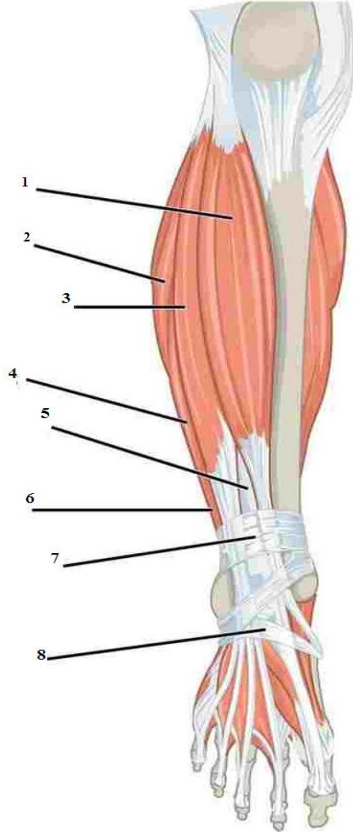
brevis	calcaneum		nerve	& lateral longitudinal arches
abductor digiti minimi	medial & lateral tubercles of calcaneum	lateral side base of proximal phalanx 5th toe	lateral plantar nerve	flexes, abducts 5th toe; supports lateral longitudinal arch
Muscles of sole of foot (second layer)				
flexor accessorius (quadratus plantae)	medial and lateral sides of calcaneum	tendons flexor digitorum longus	lateral plantar nerve	aids long flexor tendon to flex lateral four toes
flexor digitorum longus tendon	shaft of tibia	base of distal phalanx of lateral four toes	tibial nerve	flexes distal phalanges of lateral four toes; plantar flexes foot; supports longitudinal arch
lumbricals	tendons of flexor digitorum longus	dorsal extensor expansion of lateral four toes	1st lumbrical from medial plantar; remainder lumbricals from deep branch of lateral plantar nerve	extends toes at interphalangeal joints
flexor hallucis longus	shaft of fibula	base of distal phalanx of big toe	tibial nerve	flexes distal phalanx of big toe; plantar flexes foot; supports medial longitudinal arch
Muscles of sole of foot (third layer)				
flexor hallucis brevis	cuboid, lateral cuneiform bones; tibialis posterior insertion	medial & lateral sides of base of proximal phalanx of big toe	medial plantar nerve	flexes metatarsophalangeal joint of big toe; supports medial longitudinal arch
adductor hallucis (oblique head)	bases of 2nd, 3rd & 4th metatarsal bones	lateral side base of proximal phalanx big toe	deep branch of lateral plantar	flexes big toe, supports transverse arch
adductor hallucis	plantar ligaments	lateral side of base of proximal	deep branch of	flexes big toe; supports transverse arch

(transverse head)		phalanx big toe	lateral plantar nerve	
flexor digiti minimi brevis	base of 5th metatarsal bone	lateral side of base of proximal phalanx of big toe	superior branch of lateral plantar nerve	flexes little toe
Muscles of sole of foot (fourth layer)				
dorsal interossei (4)	adjacent sides of metatarsal bones	bases of phalanges and dorsal expansion of corresponding toes	lateral plantar nerve	abduct toes with 2nd toe as the reference; flex metatarsophalangeal joints; extend interphalangeal joint
plantar interossei (3)	3rd, 4th, and 5th metatarsal bones	bases of phalanges & dorsal expansion of corresponding toes	lateral plantar nerve	adduct toes with 2nd toe as reference; flex metatarsophalangeal joints; extend interphalangeal joints
tendon of peroneus longus	see above	see above	see above	see above
tendon of tibialis posterior	see above	see above	see above	see above

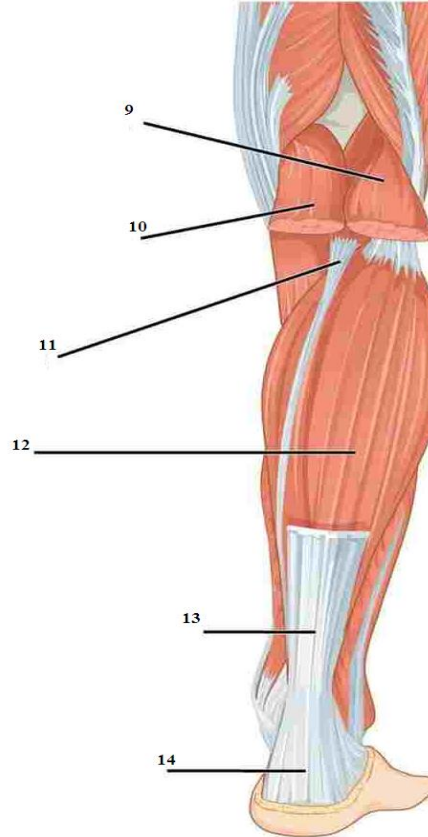
CR!

The insufficiency of the ligaments and muscles of the foot sole often lead to foot deformities. One of the most common is the bunion (hallux valgus), which characterized by a abnormal adduction of the metatarsal bone of the big toe. This results in a noticeable deviation of the great toe/hallux laterally towards the second toe. Typical symptoms are callus formation around the first metatarsophalangeal joint, pain during stress and restriction of mobility. Obese women wearing inappropriate shoes (high-heeled, tight, pointy) and lacking physical exercise are particularly in risk of suffering from bunions. Treatment for bunions usually begins by means of relatively conservative treatments such as rest, ice and medications for pain and inflammation. These interventions however, do not deal with the actual deformity involved, and function mainly to relieve discomfort and pain. In more serious cases, surgical intervention by means of a bunionectomy may be undertaken by a podiatric or orthopaedic surgeon.

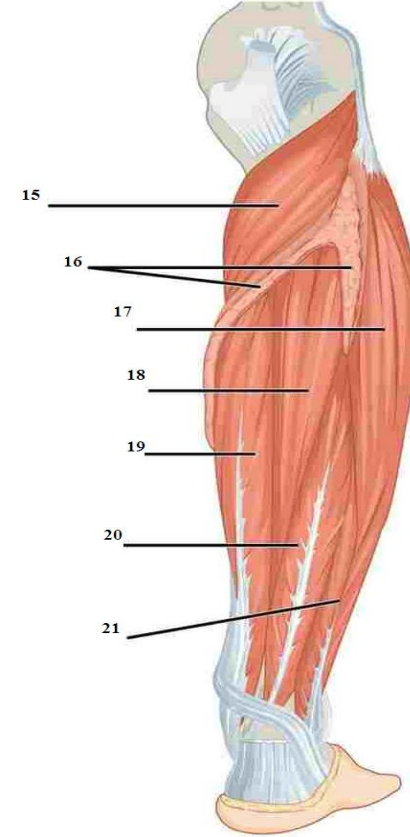
Write all anatomical structures.



Superficial muscles of the right lower leg (anterior view)



Superficial muscles of the right lower leg (posterior view)



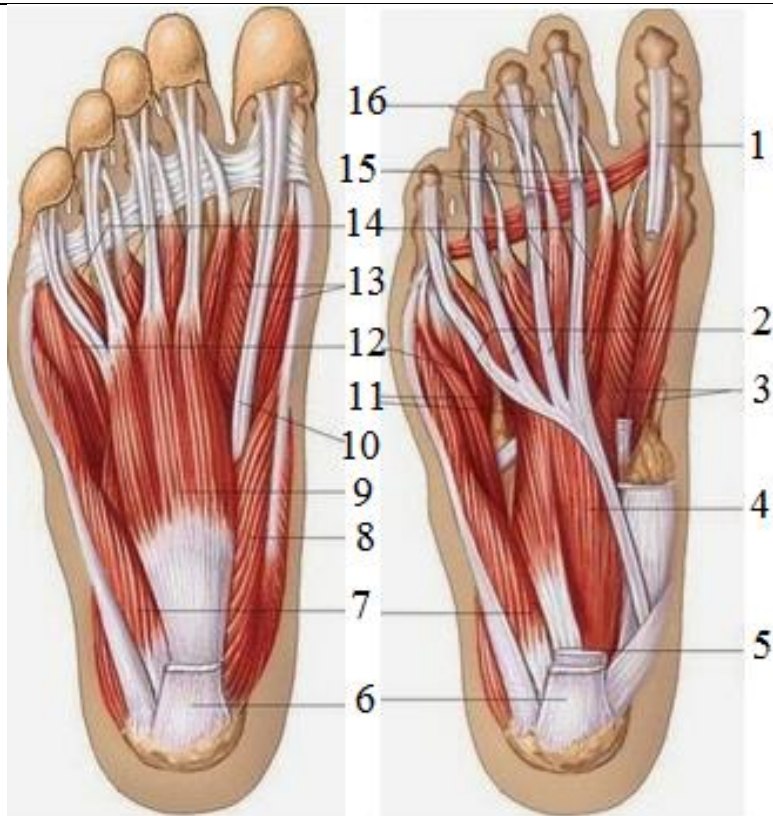
Deep muscles of the right lower leg (posterior view)

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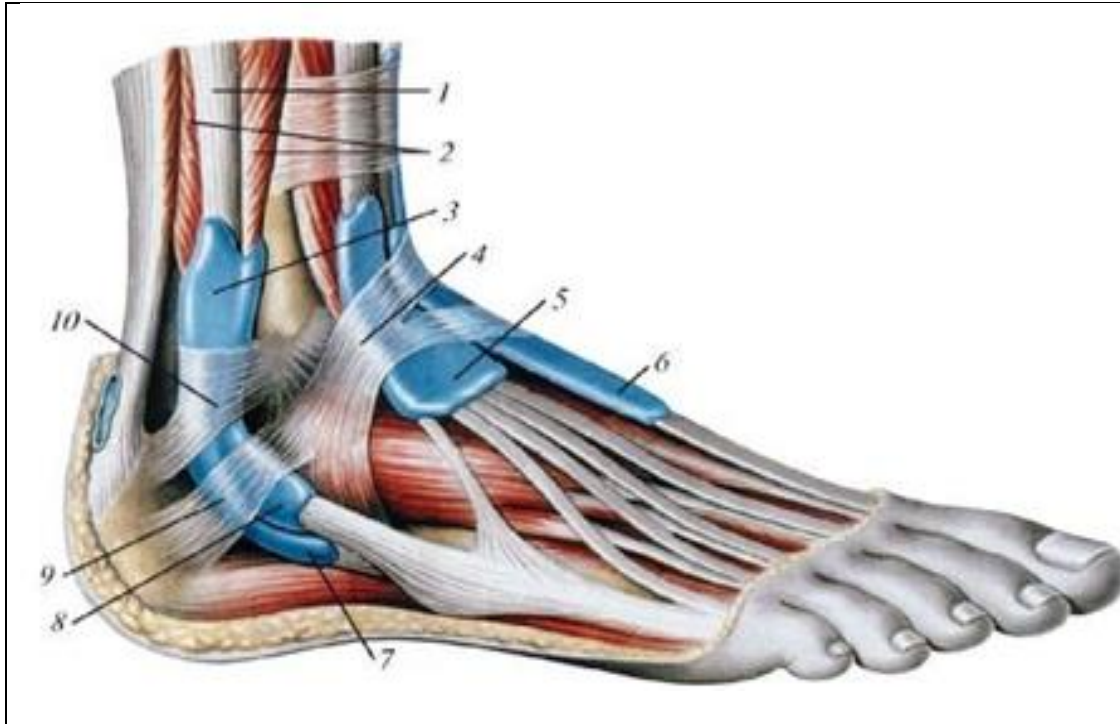
19. _____
20. _____
21. _____



Muscles of the foot.

Write all anatomical structures.

1. _____
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16. _____



Muscles of the foot, synovial vagina.

Write all anatomical structures.

1. _____
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9. _____
10. _____

Questions:

1. The patient was admitted to the hospital with inflammation of the adipose body of the gluteal anal area. During the operation a surgeon must know which muscle limits its lateral wall: _____
2. The surgeon carries out operation in the area of the femoral triangle. What muscle is it bounded by laterally? _____
3. During the surgery within the anterior femoral area the surgeon examines the contents of sulcus iliopectineus. What muscle limits it laterally? _____
4. The patient was admitted to hospital with the injury of the medial group of muscles of the thigh. What movements can the patient not to do? _____
5. A patient with a hip injury experiences the difficulty in shin extension. What muscle was affected? _____

6. After a long walk on the bike, the young man felt pain in the knee joints while going down the stairs. The pain intensifies in knee extension. What muscle was overextended? _____
7. A 60 year old female patient complains about the inability to adduct the thigh to the stomach. History: injury of soft tissues and muscles of the medial femoral area group. What muscles lost its function? _____
-
8. The patient experiences inflammation of the ischial bursa of gluteus maximus muscle. The doctor diagnosed an inflammation and recorded in the medical history that the patient had: _____
9. During examination an orbicular induration in the popliteal fossa has been found in the female patient. The doctor explained the patient that there is an urgent need to remove it and send to the analysis. What limits the popliteal fossa laterally and superficially? _____
-
10. Which of these muscles strains the broad fascia of the thigh: _____
-

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